

SUSTAINABLE DEVELOPMENT: A CHALLENGE TO MUSLIM COUNTRIES

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FACULTY OF HUMANITIES, DEVELOPMENT & SOCIAL SCIENCES

by

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27 February 2009

DECLARATION

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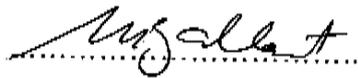
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ABSTRACT

The aim of sustainable development can be summarized as meeting the needs of the present generation, without destroying the needs of the future generations (Brundtland in WCED :1987:5).

The different indicators of sustainable development, as formulated by the United Nations documents, are discussed. These include poverty alleviation, health care, education, security, good governance and trade. The study lists protection of the environment as a sustainable development indicator. This refers to the protection of the atmosphere, the correct usage of land which involves agriculture, the sustainability of water as well as the protection of fauna and flora. It identifies these indicators in the primary sources of Islam.

The study shows that sustainable development was a feature of early development in the Muslim World. It then uncovers the major factors that contributed to environmental degradation in Muslim countries in the late twentieth century as well as some of its consequences.

Finally, the study looks at some of the major challenges that sustainable development poses to Muslim countries. It delineates the obstacles that Muslim countries themselves have recognised, and identifies proposals by Muslim scholars to promote sustainable development. It suggests measures which could facilitate sustainable development by endorsing what are

considered globally as essential principles of sustainable development as well as adopting local processes. The declarations endorsed by Muslim rulers on sustainable development are analyzed. The study suggests that the approaches of the scholars in combination with the declarations could form the basis of a new paradigm of development in the Muslim world based on Islamic principles and values.

TABLE OF CONTENTS

DECLARATION	ii	
ABSTRACT	iii	
TABLE OF CONTENTS	v	
LIST OF TABLES	xiii	
LIST OF FIGURES	xv	
ACKNOWLEDGEMENTS	xvi	
LIST OF ABBREVIATIONS	xvii	
GLOSSARY	xviii	
CHAPTER 1		
INTRODUCTION		1
1.1 Statement of the Problem		1
1.2 Rationale for Research		1
1.3 Significance of the Study		2
1.4 Purpose of the Study		3
1.5 Key Critical Questions		3
1.6 Scope of Research		4
1.7 Limitations		4
1.8 Prior Research		5
1.9 Research Hypothesis & Theory		8
1.10 Research Method		11

1.11 Key Assumptions	15
1.12 Chapter Outline	16
1.13 Literature Review	17
1.14 Chapter Summary	25
CHAPTER 2	
SUSTAINABLE DEVELOPMENT: ORIGIN & MEANING	
2.1 Introduction	26
2.2 Origins of the term sustainable development.	26
2.3. What is sustainable development?	35
2.3.1 Key elements of sustainable development	45
2.3.1.1 Equitable distribution of resources	46
2.3.1.2 Concern for the well being of future generations	47
2.4 Theme Descriptions of sustainable development	48
2.4.1 Environmental features	48
2.4.1.1 The Atmosphere	51
2.4.1.2 Land	56
2.4.1.3 Oceans, Seas and Coasts	63
2.4.1.4 Freshwater	65
2.4.1.5 Biodiversity	68
2.4.1.6 Forests	69

2.4.2 Social Features	70
2.4.2.1 Equity	70
2.4.2.2 The elimination of poverty	71
2.4.2.3 Education	78
2.4.2.4 Housing	81
2.4.2.5 Security	85
2.4.2.6 Population growth	85
2.4.2.7 Health	86
2.4.2.7.1 Sanitation	90
2.5 Economic Performance	92
2.5.1 Economic Structure	92
2.5.2 Consumption and Production Patterns	93
2.5.2.1 Industry	94
2.5.2.2 Energy	94
2.5.2.3 Waste (hazardous)	97
2.5.2.4 Waste (radioactive)	101
2.5.2.5 Waste (solid)	102
2.6 Institutional Structure	105
2.6.1 Institutional Framework	105
2.6.2 Institutional Capacity	110
2.7 The role of science for sustainable development	111

2.8 Good Governance	113
2.9 A Critical Review of Sustainable Development	115
2.10 Chapter Summary	119
CHAPTER 3	
A BRIEF SURVEY OF DEVELOPMENT IN THE MUSLIM WORLD	
3.1 Introduction	120
3.2 Agriculture	121
3.3 Mining	128
3.4 Trade & Industry	129
3.5 Health	144
3.6 Water Systems	153
3.7 Animal Care	159
3.8 Education	160
3.9 Good Governance	179
3.10 Poverty Alleviation	194
3.11 Chapter summary	198
CHAPTER 4	
4.1 Introduction	201
4.2 The influence of industrialization	202

4.3 Impact of economic development on the Environment	206
4.3.1 Pollution of the Atmosphere	206
4.3.2 Degradation of Land	211
4.3.3 Pollution of Oceans, Seas and Coasts	226
4.3.4 Contamination of Freshwater	238
4.3.5 Destruction of Biodiversity	250
4.3.6 Deforestation	260
4.3.7 Dangers of Waste	267
4.3.7.1 Hazardous Waste	267
4.3.7.2 Radioactive Waste	269
4.3.7.3 Solid Waste	270
4.4 Effects of Environmental Degradation	277
4.4.1 Increasing Poverty	277
4.4.2 Deterioration in Health	279
4.5 Challenges of implementation	284
4.6 Measures to facilitate sustainable development	293
4.7 Chapter Summary	300
CHAPTER 5	
SUSTAINABLE DEVELOPMENT PRINCIPLES IN ISLAMIC SOURCES	

5.1 Introduction	301
5.2 Caring for the Environment	304
5.3 Avoiding Wastefulness	310
5.4 Promoting Agriculture	311
5.5 Conserving Water	313
5.6 Avoiding pollution of the atmosphere	317
5.7 Caring for Animals	318
5.8 Avoiding environmental pollution	322
5.9 Maintaining personal and environmental hygiene	322
5.10 Governing with justice	326
5.11 Promoting peace and reconciliation	328
5.12 Alleviating poverty	335
5.13 Engaging in Industry, Trade and Commerce	340
5.14 Educating and disseminating information	342
5.15 Chapter Summary	344
CHAPTER 6	
THE CHALLENGE OF SUSTAINABLE DEVELOPMENT FOR MUSLIM COUNTRIES	
6.1 Introduction	345
6.2 The Approach of Muslim governments	346

6.3 The Approaches of Muslim Scholars	350
6.3.1 Supporting Sustainable Development in principle	350
6.3.2 Giving legal force to Sustainable Development	356
6.3.3 Focus on Sustainable Living	363
6.3.4 Development on the basis of <i>tazkiyyah</i>	364
6.3.5 Infusing sustainable development with ethical values	367
6.3.6 Promoting the <i>shuratic</i> process	369
6.3.7 Reestablishing the Islamic trading system	370
6.3.8 Resurrecting the hisba	371
6.4 Chapter Summary	372
CHAPTER 7	
CONCLUSION: SUMMARY, DISCUSSION, RECOMMENDATIONS	
7.1 Summary of chapters	379
7.2 Discussion	380
7.3 Recommendations	383
Bibliography	389
APPENDICES	439
Appendix 1: Jeddah Commitments for Sustainable Development - 13– 15 December 2006	

Appendix 2 : Abu Dhabi Declaration on Environment and Energy 3

February 2003

Appendix 3: The Sustainable Development Initiative in the Arab Region

Appendix 4: General Framework of Islamic Agenda for Sustainable
Development

Appendix 5: Report on ISESCO Efforts in Environmental, Health &
Population Education

Appendix 6: The Islamic World and Sustainable Development
(Specificities, Challenges and Commitments)

Appendix 7: Arab Ministerial Declaration on Sustainable Development

Appendix 8: Islamic Declaration on Sustainable Development

Appendix 9 : Ottoman Empire Trade Routes

LIST OF TABLES

Table 1 Key elements or dimensions of sustainable development	45
Table 2 Environmental concerns of developing and industrialized countries.	49
Table 3 Top fifteen ‘carbon culprits’	53
Table 4 Causes and impacts of poverty	76
Table 5 Percentage of total children who will not reach one year of age, selected countries.	87
Table 6 The Rio Declaration on Environment and Development	106
Table 7 The major commodities produced by the various regions	130
Table 8 Ottoman exports to European countries and countries in the East	134
Table 9 Egypt state of the environment report 2005	216
Table 10 Overall Estimated Cost of Environmental Degradation in Morocco in 2000	274
Table 11 Overall Estimated Cost of Environmental Degradation in Egypt in 2001	274
Table 12 Overall Estimated Cost of Environmental Degradation in Algeria in 1999	274
Table 13 Overall Estimated Cost of Environmental Degradation in Lebanon in 2000	275

Table 14 Overall Estimated Cost of Environmental Degradation in Tunisia in 1999 275

Table 15 Overall Estimated Cost of Environmental Degradation in Syria in 2001 275

Table 16 Environmental Degradation of Some Muslim Countries 276

LIST OF FIGURES

PAGE

Fig 1 Saharan Trade Routes 140

Fig 2 Kanem, Borno Hausaland & the Niger from 802/1400 to 1008/1600 140

Fig 3 Map of trade routes between West Africa and North Africa 141

Fig 4 Turkey's Energy-Related Carbon Emissions : 1980-1998 209

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LIST OF ABBREVIATIONS

100HS- 100 Historic Sites Secretariat

BPRAC - Blue Plan Regional Activity Centre

C- Carbon

CBD - Convention on Biological Diversity

CFC- chlorofluorocarbon

CH₄ - methane

CITES - Convention on International Trade in Endangered Species

CPRAC - Cleaner Production Regional Activity Centre

CO₂ - carbon dioxide

CSD - Commission on sustainable development

CZM - Coastal Zone Management

DESD - Department of Economic and Social Development

DH - Department of Hydrology

EEC - European Economic Community

EIA - Environmental Impact Statement

EMINWA - UNEP Environmentally Sound Management of Inland Waters

EPC - Environment Protection Council

ESMAP - Energy Sector Management Assistance Program

FAO - Food and Agriculture Organization

GDP- Gross Domestic Product

GDFCD - General Department of Forestry and Combating Desertification

GEF - Global Environmental Fund

GEMS/WATER - the Global Water Quality Monitoring Programme

GHG - globe's greenhouse gas

GIS - Geographic Information System

GTA - General Tourism Authority

HIV/AIDS - HIV stands for Human Immunodeficiency Virus. HIV is the virus that causes AIDS.

AIDS stands for Acquired Immune Deficiency Syndrome. AIDS is the most advanced stage of HIV infection.

HWC - High Water Council

ICIMOD - International Centre for Integrated Mountain Development

ICLEI- International Council for Local Environmental Initiatives

IDA - International Development Association

IFAD - International Fund for Agricultural Development

IIED- International Institute for Environment and Development

IPCC - Intergovernmental Panel on Climate Change

ITTO - International Tropical Timber Organization

IUCN- International Union for Conservation of Nature and Natural Resources

JPOI - Johannesburg Plan of Implementation

LGMB- Local Government Management Board

LPG- Liquid Petroleum Gas

MARPOL - International Convention for the Prevention of Pollution of ships

MAWR - Ministry of Agriculture and Water Resources

MCHUP- Ministry of Construction, Housing and Urban Planning

MCSD: Mediterranean Commission on Sustainable Development

MEDPOL - The Programme for the Assessment and Control of Marine
Pollution in the Mediterranean Region

MEDU - Coordinating Unit for the Mediterranean Action Plan

MOMR - Ministry of Oil and Mineral Resources

NAPED - National Action Plan for Environment and Development

NEAP - National Environmental Action Plan

NGO - Non Government Organization

N₂O – nitrous oxide

NO_x - Oxides of Nitrogen

NPDC - National Program for Desertification Control

NWASA - National Water and Sanitation Authority

ODA – Overseas Development Administration (UK –now the Department of International Development).

OECD- Organisation for Economic Cooperation and Development

PAPRAC - Priority Action Programme Regional Activity Centre

PCB - polychlorinated biphenyls

REMPEC - Regional Marine Pollution Emergency Response Centre

RPAA - Regional Planning Association of America

SARD - sustainable agriculture and rural development

SAW – Sallallāhu 'Alyhi Wasallam

SPARAC - Specially Protected Areas Regional Activity Centre

T. A. – *Ta 'Alā* (Refers to Allāh the Most High)

TAZ- The Tajikistan Aluminum Plant

TVA- Tennessee Valley Authority

UK- United Kingdom

UN- United Nations

UNCED - United Nations Conference on Environment and Development (Rio Conference).

UNCLOS - United Nations Convention on the Law of the Sea

UNCTAD- United Nations Conference on Trade and Development

UNDP - United Nations Development Program

UNFCCC - Montreal Protocol on Reduction of Ozone Depleting Substances and the UN Framework Convention on Climate Change

UNEP- United Nations Environment Program

UNESCO - United Nations Educational, Scientific and Cultural Organization

USAID - United States Agency for International Development

UV-B - The sun gives off ultraviolet radiation that we divide into categories based on the wavelength.

- UVC - 100 to 290 nm
- UVB - 290 to 320 nm

- UVA - 320 to 400 nm

WCED- United Nation's World Commission on Environment and Development

WCS- World Conservation Strategy

WHO - World Health Organization

WSSD – World Summit on Sustainable Development

WWF- World Wide Fund for Nature (formerly World Wildlife Fund)

YAR - Yemen Arab Republic

YR -Yemeni Riāl

GLOSSARY

'*adl* : just

ahādīth (plural of *hadīth*)

amānah : trust

amīn: most important official of the Bayt al- mal in the Mahdist state

amīn al- aṭibbā': chief doctor

ansār: helpers – referring to the people of Madinah who invited the Prophet of Islam and his followers to migrate to their city

ayāt: signs

bayt al-māl: treasury house; an institution from which the poor and needy can obtain material assistance

bedouins: Arab of the desert; Tunisian locals (people from country)

bi'ah: environment

dīyā: waste

Çift: pair of oxen

çift-hane: a system to eliminate poverty

çiftlik: a farm

diwār: register

ezba: a small piece of agricultural land given to peasants in exchange for cheap labor

fiqh: Jurisprudence

ghanīma: one fifth of the war trophy

hadīth: saying of the Prophet of Islam, Muḥammad (SAW).

ḥalāl: those things which are permitted

ḥammām: public bath

hane: families

ḥalqah: a circle of learning

ḥarām: that which is prohibited.

hubus: income of religious donations of properties

'ibādah: worship

'ilm al-farā'id: knowledge of inheritance

ijāzah: license or certificate (e.g to teach or recruit disciples)

imām: preacher

imaret: Soup kitchens

istislāh: to do what is in the public interest

jizya: tax paid by non-Muslims in Muslim lands

katātīb: primary school which taught literacy in Arabic and memorization of the Qur'ān.

khalīfah (pl. *khulafā*): literally, successor; refers to those who succeeded the Prophet (SAW) as rulers

khammes (pl *khamāmis*): farm tenants receive in return for their labor, land, tools, seed and animals one-fifth of the harvest

khāns: inns built around a courtyard where caravans could rest

kharāj: land tax

kuttāb (sing. *katib*): private schools

lyc'ee: French school in colonized area

madāris (sing: *madrasah*): school

majlis: assembly

māristān : hospital (in Tunisia)

médecin toléré: a position created for non- European-trained doctors

masjid: mosque

mevat: dead land

muhājirūn: emigrants – refers to Prophet's Companions who migrated to Madīnah

muhtazeb: bazaar inspector

narh: maximum price system

nisāb: amount of wealth in one's possession which makes the payment of *zakāh* compulsory

qādi (pl. *qudāh*): judge

qanāt: an underground conduit

SAW (Salallāhu 'Alayhi Wasallam): May the Peace and Blessings of Allah be upon him – recited when the name of the Prophet Muhammad is mentioned

sadaqah: voluntary contribution

sipahis: agents

shaykh: an old man, chief of a tribe, a teacher, a religious scholar, a sufi master

tawhīd: the Oneness of Allāh

temlik: grant

ummah: nation/community

'*ulamā'* (sing '*ālim*): a learned person; a religious scholar

'*umra*: lesser pilgrimage

wādīs: watercourses that are dry except in the rainy season

waqf: cash or kind given as a form of charity

zakāt: alms tax; compulsory alms to be paid annually by those in possession of *nisāb* (see above for meaning)

zakāt al-fitr: tax paid at end of Ramadaan

ẓulm: oppression/wrong/injustice

CHAPTER 1

INTRODUCTION

1.1 Statement of the Problem

The Muslim World is currently confronted with serious problems and major challenges in relation to sustainable development. This gives rise to the following questions: What is the impact of current economic development in Muslim countries on the environment? Are sustainable development principles consonant with the teachings of Islam? What challenges do Muslim countries face in respect of sustainable development?

1.2 Rationale for Research

Sustainable development has been accepted by both developed and developing countries as a matter of priority in planning future development. While there are debates about the ideal model of sustainable development, its efficacy for developing countries due to its reliance on modern technology (which these countries cannot afford) as an instrument of development, and about its ultimate goals, it has been generally recognized as one of the major challenges for all governments. Sustainable development goals now form the

development agenda of many, if not most, governments.

It appears, though, that until fairly recently sustainable development has not been treated with the urgency it deserves in the Muslim World. Given the importance that Islam accords to the environment as well as to issues of equity one would have expected Muslim governments to be in the forefront in the drive for sustainable development. This is, unfortunately, not the case, though there are indications that of late they have begun to recognise the importance of sustainable development and have in principle committed themselves to achieving its goals. Concurrently, there has been a steady increase in literature on the subject from a Muslim perspective. Through this study, I hope to add to the awareness of sustainable development issues among Muslim scholars and decision makers.

1.3 Significance of the Study

This study will highlight the influence of economic development in the Muslim World, specifically on the environment. It will demonstrate that many sustainable development principles and elements are supported by Islamic sources. Hopefully, it will encourage policy-makers in the Muslim World to pay greater attention to sustainable development which has become such a critical issue that countries can only ignore it at their own peril.

1.4 Purpose of the Study

The primary purpose of the study is to emphasize the importance of sustainable development for the Muslim World through highlighting the impact of current development in select Muslim countries on the environment.

The aims of the study are:

- (a) to identify sustainable development principles in Islamic sources
- (b) to establish the presence of elements of sustainable development in early development in the Muslim World
- (c) to demonstrate the impact of current economic development on the environment in select Muslim countries
- (d) to highlight the challenges confronting Muslim countries in relation to sustainable development.

1.5 Key Critical Questions

The study attempts to answer the following key critical questions:

- (a) Are sustainable development principles supported by Islamic sources?
- (b) Can elements of sustainable development be located in early development in the Muslim World?

(c) How has current economic development in Muslim countries impacted on the environment?

(d) What are the major challenges facing Muslim countries in relation to sustainable development?

1.6 Scope of Research

The chapters on early development in the Muslim World and impact of current development on the environment focus on select countries in the Muslim World. Since there are over fifty Muslim countries, it is not possible to deal with developments in all or even most of them. The first illustrates early development in the Muslim World in summary form only. A thousand years of Muslim history under various dynasties cannot be captured in detail in a limited study. The second focuses on the impact of economic development on the environment only.

1.7 Limitations

The following limitations of the study are acknowledged:

- Since the study is focused on development in Muslim countries, its findings are naturally applicable to the Muslim World only.

- The scope of development is so vast that the chapters on past and present development in the Muslim World had to be confined to select countries in the first instance and environmental issues in the second.
- The study could not possibly have covered all or even the majority of Muslim countries. The choice of countries was determined by the material available.

1.8 Prior Research

In his Masters Thesis *An Islamic perspective on Sustainable Development in the context of globalization*, Taibu Makwemba identifies the sustainable development issues in the primary sources of Islam in chapter 2. He gives a brief synopsis on the following descriptions of sustainable development: the environment in general, personal and environmental health, sustainable biodiversity, poverty eradication, trade and commerce, prohibition of interest, good governance, education and information dissemination, equality and justice, as well as peace and reconciliation. Many of these definitions were used as a basis for my research.

Makwemba uses Qur'ān and Aḥādīth to discuss his various descriptions of sustainable development. However, he does not include all the themes of sustainable development which can be found in the primary Islamic sources,

viz Qur'ān and Aḥadīth, such as water, the atmosphere, animals, or polluting of the environment. Some of his interpretations of the Islamic sources seem to be his own, because they differ from that of the classical interpreters. His study is a good basis for someone who wants to conduct research on sustainable development, although I think he could have discussed the Islamic resources in greater detail.

In his paper, *Towards an Islamic Jurisprudence of the Environment (Fiqh al-Bi'ah fil-Islam)*, which was delivered at the Belfast Mosque in February 1998, Prof. Dr. Mustafa Abu-Sway gives a convincing rationale for the necessity to protect the environment, citing the relevant Islamic sources. The paper cites many verses of the Qur'ān and Aḥadīth which have a direct bearing on my topic. He sent me the original paper which is in Arabic; this aided my research, particularly on the Aḥadīth. .

In a section of the paper where he discusses the relationship between human beings and the environment, with reference to Islamic sources, he argues that man was made a trustee of the earth and that to take care of the environment is an act of faith and the environment is the loci of the signs pointing to Allāh (SWT). In another section of the paper, *The Islamic protection of the environment*, he provides detailed references from the Qur'ān and the Sunnah regarding the protection of human beings, animals, plants, land, water, and air.

Abu Sway's work provides a good resource for any person who wants to do research on sustainable development from an Islamic perspective. The chapter on sustainable development principles in Islamic sources relies a great deal on the seminal work done by him. Though Abu Sway does not discuss the protection of the oceans, sea or the coast he cites the Qur'ānic verses and Aḥādīth related to the topic of sustainable development. Often he relates these texts to the twentieth century situation which makes his work even more relevant. His analysis of the Aḥādīth, in particular, can be considered to be a pioneering approach.

Fazlun M Khalid's *Islam and the Environment* had a significant impact on my decision to link Qur'ān and Aḥādīth to sustainable development. After reading his work, I was convinced that I could gather enough material for one aspect of my research. He expounds much on what he calls "environmental law" in Islam. It is on this basis that he uses Islamic texts as evidence of their link with the environment.

Khalid reminds humanity of its responsibility to the planet, citing Qur'ān and Aḥādīth as well as historical evidence from the period of the first Kḥalīf, Abū Bakr. His work fails to relate this to the notion of sustainability. However, it is a useful work which provided me with background information for the chapter on Islam's approach to sustainable development.

Mohammed Said Karodia's doctoral thesis entitled *Islam and the Environment within the context of globalization and South Africa* is meant to encourage schools to include environmental studies in their curriculum by emphasizing the importance of environmental conservation. It contains useful references to Qur'anic verses relating to the environment.

The United Nation's publication *Indicators of Sustainable Development: Guidelines and Methodologies*, identifies the different themes of sustainable development, including social equity, poverty eradication, health, education, housing, security, population change, the environment, economic structures and institutional framework. This publication gave me a good idea of the different theme descriptions of sustainable development.

1.9 Research Hypothesis & Theory

A survey of literature on sustainable development in general and on the Islamic perspective in particular, as well as on the history of development in the Muslim World provided the hypotheses for this study. The following hypotheses were posited for testing:

(a) The essential features of sustainable development are to be found in the teachings of Islam.

- (b) The elements of sustainable development can be identified in early development in the Muslim World.
- (c) Current economic development in Muslim countries is impacting negatively on the environment.
- (d) Muslim countries face major challenges in relation to sustainable development.

The conceptual framework for this study is informed by the theory of sustainable development. For the purpose of this study, sustainable development is understood in its general sense to mean effecting change in society to facilitate human development and improve the quality of life.

Taking into account the criticisms of the popular models of development, in particular in relation to their emphasis on economic issues, sustainable development has been adopted as an appropriate paradigm of development because it “offers a powerful challenge to conceptions of development that emphasize rapid, even ruthless, economic development for a few at the expense of economic, environmental and even human destruction for many”.

(Estes:1993 http://www.sp2.upenn.edu/~restes/Estes%20Papers/Toward%20Sustainable%20Development_.pdf. Date Accessed : November 2007).

However, the diversity of interpretations of sustainable development has been recognized. For this reason, it was considered important that sustainable development moves away from a single universal model for development to one that can accommodate diversity and different contexts. An approach combining the “co-evolutionary view” of development which questions Western reductionist views on the environment and encourages a more flexible attitude to other knowledge systems, and elements of the “populist view” emphasizing social, environmental and cultural development has been adopted (Treurnicht : 2004:66-67).

In this context, the concept of trusteeship (*amānah*) in Islam is of fundamental importance to this study. Man (used in a generic sense throughout this thesis) has been designated by the Qur’an as a *khalīfah* (vicegerent). Haq (2003:133) states that this vicegerency is a trust (*amānah*) in terms of which “he is responsible for the survival and sound condition of the various communities within the physical sphere”.

Mawil Izzi Dien (2003:109) supports the view that humanity has been given responsibility to protect the environment. According to Ozdemir (2003:28), human beings will ultimately be held accountable for the way they discharged this responsibility.

The exegete, Ibn Kathīr (774 AH : 3: 501) argues that the *amānah* which was given to humankind implies that it must use, maintain and protect the earth in accordance with the Divine Will as contained in the Qur'ān and the Prophetic Traditions.

In analyzing the above concepts, it is evident that Islam (a) establishes a relationship between humanity and nature (b) grants humankind a right to benefit from natural resources and (c) places a responsibility on human beings to protect the environment.

1.10 Research Method

The study is based primarily on the use of secondary data, collected by literature survey.

An extensive literature review was conducted to provide a basic theoretical framework for the concept of sustainable development. I consulted several lecturers in the Department of Sustainable Development at the University of Stellenbosch who referred me to various sources on sustainable development. I also utilised the internet extensively for this chapter.

An in-depth study of the primary sources in Islam was undertaken to identify sustainable development principles. I utilized the Qur'ān and Aḥādīth extensively for this chapter. Fortunately, I have a good grounding in the Arabic language and was, therefore, able to consult and translate the research material into English. I consulted Ibn Kathīr's *Tafsir al-Qu'rān al-'Azim* in order to get a clearer understanding of many verses of the Qur'ān relating to environmental issues. As far as the Aḥādīth books are concerned, I used the *Fath al- Barī* by Ibn Hajar Al-Asqalānī for Saḥīḥ Al-Bukhārī; *Sharḥ Shaḥīḥ Muslim* by al-Nawawī for *Saḥīḥ Muslim*. I also consulted the following Aḥādīth books and translated the relevant text: *Musnad Imām Aḥmad Ibn Hanbal*; *Sunan an-Nasāī bi-sharḥ al-Hafiz Jalal al-Din al-Suyūti*; *Sunan Ibn Mājah*; *Al-Muwaṭṭa*; *Sunan at-Tirmidhī* and *'Awn al-Ma'būd Sharḥ Sunan Abi Dāwūd*.

The chapter on the history of development in the Muslim World required extensive research of many historical texts. Some of the works were very old, and I had to link the sustainable development indicators relating specifically to Muslim countries with historical texts which were spread across approximately twelve centuries.

I consulted several sources dealing with current development in the Muslim World and its impact on the environment. I was able to source a number of recent declarations by Muslim countries on sustainable development. These

provide a useful insight into the approach of these countries to the issue of future development.

Publications by scholars on sustainable development from an Islamic perspective (most of them very recent) were analyzed to gauge their approach - to establish whether they supported the notion of sustainable development in principle and to identify the unique insights they have contributed to the discourse on the nature of sustainable development.

In this respect, I have not simply endorsed the standard approach to sustainable development, but have consciously sought out Muslim scholars who have identified aspects which they consider integral to the project of sustainable development in Muslim countries.

The qualitative research method was adopted for this research. The core of qualitative data analysis consists of the description of the data, classification of the data and seeing how concepts interconnect (Kitchen & Tate: 1993:2000). It aims to rebuild the research result in a presentable design to provide a new insight into the phenomenon.

The descriptive and analytical approaches were used to achieve the objectives of this study.

With regard to transcribing Arabic words phonetically in the Latin script, I have followed a standard system of transliteration. For example, names which begin with the article “al”, have been utilized consistently without distinction between the “sun” and “moon” letters, such as, al-Shahīd instead of Ashahīd. The *ta marbūta* is indicated by the latter “h”, for example, *sharīḥah*. Names of places that have been anglicised, such as Mecca (Makkah), have not been transliterated. The Arabic alphabet and its transliteration symbols are presented below.

The Arabic Alphabet

Name	Phonetic Symbol	Name	Phonetic Symbol
ا	alif a	ض	dad ḍ
ب	ba' b	ط	ta' ṭ
ت	ta' t	ظ	za' z
ث	tha' th	ع	`ayn `a
ج	jim j	غ	ghayn gh
ح	ha' ḥ	ف	fa' f
خ	kha' kh	ق	qaf q
د	dal d	ك	kaf k
ذ	dhal dh	ل	lam l

ر	ra'	r	م	mim	m
ز	za'	z	ن	nun	n
س	sin	s	و	waw	w
ش	shin	sh	ه	ha'	h
ص	sad	ṣ	ي	ya'	y

Vowels

ا	a	fatha	a
و	u	damma	u
ي	i	kasra	i

Monophthongs

ا	ā
و	ū
ي	ī
ى	ā

1.11 Key Assumptions

The key assumptions underlying this study are:

- (a) By surveying the general history of Islam, we will be able to identify elements of sustainable development.

(b) By studying the primary Islamic sources we will be able to locate the principles of sustainable development

© By analyzing current development in the Muslim World, we will be able to illustrate its contribution to environmental degradation

1.12 Chapter Outline

Chapter One deals with the Research Design.

Chapter Two focuses on the origin and meaning of sustainable development.

It traces the historical development of the term sustainable development. It delineates aspects of sustainable development under several themes.

Chapter Three provides a brief history of development in the Muslim World.

Chapter Four reveals the impact of current economic development in the Muslim World on the environment

Chapter Five demonstrates that sustainable development features are identifiable in the primary sources of Islam.

Chapter Six identifies some of the challenges confronting Muslim countries in their efforts to promote sustainable development

Chapter Seven captures the summary of chapters, discussion and recommendations.

1.13 Literature Review

I used three works of A.L. Tibāwi : *"Arab Education in Mandatory Palestine"*, *"A Modern History of Syria"* and *Islamic Education: Its Traditions and Modernizations into the Arab National Systems"*.

The latter work which I used the most provides good insight into the system of education in Muslim countries. It gives a brief overview on the history of Islamic education, its theory and practice from the time of the Prophet (SAW) until the beginning of the nineteenth century. Tibāwi explains that European colonialism, by infusing its own philosophy of education into the educational system of Muslim countries in the Middle East, seriously disrupted the indigenous system of education.

Halil İnalcik in his edited work *"Economic and Social history of the Ottoman Empire"* sketches the significance of the Ottoman economic structure, which contributed to the rise of modern Europe. Ironically, it was the European powers which brought about the collapse of the Ottoman Empire through colonialism. I used the work to describe the care and concern for the poor

demonstrated by the Ottoman Empire and the role the Sultans played in poverty alleviation, as well as in the enactment of legislation to guarantee fairness in trade. I briefly discuss the reasons why the Ottoman Empire had such a stable economy.

“The development of Islam in West Africa” by Mervin Hiskett describes the situation in West Africa long before the arrival of European colonialism. I used this work to explain the different types of crops grown in Hausaland, which formed part of the export commodities in the great trans-Saharan trade. I also discuss the Muslim involvement in the gold trade of Ghana. I briefly explain the significance of the great trade routes of the Sudanic states across central Africa, as well as the spice trade of West Africa, in which there was great European interest.

Nancy Elizabeth Gallagher’s *“Medicine and power in Tunisia, 1780-1900”* gives a good description of medicine used by the Tunisian people prior to the arrival of the European colonialists. I used Nancy's work to illustrate the success of Prophetic medicine in Tunisia prior to European colonization. In the thesis, I briefly discuss the transition from Muslim to European medical authority, the expansion of “empirical medicine” as well as colonial domination over medicine.

One work which discusses the definition of the term “sustainable development” is *The Principles of Sustainability* by Simon Dresner. He goes into a detailed discussion of the meanings of sustainability and development, and then shows how the two are combined to form the notion of “sustainable development”. He analyzes the debates among various environmentalists on the definition of the term sustainable development, citing many famous writers such as Tim O’ Riordan. He goes into the historical background of how environmentalists fought for the sustainability of the environment, starting with the Rio summit. He mentions their frustrations in being unable to bring about a reduction in damage to the environment. Dresner's work summarizes many debates on the development of the terms “sustainability” and “sustainable development”. I found this work very relevant for this study.

Islam and the World written by Abul Hassan 'Ali Nadwi, is another valuable work on Islamic history. Nadwi discusses the social discontent and the economic chaos of Middle East and its surrounding areas, before the advent of Prophet Muhammad (SAW). He sketches the racial prejudices which existed at that time, the oppression and discrimination of women, absolute dictatorship of the monarchies, as well as the warlike temperament of the Arabs. He cites further the advent of the Prophet (SAW) and the changes he brought to human society. He argues that the Prophetic era provided the basis for Muslim glory for the next six centuries that ensued

While describing the heydays of the Umayyads and Abbāsids, Nadwi also analyses the reasons for their decadence. He outlines the invasions of the Crusades and the Tartars and the impact this had on the Muslims. He discusses the rise of the Ottoman Turks, their zenith as well as their decline. He then goes on to discuss the rise of the West and its consequences for Muslims. The strength of this work is that the author is frank and unbiased in his accounts of historical events.

Husaini's book *Arab Administration* describes sustainable development in a historical context from the advent of Islam until the onset of European colonialism. His work gives a comprehensive idea of the development of agriculture, education, water supply, health facilities, during the Umayyad and Abbāsīd periods. This work provided the basis for the chapter on development in the Muslim World.

The work of Sydney Fisher, *The Middle East A History*, covers the history from the Pre-Islamic era in the Middle East until just after World War II. The writer gives us a brief account of Prophet Muhammad's (SAW) early life, the first phase of his mission in Makkah as well as the establishment of the Islamic State in Madīnah. He discusses in detail the spread of Muslim rule under the Umayyads as well as the flowering of the Muslim World under the Abbāsids. He also describes the development of philosophy, medicine,

mathematics, astronomy, agriculture, geography, education and architecture during the Abbāsid era. He gives an account of the Mongol invasions into Muslim lands, as well as the attack and occupation by the Crusaders.

Fisher wraps up the history of the Ottoman Empire in a very concise manner. He then discusses European imperialism in the Middle East and the effects that it had on the Arab speaking people. He goes on further to analyze and discuss the Middle East in terms of its position during the two great wars. Although the author does not go into detail about many events, his work provides a brief synopsis of many centuries of Islamic history. It contains many historical facts that must be understood in the context of complex events and happenings over a long period of time. This work was used as the major guide to the historical events that took place in Muslim countries within the time-span covered by the thesis.

John G. Soussan in his work, *Sustainable Development*, gives an overall summary of the historical development of the term. He also analyzes the Brundtland report which played a key role in the emergence of the term sustainable development. Soussan, recognizing that sustainable development is a new concept, attempts to make it more meaningful and also gives several suggestions on how it can be taken promoted. He uses the work of Pearce et

al (1989) extensively. He also presents a radically new way of approaching resource exploitation and economic development.

Peter Bartelmus in his much acclaimed work, *Environment, Growth and Development - The Concepts and Strategies of Sustainability* summarizes in tabular form the environmental impacts, its effects and repercussions as well as its limits/thresholds on the following: biomass appropriation, climate change, the ozone layer, land degradation and desertification, biodiversity and deforestation and energy. He provides much numerical data on the effect on the environment e.g. rise in global mean temperature 0.3° -0.6°C in the last 100 years. He gives an estimate in numerical terms as to what will happen in the future if what he calls 'business –as –usual' will continue. It was as a source of this numerical data that I mostly used his work.

Mark Mawhinney explores the various strands of thought that claim to define sustainable development, as a concept, a theory or as a set of principles in his work, *Sustainable Development: Understanding the green debates*. He discusses the views on sustainable development between the mainstream economists and hardened environmentalists.

In my work I have listed some of these views. Mawhinney also discusses the debates between the economists and environmentalists. He attempts to break

down the various barriers that exist to the understanding of sustainable development.

In her work: *An Introduction to Sustainable Development*, Jennifer A. Elliott evaluates the progress made in the last decades of the twentieth century towards establishing new patterns and progress of development which are sustainable in terms of the demands they make on the world's physical, ecological and cultural resources and the characteristics of technology, societal organization and economic production which underpin them. She focuses on the developing world, where conditions such as rising poverty and mounting debt combine to present particular challenges of sustainability. She also explains her understanding of sustainable development to her readers.

Frederik Wilhelm Johannes Voges produced a doctoral thesis entitled *Sustainable development and the socially embedded firm: An enquiry into the nature, causes and transformation of structural unsustainability in contemporary liberal capitalism*. In his thesis he discusses the history of the term sustainable development in order to clarify the fundamental importance attached to intra- and intergenerational justice in the pursuit of sustainable development. He gives an overview of developments from the Stockholm conference until the release of the Brundtland report. He criticizes the Brundtland report using the views of many authorities on the subject. He also

discusses a process of planning for sustainable development as the first and foremost means with which to secure an equitable distribution of resources and a sustainable future. He also argues in his thesis that a green economy cannot be created by government fiat alone and that market economies should be democratically embedded in society.

Lebanese born Philip K. Hitti in his book, *History of the Arabs*, covers a period in history of Arabia and its surrounding areas from the Semites in Arabia until the advent of Western powers in the Middle East. Central to his work is the rise of Prophet Muḥammad (SAW) and the teachings of Islām which made the followers of that religion the world's most powerful people for many centuries. Hitti focuses mainly on the Arabs, their participation and contributions in world affairs in terms of their conquests, empire building and decay. I used Hitti's work to illustrate Muslim contribution to the development of education.

Aḥmad Dallāl's work, *Science, Medicine and Technology. The making of a scientific culture*, appears as a chapter in John L. Esposito's editorial work, *The Oxford History of Islam*. Dallāl expounds on Muslim contribution to the fields of astronomy, mathematics, optics, engineering, technology, medicine, botany and pharmacology. He also explains the links between the ancient nations before and how Muslim scientists and technologists advanced their

findings. I made fairly extensive use of Dallāl's work when discussing the mechanical engineering of the water irrigation systems.

1.14 Chapter Summary

The origin and background of the problem, the purpose and value of the study, and the importance of the research have all been described. The hypotheses have been formulated, the theories outlined and the method explained. A summary of prior research and a literature review have been provided.

CHAPTER 2

SUSTAINABLE DEVELOPMENT: ORIGIN & MEANING

2.1 Introduction

In this chapter the origin and meaning of sustainable development will be discussed in general. A brief history of the evolution of the term sustainable development will be presented. Various definitions of the term sustainable development by theorists worldwide will then be discussed and analyzed.

2.2 Origins of the term Sustainable Development.

Man started to feed himself by means of hunting and food gathering.

Approximately 8 000 years ago the population of the earth numbered about 10 million (Meadows et al. 1992 cited in Mebratu:1998:494). As the number of human beings increased, the hunter-gathering resources started to diminish.

Some people migrated to other parts of the world, but there were those who remained in one place and domesticated animals and cultivated plants. They changed the face of the earth with their methods of farming. I understand this to have been the first instance of environmental exploitation and degradation.

Mebratu (495) holds that striving for wealth, trade, money and power, were born at the time when the development of agriculture was a successful response to wildlife scarcity.

As the centuries passed, agriculture and agricultural tools became more advanced. Meanwhile there was a slow population growth and by 1750 the world population was 800 million (Meadows cited in Mebratu:495).

The industrial revolution which started in Britain in the 18th century, gave rise to the usage of coal and controlled combustion. The development of machinery led to massive production of commodities. Population growth increased in the last three centuries to such an extent, that according to Meadows (cited in Mebratu:495) the earth population is now 5 billion.

I would argue that although there was exploitation of the earth's resources over thousands of years with the development of agriculture, there was no threat to the environment. This **irreversible environmental impact** only started on a massive scale with the industrial revolution. Mebratu (495) holds the view that the success of industrial transformation, like the more limited successes of hunting-gathering and agricultural transformations, has led to ecological scarcities not only in terms of natural resource supply but also the absorptive capacity of the natural sinks. A time arrived when humanity had to control the

usage of the earth's resources, and it is this that gave rise to the term sustainable development.

The concern for the environment started in the late 19th century in the United States. The most prominent people who raised their voices in defence of the environment included Jane Adams, Florence Kelly and Alice Hamilton (Pezzoli 1997: 550). In her publication *Industrial Poisons in the US*, Hamilton looked at the way health, the environment and politics intersect. The Progressive Era (1880s -1920s), the Regional Planning Association of America (RPAA), the Tennessee Valley Authority (TVA) and Garden Cities movements (in vogue 1920s-1930s) each expressed concerns about sustainability even though at that time this precise term was not used (Pezzoli: 1997: 550).

Neo-colonialism, modernization and conflict theories dominated early thinking of development. While these theories differed from each other, what they shared in common was to interpret development in terms of economic growth (Burkey :1993). Furthermore, it was assumed that developed countries would facilitate the development of the so-called "Third World" countries and that economic growth would eradicate poverty. Social transformation and environmental protection did not feature in earlier notions of development.

The optimism of economists and social scientists was misplaced. Evidence suggested that the economic growth benefited very few members of society and that there was poverty, unemployment and starvation on a large scale globally (Burkey: 1993:28). **Some** third world countries, in fact, experienced a negative growth. Finally, economic development contributed directly to environmental degradation (Ngobese & Cook : 1997 : 256).

In the 1970s the focus shifted to the “basic needs” theory in terms of which the needs of the poor became the primary concern (Preston : 1996 :245). Subsequently, the idea of sustainable livelihood gained ground and the concept of poverty reduction was expanded to include resource accessibility, education, health, asset management and environmental preservation (Mullen 1999: IX).

Sustainable development is a new term which grew from the conservation environment movement of the 1970s. The term developed due to the constant clashes between those who supported economic growth and those who were concerned about environmental protection.

The term “sustainable development” was invented by Eva Balfour, founder of the Soil Association, the International Institute for Environment and Development (IIED), and Wes Jackson, the American geneticist and

biodynamic farmer (Reid 1995: xiii).

The 1972 UN Stockholm Conference on the Human Environment marked the first great international meeting called to discuss how human activities were harming the environment and putting humans at risk (www.sustreport.org/background/history.html Date Accessed: December 2004). This conference recognized the 'importance of environmental management and the use of environmental assessment as a management tool' (Du Bose et al. 1995 cited in Mebratu 1998:500). A declaration was made which highlighted the problems of pollution, destruction of resources, damage to the environment, danger to species and the need to enhance the human social well being (www.uyseg.org/sustain-ed/PAGES/WhatSD/hist_text.html Date accessed : December 2004). Adams (1992:15 cited in Voges 1999:28) holds that the Stockholm conference 'formed the immediate frame for the development of the ideas of sustainable development in the World conservative strategy'.

At about the same time, a group of scientists, researchers, industrialists and concerned people gathered in Rome to discuss the global environment crisis which was expanding at a very fast rate. This group which became known as the *Club of Rome* (Mebratu:500) published '*The Limits to Growth*', a report outlining the 'predicament of mankind' (Meadows et. al:[1.4] 1972 cited in Pezzoli:550). The report pointed out that if the present pollution, food production and resource depletion continue unchanged then the limits to

growth on this planet will be reached within the next one hundred years (Meadows et. al :23 cited in Pezzoli:550). The report also stipulated that the state of the global equilibrium could be designated so that the basic material needs of each person are satisfied and each person has an equal opportunity to realize his individual human potential (Meadows et. al:24 cited in Pezzoli:550).

Out of the 1972 UN Conference emerged the United Nations Environment Program (UNEP). In 1974 UNEP and the United Nations Conference on Trade and Development (UNCTAD) convened the Cocoyoc (Mexico) seminar on Patterns of Resource use Environmental and Development Strategies. This seminar brought together two different schools of thought regarding that period's alternative development movement: those who argued that priority should be given to satisfying the basic needs of people for food, water and shelter rather than to simple growth maximization, and those concerned with the outer limits of the planet's resource and its environment to sustain such growth. The term "sustainable development" was already in vogue at the time of the seminar (Pezzoli: 551).

In the *World conservative strategy* (1980) report which was prepared by the International Union for Conservation of Nature and Natural Resources (IUCN), the United Nations Environment Program (UNEP) and the World Wide Fund (WWF), the central idea of sustainable development integrates environmental

issues into development planning (Achterberg 1994:27; Adams 1990:3 cited in Voges 1999:28). It is in this report that conservation is defined as 'the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations' (IUCN, UNEP, and WWF, 1980: *World conservative strategy* quoted in Achterberg:27 cited in Voges:28).

Sustainable development first came to prominence in the World Conservation Strategy (WCS) published by the World Conservation Union (IUCN) in 1980 (Soussan: 1992:24). The 1980 World Conservation Strategy, prepared by the International Union for the Conservation of Nature along with the UN Environment Program and the World Wildlife Fund, promoted the idea of environmental protection in the self-interest of the human species ([www.sustreport.org/ background/history.html](http://www.sustreport.org/background/history.html). Date Accessed: December 2004).

By the 1980's the United Nations had conceded its failure to halt the cycle of poverty that existed in the world's poorest and slowest developing nations. Criticism of the development paradigms emanated from various sectors of development. These paradigms failed to establish parity between developing nations and economically advanced nations and had a devastating impact on the environment. The need for a new development paradigm became

paramount by the mid-1980s. In the emerging conception of development, the environment became a central issue.

In 1987 a report, *Our Common Future*, was made public by the United Nation's World Commission on Environment and Development (WCED) (Soussan:24) and later became known as the Brundtland report after its chair and later Norwegian prime minister Gro Harlem Brundtland (Dresner: 2002:1). It was through this report that sustainability and sustainable development really came to light.

The world's attention on sustainability reached a high point at the 1992 UN Conference on Environment and Development, in Rio de Janeiro. It was attended by 116 heads of states or governments, 172 states, 8000 delegates, 9000 members of the press, and 3000 accredited representatives of non-governmental organizations (Robinson 1993:p. xiii [1.1] cited in Pezzoli:552). It was one of the largest-ever meeting of world leaders.

Rio produced two international agreements, two statements of principles and a major action agenda on worldwide sustainable development (www.sustreport.org/background/history.html Date accessed: December 2004).

The Rio summit adopted the following agreements:

The Convention on Climate Change, which limits emissions of the greenhouse gases carbon dioxide (CO₂) and methane (CH₄).

The Convention on Biological Diversity, which gives countries responsibility for conserving species diversity and using biological resources in a sustainable way.

The Rio Declaration and the Forest Principles which sets out the principles of sustainable development and pledges to reduce deforestation.

Agenda 21 which was a plan for achieving sustainable development in the 21st century (www.uyseg.org/sustain-ed/PAGES/WhatSD/hist_text.html Date accessed: December 2004).

Agenda 21 proposed that poverty be reduced by giving people access to the resources they need in order to support themselves. Developed nations agreed to assist others to develop in a way that will minimize the environmental impact of their economic growth. It also called on countries to reduce pollution, emissions and the use of precious natural resources (www.uyseg.org/sustain-ed/PAGES/WhatSD/hist_text.html Date accessed: December 2004).

In 1997, governments met in Kyoto, Japan, to deliberate on the problem of global warming. Many countries had failed to achieve even the small reduction proposed by the Kyoto Protocol (www.uyseg.org/sustained/PAGES/WhatSD/hist_text.html Date accessed: December 2004).

Ten years after the Rio Earth Summit, the World Summit on sustainable development which was held in Johannesburg in 2002 reviewed progress towards sustainable development. The conference focused on poverty and the access to safe drinking water and sanitation. It agreed to the following:

- To reduce the number of people who are not connected to clean drinking water supplies from over 1 billion to 500 million by the year 2015.
- To halve the number of people without proper sanitation to 1.2 billion.
- To increase the use of sustainable energy sources and restore depleted fish stocks (www.uyseg.org/sustained/PAGES/WhatSD/hist_text.html Date accessed: December 2004).

2.3 What is sustainable development?

There has been great debate on the difference between “sustainability” and ‘sustainable development’. According to Tim O’ Riordan, the environmental scientist, “sustainable development” is a term that gave priority to

development, while “sustainability” primarily concerns the environment (Dresner: 64).

Sustainability concerns meeting basic human needs and wants, and has much to do with the kind of legacy that we want to leave for our children and grandchildren (www.sustreport.org/background/history.html. Date accessed: December 2004). Dresner (2) defines sustainability as implying not destroying the basis of your existence.

Shiva (1992:187-193 cited in Voges:30) argues that the real meaning of sustainability is not disclosed by the capitalist. The way sustainability is interpreted diverts attention away from its real essence which is that the capitalist market economy is dependant on the life-support systems of nature (Shiva 192).

The nine principles required for building a sustainable society are:

- Respecting and caring for the community of life.
- Improving the quality of human life.
- Conserving the Earth’s vitality and diversity.
- Minimizing the depletion of non-renewable resources.
- Keeping within the Earth’s carrying capacity.
- Changing personal attitudes and practices.
- Enabling communities to care for their own environments.

- Providing a national framework for integrating development and conservation.
- Creating a global alliance. (IUCN, UNEP, WWF :1991:9-11 cited in Voges :31)

The Brundtland report defined Sustainable Development as '*development which meets the needs of the present without compromising the ability of future generations to meet their own needs*' (<http://www.lbgov/education/ELSI/sustain-main.html>) Date accessed July 2004; WCED (1987) cited in Moffat (1996:ch.3), WCED (1987:5), cited in Baker et al. (1997) Soussan (24) and Dresner (31).

Brundtland's statement refers to an intergenerational legacy which means to develop only that which is necessary, and not to waste resources. The emphasis is on conservation so that future generations can enjoy the earth's resources (Mawhinney 2002:5). The statement can also be interpreted to mean that when people make decisions as to how to use the earth's resources (forest, water, minerals, and wildlife) then it is important that they take into account how much of the resources they are using; the process that they use to get these resources, as well as who has access to these resources (<http://www.lbl.gov/Education/ELSI/sustain-main.html>, Date accessed: July 2004).

Soussan's (1992:25) interpretation on the Brundtland report states that poverty, resource depletion and environmental stress arise due to disparities in economic and political power. Sustainable development can only be achieved through major changes in the ways the planet is managed.

Voges (1999:29) extracts from Brundtland's statement two basic concepts. Firstly, the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given and, secondly, the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

The Brundtland commission proposed the following principles to guide national policies (Clark 1995:42-43 cited in Voges 1999:29).

- revive growth, because poverty is a major source of environmental degradation
- change the quality of growth to achieve sustainability, equity, social justice and security
- ensure a sustainable level of population through population policies which are integrated with programs of education, health care and raising standards of living, especially for the poor
- reorientate technology to pay greater regard to environment factors and costs

- integrate environment and economics by requiring decision-makers to be responsible for the impact of their decisions upon the environment resource capital (i.e. the true costs of resource depletion and pollution should be calculated rather than just short-term costs and profits)
- reform international economic relations to help developing countries to diversify their economic trade bases and build self-reliance, and
- strengthen international co-operation for sustainable human progress.

Brundtland's statement underlines the idea that the present generation should meet their needs in terms of economic, social and political development on an equitable basis, but must leave human and natural resources for the next generation on the same basis as they have received from the previous generation.

Why was the Brundtland Commission so effective? Adams (2001:70) argues that it is because it had its origins in the UN General Assembly. Secondly, *Our Common Future* placed elements of the development debate within the economic and political context of international development. Thirdly, Brundtland placed environmental issues firmly on the formal international political agenda with the result that the assembly came to discuss environment and development as one single problem.

Though Brundtland made the term “sustainable development” famous, there were other definitions of this term depending on a person's viewpoint, starting point, process or end goal.

Nitin Desai (cited in Dresner 2002:64) interprets the term “sustainable development” as redirecting development and growth rather than stopping it. Sustainable development stems from the idea that our finite planet, earth, is not sustainable because mother earth cannot accept the continued exploitation of its natural resources, the poisoning of its ecosystems and environmental systems (Moffat 1996:ch.3). According to Dresner (2002:2) the Brundtland Commission’s conception of sustainable development brought together equity between generations and equity within generations.

Sustainable development can also be described as the three e’s: environment, economy and equity (<http://www.igoli.gov.za/summit/simple.stm> Date accessed: July 2004). Some view sustainable development as a meeting point between environmentalists and developers (Dresner:64). Tim O’ Riordan believes that the reason for the popularity of the term is that both developers and environmentalists use it, the former emphasizing the sustainable part and the latter the development part (O’ Riordan :1988 cited in Dresner:64).

According to Soussan (24) sustainable development at the initial stages was

concerned with maintenance of ecological processes, the sustainable use of resources and the maintenance of genetic diversity. Richard Norgaard, the ecological economist argued that the concept of sustainable development marks the beginning of a break by the dominant strand of Western culture – faith in Progress. People started to believe in progress but did not take care of the environment for the sake of their children or grandchildren (Norgaard 1994 cited in Dresner :4:2002).

Pearce and Warford (1993 cited in Human 2004:47) described sustainable development as development that secures increase in the welfare of the current generation provided that welfare in the future does not decrease.

Garvare and Isaksson (2001 cited in Human 2004: 47) described sustainable development as the process of reaching a steady state where both humanity and nature thrive.

Mawhinney (3) cites the following definitions of sustainable development:

- The National Strategies for Sustainable Development (2000) define sustainable development as ‘economic and social development that meets the needs of the current generation without undermining the ability of future generations to meet their own needs.’
- The World Wildlife Fund's definition is: ‘Sustainable development means improving the quality of life while living within the carrying

capacity of supporting systems.’ (IUCN et al. 1991).

- The ICLEI (International Council for Local Environment al Initiatives 1994) says sustainable development ‘delivers basic environmental, social and economic services to all residents of a community without threatening the viability of the natural, built and social systems upon which the delivery of these services depends.’
- According to the LGMB (Local Government Management Board, UK, 1993) sustainable development is, ‘reducing current levels of consumption of energy and resources and production of waste, in order not to damage the natural systems which future generations will rely on to provide them with resources, absorb their waste and provide safe and healthy conditions’
- The US Department of energy (2001) defines sustainable development as ‘a strategy by which communities seek economic development approaches that also benefit the local environment and quality of life. It has become an important guide to many communities that have discovered that traditional approaches to planning and development are creating, rather than solving, societal and environmental problems.’
- Schoonrad (1995) stated that sustainability should include ‘all rounded development (economic, social, cultural and political) and equal rights for all with the best quality of life to each and every person; reject social, economic and political exclusion; control of pollution and

minimize waste.'

- The UK Department of Environment, Transport and Regions (1990a) stated that sustainable development is: 'Social progress that recognizes the needs of everyone; effective protection of the environment; prudent use of natural resources; maintenance of high and stable level of economic growth and employment.'
- The Novartis Foundation for Sustainable Development (2001) contends that it involves 'Programmes in the developing countries that directly contribute to an improvement in the quality of life of the poorest people.'
- Wackernal and Rees (1996) hold the view that sustainable development is 'The need for humanity to live equitably within the means of nature.'
- Pearce et al. (1990) define it as 'conditions necessary for equal access to the resource base to be met for each generation'.
- The World Bank (Pezzey 1990) declared that 'sustainable development will be non-declining per capita utility because of its self-evident appeal as a criterion for intergenerational equity.'

According to Opschoor (cited in Dresner:85) sustainable development implies that the environmental impact of human activities stays well within limits of how much environmental space the biosphere can take. Caring for the earth defines sustainable development as a process of 'improving the quality of

human life while living within the carrying capacity of supporting ecosystems'.
(IUCN, UNEP, WWF:1991:10 cited in Voges ::31).

In the world conservation strategy in 1980, the term 'sustainable utilization of resources' was noted as having three principle aims: to maintain essential processes and life support systems, to preserve genetic diversity and to ensure sustainable utilization of species and ecosystems" (IUCN 1980 cited in Moffat 1996:ch.3).

The World Commission on Environment (WCED) emphasizes that Sustainable Development is not a fixed state. Rather it is ' ... a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs.' WCED (1987:9 cited in Hugo et al. 1997:176).

Sustainable development can also be defined as development that is likely to achieve lasting satisfaction of human needs and improvement of the quality of human life (Allen1980 cited in Elliot 1996:3).

It seems that there is no simple single meaning of the term sustainable development. I understand sustainable development to mean the following from an Islamic point of view: Humankind has been given the trusteeship to

protect the earth. Therefore it should not degrade the planet. Humans may use the earth's natural resources such that it will benefit those who are present as well as the future generations.

2.3.1 Key elements or dimensions of sustainable development

An examination of the above definitions reveals that there are three key elements or dimensions of sustainable development:

(a) Ecological integrity or environmental wellbeing – sometimes called intergenerational justice	This refers to the responsibility of preserving the integrity of the world's ecosystems so that both the present and future generations will be able to survive
(b) Economic growth	This is to satisfy the basic material needs of all human beings and to improve their quality of life
(c) Social justice or equity – sometimes called intragenerational equity –	This refers to the concern for the well being of future generations by living within the caring capacity of the environment. The focus is on the equitable distribution of income and other sources of need and material satisfaction of communities

(Johnston et al, 1994).

Unlike in the past where the focus of sustainable development was on the environment, the social environment is now accorded the same importance as the natural environment. The implication is that in the pursuit of economic growth and development nations must bear in mind their social responsibilities and the importance of responsible use of natural resources.

2.3.1.1 Equitable distribution of resources

One of the key elements of sustainable development is the equitable distribution of resources throughout the globe.

Le'le' (1991:661) cited in Baker et al. (1997:2) states that there must be an equal distribution of global resources. Pearce et al. (1989 cited in Soussan 1992:28) emphasized intra-generational equity, which means there must be a policy where provision is made for the least advantaged in society. This will also mean that there must be a sacrifice of economic growth which will lead to the gap between the rich and the poor being narrowed. It is important that this policy must be operational within the local community, at a national level as well as between countries in the global community.

In Tolba's (1987 cited in Elliot: 3) view, sustainable development encompasses the idea that the great issues of health control, appropriate technologies, food self reliance, clean water and shelter should be for all, and not for a select few.

2.3.1.2 Concern for the well being of future generations

Sustainable development strongly emphasizes the well being and survival of future generations. The present generation must act to limit global environment threats e.g. air quality, wildlife and landscapes. Non renewable resources such as oil and gas should be used efficiently, and we should look to alternatives which could replace them in the future. Renewable resources such as water should be used in a manner that does not endanger the resource.

It is important to see that the overall capital stock of the world does not decline, because its loss has an irreversible effect on world society (Atkinson: 1997:16).

The term '*common future*' in the Brundtland report can also be interpreted as a challenge to the industrialized nations, who consume a high share of the world's resources and also contribute to the destruction of the ecological

equilibrium of the south. A new decree of sharing should be implemented by the north towards the south (de Santa Ana: 1998:6)

Sustainable development encompasses the idea of self reliant development, but within the natural resource constraint. It also includes cost-effective development where different economic criteria are used instead of the traditional approach which means development should not degrade environmental quality, nor should productivity be reduced in the long run (Tolba 1987 cited in Elliott:3).

Commenting on Brundtland's report Soussan (1992:25) discusses certain objectives of sustainable development. There must be a revival of economic growth as well as change in the quality of growth, essential needs such as jobs, energy, water and sanitation must be seen to, a sustainable level of population must be kept, enhancement and conservation of the resource base must be kept, there must be re-orientation of technology and management risk and there must be a merging of the environment and economics in the decision making process.

2.4 Theme Descriptions of sustainable development

2.4.1 Environmental features

It is due to the damage on the environment that the term sustainable development has been coined. The environment has been damaged by industrialized countries due to their high level of economic growth and consumption, as well as developing countries, to overcome their extreme conditions of poverty.

Industrialized countries are very concerned about air, land, and water pollution, global environmental phenomena of climate change and the depletion of the ozone layer. Developing countries are more concerned about degradation of natural resources such as land, soil and water and their effects on food and energy supply, marginal conditions in human settlements, environmentally conditioned diseases and natural disasters. See table 1

Humankind has inherited a 3.8 billion store of natural capital. The present rate of use and degradation will result in there being very little left by the end of the century (Hawkin et. al: 1999:3). The over-use of environmental resources is at the centre of the challenge of sustainable development. Humankind is consuming and wasting resources at a faster rate than the ecological systems of the planet can tolerate. (McLaren: 2003: 20)

Table 1 Environmental concerns of developing and industrialized countries.

Environmental concerns	Developing countries	Industrialized countries
<i>I. Natural environment</i>		
A. Air	Air pollution in major cities	AIR Pollution
B. Land, Soil, mineral resources (incl. energy)	SOIL EROSION AND DEGRADATION; DESERTIFICATION	Soil loss and deterioration; dumping of waste; risk of radioactive contamination from nuclear-power production
C. Water	FRESHWATER SHORTAGE freshwater pollution (sewage pesticides); pollution of coastal waters	Freshwater shortage: INLAND AND MARINE WATER POLLUTION
D. Fauna and flora	DEFROSTATION (especially of tropical forest); loss of genetic resources; endangered species	Loss of croplands to urban sprawl; pests and pest resistance; contamination of crops and fish;
E. Ecosystems	Pollution of coastal ecosystems (decreasing fish catch)	Disruption of mountain, wetland, freshwater (especially FOREST DAMAGE from acid rains and eutrophication) and coastal ecosystems.
F. Natural disasters	FLOODS; DROUGHTS; STORMS;	Floods; earthquakes

II Man-made environment and

living conditions

A. Bioproductive systems	LOSS AND DEGRADATION OF	Loss of croplands to urban sprawl;
	ARABLE LAND; pests and pests;	pests and pests resistance;
	water shortage; pressures on	contamination of crops and
	fish population (over-fishing,	fish; over exploitation of fishing
	grounds	
B Human settlements	MARGINAL SETTLEMENTS	URBAN SPRAWL; NOISE; LAND
	(RURAL-URBAN MIGRATION,	CONTAMINATION; TRAFFIC
	URBAN GROWTH)	CONGESTION
C Health	MAL-AND UNDERNUTRITION;	CANCER; cardiovascular
	INFECTIOUS AND PARASATIC	diseases; genetic and long-
	DISEASES	term effects of POTENTIALLY
		TOXIC CHEMICALS and
		HAZARDOUS WATE
D Environment and	SUSTAINABLE DEVELOPMENT	ENVIRONMENTAL
Development		EXTERNALITIES; energy and
		Environment
III <i>Global Problems</i>	Global warming and	CLIMATE CHANGE; depletion
	consequential effects	of the OZONE LAYER

Sources Bartelmus (1986:table 2.1); OECD (1992); UNEP (1992).

In the following section I will discuss the various themes which affect the environment and suggest measures to promote sustainable development.

2.4.1.1 The Atmosphere

In the atmosphere, climate change is taking place due to the green house effect, a term used for the role the atmosphere plays in helping to warm the earth's surface. The earth's atmosphere is largely transparent to incoming short-wave, better known as ultraviolet solar radiation, which is absorbed by the earth's surface. Much of this radiation is then re-emitted as heat energy at long-wave, infrared wavelengths; some of this energy escapes back into space, but much of it is reflected back by gases such as carbon dioxide, methane, nitrous oxide, halocarbons, and ozone in the atmosphere. This heating effect is at the root of the theory known as global warming.

Climate change is largely due to unsustainable consumption and production patterns. This includes high fossil fuel consumption for energy production and transportation, industrial processes, deforestation intensive farming and waste disposal. All of this can have an impact on the rise of the sea level which can lead to flooding of low lying areas, higher average temperatures, the melting of glaciers and ice caps and extreme weather patterns with implications for floods and droughts.

Climate change will affect the socio-economic systems of the world populations and it will also have an impact on agriculture, the forests and the marine eco systems.

Global warming is also caused by the alteration of the globe's greenhouse gas (GHG) balance. There is more GHG being pumped into the atmosphere than is being absorbed by the sinks. The sinks are the oceans and the living biomass (Pasztor 1998:77). Greenhouse gases cause an increase in atmospheric concentration. In the years 1765 -1990 the percentages of gases which were released into the atmosphere were as follows : CO₂: 25%; CH₄: 100% NO_x: 8% (Bartelmus 1994:15).

The origin of GHG is the combustion of fossil fuels such as coal, oil and natural gas, methane as well as chlorofluorocarbons which come from agricultural and industrial activities (Pasztor 1998:77).

Carbon dioxide emissions from the industrialized nations are presently outweighing those of the developing world as shown in table 2 According to Kelly and Granwich (1995 cited in Elliot :58) industrialized nations with approximately one-quarter of the world's population have been directly responsible for half of the emissions causing global warming.

Table 2 Top fifteen 'carbon culprits'

Country	Total annual emission (million metric tonnes)	Per capita
United States	4 881	19.1
China	2 668	2.3
Russian Federation	1 093	14.1

Japan	1 093	8.8
Germany	878	10.9
India	769	0.9
Ukraine	611	11.7
United Kingdom	566	9.8
Canada	410	14.4
Italy	408	7.2
France	362	6.3
Poland	342	13.5
Mexico	333	8.9
Kazakhstan	298	17.6
South Africa	290	7.5

.....
 Source : World Bank (1997b) cited in Elliot (1996:58)

Global warming means that there is an increase in the mean global temperature. In the past 100 years it increased from between 0.3^o -0.6^oC (Bartelmus 1994:15). Most of the global warming is due to man-made phenomena although data and modeling are still imprecise (Dunne 2000 cited in Mawhinney: 2002: 53). There is evidence that due to global warming, limits to growth have been reached (Goodland cited in Bartelmus :1994:15). Global warming can cause many of the ice caps in the polar regions to melt, leading to an increase in the rise of sea levels. It is estimated that \$5 000 billion of problems will result soon if no action is taken, most which will occur in the developing countries of the world (Lomberg 2000 cited in Mawhinney 2002:53). Middleton et al. (1993 cited in Mawhinney: 53) have listed the ten lowest countries of the world who will have significant areas submerged if current trends continue: Bangladesh, Egypt, Gambia, Indonesia, The Maldives, Mozambique, Pakistan, Senegal, Surinam and Thailand.

According to Intergovernmental Panel on Climate Change 1996 (cited in McLaren 2003: 20) there is a need for global reduction of greenhouse gas emissions of at least 50 percent in the next 50 years to stabilize the climate.

The ozone layer which protects the earth from damaging ultraviolet radiation has been damaged due to ozone depletion substances. These substances include refrigerants, foam-blowing agents, spray propellants, fire extinguishers and agricultural pesticides (United Nations: 2001: 46). Damage to the ozone layer and exposure to UV-B can suppress the immune system, lead to cataracts and skin cancer, damage plants and aquatic organism and reinforce the greenhouse effect (Bartelmus:1994:15).

Damage to the ozone layer can lead to increase of ultraviolet radiation at the earth's surface. This can lead to dire consequences to human health, which includes skin cancer, eye cataracts and suppression of the immune system.

If the Montreal Protocol which seeks to eliminate emissions of ozone - depleting substances is fully implemented the ozone layer will not return to its pre-depletion state before 2100 (McLaren 2003:20). Marine and terrestrial ecosystems can also be affected through reduced photosynthesis and production of phytoplankton (United Nations: 2001: 46).

The air quality has been affected due to ambient concentration of air pollutants in urban areas. This was mainly due to the rapid increase in urbanization and the transport sector. Congestion and high mobility levels have led to substantial increases in emission levels of air pollutants such as suspended particulate matter, sulphur dioxide, nitrogen oxides, and volatile organic compound (United Nations: 2001: 46). The poor air quality increases a health risk to humans and it also damages the flora and fauna.

There are several major sources of air pollution. According to Hardoy et. al (1992 cited in Adams 2001:293) coal and woodfuel-burning produce smoke or suspended particulates, sulphuric acid and polycyclic aromatic carbons better known as the 'London smog' in many Third World cities. Vehicle traffic and other hydrocarbon combustion produce photochemical pollutants including hydrocarbons from evaporating petrol or other sources, nitric oxide, nitrogen dioxide, ozone and aldehydes and other oxidation products. All these create a heavy smog better known as the 'Los Angeles' smog. Other air pollutants which are connected with vehicle use include carbon monoxide and lead. Agenda 21 Chapter 9 (cited in United Nations: 2001: 45) focused on 'improving the scientific basis for addressing uncertainties; preventing stratospheric ozone depletion; addressing transboundary air pollution and promoting more sustainable and efficient energy use, transportation, consumption, industrial development and land and marine resource use.'

2.4.1.2 Land

If land is being used in an unsustainable way, it affects the physical space, topography, natural resources such as soil, mineral deposits and water, as well as plant and animal life. It will also affect the atmosphere and the marine ecosystems.

The expansion of human activities has affected the quality of the land. It causes instability of the earth's ecosystems and leads to the disruption of the global nitrogen cycle (United Nations 2001: 47).

Poverty, population pressure, unsuitable land allocation, inappropriate farming and grazing practices, lead to increase in land degradation, desertification and deforestation.

Desertification is the transformation of arable or habitable land to desert due to a change in climate or destructive land use. Desertification involves the impoverishment of vegetation and soil resources. Characteristics of desertification include the degradation of natural vegetation cover and undesirable changes in the composition of forage species, deterioration in soil quality, decreasing water availability, and increased soil erosion from wind and water. Human activities, particularly excessive resource use and abusive land-use practices, are the primary cause of desertification. Specific activities

leading to desertification include clearing and cultivation of low-rainfall areas where such cultivation is not sustainable, overgrazing of rangelands, clearing of woody plant species for fuelwood and building materials, and mismanagement of irrigated cropland leading to the buildup of mineral salts in the soil. Consequences of desertification include reduced biological productivity, reduction of biodiversity, a gradual loss of agricultural potential and resource value, loss of food security, reduced carrying capacity for humans and livestock, increased risks from drought and flooding.

(<http://www.answers.com/topic/desertification> Date Accessed: January 2009)

Desertification affects approximately one-sixth of the world's population, seventy percent of all dry lands, and one-quarter of the total land area of the world. This leads to widespread poverty as well as in the degradation of billion hectares of rangeland and cropland (www.un.org/esa/sustdev/sdissues/sdissues.htm. Date accessed: November 2004). Due to desertification 5 million ha of cropland are lost annually (Bartelmus 1994:15). 11% of the earth's vegetated surface has been severely degraded since 1945 (WRI 1992:3 cited in Bartelmus:15). 500 billion ton of topsoil have been lost since 1972 (Brown 1994:4 cited in Bartelmus:15).

Salinization is the build-up of salts at or near the surface of a soil. In hot, dry climates, evapotranspiration exceeds precipitation, so that surface water evaporates rapidly. This causes the soil moisture, together with its dissolved

salts, to come to the surface by capillary action. This water then evaporates, leaving behind a crust of salts on the surface. This process occurs naturally in desert soils, but the incorrect use of irrigation in arid lands can cause salinization, (<http://www.answers.com/topic/salinization> Date Accessed: January 2009)

Goudie (2000 cited in Mawhinney 2002: 58) holds that countries such as Australia, China and the USA have 15% or more of their irrigated land affected by salinisation. The productivity of the land, the biodiversity and the ability of the population to sustain their economy is affected due to salinisation.

Deforestation is the indiscriminate cutting or over-harvesting of trees for lumber or pulp, or to clear the land for agriculture, ranching, construction, or other human activities (United Nations 2001:47). It is as a direct result of pressure on resources, with population growth the primary driving force (Myers 1980 cited in Adams 2001:259). The annual deforestation rate (measured between 1981 and 1990) is 16.6 million ha p.a. (Bartelmus:16).

The use of fertilizers results in soil fertility decline, eutrophication, acidification and contaminated water supplies (United Nations 2001: 47).

Combating desertification to be able to sustain development requires protecting lands that are not yet degraded or which are only slightly degraded. The severely degraded areas, however, should not be neglected.

Mountain areas play a significant role in sustainable development. Mountain environments have major ecosystems and play an essential role in the survival of the global ecosystem, but they are rapidly changing. Mountains are an important source of fresh water, energy, biological diversity and have key resources, such as minerals, food, medicine, forest and agricultural products, and they also provide recreational activities (<http://www.un.org/esa/sustdev/sdissues/mountain/mountain.html>). Date accessed: December 2004).

Besides providing freshwater for half of humanity, mountains are storehouses of genetic diversity that help feed the world. In spite of this, mountains are under threat from climate change, overexploitation and environmental degradation. Mountain people are among the world's poorest and hungriest and a disproportionate number of the world's 845 million chronically undernourished people live in mountain areas (<http://www.mountainpartnership.org/> Date accessed: December 2004).

The International Centre for Integrated Mountain Development (ICIMOD) formulated a vision to attain prosperous and secure mountain communities committed to a shared vision of peace, equity, and environmental

sustainability by working together with regional member countries, international, regional, national and local bodies. Their mission is to develop and provide integrated and innovative solutions, in cooperation with national, regional, and international partners, which foster action and change for overcoming mountain peoples' economic, social, and physical vulnerability (<http://www.icimod> Date accessed: December 2004).

ICIMOD commits itself to pursuing its vision and mission, in support of the following values.

- Well-being and dignity of all mountain people
- Conservation of the natural and cultural inheritance of the mountains
- Primacy of the interests and voices of poor and marginalised mountain people, with emphasis on women
- Equity, inclusion, and respect for diversity
- Peace for mountain peoples and communities

(<http://www.icimod.org/> Date accessed: December 2004).

The promotion of a sustainable agriculture and rural development is vital for sustainable development. The majority of the global population is living in developing countries. There must be a priority to maintain and improve the capacity of the higher potential agricultural lands to support an expanding population. The capacity of available resources and technologies to satisfy

the demands of this growing population for food and other agricultural commodities remains uncertain. Agriculture has to be improved in terms of production.

The major aim of the sustainable agriculture and rural development (SARD) is to increase food production in a sustainable way and enhance food security. It will include education initiatives, the utilization of economic incentives and the development of appropriate and new technologies. This will ensure stable supplies of nutritionally adequate food, access to those supplies by vulnerable groups, and production for markets, employment and income generation to alleviate poverty, and natural resource management and environmental protection (<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter14.htm> Date accessed: January 2005).

The plan of implementation adopted by the World Summit on Sustainable Development (Johannesburg, 26 August - 4 September 2002) proposed the following for an improved agricultural system world wide: integrated land management and water-use plans; the sustainable and efficient use of land and of other natural resources, including the strengthening of national +research and extension services and farmer organizations; the enhanced participation of women in sustainable agriculture and food security; guaranteeing well-defined and enforceable land and water use rights and

promotion of legal security of tenure; increasing public sector finance for sustainable agriculture; enhancing access to existing markets and development of new markets for value-added agricultural products; and support for traditional and indigenous agricultural systems

(<http://www.un.org/esa/sustdev/sdissues/agriculture/agri.htm> Date accessed: January 2005).

At its Eighth Session, the Commission on Sustainable Development (1999 & 2000 cited in United Nations 2001: 48), suggested the following areas for future work related to integrated land management: 'prevention and/or mitigation of land degradation; access to land and security tenure; critical sectors and issues including forests, drylands, rehabilitation of land-mined areas, and rural-urban and land management interactions; access to information and stakeholder participation; international cooperation for capacity building, information sharing, and technology transfer and rehabilitation of land degraded by mining'.

2.4.1.3 Oceans, Seas and Coasts

Over-fishing is one major problem impacting on the sustainability of the oceans. The numbers of people in coastal areas continue to rise, therefore the potential for harming the natural growth of fish in the ocean increases correspondingly. In the 1990s it was estimated that 60 percent of the world's

fisheries were either fully exploited or over-fished. An estimated 27 million tons of fish are discarded each year (United Nations: 2001: 51)

Marine pollution is caused due to land-based activities. This includes deforestation, industrial chemical emissions, pesticide and fertilizer run-off, oil spills and sewage effluent. The world's coastal ecosystems face degradation due to this pollution.

Coral reefs have been damaged by human activities. This is due to soil erosion from deforestation, sewage discharge, and industrial and agricultural chemical pollution. Industrial waste products are released into coastal waters, both intentionally and as a by-product of routine practices. Most of these waste products come from land run-off, natural sources, and "normal" spillage associated with loading oil into tankers and cleaning out storage tanks while at sea.

Sewage dumping also poses a widespread threat to coastal waters. Sewage does its damage by fertilizing water, it then causes huge algae blooms that deplete the water's oxygen, eventually killing much marine life. Red tide which is a toxic plankton thrives in such rich environments and it regularly kills fish, marine mammals, and, occasionally, people who eat toxin-contaminated seafood.

The marine and coastal issues which are significant to sustainable development were identified in Agenda 21, Chapter 6 (cited in United Nations 2001: 50) and include: 'degradation from land-based activities; unsustainable exploitation of fish and other living resources; marine pollution from shipping and offshore oil and gas project; the protection of biodiversity and fragile ecosystems and the relationship to climate change, including the implication of sea level rise.'

2.4.1.4 Freshwater

Freshwater resources are an important component of the earth's hydrosphere and an indispensable part of all terrestrial ecosystems. The freshwater environment is characterized by the hydrological cycle, including floods and droughts. Global climate change and atmospheric pollution could also have an impact on freshwater resources and their availability. To maintain sustainable development it is important to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of the ecosystems. Freshwater resources are used for sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation (<http://www.un.org/esa/sustdev/>

documents /agenda21/english/agenda21chapter18.htm Date accessed:

January 2005)

The long term sustainability of water is in doubt in many countries worldwide.

This is so, because water usage has grown faster than the population rate which results in many regions having shortage of water. These regions can also be described as water-stressed countries. This has serious implications for the socio-economic development of the world (United Nations: 2001: 52).

Across developing countries 2.5 billion people do not have access to safe water (Adams 2001:11).

Poor water allocation and pricing, insufficient use as well as lack of adequate integrated management, gives rise to poor water quality as well as quantity.

When water used by industries and municipalities is returned to water houses, then it is degraded in quality. Water is mostly drawn into agriculture which amounts to seventy percent, industry takes twenty three percent and domestic consumption eight percent. Water tables are being lowered in many areas, and thus it becomes expensive to access it.

Damming of water in rivers upstream prevents the population downstream from obtaining an adequate supply of water. A typical example is in the Middle East where Israel controls the river Jordan, resulting in a water shortage for many people in the area. Mylius (2000 cited in Mawhinney:58) contends that

access to water is one of the major causes of the disputes in that region. In a 1992 report it was suggested that 32 countries were in dispute over access to water rights (Middleton et al. 1993 cited in Mawhinney 58).

Water quality problems are due to sewage pollution, intensive agricultural use of fertilizers and pesticides, industrial wastes, saltwater intrusion and soil erosion. Nitrates (the salts of nitric acid) contaminate the water due to high fertilizer use. This can cause a disease in infants and sometimes even result in death. It also causes algae growth and eutrophication in waterways (United Nations 2001: 52). Polluted water is a big contributor to health problems such as cholera (Flavin et.al: 2001:7). It is believed that 80% of all diseases and one-third of all deaths result from contaminated water (Middleton et al. 1993 cited in Mawhinney: 58).

Eutrophication is a process whereby water bodies, such as lakes, estuaries, or slow-moving streams receive excess nutrients that stimulate excessive plant growth (algae, periphyton attached algae, and nuisance plants weeds). This enhanced plant growth, often called an algal bloom, reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die. Nutrients can come from many sources, such as fertilizers applied to agricultural fields, golf courses, and suburban lawns; deposition of nitrogen from the atmosphere; erosion of soil containing

nutrients; and sewage treatment plant discharges. Water with a low concentration of dissolved oxygen is called hypoxic. (<http://toxics.usgs.gov/definitions/eutrophication.html>. Date Accessed: December 2008)

Access to safe water and sanitation has not improved in the last decade in developing countries. As a result over 9 000 million people suffer from diarrhoeal diseases which cause the death of 3 million children each year (World Bank 1992:8 cited in Bartelmus 1994:24).

2.4.1.5 Biodiversity

Advocates of sustainable development claim that maintaining biodiversity will help to ensure that the earth continues to perform its natural ecological functions upon which all life depends. Biodiversity can be measured as the number of species or subspecies of plants, animals, and microorganisms. It is not exactly known how many species exist in the world, but 1.7 million have been identified out of a total of 14 to 100 million estimated to be in existence (Mawhinney 2002:54). Biodiversity is complex beyond understanding and valuable beyond measure (Ryan 1992:9 cited in Bartelmus 1994:16). It is also considered as an indication of the health of an environment.

Climatic stability, food and freshwater security and the maintenance of human health, are all associated with the maintenance and use of biodiversity. Degradation of biodiversity can cause serious economic, social and cultural impacts on the world's population.

Biodiversity can be affected by the over-harvesting or depletion of species, habitat loss or fragmentation, the introduction of exotic species, pollution, land degradation, climate change and natural disasters (United Nations 2001: 54).

Research has shown that 34% of fish species and 25% of mammals are currently threatened with extinction (Mawhinney: 2002: 54).

Global warming and the loss of tropical forests play a big role in the loss of many species. Most of the world's species live in the equatorial regions as well as the tropical rain forests.

Increase in human population and human activities threaten biodiversity. A quarter of the world's total biodiversity is in serious danger of extinction during the next 20-30 years (Bartelmus:16). There are 5000 to 150 000 species lost annually (Goodland 1991 cited in Bartelmus:16). Some ecologists believe that more than 50 percent of existing species will be lost in the next 100 years.

It is considered that the current rate of species extinction is exceeding that at which new species are emerging by over one million times (Mather and Chapman: 1995:120). From a human perspective every species that is made extinct eliminates knowledge and reduces future options for society (McCLaren 2003:21).

2.4.1.6 Forests

Forests provide timber, fuel and are also a habitat to thousands of species. They also protect soils and regulate water balances and climates. In developing countries tropical forests have declined by nearly one fifth in the last century due to agricultural land development as well as wood production which was used for shelter and energy. In the case of developing countries most wood is used for cooking and heating (Bartelmus:24).

Wood has been consumed on such a high level that it was estimated that by the year 2000 2.1 million people will not be able to have met the minimum needs on a sustainable basis (Lanly:82 cited in Bartelmus:24).

2.4.2 Social Features

2.4.2.1 Equity

One of the principal values underlying sustainable development is social equity. In this case people and their quality of life are being recognized as the central issue. Equity involves the amount of fairness and inclusiveness with which resources are distributed, the amount of opportunities afforded and the way decisions are made. This can be between communities and nations (United Nations: 2001: 35).

Social equity includes poverty alleviation, employment and income distribution, gender, ethnic and age inclusiveness, access to financial and natural resources and intergenerational opportunity (ibid).

2.4.2.2 The elimination of poverty

Poverty in society today is mainly due to economic, socio-economic, political and institutional factors over a period of time. The enormity and complexity of poverty could endanger the social fabric of the world, it could undermine economic development as well as the environment, and poverty could threaten political stability in many countries.

Le'le' (1991:661) cited in Baker et al. (1997:2) stated that the Brundtland report is linked to major political and social changes which include the elimination of poverty and exploitation.

Julio de Santa Ana (1998:4) understands that by the "elimination of poverty" Brundtland means that 'the essential needs of the worlds' poor need to be given overriding priority'. Goodland et. al (1993:297 cited in Adams 2001:9) declare that poverty is a massive global outrage.

Tolba (1987 cited in Elliot:3) cautioned that if sustainable development did not help the poor, they had no option other than to destroy the environment.

Brundtland (1986 in a letter to Scott, cited in Pearce et al. 1989 cited in Moffat 1996:ch3) stated that Sustainable Development requires the elimination of poverty and deprivation as well as the conservation and enhancement of the resource base which alone can ensure that the elimination of poverty is permanent.

Brundtland also maintained that sustainable development can be attained by promoting values which will encourage consumption patterns within the ecological possibility to which all can reasonably aspire. Here she was especially referring to the northern developed countries (Baker et al.:1997:3).

Clark (1995:43 cited in Voges :30) points to the criticism of the Brundtland report on the grounds that it did not stress that the developed countries are responsible for most of the severe environmental problems 'nor did it emphasize the need to redistribute the world's wealth'.

Brundtland was correct, however, in stressing that a healthy environment will not be achieved if there is extreme poverty. The poorest groups in the world are usually affected by environmental degradation because they are unable to protect themselves against the environmentally destructive activities of the richer and more powerful nations. It was poverty that usually forced the impoverished to practice destructive activities in the environment. '...poverty itself pollutes the environment, creating environment stress in a different way. Those who are hungry will often destroy their immediate environment in order to survive.' (WCED 1987:28-29 cited in Dresner:34). Poverty reduces people's capacity to use resources in a sustainable manner (WCED 1987:49-50 cited in Dresner:34).

It is required from governments, producers and consumers to make a stronger commitment to meeting the needs of the poor and at the same time to focus on economic systems that will account for social and environmental costs (United Nations: 2001: 57).

Poverty in developing countries usually is accompanied by environmental degradation. The dire needs of the poor are wood for fuel, access to clean water, sanitation facilities and productive lands. They cultivate marginal lands and live in unsafe housing.

Leonard (1989 cited in Elliot:45) mentions several types of poor communities and their impact on the environment:

- Those who have a rapid population growth and migrate to the cities e.g. Mexico City, Lagos and Bombay where they settle down in hazardous ecologic areas. They lack clean water and sanitation and are open to diseases due to faecal and chemical contamination.
- Rural populations who have limited access to productive land in dry areas e.g. Sahel-region, North-Eastern Brazil. The dry conditions are exacerbated by desertification and land degradation, causing destruction of the vegetative cover. They experience fuel wood shortages and there is a decline in land productivity.
- Rural populations who have limited access to productive land in steep hillsides e.g. Himalaya region and the Highlands of Central America. They cause destruction of vegetative cover in watersheds. Their activities cause much soil erosion in their areas. They experience fuel wood shortages and they cause downstream flooding and sedimentation.

- People who stay in the forest areas e.g. Amazon region, the outer islands of Indonesia and West Africa. They are responsible for large-scale deforestation and loss of soil fertility. They cause biological diversity and their activities cause global warming. Due to their activities, there is a decline in land productivity and loss of potential forest-based production. They are vulnerable to tropical diseases.

While the poor threaten the ecosystems they are at the same time victims of environmental decline. An estimated 600 million urban residents in developing countries have their health threatened daily by health impacts associated with inadequate provision of quality water supplies, sanitation and sewage disposal and the lack of emergency service Hardoy et. al (1992 as cited in Elliot:46). Poor households suffer more losses than wealthier residents when heavy rainfall causes landslides or when earthquakes strike urban environments (Hewitt 1997 cited in Elliot:46).

The General Assembly, in its 1997 Programme for the Further Implementation of Agenda 21 (para.27) decided that poverty eradication should be an overriding theme of sustainable development for the coming years. Their priorities include: (1) improving access to sustainable livelihoods, entrepreneurial opportunities and productive resources; (2) providing universal access to basic social services; (3) progressively developing social

protection systems to support those who cannot support themselves;

(4) empowering people living in poverty and their organizations;

(5) addressing the disproportionate impact of poverty on women; (6) working with interested donors and recipients to allocate increased shares of ODA to poverty eradication; and (7) intensifying international cooperation for poverty eradication. (<http://www.un.org/esa/sustdev/sdissues/poverty/poverty.htm>
Date accessed: December 2004.)

The World Summit for Social Development report (1995 cited in United Nations 2001:35) formulated the following commitments: 'poverty eradication in the world; full employment; social integration including equality of opportunity; equality between woman and men; universal and equitable access to quality education and primary health care and accelerated development in the least developed countries.'

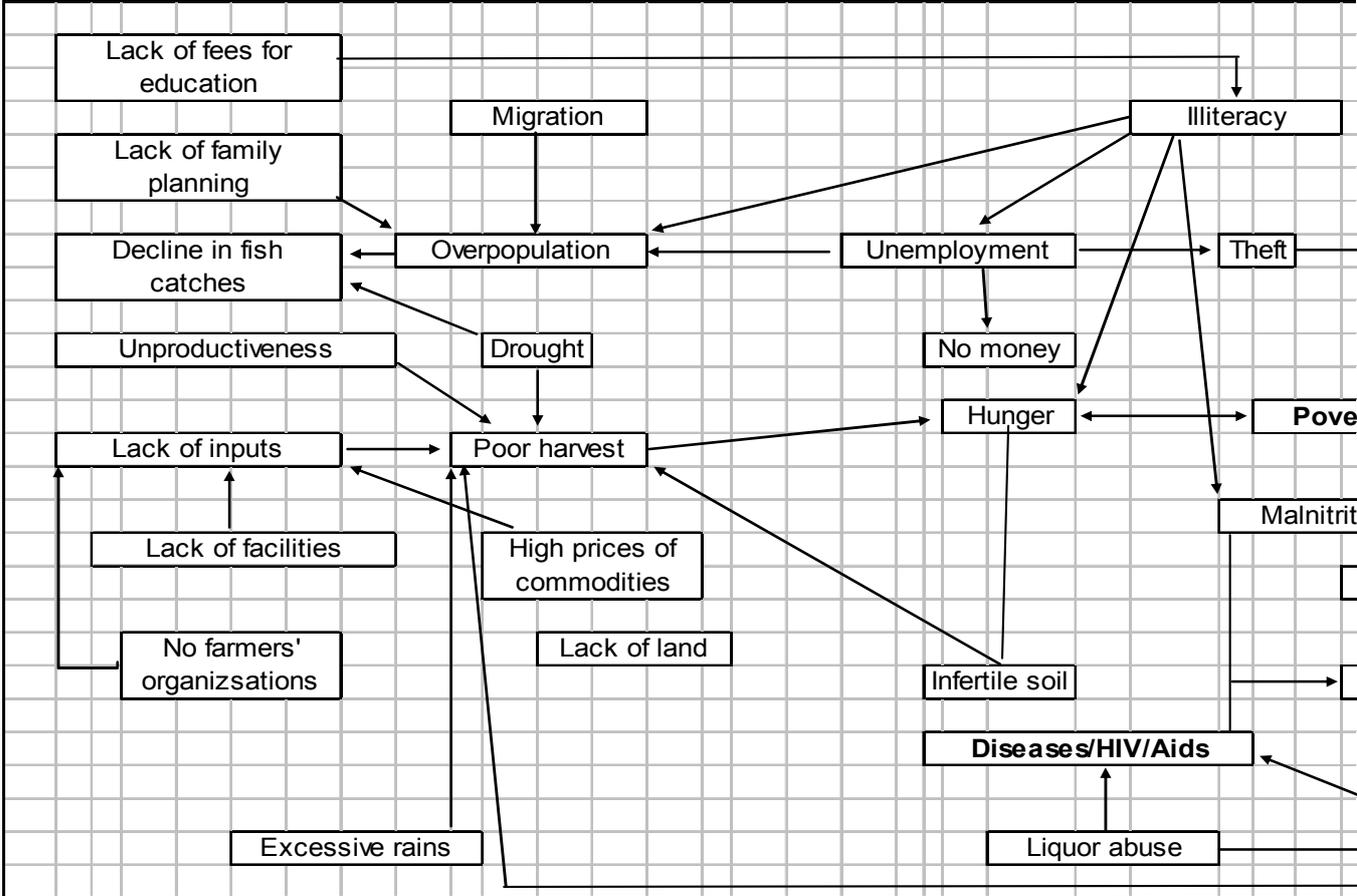
In order to foster sustainability, it is important for the world to be committed to eradicate poverty with a focus on the developing countries. If the wealthier countries are not going to commit themselves to eradicate this scourge of poverty, then the negative impact on the environment will lead to further ecological decline.

Table 3 Causes and impacts of poverty

(Source: Adapted from Narayan and Petesch 2002:70 cited in Van
Rooyen:2004)

CAUSES AND IMPACTS OF POVERTY

CAUSES



2.4.2.3 Education

Education is a fundamental prerequisite for the achievement of sustainable development. It is important for meeting the basic needs such as achieving equity, capacity building, access to information and the strengthening of science (United Nations: 2001: 39).

Education can be divided into formal education i.e. school, technikon, university, and informal education i.e. learning in the workplace such as workshops. Through the means of education, consumption and production patterns can be changed to meet with the demands of sustainable development.

Governments and educational policy makers should review national education policies and integrate information on and awareness about sustainable development into national education strategies and plans.

Reid (1995:174) recommends that education for sustainable development must not only create an awareness of the global crisis, but must be placed at the heart of the curriculum. Education must be rather ecological than environmental as this will encourage broad, holistic thinking. Education must not only be about environmental ethics but it must induce the production of those values in a wide proportion of the population (Proops & Wilkinson:

2000:31). This ecological education will not only teach students about empowerment but it will enable students to fulfill their aspirations by helping them to develop their full range of abilities.

Creativity, commitment and initiative should be encouraged because this will equip students to take responsibility for themselves. They will also become independent individuals (Harrison 1990:203 cited in Reid 1995:175) calls this the work of human communication, of caring and nurturance, of tending the personal bonds of community which enhances our ability to relate to each other and eventually to acknowledge each other's identities and rights.

Educational issues which are significant to sustainable development were listed in Agenda 21 (cited in United Nations 2001: 40) and include 'reorienting education towards sustainable development; increasing public awareness and promoting training.'

The objective was to strive for universal access to basic education, reduction of adult illiteracy, integration of sustainable development concepts in all educational programmes to achieve interdisciplinary learning, the promotion of broad public awareness and the strengthening of vocational and scientific training. It was on this basis that the CSD through its UNESCO partner established an educational work programme to re-orientate education towards

sustainable development (United Nations: 2001: 40).

Non-formal education can also play a role in sustainable development. This can be done by using life related and skills orientated processes to foster sustainable development. Nhundu (2003:171) mentions the following non-formal education activities:

- (a) adult literacy programmes;
- (b) agricultural extension and farmer training programmes;
- (c) community extension and farmer training programmes, such as health and sanitation, nutrition, and family planning education;
- (d) in-house training, including apprenticeship, induction and refresher courses run at work;
- (e) youth work such as those that take place at youth clubs;
- (f) open and distance learning;
- (g) e-learning;
- (h) continuing professional development education.

Non-formal education will provide its participants with economic, technical, political and cultural skills. It is a continuing process and, therefore, can change an individual's personality and he/she can take on more challenges.

The participants in informal-education all have an equal opportunity to progress as there are no prerequisites such as qualifications to enter into

informal-learning. Non-formal education gives its participants new hope, it provides them with fulfillment and enables them to lead a more productive and meaningful life afterwards.

It also helps with the alleviation of poverty because unemployment will be reduced when people start self-employment through their training. The skills which they acquired through training will help them to self-reliance, entrepreneurship and an increase in productivity.

Non-formal education also promotes the awareness of health related issues e.g. HIV/AIDS, immunization.

The education systems should promote a process of lifelong growth in terms of awareness and aspiration. It is important that students learn to plan, organize, communicate with each other, develop strategies and form alliances. If they do so, they will contribute to sustainable development because people will eventually learn to work with each other, instead of working against each other.

2.4.2.4 Housing

Adequate shelter is a basic requirement for sustainable development.

Adequate shelter results in safer, productive, more equitable and healthier

settlements. Inadequate housing leads to environmental problems. This was the conclusion at the United Nations conference on the human environment in 1972 at Founex in Switzerland (Bartelmus: 1994:6).

In the late 20th century people moved more to urban areas globally, resulting in excessive population concentration. This is due to inadequate planning and lack of financial resources and high unemployment.

This rural to urban migration contributes to the development of slums and poor living conditions which are associated with poverty, homelessness, poor health, social exclusion, family instability and security, violence, environmental degradation, and an increased vulnerability to disasters (United Nations: 2001: 41). The pollution of urban poverty that is a consequence of inadequate water supplies, sanitation, drainage and solid waste collection is known as the 'Brown Agenda' and is a problem in the developing world (Elliot: 138).

The poor residents in the cities live in locations and settlements which are hazardous and can be detrimental to their well-being. 'Poor groups do not live here in ignorance of the dangers; they choose such sites because they meet more immediate and pressing needs, Such sites are only places where they can build their own house or rent accommodation. The sites are cheap because they are dangerous.' (Hardoy and Satterthwaite :1989:159 cited in Elliot:146).

There are many reasons why people settle down in informal settlements near the cities. One is that the demand for housing outweighs the supply of formal housing units. Another is that they are near to their place of work.

Elliot (148) calls these unauthorized informal settlements 'shanty' towns or 'favelas' or 'bustees'. Hardoy et. al (1992a cited in Elliot :148) estimate that between 30 to 60 percent of the population of the cities of the developing world live in houses and neighbourhoods which have developed illegally. In addition to the informal settlements there are also millions who live on the streets world wide.

Informal settlements usually lack emergency services. They also do not have electricity which means they have inadequate or poor lighting. Open fires used for cooking purposes lead to many accidents which result in destruction, injury and death. Many of the dwellings are made of flammable materials.

There is poor ventilation which leads to respiratory illnesses like lung disease and respiratory tract inflammation. This is further aggravated by the burning of low-quality fuels such as charcoal for domestic heating and lightning.

These settlements are usually overcrowded and serve as a favorable platform for the spread of disease. Lack of adequate water supply in these

settlements as well as sanitation facilities breeds germs and causes more illnesses.

Migration and rapid population growth leads to unsustainable living conditions and also lead to an increased pressure on the environment especially in ecological –sensitive areas (United Nations: 2001: 43).

Urbanization in the late twentieth century and early twenty-first century plays a big role in population distribution. It takes place due to unemployment and underemployment, poor rural social services, unavailability of arable land, natural disasters like drought and civil unrest.

Holdgate, Kassas, and White (1982:342 cited in Bartelmus 1994:26) call this 'mushrooming of marginal settlements within and on the periphery of large cities'. These shelters are characterized by poverty, inadequate health and educational facilities. As mentioned above, they also lack basic sanitation, clean water supply and waste disposal facilities. Communicable disease flourish in these settlements and high crime rates become the order of the day.

The increase in both the number and size of cities means that greater attention should be given to the human factor to be able to sustain their

development. The increase in the number of informal settlements puts enormous strain on existing social services and infrastructure in the cities.

2.4.2.5 Security

Globalization creates an environment which is conducive to expanded forms of criminality, including drug trafficking, smuggling of migrants, computer crime and the illegal firearms trade as well as violence. These factors contribute to social disintegration (United Nations: 2001: 43).

A secure atmosphere promotes a just society, social integration and development (United Nations: 2001: 43).

2.4.2.6 Population growth

Researchers in sustainable development use population statistics to make decisions on the basis of interrelationship between people, resources, the environment as well as population change. Population change concerns the numbers of births, deaths, immigrants, and emigrants over a specified time interval (United Nations 2001: 43).

The dramatic growth in world population combined with unsustainable

consumption patterns, places increasingly severe stress on the life-supporting capacities of the earth such as land, water, air, energy and other resources.

(www.un.org/esa/sustdev/sdissues/sdissues.htm. Date accessed: November 2004).

Policymakers stress the need to curb population growth as a means of easing the demand for natural resources.

2.4.2.7 Health

Sustainable development and health are closely connected. Health includes safe water supply, sanitation, proper nutrition and a safe food supply, unpolluted living conditions, the control of disease and access to health services. (United Nations: 2001: 37).

The health situation of a community can be influenced by natural and human induced disasters, poverty, lack of information and education and rapid urbanization (United Nations: 2001: 37).

The United Nations conference on the human environment in 1972 at Founex in Switzerland concluded that disease and malnutrition leads to environmental problems (Bartelmus:6).

Air and water pollution are connected with excess morbidity and mortality. Overcrowding and inadequate housing can lead to respiratory and other diseases. The health of a population can also be affected by environmental pollution due to energy production, transportation and industry, inadequate waste management, pesticides and radiation (United Nations: 2001: 38).

'Wealth determines health' is a term often used to explain the spatial pattern of ill health and premature deaths at various levels (Elliot:1996: 48).

The Table below will substantiate the above statement

Table 4 Percentage of total children who will not reach one year of age, selected countries.

Country	GNP per capita (dollars 1995)	Infant mortality	
		1980	1995
Niger	220	15	12
Ghana	390	10	7
India	340	12	7
Indonesia	980	9	5
Peru	2 310	8	5
Brazil	3 640	7	4
Ecuador	1 390	7	4
Sri Lanka	700	3	2
USA	26 980	1	1
UK	18 700	1	1
Japan	39 640	1	1

Source: World Bank (1997b) cited in (Elliot:1996: 48).

The above table illustrates that a child born in a developing country is ten times more likely to die before the age of one, than a child in a developed country. The premature deaths of children in the developing nations, is an indication that current developing patterns are not meeting the needs for future generations. Sustainable development could suffer a drawback due to this early child death in the developing world.

There are an estimated 12 million child deaths per year in the developing world. Of these, 3 million die of diarrhoeal diseases due to poor quality water and standards of sanitation (Satterthwaite et al. : 1996 cited in Elliot:49), 5 million children due to diseases such as whooping cough or measles, and nearly 2 million from malaria as well as malnutrition and worms (Elliot: 49).

Hancock (1996 cited in Mason 2000:84) says that traffic in urban areas is a major source of air pollution and that air pollution leads to respiratory disease and asthma attacks. Reduction of cars, improvement of public transport, development of cleaner fuels, more efficient engines and creating an environment which will encourage pedestrians and cyclist are all sustainable objectives. Respiratory disease is a major killer in Third World cities. In Bangkok there are estimated to be 1 400 deaths a year due to airborne particulates (Hardoy et. al :1992 cited in Adams : 2001 ; 293).

Satterthwaite (et al.: 1996 cited in Elliot: 49) holds that children suffer most under the effects of pollution. A resting three-year-old consumes twice as much oxygen and therefore twice the pollution weight for weight as resting adult. Children's underdeveloped kidneys, livers and enzyme systems are less able to process such pollutants. Development can be stagnated if a population is affected by poor health and inadequate health facilities.

Lack of funds in developing countries means a lack of health education. A typical example is the lack of HIV/AIDS awareness programmes in developing countries. Large amounts of the population succumb to HIV due to the lack of knowledge or how to handle the disease.

The protection and promotion of human health is a major objective of the United Nations (Agenda 21, Chapter 6 cited in United Nations: 2001: 37) 'meeting primary health care needs, especially in rural areas; controlling communicable diseases; protecting vulnerable groups; meeting urban health needs and reducing health risks from environmental pollution and hazards.'

Special care should be given to vulnerable groups such as children, women, indigenous people, the poor, the elderly and the disabled.

Primary health care include the provision of clean water, adequate sanitation

and safe food through community based, scientifically sound, and socially acceptable approaches.

To be able to control infectious diseases there must be an adequate supply of clean water, sanitation, health education and vaccine use which will be able to control malaria, cholera and HIV/AIDS.

2.4.2.7.1 Sanitation

Sanitation includes the adequate management and disposal of different types of wastes, with a view to minimizing harmful effects to human health and the environment.

The United Nations conference on the human environment in 1972 at Founex in Switzerland concluded that lack of sanitation leads to environmental problems (Bartelmus:1994:6).

Lack of sanitation can cause various types of diseases, such as diarrhea. Inadequate facilities for the disposal of excreta or household garbage can lead to infectious diseases. Elliot (1996:155) claims that an estimated 420 million urban residents have no access to the simplest latrine. They therefore resort to defecating in open lands or waterways. This result in direct exposure to faces near homes and the contamination of drinking water. With rapid

urbanization taking place in many developing countries many informal settlements become the order of the day. These cramped conditions aggravate rapid transmissions of disease between individuals.

The goals and targets related to sanitation reflected in Johannesburg Plan of Implementation (JPOI) include:

- Ensure, by the year 2025, that sanitation coverage is achieved in all rural areas;
- Improve sanitation in public institutions, especially schools;
- Promote safe hygiene practices;
- Promote affordable and socially and culturally acceptable technologies and practices;
- Integrate sanitation into water resources management strategies;
- Develop innovative financing and partnership mechanisms and
- Strengthen existing information networks. (<http://www.un.org/esa/sustdev/sdissues/sanitation/sanitation.htm>. Date Accessed: January 2005).

2.5 Economic Performance

2.5.1 Economic Structure

Trade and investment plays an important role in economic growth and sustainable development. Access to financial markets, the transfer of

financial resources and technology as well as debt relief are all positive contributions to economic growth and sustainable development. Poverty and the exploitation of natural resources have a negative influence on economic growth and sustainable development.

Agenda 21 recommends the concept of trade liberalization, to support economic performance within the context of sustainable development. This is done by making trade and environment mutually supportive, providing new and additional financial resources to developing countries and encouraging macroeconomic policies favorable to environment and development (Agenda 21, Chapter 2, 33 cited in United Nations: 2001: 56).

Trade liberalization usually has a positive effect on sustainable development. It can stimulate economic diversification, improve the efficiency of resource allocation and encourage the transfer of cleaner and more efficient technology (United Nations: 2001: 56).

2.5.2 Consumption and Production Patterns

The high consumption and production rate in many highly industrialized countries, leads to a continued depletion of natural resources and deterioration of the global environment.

To be able to adapt to a policy of sustainable development, governments, producers and consumers should put less emphasis on material consumption and more effort on resource and energy-efficient technologies.

The sound management of toxic chemicals, including the prevention of illegal international traffic in toxic and dangerous products is an important aspect of sustainable development.

Chemical contamination, which causes a considerable amount of damage to human health, genetic structures and reproductive outcomes, as well as the environment, has in recent times been continuing within some of the world's most important industrial areas. Toxic chemicals have had an effect on the fundamental chemical and physical processes of the earth's atmosphere and climate.

Agenda 21 Chapter 21 of the UN has proposed a six point plan to manage the control of chemicals. The programme areas involve hazard assessment (based on the intrinsic properties of chemicals), risk assessment (including assessment of exposure), risk acceptability and risk management and it is:

- (a) Expanding and accelerating international assessment of chemical risks;
- (b) Harmonization of classification and labelling of chemicals;
- (c) Information

exchange on toxic chemicals and chemical risks; (d) Establishment of risk reduction programmes; (e) Strengthening of national capabilities and capacities for management of chemicals; (f) Prevention of illegal international traffic in toxic and dangerous products.' (<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter19.htm> Accessed December 2004)

2.5.2.1 Industry

Industry has an important role to play in achieving the goals of sustainable development as supplier of goods and services required by society, as a source of job creation and as an active participant in community life (<http://www.un.org/esa/sustdev/sdissues/industry/industry.htm>)

2.5.2.2 Energy

Energy services are essential for sustainable development. They include things such as lighting, cooking, heating and cooling, water pumping, refrigeration, transportation and communication. If people do not have access to energy services, then they must spend a great deal of time and physical energy on basic subsistence activities rather than on earning money. The lack of energy correlates closely with many indicators of poverty, poor education

and inadequate health care. On the other hand a reliable energy supply is essential to economic stability and growth, jobs and improved living standards. (http://www.un.org/esa/sustdev/sdissues/energy/wehab_energy.pdf. Date accessed: December 2004)

Energy plays an important role and is vital to all aspects of development from powering manufacturing and modernisation of agriculture to providing electricity to run schools and health facilities. The impact of its production, distribution and use grows more severe with every decade. New alternative and renewable as well as cleaner and more efficient technologies are being developed and implemented every year, but the strain caused by the rise in energy demand and global consumption outweigh the benefits brought by these improvements.

Current levels of energy consumption and production are not sustainable, especially if demand continues to increase. Agenda 21 stresses the importance of using energy resources in a way that is consistent with the aims of protecting human health, the atmosphere, and the natural environment (<http://www.un.org/esa/sustdev/sdissues/energy/enr.htm> Date accessed: December 2004).

It was estimated that in 2005 the CO₂ emission would be 9.1 billion ton of C into the atmosphere due to energy consumption of fossil fuel, oil and gas (Bartelmus:16). This causes air pollution, change in air quality and eventually climate change.

At the CSD-9 and the WSSD, countries agreed that stronger emphasis should be placed on the development, implementation, and transfer of cleaner, more efficient technologies and that urgent action is required to further develop and expand the role of alternative energy sources .(<http://www.un.org/esa/sustdev/sdissues/energy/enr.htm> Date accessed: December 2004).

2.5.2.3 Waste (hazardous)

The effective control of hazardous wastes is of great importance to sustainable development. It is important for proper health, environmental protection and natural resource management.

Hazardous materials and wastes are daily on the increase. It is estimated that 375 to 500 million ton are produced annually and is on the increase. (Middleton et al. 1993 cited in Mawhiney 2002: 55).

Hazardous waste is a substance, such as nuclear waste or an industrial by product, which is potentially damaging to the environment and harmful to humans and other living organisms. Any solid, liquid, or gaseous waste materials that, if improperly managed or disposed of, may pose substantial hazards to human health and the environment. Every industrial country in the world has had problems with managing hazardous wastes. Improper disposal of these waste streams in the past has created a need for very expensive cleanup operations. A waste is considered hazardous if it exhibits one or more of the following characteristics: ignitability, corrosivity, reactivity, and toxicity. Ignitable wastes can create fires under certain conditions; examples include liquids, such as solvents, that readily catch fire, and friction-sensitive substances. Corrosive wastes include those that are acidic and those that are capable of corroding metal (such as tanks, containers, drums, and barrels). Reactive wastes are unstable under normal conditions. They can create explosions, toxic fumes, gases, or vapors when mixed with water. Toxic wastes are harmful or fatal when ingested or absorbed. When they are disposed of on land, contaminated liquid may drain (leach) from the waste and pollute groundwater. Hazardous wastes may arise as by-products of industrial processes. They may also be generated by households when commercial products are discarded. These include drain openers, oven cleaners, wood and metal cleaners and polishes, pharmaceuticals, oil and fuel additives, grease and rust solvents, herbicides and pesticides, and paint

thinners.(<http://www.answers.com/topic/hazardous-waste> Date Accessed: January 2009)

Examples of hazardous wastes are used and outdated computers, agriculture wastes such as pesticides and herbicides, household wastes such as toxic paints, toxic batteries, asbestos particles and drugs, medical wastes contaminated with blood and tissue which could include needles, scalpels and glassware.

Hazardous wastes can pollute soil and affect plants that root into it as well as animals that move over it. Toxic substances which do not break down or bind tightly to the soil may be taken up by growing plants. These toxic substances may later appear in animals that eat crops grown there and possibly in people who do so. The air may become contaminated by direct emission of hazardous wastes such as evaporation of toxic solvents from paints and cleaning agents. River and lake pollution can occur if it is toxic enough then it may kill animal and plant life.

Mawhiney (2002: 55) also holds that agricultural and human waste into rivers and lakes causes huge increase in nitrogen and phosphorus and this usually cause algal blooms as well as health hazard to many species.

Industrialized countries are using the Third World to dump their hazardous waste on a big scale. Between 1986 and 1991 175 million ton of hazardous waste were offered on the formal world markets (Guardian:1992 cited in Elliot:1996: 63). Ten million ton of these wastes were exported in this period from the industrialized world to the developing world. The main receiving areas at the time were the Caribbean and Central and South America. Huge shipments were sent to former Soviet states. Many of the wastes were dumped in West Africa : 15 000 ton in Guinea, 1.5 ton in Benin, 3 800 ton in Nigeria, 2 million ton in Equatorial Guinea, 15 million in Guinea-Bissau and 1 million ton in Congo (Elliot:1996: 63-64).

Attraction to individual companies and governments of poor countries are clear e. g. British firms offered US\$ 120 million per year to Guinea-Bissau to bury industrial waste material (Elliot:1996: 64).

The control of hazardous wastes was stated in Agenda 21 Chapter 20 and it is as follows: (1) preventing or minimizing the generation of hazardous wastes as part of an overall integrated cleaner production approach; (2) eliminating or reducing to a minimum transboundary movements of hazardous waste; (3) ratifying the Basel Convention on the Control of transboundary Movements of Hazardous Wastes and their Disposal; (4) ratifying and full implementation of

the Bamako Convention on the Ban of the Import into Africa and the Control of transboundary movement and management of Hazardous Wastes within Africa; and (5) eliminating the export of hazardous wastes to countries that prohibit such imports. (<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter20.htm> accessed in January 2005)

2.5.2.4 Waste (radioactive)

The correct management, transportation, storage, and disposal of radioactive waste is important in terms of sustainable development. This is important for the protection of human health and the environment. Radioactive wastes are generated in the nuclear fuel cycle as well as in the nuclear applications. This includes the use of radionuclides in medicine, research and industry.

Radioactive waste varies, from very low in short-lived, low-level waste, to very large for high-level waste(<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter22.htm> accessed in January 2005).

If one looks at nuclear waste then the volume of high-level waste and spent fuel in 1990 was 21 000m³ and it could reach some 1 million m³ in the year 2000 (Bartelmus:1994:15).

The Commission on Sustainable Development discussed the safety of radioactive wastes during its seventh session in 1999. During this session the

transboundary movement of the radioactive wastes was considered. In 2001 they deliberated on nuclear energy technologies. The World Summit on Sustainable Development stressed the importance of effective liability measures for international maritime transportation and other transboundary movement of radioactive material, radioactive waste and spent nuclear fuel. They also encouraged Governments to examine and improve measures and internationally agreed regulations regarding the safe handling, transport and disposal of this waste(http://www.un.org/esa/sustdev/sdissues/waste_radioactive/waster.htm accessed in January 2005).

Nuclear waste will not only be an environmental health hazard now but they will persist to be in a dangerous state for centuries. The financial cost of decommissioning and waste management will eventually fall on future generations (McLaren 2003: 20). The OECD estimates that the cost for the UK alone will be 45 million British Pounds by 2100. (OECD : 1996 cited in McLaren :2003: 20). The direct cost of the Chernobyl disaster to Belarus alone are estimated at US\$ 235 million (Nuclear Engineering International : 1996 cited in McLaren :2003: 20).

2.5.2.5 Waste (solid)

The sound management of solid wastes is of major concern in maintaining the quality of the earth's environment, and especially in achieving environmentally

sound and sustainable development in all countries.

Solid wastes include domestic refuse such as garbage, which includes decomposable wastes from food, as well as rubbish which include non decomposable wastes, either combustible such as paper, wood, and cloth or noncombustible such as metal, glass, and ceramics. It also includes ashes from residues of the combustion of solid fuels as well as ashes from incinerators. Large wastes from demolition and construction debris and trees. Sewage-treatment solids such as material retained on sewage-treatment screens, settled solids, and biomass sludge, septic tank sludge and sludge from sewage treatment plants. Mining wastes such as slag heaps and coal refuse piles. Agricultural wastes such as farm animal manure and crop residues (<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter21.htm> accessed January 2005)

Bartrone et. al (1994) cited in Elliot (1996:155) holds that where waste is collected then 90 percent of the cases it is discharged untreated and directly into rivers, lakes and coastal waters.

Hardoy and Satterthwaite (1989 cited in Elliot 1996:155) argue that 50 percent of solid waste in neighborhoods may go uncollected. This leads to environmental problems among low-income communities. Many of the

waste is left on the road sides or dumped in canals or rivers or left on open lands. This uncontrolled garbage attracts pests, is a health hazard for children playing nearby in urban areas and also is a fire hazard.

Solid waste also include heavy metals such as lead, mercury and cadmium are in various forms such as polychlorinated biphenyls (PCBs), hydrocarbons, organic solvents, asbestos and cyanide. The threat posed by these chemicals is invisible and their effects cumulative, it is exacerbated in the bodies of children (Adams:2001:294).

Agenda 21 Chapter 21 proposes the following to establish solid waste control:(a) Minimizing wastes; (b) Maximizing environmentally sound waste reuse and recycling; (c) Promoting environmentally sound waste disposal and treatment; (d) Extending waste service coverage.

(<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter21.htm> accessed January 2005)

The promotion and implementation of more sustainable consumption and production patterns stated in Agenda 21 Chapter 4 cited in United Nations: 2001: 57: 'encouraging greater efficiency in the use of energy and resources; minimizing the generation of wastes; assisting individuals to

make environmentally sound consumer decisions; showing leadership through government purchasing and moving towards environmentally sound pricing.’

2.6 Institutional Structure

2.6.1 Institutional Framework

To implement sustainable development, appropriate legal and policy instruments are required as an institutional framework. The integration of social, economic and environmental factors is important for such instruments. Socioeconomic and environmental conditions on a global scale can improve by means of the implementation of sound sustainable development strategies and international treaties by countries.

One way of co-operation of the global community in terms of sustaining development is signatures of governments to various protocols, treaties and conventions. Over a hundred such environment treaties have been adopted since the 1972 UN Conference on the Human Environment, World Resources Institute (1994) cited in Elliot (1996:70).

The United Nations Environment Programme (UNEP) brought many

government representatives together in Montreal in 1987 to phase out the usage of CFC. This became known as the 'Montreal Protocol' (Elliot 1996:70). In 1995 the 150 parties to the protocol revised once again to include the control of hydrochlorofluorocarbons which are being used as replacements for CFCs, but which are also damaging the ozone levels. Starke (1987) cited in Elliot (1996:70).

In 1987 UNEP established an Intergovernmental Panel on Climate Change (IPCC) to co-ordinate and identify response strategies to global warming. The IPCC later became instrumental in designing the UN Framework Convention on Climate Change signed by more than 150 states at the Earth Summit in Rio. After Rio the Conference of Parties met three times and in 1997 in Kyoto in Japan a legally binding agreement on emission reduction was reached (Elliot 1996:70).

In 1983 the International Tropical Timber Organization (ITTO) was formed and by the end of the decade it consisted of 45 member countries who accounted for 80% of these forests and 95% of tropical exports (Starke : 1990 cited in Elliot 1996:71). All the members are signatories to an agreement committed to the sustainable use and conservation of tropical forest.

The Convention on International Trade in Endangered Species of Wild Flora

and Fauna (CITES) was formed in 1973. It continues to be the major international monitor of species loss (Elliot 1996:70). At Rio 155 states and the European Union signed the Convention on Biological Diversity. It went further than CITES in establishing a wider context for all biodiversity protection and for the sustainable use of the components of biodiversity (Munson : 1995 cited in Elliot:71). The Convention has been described as the most significant outcome of UNCED Barrow (1995) cited in Elliot (1996:71). At the earth summit in Rio all participating countries agreed to the Rio

Declaration on Environment and Development Table 5

Table 5 The Rio Declaration on Environment and Development

.....
 ...

1. Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.
2. States have the sovereign right to exploit the resources and the responsibility to ensure that such exploitation does not cause damage to the environments of other states.
3. The right to develop should equitably meet the needs of present and future generations.
4. In order to achieve sustainable development, environmental protection shall be an integral part of the development process.
5. All states shall co-operate to eradicate poverty
6. Developing countries especially the least developed and most environmentally vulnerable, will be given special priority.
7. States have common but differentiated responsibilities. The developed countries acknowledge their responsibility in view of the pressure they place on the global environment.
8. States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.
9. States should co-operate to strengthen capacity for sustainable development through exchanges of scientific and technological knowledge.
10. States shall facilitate and encourage public awareness by making environmental knowledge widely

available.

11. States shall enact effective environmental legislation
12. States shall co-operate to promote a supportive and open international economic system.
13. States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage
14. States should co-operate to discourage or prevent the relocation and transfer to other states of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.
15. the precautionary approach shall be widely applied by states
16. national authorities should promote the internalization of environmental costs and the use of economic instruments. The polluter should, in principle, bear the cost of pollution.
17. Environmental impact assessment, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment.
18. States shall notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful environmental effects.
19. States shall notify potentially affected states of activities that may have a significant transboundary environmental effect.
20. Women have a vital role in environmental management and their participation is therefore essential to achieve sustainable development.
21. The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development.
22. Indigenous people and other local communities have a vital role in environmental management and development.
23. The environment and natural resources of people under oppression, domination and occupation shall be protected.
24. Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of conflict.
25. Peace, development and environmental protection are interdependent and indivisible.
26. States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations.
27. States and people shall co-operate in the fulfilment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development.

Agenda 21 which contains forty chapters was the action plan which emerged from UNCED. I have constantly used significant quotations of Agenda 21 in this chapter to show the possible solutions that can be found in terms of sustainable development. Koch and Grubb (1997:455) comments on Agenda 21 saying it is has been referred to as a collection of agreed and negotiated wisdoms as to the nature of the problems and relevant principles of the desirable and feasible paths ... against which government and other actions can and will be compared.

All governments who were present at Rio committed themselves to the action in Agenda 21. Three years after Rio, 74 countries submitted to the Commission on Sustainable Development national reports on their activities undertaken to meet the objectives set out in Agenda 21 Lindner (1997:9) cited in Elliot (1996:91). Many countries have set up national commissions for Sustainable Development through which NGOs and other interested parties can engage in the Agenda 21 process Elliot (1996:91).

Agenda 21 (Chapter 8) recommends the adoption of national strategies of sustainable development. These strategies should ensure socially responsible economic development, while protecting the environment and the natural resource base for future generations. These strategies should be built on existing initiatives such as environmental action plans, it should reflect current

priorities and it should take into account emerging issues. There should also be the widest possible participation and involvement from of all segments of society (United Nations: 2001: 59).

Agenda 21 (Chapter 8) also suggests improving the effectiveness of national and international legal instruments and mechanisms with respect to achieving sustainable development. It is in this context that there must be an action plan which supports the participation of developing countries in formulating international law; the coordination and consistency among international legal instruments' and the identification of new and emerging issues in the field of sustainable development relevant to international law (ibid).

2.6.2 Institutional Capacity

The capacity of a country and its people and institutions determines the ability of a country to progress towards sustainable development, Agenda 21 Chapter 34 cited in United Nations (2001: 60).

The capacity of a country can be measured by its human, scientific, technological, organizational, institutional and resource capabilities. When there is an increase in capacity then it improves the community skills and abilities to address crucial questions, evaluate policy options and

implementation approaches, and it appreciates constraints and limitations.

Institutional capacity includes participatory planning, implementation and monitoring related towards sustainable development. Elements of a country's institutional capacity include communication systems, information access and availability, the support for science and technology, and the prevention and mitigation of natural disasters.

Science and technology can be used as avenues for improving sustainable development decision-making through better understanding of ecological and social processes. It can also enhance efficiency of resource utilization and systematic assessment of current conditions and future prospects.

2.7 The role of science in sustainable development

The role of science should be to provide information to enable formulation and selection of environmental and development policies in the decision-making process. To achieve this requirement, it is essential to enhance scientific understanding, improve long-term scientific assessments, strengthen scientific capacities in all countries and ensure that the sciences are responsive to emerging needs. (<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter35.htm>. Date Accessed: January 2005).

Biotechnology is a set of techniques which brings about specific human-made changes in genetic material, in plants, animals and microbial systems, leading to useful products and technologies. In terms of sustainable development it will make a positive contribution to better health care, enhanced food security, improved supplies of potable water, more efficient industrial development processes for transforming raw materials, support for sustainable methods of afforestation and reforestation, and detoxification of hazardous wastes.

(www.un.org/esa/sustdev/sdissues/sdissues.htm. Date accessed: November 2004).

Biotechnology laid the foundations for vaccines which controlled infectious diseases in the northern countries. It is important that a good vaccination programme be established in the rest of the world which will lead to good delivery of health services. (Santa Ana:1998:74)

In chapter 35 of Agenda 21 the following are proposed for science for development:

a) strengthening the scientific basis for sustainable management; this means that sustainable development requires longer-term perspectives; it also needs integrating local and regional effects of global change into the development process, and using the best scientific and traditional knowledge available;

b) enhancing scientific understanding because in order to promote sustainable development, more extensive knowledge is required of the earth's carrying capacity, including the processes that could either impair or enhance its ability to support life;

c) improving long-term scientific assessment which means meeting scientific research needs in the environment and development field which can support the sciences that can provide for the sustainable development process. The scientific knowledge acquired may then be used to provide scientific assessments of the current status and for a range of possible future conditions;

d) building up scientific capacity and capability because sciences have a vital role to play in dealing with the issues of environment and development (<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter35.htm>. Date Accessed: January 2005).

2.8 Good Governance

A Government's policy based on justice and equality is important for sustainable development. Flavin (et al 2001:13) holds that to eradicate poverty delicate government interventions should include investments in

education and health, strong legal and financial systems, land reform and strong anti-corruption policies. Investment in a country will not materialize in countries with weak governments, inadequate legal systems and rampant corruption. Suzman (2005 cited in Cape Argus 04:11:2005: 12) argued that poverty had a direct correlation to bad governance.

Governance based on justice will make decisions that enhance sustainable development principles. Greater shared responsibility globally by governments will result in the greater acceptance of the need to deal carefully with environmental, social and economic issues.

Governments should allow its citizens to participate in local and national politics. They should also be able free to be part of decision making regarding management. They must promote democracy.

A stable and secure climate is absolutely necessary for poverty eradication, economic investment, environmental stewardship and sustainable livelihoods.

It is the duty of the state to create conditions so that unemployment could be eradicated. This will result in economic security for its citizens. Drug trafficking and crime will then be kept to a minimum.

The state must see to the social and cultural needs. It must also see that it is possible for its citizens to have shelter which is safe and healthy, affordable and safe neighborhood. They must be provided with piped water, sanitation, drainage, transport health care, education and child development. The living areas must be free from chemical pollution.

2.9 A Critical Review of Sustainable Development

There are several factors that present obstacles to the attainment of the goals of sustainable development. These are summed up below:

(a) There are many interpretations of sustainable development as I have shown in this chapter. While some consider this to be its strength, others see it as a weakness because it allows the sustainable development agenda to be easily manipulated. As I understand it, capitalists also joined the sustainable development “bandwagon” and tried to manipulate it in way to suit their own agenda. This makes it difficult for the objectives of sustainable development to be realized.

(b) There is no entirely convincing answer to the question as to how sustainable development can be achieved through a combination of economic development and environmental protection. It seems to be a contradiction in

terms. However, I am still convinced that if there is limit set on the use of the present resources or alternative methods for the use of these resources are developed, there will be sufficient resources for future generations.

© In developing countries economic activity still relies heavily on the extraction and utilization of natural resource like minerals, forests, marine life, underground petroleum, and water. With a large part of their populations still steeped in poverty, they cannot slow down exploitation of resources (existing and potential). The economic plight of developing countries unfortunately makes it extremely difficult for them to implement sustainable development policies.

(d) Developing countries accuse developed countries of having exhausted the resources and of creating dependency on high level technology which is one of the major contributing factors to environmental degradation (Hines: 2000:222). I agree with Hines that developed countries have their bread buttered on both sides. At the dawn of the twenty first century, for example, we have seen that the majority of carbon in the atmosphere comes from developed countries. At the same time, most developing countries are forced to import goods produced from highly technologically-developed countries – which in essence means that they also contribute to environmental degradation.

(e) Prosperity can lead to excessive consumption, in turn leading to further depletion of resources. Curbing exploitation and total degradation of resources was the primary motive for conceiving sustainable development. In my view, both developed and developing nations must review their priorities and commit themselves to a moderate standard of living which does not devastate the environment beyond redemption.

(f) Higher levels of education and mass communication have benefited the prosperous countries and there is both a greater awareness and appreciation of environmental issues amongst them. Education, however, is a double edged sword. People normally get educated to increase their standards of living, to prosper and thus become bigger and better consumers with its attendant environmental problems. This is a problem that we have been facing since the dawn of the industrial revolution. However it is my contention that this mindset can be altered through education. Environmental protection should form a core part of the curriculum of all education systems in countries world wide.

(g) The priorities for developing and industrialized countries though similar in some respects, differ markedly in others. These are illustrated in Table 1 above.

It is precisely because of the complexities involved in implementing sustainable development that some view it as an ethical guiding principle (Reid 1995), convinced that it is virtually impossible to achieve the goals of sustainable development.

I do not agree with Reid (1995) in totality. To cite an example, there are many countries which are currently working out strategies to deal with climate change. Global warming which is having a negative impact on economies world wide has compelled them to reassess their modes of production.

It is clear that both the developed and developing nations are guilty of depleting resources and causing environmental damage – the former to maintain their affluent lifestyle and the latter simply for the sake of survival.

Despite concerns about the efficacy of sustainable development, I am of the view that sustainable development should be supported in principle.

Economic sustainability, while crucial to meet the demands of the growing population, should not be pursued in a manner that causes incalculable harm to the environment. With the advanced technology now available to us, I believe that it is possible to develop alternate modes of development that at least substantially reduces environmental degradation.

Education can and should play a critical role in promoting an awareness of the

significance of sustainable development. Though the needs and priorities of the developed and developing nations differ substantially, nothing precludes them from continuing to search for strategies that will guarantee economic development while ensuring that it does not subvert the environment to the extent that it is lost as a resource to future generations.

2.10 Chapter Summary

This chapter has given an outline of the origin and meaning of sustainable development. The major thrust of sustainable development can best be summed up in the words of Estes as “interventions that seek to promote and enhance social, political and economic well-being of people within an ecologically-sustainable context at all levels of social organization” (Estes :1992: www.sp2.upenn.edu/~restes/isw/toc.html - 8k - Cached[PDF] Date Accessed : November 2007).

The chapter has also identified some of the problems related to the implementation of sustainable development.

In the next chapter the elements of sustainable development will be identified in past development in the Muslim World in a generalized way.

CHAPTER 3

A BRIEF SURVEY OF DEVELOPMENT IN THE MUSLIM WORLD

3.1 Introduction

In this chapter I will give a brief history of development in the Muslim World from the time of the Early Caliphate, *al-Khulafā al-Rashidun* (literally, Rightly-Guided Caliphs) until the 19th century in the following areas: agriculture, water systems, education, health, economics, governance, and poverty alleviation. The 19th century ushered in industrialization in a number of Muslim countries and with it contemporary problems related to development.

One of the definitions of sustainable development is that it is development that is likely to achieve lasting satisfaction of human needs and improvement of the quality of human life (Allen: 1980 cited in Elliot 1996:3). If we accept this understanding of sustainable development, it will become evident from our discussion below that the socio-economic developments in the Muslim World were aimed at achieving the latter objective.

Furthermore, these advancements contained some of what are considered to be the key elements of sustainable development as identified in chapter 2.

Though the term sustainable development was not in vogue at the time, the notion of comprehensive development which includes the economic, social and ecological dimensions (the so-called “pillars” of sustainable development) was certainly a feature of early development in the Muslim World.

3.2 Agriculture

Agriculture was important for the Islamic Empire because it provided important crops for food. In later years it provided raw material for their industries.

Even in the time of the Early Caliphate, people were instructed not to cut down trees unnecessarily. Abū Bakr, the first *khalīfah* (caliph), prohibited the destruction of trees as an act of vengeance or collective punishment. In his address to Yazīd ibn Abī Sufyān, the commander of the army that was sent north to Shām [i.e. Greater Syria] to confront the Byzantine army he said:

“...And I instruct you [to fulfill the following] ten [orders]: ...do not cut down fruit-bearing trees...” (Mālik 1994: Vol.1:628).

Muslim conquest - from al-Andalūs (Spain) in the west to China in the east and south to Mozambique - was accompanied by changes in agriculture.

Under Muslim governments gardens flourished and many different plants, vegetables and fruits were produced. The governing classes, landowners and actual farmers were concerned with agricultural progress. They took great care of and pride in their gardens and their lands. Their peaches, apricots, cotton, sugar cane, melons and squashes were always something special. They took great care in improving the quality of their produce. On their pilgrimage to Makkah many of them would carry cuttings and seeds to exchange for others from distant lands (Fisher:1966: 121). In this way the best varieties were spread far and wide over Islamic lands.

Muslim agriculturists produced excellent results in terms of increase in produce, and improvement in quality and variety of crops. When Muslim missionaries went to other countries they introduced new crops to those lands. They also brought to those countries not only a new pattern of agriculture but also a changed pattern in food production.

As the Islamic empire expanded, the Muslims came into contact with new types of agriculture unknown to them before. Valuable crops such as cotton, bananas and sugar cane needed much water to grow. To cultivate these types of crops, a widespread artificial irrigation system was needed.

The various references to agriculture in the Qur'ān and in the Prophetic tradition encouraged many Muslim scholars **in the past** to do extensive research in agriculture. Among them were Yuhannah ibn Masāwayh, Hunāyn ibn Ishaq, Aḥmad ibn Abī Bakr ibn Wahshiyyah, Abu'l Ḥassan al-Qurtūbi, Abd al-Qāsim al-Zahrāwi, Abu 'Umar ibn Hajjaj al-Ishbili, `Abd Allāh ibn Bassal of Toledo, `Abd al-Khayr al-Ishbili, Abī Zakariyyah ibn `Awwām, Umar ibn Yusuf and Al-Abbās ibn `Ali (Rahman :1980: 335).

The advanced knowledge of agriculture amongst Muslims improved agricultural technology and also gave a boost to the industry. Islamic agriculture was said to contain "a precious treasury of know-how concerning the wise use of the soil, water, plants and animals" (Nasr: Islamic Science : 218 cited in Rahman 335).

Al-Hajjāj, who lived during the time of Mu'āwiyah, prevented the slaughter of oxen so that they might be available for ploughing. He was one of the first intellectuals to propose the preservation of livestock in the Muslim Empire. He imported a large number of buffaloes from India and introduced them in Iraq and Syria (Al- Balādhūri: 866: 293 cited in Husaini :1970: 144).

The Abbāsīd rulers took great care to improve cultivation in al-Sawād, the most fertile part of the Abbāsīd Empire. Deserted villages were reinhabited

and ruined farms were rehabilitated (Husaini: 1970: 237). Old Canals from the Euphrates were re-opened and new ones dug, and these eventually formed an entire network. (Al-Istakhri 85; Ibn Hāwqal 1873: 166 cited in Husaini:1970: 237).

In the Abbāsīd period the staple crops of Iraq were barley, wheat, dates, sesame, cotton and flax. On the very fertile and alluvial plains of the south large quantities of nuts, oranges and sugarcane were grown (Husaini: 1970:238). Fruit was grown extensively in all provinces. Palestine and Yemen were famous for grapes. Oranges were cultivated in Sind, Basra and Omān (Glubb: 1976:227).

In terms of the availability of food the Abbāsīd Empire was self-sufficient.

There were no imports from abroad.

Khurasān and Bukharāh were also rich in agriculture. There were also a variety of flowers grown, especially jasmines and roses (Husaini: 238).

Agricultural advances were part of the Muslim legacy. Important books were written on soil analysis, water, and kinds of crops that were suited to particular types of soil. There was considerable interest in new varieties especially for nutritive and medicinal purposes. Among the great works produced by Muslim agriculturists were *Kitāb nabāt* (a treatise on plants) by Abū Hanīfa al-

Dinawāri who died in 282 / 895 C.E. (Toufīc Fahd:1997: 77 cited in Idrīsi : 2005: 4) and *Kitāb al-Filāha* (treatise on agriculture) by Ibn Al 'Awwām a great 12th century author (Idrīsi : 2005:5).

Crops and livestock were introduced for subsistence purposes. The introduction of artichokes, spinach, aubergines, carrots, sugar cane and various exotic plants improved the quality of life (Idrīsi : 2005: 6). The introduction of plums, apricots, cauliflower, celery, fennel, squash, pumpkins, and eggplant, as well as rice, sorghum, new strains of wheat, the date palm, and sugarcane transformed the diet of medieval Europe.

(<http://www.islamiCity.com> date accessed: March 2006) Vegetables were available all year round. Citrus and olive plantations were a common sight in the community. Gardens and orchards used to exist around the city. High quality of wool was produced in the Maghrib areas and it was known throughout the world (Lombard cited in Idrīsi: 6: 2005).

Cotton which originated in India became a major crop in Spain and Sicily.

Sugar cane - also of Indian origin - was cultivated in Spain, Egypt, Morocco and Sicily (Lombard cited in Idrisi :2005: 6). One of the best known gardens in Spain was *Jannāt al-a'rīf* near Alhambra (Fisher : 1966: 52).

Agriculture in North Africa and the occupied Muslim areas of Europe in 10th century was successful due to the following reasons :

- extension of the exploitable land area by means of irrigation
- the rapid implementation of improved farming techniques derived from the collection and collation of relevant information throughout the then known world
- incentives based upon two principles: the recognition of private ownership and the rewarding of cultivators with a harvest share in recognition of their efforts
- the use of advanced scientific techniques allowing people like Ibn Baytān to grow plants thousands of miles from their origins even in semi-arid and arid climates (Idrisi:2005:7).

The revival of dead land (*mevat*) as well as the sultan's grant (*temlik*) for the elite played a significant role in the social and economic role of the Ottoman Empire. Dead land was defined as arable lands which were abandoned by their cultivators and remained uncultivated and ownerless for a long period of time. However, if the previous cultivators returned before much time elapsed then they had the preeminent right to reclaim the land. The State would then make land grants (*temlik*) of arable lands which had been deserted by their former inhabitants to members of the ruling elite (İnalçik: 1996:120).

In the first three centuries of the Ottoman Empire, large land grants were given to sultanas or viziers so that they could in turn give *waqf* (*waqf* is any

amount of cash or kind given as a form of charity). Sokollu Mehmed Pasha built a mosque in the city of Beckserek after several abandoned villages were given as a freehold in the 1550s. Sultana Kösem (d.1651) constructed a monumental bridge linking northern and southern Greece due to rich *waqfs* in the area (İnalçik:1996:120).

Reclamation and cultivation were the real purposes for land grant and legalized ownership. If a person did not cultivate the land for three successive years, he lost his ownership rights. Ownership rights appear to have been always dependent on the paramount interest of the Islamic community or the state.

When the state granted *mevats* to individuals, new sources of revenue were created and eventually important public services were provided. What happened was that the ruling elite revived and cultivated the abandoned lands. Many of these lands' profits were donated to charitable organizations. The result was that mosques, schools, libraries, bazaars, and shops, bridges and fountains were built (İnalçik:1996 :124).

Katib Çelibi (1732: 900 cited in Farūqhi:1996: 451) and his fellow scholars report that in the 16th century Ottoman agriculturists used sophisticated

techniques for producing attractive-looking fruit in the vicinity of Malayta. At the same time the Aegean coastlands produced olives, beans, almonds, figs and raisins.

By 1800 Ottoman agriculture had made a significant impact in the international economy. Ottoman farmers were the major producers of silk, wheat, grains, cotton, tobacco, barley, vines, vegetables and industrial crops (Quataert :1996: 844-851).

Government influence affected the agricultural prosperity of the Ottoman Empire. This happened when Selim II (1566-1574) became the ruler of the Ottoman Empire. It began to experience various administrative and agricultural problems. These included "corruption, problems with the system of government and problems with their ships. There were also years when the crops didn't grow well". (*Shoebottom: 1996 : <http://esl.fis.eduesl.fis.edu/learners/support/hum/text/wc2-516.htm> Date Accessed: January 2009*)

3.3 Mining

According to Dr. Joumard, iron, copper and lead were mined in Persia in the 'Abbasid period (Glubb: 1976:228). Gold was used for minting dinars, the manufacturing of cups and plates for the rich, as well as ladies' jewellery.

Gold was mined in central western Arabia (Glubb:1970:228).

3.4 Trade & Industry

The economic development of the Islamic Empire which went with the spread of Islam played a significant role in the shaping of the rest of the world.

Muslim traders in the time of the second *khalifa*, 'Umar, continued their ancient Arab trade routes to Abyssinia, India, Iran and China. Coins found in Russia from the river Volga to the coasts of the Baltic Sea prove that trade relations of the Muslims started in the first years of the caliphate of 'Umar. The Volga River was an important trade route to Europe. Muslim trade during 'Umar's time also extended to Sweden, Finland and Denmark.

(Ra'ana:1970:32).

Trade was one of those economic structures which became a point of contact between Muslims within the Muslim Empire, as well as the rest of the world.

Muslim rule from Spain to the borders of India by the tenth century unified much of the Eastern world (Mahmūd :1960:107). Trade was free, safe, and extensive. Muslim traders, consequently, established trading posts as far away as India, the Philippines, Malaya, the East Indies, and China

(<http://www.islamiCity.com> date accessed: March 2006).

From the eighth to the eleventh centuries, this trade was largely concerned with finding and importing basic necessities including grain, iron, copper, lead and tin and wood (Mahmūd :1960:131). To be able to obtain these products Muslims had to export too, often using the imports from one region as exports to another: pearls from the Gulf, livestock from the Arabian Peninsula (particularly Arabian horses and camels), and cloth (which was one of the chief exports). The Muslims also traded medicines, an offshoot of 'Abbasid advances in medical science, as well as paper and sugar (<http://www.islamiCity.com> date accessed: March 2006).

During the 'Abbāsīd period there was a great economic boom. This created economic sustainability in those areas from where products were being exported. The table below lists the major commodities produced by the various regions.

Table 7

AREA	PRODUCT(S)
Northern Mesopotamia	Grain
Syria and Palestine	olive oil
Yemen	Sugar
Syria	fruits.
Khurasān, Bukharā and Samarkand	cotton.
Caspian provinces	woolen stuff
Armenia	Carpets

Khuzistān and Fars in South-West of Persia	precious silk and cotton fabrics
North African provinces	woolen fabrics
Bukharā	Carpets
Kūfah	Silk

Ashtor: 1976: 78 & Fisher: 1966: 77

The highly industrialized areas led to well developed skilled labor for the citizens of the Muslim Empire. The Muslims improved methods of production in the industrial enterprises which they inherited from the Persians the Byzantines, the Greeks and the Egyptians. The syntheses of these gave great life to the new industries. They not only developed new branches of old industries but also new ones.

There was also trade between the Scandanavian countries and the Muslims during the 'Abbasid period. This is evident from the ten million coins found there in the first quarter of the twentieth century (Mahmūd:1960 :107)

The Muslims also established good road systems. Commercial transport was supplied by camels, mules and donkeys. They moved along main roads in huge caravans. The roads were wide earth tracks in which the packed animals were moved in huge convoys. The rocky areas were transformed into moveable throughways. Stone or brick bridges were built to cross waterways. Khans (inns built around a courtyard where caravans could rest) were erected

along the caravan routes. Security along the route was provided by the 'Abbasid state (Glubb: 1976:229).

The expansion of commercial activity led to other developments too. One was a system of banking and exchange so sophisticated that a letter of credit issued in Baghdād could be honored in Samarkand in Central Asia or Kairouan in North Africa. The demands on trade also generated development of crafts. From Baghdad's large urban population, for example, came craftsmen of every conceivable sort such as metalworkers, leatherworkers, bookbinders, papermakers, jewelers, weavers, druggists, bakers, and many more. As they grew in importance to the economy of these craftsmen they eventually organized themselves into mutual-benefit societies. They offered many social services for example lodging travelers, caring for orphans, and endowing schools (<http://www.islamiCity.com> date accessed: March 2006).

The science of producing paper was acquired from China. By the tenth century paper mills existed in Iran, Iraq and Egypt. In the twelfth century one was built in Spain (Fisher:1966:90). The usage of paper replaced parchment and papyrus. It made a pivotal advance on education and scholarship. It made it possible to put books within the reach of everyone.

Fine glass was produced in Egypt. The 'Abbāsīd era produced some of the finest pottery and glazed tiles. Damascus, Baghdād and Samarkand won

fame for their decorated porcelains and their fine blues, greens and turquoise shades. The industries also produced soaps, dyes, perfumes, jewelry, leather, inlaid and decorated wood and enamel work on wood and metal (Fisher:1966:90).

The production of silk cloth formed the structural basis for the development of the Ottoman and Iranian economies. The silk industries of the Ottoman Empire were based at Amasya, Busrā, İstanbul. Mardin and Diyarbekir. Raw silk was imported from Irān (İnalçik :1996:219).

By the year 1400 Busrā was one of the great centers for commerce and silk industry. The most important silk routes were Tabrīz-Busrā, Tabrīz-Konya-Denizli, Caffa-İstanbul, Trabzon-İstanbul, and Sivas-İstanbul. Many silk caravans could travel safely under Ottoman protection. Italian merchants stationed at Pera could travel to Busrā to purchase the commodity (İnalçik: 1996:219). From the seventh century until the First World War increasing amounts of silk was shipped abroad from Lebanon (Beaumont; Blake; Wagstaff: 1976: 378).

The following table lists the products exported from the Ottoman Empire to Europe and countries in the East.

Table 8 : Ottoman exports to European countries and countries in the East.

MAJOR EXPORTS	OTHER EXPORTS
wheat, grains, cotton, tobacco, barley, vines, vegetables, industrial crops and silk on great scale	wool skins, furs, hides, tallow and silk

McGowan(1996 :726-730).

The Ottoman Empire was enormous in size and consisted of many regions with different climatic conditions. This resulted in a big internal trade within the Empire. Caravans between Syria and Irāq carried an important amount of internal trade (Gaube and Wirth:1984:257 cited in McGowan :1996 : 730).

There were four great caravans which traveled annually between Aleppo and Istanbul (ibid). Trade was exercised through Edirne from Bulgaria to Syria (Faroqhi:1984:291). The İstanbul-Edirne-Busrā triangle played an important role in the regional trade (McGowan :1996:730). From Syria goods were transported to Egypt and back (Gaube and Wirth:251 cited in McGowan:730).

The Ottoman Empire with its various regions exported many products. Most of the export was to European countries. Egypt exported wool, cotton thread, flax and linen, leather and saffron (McGowan:732). Algeria exported grain, oil,

hides, vegetables, honey, and wax (Julien:1970:312 and Lacoste et.al :1960:171 cited in McGowan:732). Tunisia exported wool, skins, dates, wax and olive oil (Abun-Nasr:1971:194 cited in McGowan:732). From Syria and Lebanon came cotton wool and thread, olive oil, soda ash and grain (Gaube and Wirth :1984:245-246, Masters:1988:30, Issawi:1986:168, cited in McGowan:732). Anatolia sent most of its goods through İzmir and it abounded to animal fibres which included sheep's wool, camel's hair, and mohair (Wolf:1979:305 cited in McGowan:734).

Muslim traders followed the old Phoenician links. They re-opened large channels of inter-continental communications. Old markets were expanded and new ones founded, helping to shape the course of political change. Large regions of Africa benefited particularly from this recovery and expansion, creating long-enduring networks of commerce, which penetrated far into the continent (Davidson:1992:41). Andalusia exported olive oil, while North African Muslim Empire exported hides and leather (Cook:1979:217).

Muslim sailors took their new faith of Islam down the East African coast while trading with Somalia, Kenya and Tanzania. They converted some of the coastal people, as well as some of the coastal rulers. They became involved in the Indian ocean trade, and by the tenth century there were markets of importance as far south as Mozambique, building their wealth and power on

trade with ivory and gold producers of the interior (Shillington 1989 cited in Awan 1996: <http://www.aliasoft.com/themes/colonisation.html#Intro> Date Accessed: May 2006).

Muslims on the East coast of Africa traded with all the peripheral countries of the Indian ocean, exporting metals, ivory, tortoiseshell, a few slaves, and buying cottons and luxury goods from as far a field as China. The discovery of 240 Chinese coins in east Africa, some of which date back to the Sung period (960-1279), confirms the existence of this trade. In addition, pottery and porcelain have been discovered on east African shores, indicating imports from China and Iranian Gulf States. Mosques and pillar tombs are decorated with such porcelain too (Davidson 1992 cited in Awan 1996: <http://www.aliasoft.com/themes/colonisation.html#Intro> Date Accessed: May 2006).

Many Swahili cities on the east coast of Africa, such as Kilwa, Mogadishu, Mafia, Mombassa and Zanzibār had grown rich from trading with both India and China. By the 13th century, Kilwa and Zanzibār and probably Mogadishu on the Somali coast had acquired mints of their own. Their kings struck copper coins in fair quantity, usefully inscribing their names. Archaeologists working in the locality of Zanzibār recovered a horde of some three thousand silver coins of local minting. These findings indicate that the burgeoning economy of the East African seaboard moved into a local coin-minting stage

soon after 1050. Long after he had traveled through east African Kilwa in 1331, the Moroccan scholar Ibn Batūta remembered it as 'one of the most beautiful and best constructed towns in the world, and he had by that time seen the cities of India, China and his own Moorish countries (Davidson:1992:72-73).

When Islam arrived in the eighth century in the Sudān region it, was a vast geographical region of northern Africa, extending east to west across the continent from Mauritania in the west to the modern Republic of Sudān in the east. The Sudānic state of Ghana was a source of gold according to al-Fazārī who wrote between 750 and 799 (Hiskett:1984:19). The Ibādī Muslims were involved in the control of the gold trade. The main Ibādī centres were Tāhert and Tadmakkat. Ibādī ideas reached the Ghanian Empire from places such as Tadmakkat by 915 (Hiskett:1984:25).

Islam played an important role in the development of the Sudanic states especially in terms of trade. With the coming of Islam there came a system of law, a written constitution as well as written chronological history as well as knowledge of stars and planets. The usefulness of these techniques became apparent to rulers of Mali and other Sudanic kingdoms. These rulers started to incorporate Islamic ideas into their own administration. They also employed foreign Muslim experts and advisers. (Hiskett 1984:31).

When the Muslims arrived in Africa, trade increased because they introduced the use of camel transport. Camels were crucial because they were able to travel up to 100 km or more a day, that is twice the distance of pack-oxen or horses. Camels could also withstand both daytime heat and night-time cold. Berbers engaged in long-distance trade. Muslim traders financed Berber caravans. The expansion of Muslim trans-desert trade after about 750 CE provided a new and major spur to West African state formation and urbanism (Awan: 1996: <http://www.aliasoft.com/themes/colonisation.html#Intro> Date Accessed: May 2006).

By 1100, Gao, which was part of the Mali Empire, was an Islamic centre of cultural as well as political and commercial importance. It was a small Islamic kingdom of the Niger-bend. It was an important trading station on the Niger and it was the meeting point of the salt route from the West and the trans-Saharan route from the North East (Hiskett 1984:33). Mansa 'Ali who ruled the area of Mali in the thirteenth century took the commercial and religious centre of Walata under Mali control. This area of Walata was situated at the southern end of the trans-Saharan trade route. When Timbuktu and Jenne also came under Mali control Mali became a centre point of economic activity (Clark 1984:43).

Tombstones found on the Niger bend resemble those found in Muslim Spain and date back to the twelfth to fourteenth centuries. One can conclude through this that there were strong cultural as well as commercial links between these two areas during the twelfth to fourteenth century.

Hausaland and Borno in West Africa had a great trading partnership through the Mediterranean trading system to Europe by the sixteenth century. This trade route made contact with an Italian city of Ragusa (now Dubrovnik). This city was the gateway to Europe from the West African areas. From the west and central Sudan came gold, ivory, spices and leather goods. The Kano area traded with gold, ivory and spice which was known in Europe as 'grains of paradise'. Hausaland traded in pepper and similar spices (Giovanni Lorenzo Anania cited in Hiskett:1984:87). Guinea-corn, millet and locust were also exported from these areas (Mahdi Adamu cited in Hiskett:1984:95).

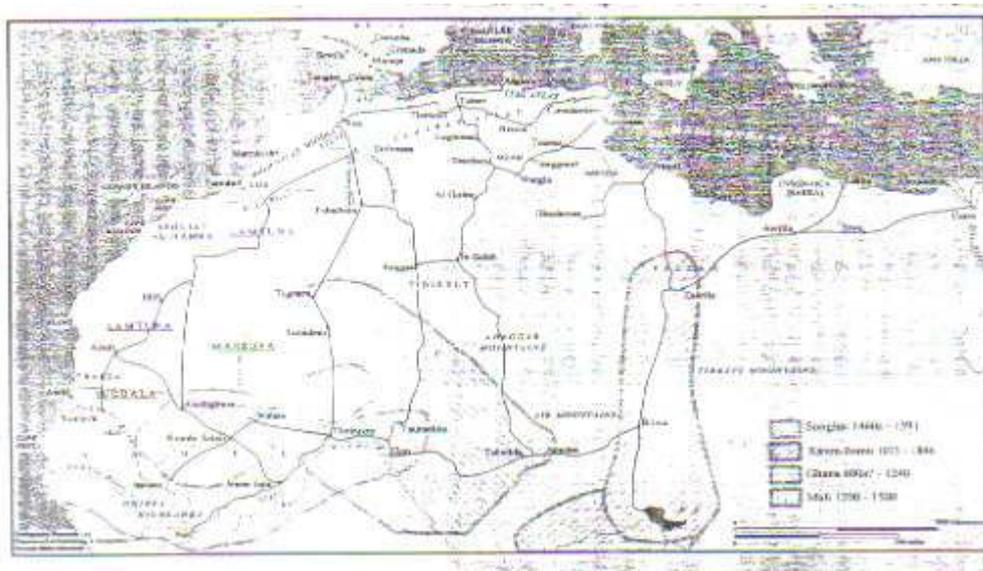


Fig. 1 Saharan Trade Routes Source: Produced by the Cartography Laboratory in the Department of Anthropology & Geography at Georgia State University Atlanta In (Smith:31:1986).

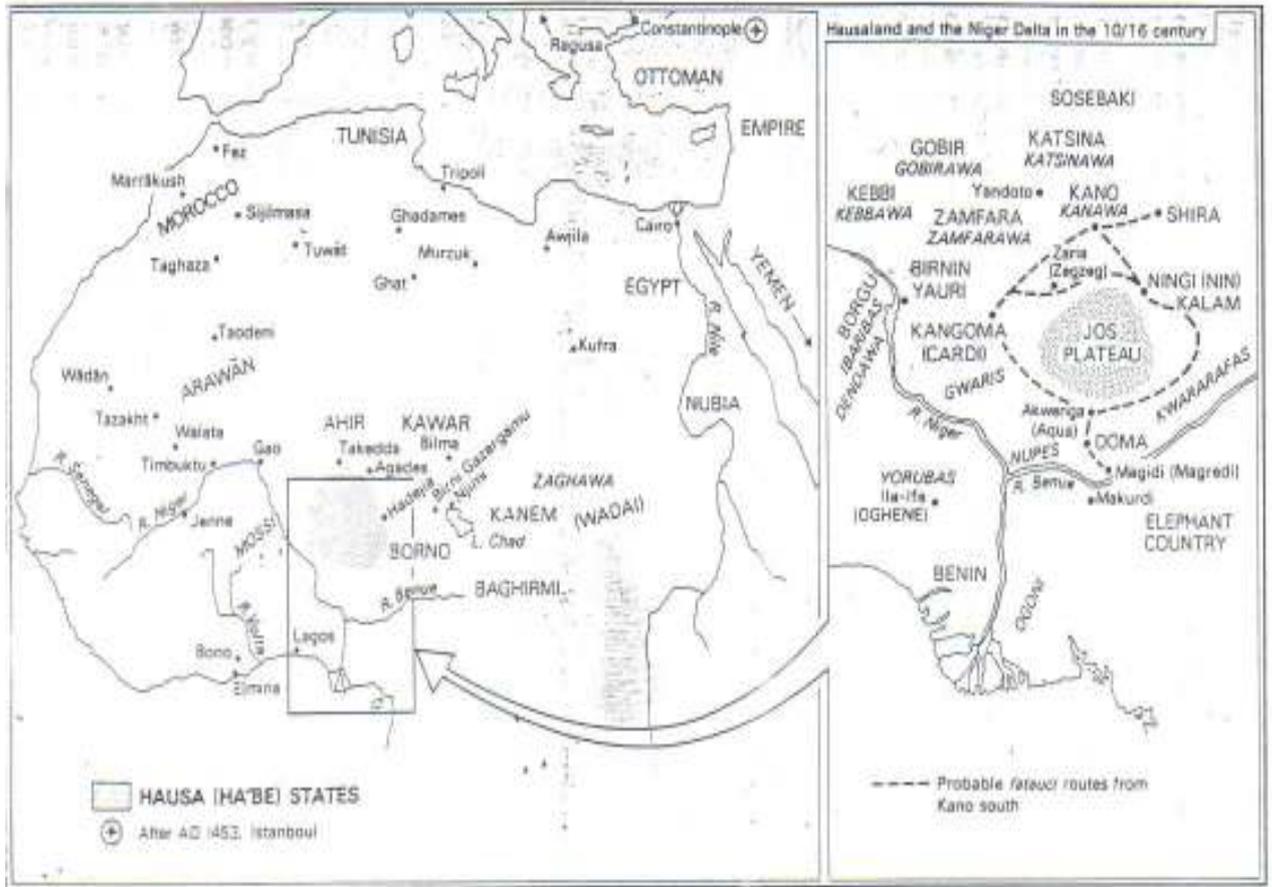


Fig. 2 Kanem, Borno Hausaland and the Niger from 802/1400 to 1008/1600 Courtesy: (Hiskett:Map5:1984)

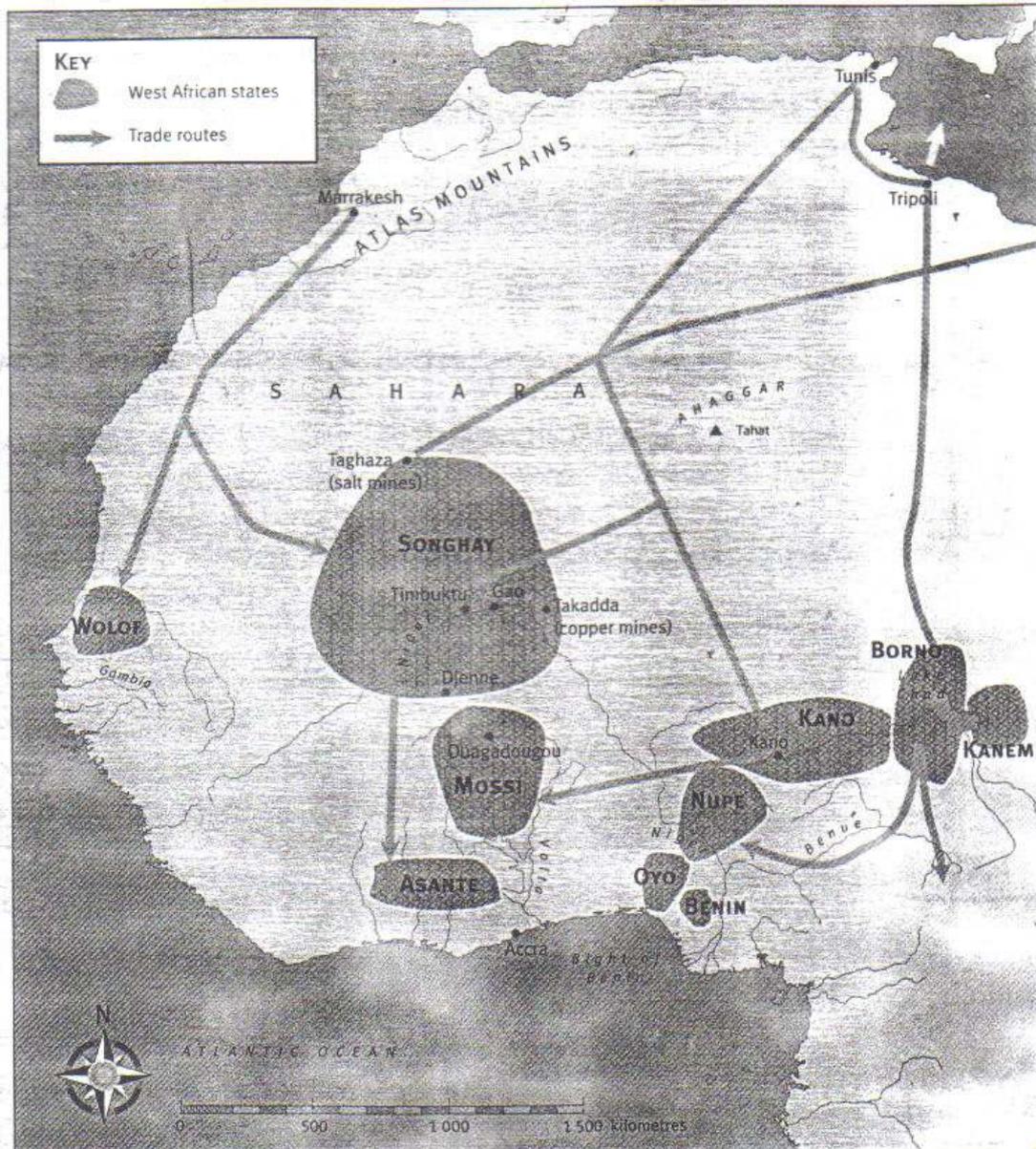


Fig. 3 The Map shows trade routes between West Africa and North Africa

Source: Courtesy of New Africa History (Janari et.al :2005:40).

If one looks at the situation in Egypt by the year 1171, five centuries after Muslim conquest, this land was the richest in the East. The ceramics, the glassware, the fabrics and the objects of metal and wood that came from Egyptian workshops attained unparalleled perfection. Egyptian agriculture

improved from the ancient products with the addition of new crops from Asia (Bianquis: 1988:192). Egypt always had a large and a reliable agricultural surplus, an intensive irrigation economy, and a harvest better than any other country in the Mediterranean area. (Cook:1979:217).

Leo Africanus mentions in his 'Geographical Historie of Africa' the existence of Morocco as a thriving noble city accounted to be one of the greatest in the world prior to European intervention. He says that there were many bookstores, stationers, scribes, children's shoe stores, fruit markets, dairy shops, restaurants and cafes, linen stores, meat stores, fish stores, liquid soap stores, leather shops, tailor shops, laundromats, silk merchants, haberdashers, lingerie shops, bedding stores, wool stores, carpet and embroidery stores, every trading place that one could expect to find in modern-day New York. (<http://www.aliasoft.com/themes/colonisation.html#Intro> date accessed: May 2006).

In the Mahdist state of the Ottoman rule in Sudan in the nineteenth century, the *Bayt al-māl* not only served the interests of the poor and needy but served structures of the state as well. In fact by this time the *Bayt al-māl* underwent many changes in its structures, aims and administration from its original resolutions. Control in the fields of trade, markets, production, currency regulations, military supplies and security, economic and moral crimes was

under normal circumstances exercised through the Bayt ul-māl (Abu Shouk: 1996:xv).

The most important official of the Bayt al-mal in the Mahdist state was the *amīn*. His duties included the supervision of state revenues and expenditures, the mint, the slave market, the lithograph press, the commercial properties of the government such as land, shops, mills, oil-press, boats and quays. He was obliged to report daily, monthly and annually to the *khalīfah* about the state of the finances (Abu Shouk: 1996:xvi).

The Mahdist state in Sudān nationalized all shops, mills, oil presses and agencies of the former Turco-Egyptian regime and its supporters in Karthoum and then hired them out to merchants. (Salim:1990: iv:413 cited in Abu Shouk: 1996:xxx). This was a secure income for public treasury. The Omdurman market was divided into various areas by the Mahdist authorities and these were hired out to different merchants. These merchants had to pay a monthly rental fee which was paid in to the *Bayt al-mal* (Abu Shouk:xxx). The *Bayt al-māl* also received revenue for freight charges across the Nile (Abu Shouk:xxx).

Before Morocco became a French Protectorate its artisans produced leather goods, carpets pottery, textiles, metalware and many other items of practical and ornament value (Cohen & Hahn: 1966:27).

3.5 Health

Health care remained a priority for the rulers of the Islamic State. Significant-sized centers of patient and health care appeared in the Islamic world in correspondence to the growth of the early Islamic cities.

The first hospital built by the Muslims was in Damascus in the year 706 A.C. during the time of Khalīfah Walīd ibn Abd Mālik (Sayili : 1980: cited in Makwemba 2004: 47). The most important hospital built in Damascus was Al-Nūri hospital 1156. It was well-equipped and well-staffed. It turned out not only to be first class in care, but also had an excellent first class medical school. The hospital adopted medical records, probably being the first in history. From its medical school, many eminent physicians graduated, for example Ibn An-Nafīs, the scholar who discovered the pulmonary circulation system. The hospital served the public for seven centuries and parts of it still exist today. (<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006).

In 766 A.D. *khalīfah* Abū-Ja'far Al- Mansūr appointed the dean of the medical school of Jindi Shapūr, Judis Ibn-Babtishu' to be the court physician and establish hospitals proportionate to the glory and prosperity of Baghdād.

(<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006). The *khalīfah* Harūn al – Rashīd built a large hospital in Baghdad in 805 (Farhat 2004: [http://www. Islamicmedical history.com](http://www.Islamicmedicalhistory.com) Date accessed: February 2006). This hospital which was named Baghdād Hospital developed into an important medical center. One of its chiefs was Al-Rāzi, the eminent internist (<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006).

The Al-Adūdi Hospital was built in Baghdād in 981 C.E. It was the most magnificent hospital built in Baghdad before modern times. It was furnished with the best logistical equipment and supplies known at the time. It had interns, residents, and 24 consultants attending its professional activities. Haliy Abbās, who wrote the famous book Liber Regius (Al-Māliki), was a member of the staff. It was destroyed in 1258 with the Mongol invasion of Baghdad. (<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006).

The Barmakids established hospitals and dispensaries throughout the Muslim lands which catered for the sick, the incapacitated and the poor (Husaini:1970 :241).

The Abbāsids showed great concern for the sufferings of the poor. In the time of Al-Wāthiq, when Abbāsid rule was at its zenith there was not a single mendicant throughout the Muslim Empire. The hospitals admitted patients of both sexes, and the state provided food and treatment (Husaini: 1970:242).

By the 11th century CE, all major Muslim cities possessed one or more large hospital institutions. This included the major cities of Cordoba, Valencia, Seville, Kairouan, Cairo, Damascus, Baghdad, Rey, Delhi and Bukharā (Farhat: 2004: <http://www.islamicmedicalhistory.com> Date accessed: February 2006).

In Cairo many great hospitals were established. In 872 C E Ahmed Ibn-Tulūn built a hospital called Al-Fustāt Hospital in the city of Al-Fustāt, which is now old Cairo. This hospital served the growing Cairo population for six centuries. (<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006).

The hospital of the Mamluk Sultan of Egypt al-Mansūr al-Qalāwūn, built in 1283 CE, in Cairo provided health care to patients of all backgrounds, faiths, financial means and gender, and was equipped with special wards for particular conditions including mental health disorder, a surgery, pharmacy, dispensary, library, lecture rooms and a mosque. The hospital was known as the Mansūri after its patron. (Farhat : 2004: <http://www.Islamicmedical>

history.com Date Accessed: February 2006). This was the best hospital built at that time as reported by the contemporary travelers and historians of that time such as Ibn-Battūta and Al-Kalkashandi. It was divided into different sections according to medical ailments for different diseases. Music was used as a form of therapy treatment for psychiatric patients. It served 4,000 patients daily and the patient's stay in the hospital was free. The Al-Mansūri Hospital has served Cairo for seven centuries. It is presently being used for ophthalmology and has been renamed Qalāwūn Hospital. (<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006).

The Al-Qayrawān hospital was built in a district of Qayrawān in a city called Adl-Dimnah in Tunisia during 830 C.E. All hospitals in Tunisia were called Dimnah instead of Bimaristan as they were called in the East. The Qayrawān Hospital was characterized by spacious separate wards, waiting rooms for visitors' patients, and female nurses from Sudan (<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006).

Women doctors, surgeons, researchers, nurse and support staff also worked at Muslim hospitals. Muslim women physicians, doctors, nurses pharmacists, pharmacologists and medical support staff were involved at every level of medicine and health care in large numbers across the Islamic world and

throughout Islamic history. Muslim women played a notable role in the spectrum of activity that comprised Muslim medicine and pharmacy or pharmacology at all levels. (Farhat 2004: [http://www. islamicmedicalhistory. com](http://www.islamicmedicalhistory.com) Date accessed: February 2006).

Mental health hospitals were instituted in the Islamic world several centuries ago. The first mental health hospitals in Europe were built in Muslim Spain, in Granada in 1365. Islam enjoins rights and protections upon the mentally ill and infirm and psychologically unstable people. Scholars from Western Europe were awestruck by the humanity and care provided at mental health institutions in Muslim Spain in the 14th century and indeed at mental health institution in the Ottoman lands of the 16th-18th centuries and were impressed too at the successful manner in which Muslim mental health institutions were able to address the needs of mental patients at a time when mental health was an anathema and largely ignored by the societies and states of Western Europe.

State support played a formative role in the rise of comprehensive and effective hospitals as centers of patient care and medical education for the first time in world history on a notable level and has greatly influenced the rise and development of hospitals in the Western world and elsewhere (Farhat 2004: [http://www. islamicmedicalhistory. com](http://www.islamicmedicalhistory.com) Date accessed : February 2006).

The Marakesh hospital was built in the capital city, Marakesh in Morocco in the year 1190 C.E. It was a huge hospital beautifully landscaped with fruit trees and flowers. Water entered all the sections through aqueducts. Patients were provided with special apparel: one for winter and another for summer.

The pharmacy was taken care of by specialists called the Saydalah

(<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006).

The Granada Hospital in the city of Granada was built in Andalusia (Spain) in the year 1366 C.E. It served a population of half a million population. The hospital represented the beauty of Islamic-Arabic architecture in Spain and served the people until the fall of Granada in 1492 C.E.

<http://www.islamonline.net/iol-english/dowalia/techng-2000-oct-07/techng2.asp> accessed March 2006).

The Muslim medical theories that existed in 1800 in Tunisia were derived from two major sources of medical sources: Galenic (Greek)-Islamic medicine and Prophetic medicine (Gallagher:1983:8).

Galenic-Islamic medicine stemmed from the works of Ibn Sina (d.1037). He held that that disease was caused by an imbalance of the four humors of the body: hot, cold, moist and dry. The primary elements in the balance were blood, mucous, yellow bile, and black bile, respectively, matters of the four humors. An individual had a characteristic humoral balance manifested as a

sanguine, phlegmatic, choleric, or melancholic temperament according to the predominant humor. When illness struck, the balance was upset and the doctor's role was to correct it. Once in early nineteenth century Tunis a Muslim doctor diagnosed a fever which he thought was caused by accretion of blood in the pituitary. The remedy was to remove the excess blood by bleeding the patient (Frank 1850:138; Shah 1966:xij; Sobhy 1928 cited in Gallagher :1983:8).

Eighteenth century North Africa also had its medical prescriptions. Hot foods such as ginger penny-royal, garlic, nutmeg cloves, honey and nuts were thought to quicken the blood and loosen the joints. Cold foods such as vinegar, cucumbers, oranges, watermelons and turnips made the skin cool and the body still. Cooling herbs and roots were taken for the 'epidemic fever'. For extended fevers bread made of barley and wheat were eaten, and the patients drank a potion of ground bark and pomegranate leaves mixed with sugar extracted from ground ginger, hummus (chicken peas) boiled with mastic and lupin. The patient's room was filled with vapors of burning willow leaves to disinfect the air (Bertherand:1855: 406 & 469-470 cited in Gallagher:1983:8).

Prophetic medicine was the second major influence in eighteenth-century Tunisia. The Muslim medical theory and practice were based on medical customs based on the sayings and traditions of the Prophet Muhammad

(SAW). The usage of honey and black seed were popular. Scarification was also widely practiced (Gallagher:1983:97).

Stomach ailments were healed by first scarifying the stomach region for a sprained limb and then the appropriate muscle (Berherand:1855:37 cited in Gallagher:1983:8).

Cautery was a means of treating superficial wounds and skin ailments.

Infected sores such as plague buboes were cauterized with branding irons (Berherand 1855:38 cited in Gallagher 1983:8).

In 1785-6 Tunisia was hit by a severe plague. Medical treatment was of such a good quality that the economy fared well. There was no political instability that can be associated with the high mortality caused by the disease (Gallagher:1983:97).

Provisions were also made for personal hygiene such as the *hammam* , public baths. The city of Tunis had eighteen *hammams* for men and fourteen *hammams* for women during the 1820s (Filippi 1929 :82 cited in Gallaher 1983:115). The *hammams* and the hot mineral springs located in various regions of Tunisia were frequently used for the treatment of disease (Peysonnel 1838:14; Plantet 1893:50 cited in Gallagher: 16).

The *maristan* which was founded by Hamuda Basha al-Murādi (1659-75) in 1662 was the only Muslim hospital in Tunis from that time until 1879. The revenue from the hospital was derived from inns, shops, public ovens, kilns, public baths, mills, water from certain springs and rents from specific houses. (Gallagher 1983:21). There were also small *maristans* in Sfax, Sousse and other cities (Bin Dyaf 1971:94 cited in Gallagher :23).

Certain Tunisian indigenous doctors were known for their skills. Hamda Tabal was widely respected and was also mentioned in European accounts of colonial medical practice. According to *ijāzas* (license or certificate of competence issued by a professional authority) the Kilani family had practiced medicine continuously since at least 1818. They provided an *amīn al-aṭibbā'* (chief doctor or head of doctor's order) from 1861 to 1871 (Gallagher :87).

Muslim medical ideas were very similar to homeopathic medicine. Galenic (Greek) medical concepts were shared by Europeans and Muslims until the nineteenth century especially in terms of allopathic medicine (Gallagher: 87)

3.6 Water Systems

The irrigation methods which were developed by Muslim societies were practices adopted from the agrarian-based ancient near Eastern societies (Dallal:1999:198).

The newly developed irrigation projects were important for the newly and expanded Muslim communities. The irrigation projects were on a big scale and involved the building of dams to control and regulate the flow of rivers, the building of canals, and the development of machines to transfer water for irrigation purposes.

In the time of the first four Calīphs, canals were built to provide drinking water to the citizens in large cities. Nahr Abī Mūsa was a canal built to supply fresh water to the citizens of Al-Bashrā (Husaini:1970:50). The Ma'qīl canal was constructed in the time of the second *khalīfah* 'Umar. The purpose was to provide more facilities for cultivation (Al- Baladhūri:866:366 cited in Husaini:1970:143). Juza' bin Mu'āwīyah built many canals in the districts of Khuzistan and Ahwas with the permission of *khalīfah* 'Umar which enabled many new lands to be brought under cultivation (Ra'ana:1970:20). In the time of the first four Caliphs it was assumed that the Caliph would consult his subjects through his council of advisers in all matters of administration. The same could not be said of the Ummayyads and the 'Abbāsids nor of those who succeeded them (Husaini:1970:179). There is no evidence that the later caliphs consulted the general populace when making important decisions which affected their lives.

Nahr Amir al-Mu'minīn, a canal connecting the Nile river and the Red Sea played an important role for irrigational and navigational purposes. A large amount of foodstuff was transported from Egypt to Madīnah in the time of the great famine in the time of `Umar I (Husaini:1970:50).

In the time of the Umayyads, the *khalīfah* Mu'awiyah had the canals of Kazīma, Azrāq and al-Shuhda' constructed around the city of Madīnah. This resulted in an increase in production so much that the city of Madīnah yielded 150 000 *wusūq* of dates and 100 000 *wusūq* of wheat. (Wafau'l-Wafa II:321 cited in Husaini:1970:143).

Al-Hajjāj who lived during the time of *khalīfah* al-Walid constructed the canal of al-Nīl and al-Zibi (Al- Baladhūri:866:290 cited in Husaini :143). The al-Nil canal connected the Euphrates and the Tigris rivers (Husaini 1970:143). He also constructed the canal of Sa'd by digging out part of a mountain (Al-Baladhūri 866:274 cited in Husaini 1970:143). He also built several dams (Al-Baladhūri: 866:290 cited in Husaini 1970:143).

The Umayyads developed technologically sophisticated water systems. 'Abd al-Malik ibn Marwan who became the *khalīfah* in 685 C.E., ordered the cleaning and reopening of the canals that irrigated the Tigris-Euphrates Valley. This was a key to the prosperity of Mesopotamia since the time of the

Sumerians. He introduced the use of the Indian water buffalo in the riverine marshes (<http://www.islamiCity.com> date accessed: March:2006)

In Damascus, the Barādah river was used to develop a system of water-courses that even the poorest houses had its particular fountain. Many of these water systems can still be found in Damascus today (Ameer 'Ali 1934: 193 cited in Husaini:149).

In Basrā there was a time when there were 120,000 streams (Al-Istikhāri 1870:80 cited in Husaini :149).

In the time of the 'Abbasids the restoration and preservation of all canals and the digging of new ones were looked upon as one of the duties of the government. In his work *Kitāb al-Kharāj* (1302 A.H), Abū Yūsuf (cited in Husaini 1970:237) stressed that one of the primary duties of a government is to restore at its cost canals for the promotion of agriculture.

The first great canal built by the Abbāsids was Nahr 'Isa which connected the Euphrates at al-Anbar in the north-west with the Tigris at Baghdād. The Nahr 'Isa had a branch great branch called Sarah. The second great canal was the Nahr Sarsar, which entered the Tigris above al-Madain. The third great canal was the Nahr al-Mālik which flowed into the Tigris below the Madain (Al-

Istakhri:84-5, Ibn Hāwqal 1873:165-6 cited in Husaini 1970:237). Other canals included the Nahr Kutha, the Great Sarah (Yaqut III :377-8:1866-70 cited in Husaini 1970:238), the Dujayl, and Nahr al-Silah (Al- Baladhūri 866:291, Qudāmah:241 cited in Husaini 1970:238).

Muslim agriculturists developed a machine called the *nau'ra*. This is a large wheel driven by animal or human power which carried a large series of pots tied to a double loop of rope so that the pots are let down into the water source and then raised to the top of the wheel's action where the contents are discharged into a feeder gully (Lombard 1902:31 cited in Idrīsi: 4: 2005). The *sakiya* was also another animal driven water-wheel (Ashtor 1976:47).

The preservation and supply of fresh water to the citizens in the Islamic Empire was kept up by the 'Abbasids. Baghdad had many canals which came from the Tigris River (Al-Khātib Vol. 1 :111-117 cited in Husaini 1970:249). There were also a large number of cisterns which were used as reservoirs. There were also two covered aqueducts built of bricks and lime Husaini 1970:249).

Naysabūr which was one of the greatest towns of the East in the time of the 'Abbasids had a large number of conduits which ran underground and it supplied water to the houses and gardens of the city (Al-Maqdisi 1906: 394

cited in Husaini 1970:250). In the city of Carthage marvelous aqueducts were found (Yāqūt 1866-70:Vol VI 58 cited in Husaini 1970:250). The Holy city of Qumm had an underground water-course like that of Naysabur (Al-Ya`qūbi 1885: 274 cited in Husaini 1970:250).

Highly advanced technical and administrative skills were needed to control the large-scale irrigation and water supply projects. In the city of Marv during the tenth century there were ten thousand workers employed in the building, maintenance and control of the irrigation system (Dallāl 1999:197).

The *qanat* system which originated in Iran was used extensively in Iran and North Africa where it was introduced during the Islamic period. The *qanāt* also appeared in Spain in the area of Madrid (Cook 1979:211). A *qanat* is an underground conduit that runs almost horizontally some fifty feet underground with a very slight inclination and transfers water from an aquifer to a specific location. It was provided with manholes so that they could be cleaned and repaired (<http://www.islamiCity.com> date accessed: March 2006). Seventy percent of water used in Iran until the modern period came from the *qanat* system (Dallāl:1999:197).

The first Abbāsīd governor of Basra, Sulaymān ibn ‘Alī carried out various reclamation projects, including the building of the al-Mughīta Canal. Dams

were constructed in al-Batā'ih to funnel water into the Nahr 'Umar in order to improve water supply to the city. The Nahr al- Amīr was dug by Al-Mansūr. The Nahr Abū al-Khasīb was dug by a friend of the *khalīfah* (Lapidus: 1981:187).

In Tunisia in the 1770s 'Ali Bey (1759-82) constructed a water supply system. He renovated many *waqf*-endowed water systems that had fallen into disrepair, and ordered that the Ras Tabi'a spring connected to the Roman aqueduct should be repaired (Gallagher :16).

Water from the hot springs at the foot of Mount Ahmar, eight miles from the capital was brought to the Kasbah (centre of old city) by means of a large underground pipeline constructed of masonry. This pipeline was fed by seven wells along its edges and branched out in the city into underground canals along the streets. Twenty public fountains were supplied by this pipeline (Briggs 1961:76-96 & Howard-Jones 1972:373-95 cited in Gallagher :16).

Ali Bey renovated wells in the areas of Bab Suwiqa. These wells were equipped with Na'uras (large water wheels) which drew water from the newly constructed reservoirs. Eventually irrigation systems in other areas were also expanded. Kairouan was provided with additional reservoirs for agricultural expansion (Snow:1936:38-55 cited in Gallagher :16).

3.7 Animal Care

The care for animal life was continued by the al-Khulafa` al-Rashidūn and those who followed them as the Muslim Empire expanded.

Malīk reported that once when 'Umar Ibn Al-Khattāb, the second khalīph, passed by a donkey loaded with mud blocks he assessed that the load was excessive and unloaded two blocks. When the owner of the donkey asked him whether he had any authority over her donkey, he responded that he considered it his responsibility as the *khalīfah* in authority (Al-Qaradāwi 295 cited in Abu-Sway 1998: <http://admin.muslimsonline.com/bicnews/Articles/environment.htm>. Date Accessed: March 2005).

Abū Bakr, the first *khalīfah*, prohibited the killing of animals without a sound reason. In his address to Yazid Ibn Abū Sufyān, commander of the Muslim army, he stipulated ... *do not kill sheep or a camel unless for food. Also do not burn bees and do not scatter them.....* (Malīk:1994: Vol.1:628 no.982).

Muslim zoologists wrote great works on the animal kingdom. These included *Kitab al-Hayawān* (Book of Animals) by al-Jāhiz, *Manāfi al-Hayawān* (Usefulness of animals) by 'Ubaid Allah b. Jibrīl and *Hayāt al-Hayawān* (Life of Animals) by al-Damīrī (Plessner 1979:452).

This demonstrates that there existed high quality scientific research amongst Muslims scientist, at a time when there was no recorded research on animals anywhere in the world.

3.8 Education

Education flourished from the time of the al-Khulafa` al-Rashidun.

In this section I will illustrate the importance that early Muslims attached to education. The achievement of Muslim scholars in virtually every branch of knowledge at the time stretched from Spain until the borders of China, and from Austria to the coast of Mozambique before the advent of European Renaissance.

A child's education would start at home with basic knowledge of knowing his Creator. Formal education began with his knowledge of how to perform prayers (Ghazzāli:vol.i:83 cited in Hitti 1986:408).

The elementary school was linked to the mosque. The curriculum centered around the Qur'ān. Memorization was the key to learning, and memorization of the Qur'ān was strongly emphasized. Along with this went history, arithmetic and Arabic grammar as well as poetry (Hitti 1986:408).

The mosque came to be used for the teaching of one or more of the Islamic sciences and literary arts. After the mid ninth century, more and more students became devoted to the legal sciences.

The mosque was also an important centre of adult education. Although it was not as systematic as the institutions of learning there were circles of learning (sing. *ḥalqah*) or assemblies (sing. *Majlis*). The *ḥalqah* can be defined as a 'gathering of people seated in a circle,' or, 'gathering of students around a teacher (<http://www.Muslimheritage.com>. Date Accessed: February 2006).

Great scholars like Imām Shafi'i who taught at the Mosque of 'Amr at al-Fustat presided over these types of informal learning centers (al-Suyūti : Vol. I : 136 cited in Hitti 1986 :411).

The mosque school took on the form of an academy and some developed into a university later on. Many of them still exist today as the oldest universities in the world. Amongst these are al-Qayrawān and al-Zaytūna in Tunisia, al-Azhar in Egypt, and al-Qarawiyyīn in Fez, Morocco. As places of renown, they attracted great names of Muslim scholarship, either as students or teachers, or both. Among the graduates of the mosques of Muslim Spain were Ibn Rushd, Ibn Al-Sayigh, and Ibn Bajja. In Basra (Irāq) Al-Khalīl Ibn Aḥmad gave lectures on philosophy at a mosque, and one of his students was Sibawaih who later became one of the most renowned Arabic grammarians of all times (<http://www.Muslimheritage.com>. Date Accessed: February 2006).

The Nizāmiyah of Baghdād was founded in 1065-7 and it was the first real academy in Islām (Hitti 1986:410). It later became a model for institutions of higher learning.

Universities in the Muslim world existed long before they appeared in other parts of the world. The universities of Granada, Seville and Cordoba were held in the highest estimation by the scholars of Asia, Africa and Europe, and in the ninth century, in the department of theology at Cordoba, alone, four thousand students were enrolled, and the total number in attendance at the University reached almost eleven thousand. On the eve of the British occupation, there were already 7600 students and 230 professors at al-Azhar (<http://www.Muslimheritage.com>. Date Accessed: February 2006).

Islamic education before colonialism used to be informal, both in form and content. An important feature of this informal education was the student-teacher relationship. There were no diplomas or degrees; instead, students received an *ijāzah*, an informal recommendation from a leading scholar to teach the knowledge he or she had learned (Progler:www.multiworld.org: date accessed March 2006).

Memorization was the core method of learning. After the fundamental materials were memorized and could be easily reproduced, students would then be encouraged to develop their ability to critically apply the memorized

materials to specific academic and legal problems. This method of training enabled Muslim scholars to produce rigorous critical responses to both ancient and contemporary texts, and it was common to organize academic exchanges around the criticism and disputation of controversial questions. (Progler: www.multiworld.org : date accessed March 20).

The Muslims were among the greatest contributors in mathematics and science. Muslims started to develop mathematics from end of the eighth century and lasted until the fifteenth century. It began under the Khalīfah Harūn al-Rashīd, the fifth Khalīfah of the'Abbasid dynasty, who encouraged scholarship and the first translations of Greek texts into Arabic e.g. Euclid's Elements by Al-Hajjaj. (O'Connor and Robertson: 2001:1).

When the *khalīfah* Al-Ma'mūn, the son of Harūn al-Rashīd, acceded to power in 813 C.E. he founded an academy called *Bayt al-Hikmah* (the House of Wisdom) which attracted scholars and from which many mathematicians originated. Iraq became the centre point of mathematical learning, and this easily spread to other parts of the Islamic regions, to North Africa and Spain in the west until the borders of China in the east <http://islam.about.com/cs/history/a/aa040703a.htm> Date Accessed May 2006)

The house of Wisdom was an unrivalled centre for the study of humanities and for sciences, including mathematics, astronomy, medicine, chemistry, zoology and geography, and alchemy. Drawing on Persian, Indian and Greek

texts - Aristotle, Plato, Hippocrates, Euclid, Pythagoras and others - the scholars accumulated the greatest collection of knowledge in the world, and built on it through their own discoveries (<http://www.guardian.co.uk/life/feature/story/0,1310285,00.htm> accessed May 2006).

One of the great contributors to modern algebra was Abū Ja'far Muḥammad ibn Mūsa al-Khwarizmi (780 – 850) from Baghdād. (Sowell 2004:118). Al-Khwārizmi was a scholar at the House of Wisdom in Baghdād (Brockelman: 1979:126).

Smith and Karpinski (1911) cited in (Al-Daffa':1978:51) says the following about Al-Khwarizmi's work: '...*the great master of the golden age of Baghdad, one of the first Muslim writers to collect the mathematical classics of both the East and the West, preserving them and finally passing them on to the awakening Europe. This man was... a man of great learning and one to whom the world is much indebted for its present knowledge of algebra and of arithmetic.*' Sarton (1:953 cited in Al-Daffa'1978:50) describe al-Khwarizmi as '*the greatest mathematician of the time, and if one takes all circumstances into account, one of the greatest of all times.* In his writings the Greek and Indian mathematics became united (Nasr 1987:149). Al-Khwārizmi produced his most famous work in 820 A.D. *Al-Jabir Wal-Muqābala*. *Al-Jabir* means transposing a quantity from one side of the equation to another, and *Muqābala* means simplifying expressions. (Al-Daffa' 1978:49). This great work

was translated in the thirteenth century into Latin as *Ludus algebrae almucgrabaloeque* and in the sixteenth century into English as *algiebar and almachabel*. In modern English it became known as *algebra* (Fillis 1989:25).

The Persian `Umar al-Khayyām (d. 1131) achieved a great number of advances in geometry which are often wrongly attributed to Rene' Descartes (Sowell 2004:118). The contribution of Sharaf al-Dīn al-Tūsī (c. 1200) who based it on Khayyām's work - applying algebra to geometry - is often wrongly attributed to French mathematician Francois Vie'te (d. 1603) (Sowell:2004: 118).

There were also great scientists such as al-Birūni (d.1048) who specialized in astronomy, mineralogy and pharmacology. (Sowell 2004:118). During this period they collected and corrected previous astronomical data, built the world's first observatory, and developed the astrolabe, an instrument that was once called "a mathematical jewel" (<http://www.islamiCity.com> date accessed: March 2006).

Advances were made into sciences and mathematics in order to facilitate certain rituals or practices. There came a time in the Islamic era where Muslims had to cope with the subject of *'Ilm al-farā'id* (the practical needs of the people) concerning inheritance, legacies, partition, lawsuits and

commerce. This gave an impetus to the development of mathematics.

Astronomy was advanced because Muslims had to establish the beginning and ending of a month for which the visibility of the moon was important as well as the different times of prayers during the day.

Muslims also made great strides in geography and cartography. Geography was developed because Muslims had to find the direction of prayers to Makkah (Mecca). They had to follow a route to Makkah for their annual pilgrimage. Some time before 1154 Muhammad al-Sharīf al-Idrīsī drew up a minimum total of seventy-one maps. He also composed some geographical works for the Norman rulers Roger II and his successor William I (Plessner 1979:455). An extract from al- Idrīsī's work was printed in Rome in 1592 and in a Latin translation by two Maronites in 1619 under the false title *Geographia Nubienses* (Plessner 1979:455).

The Muslims produced great scholars in optics in the eighth and ninth centuries. In medicine they experimented with diet, drugs, surgery, and anatomy, and in chemistry, an outgrowth of alchemy, isolated and studied a wide variety of minerals and compounds ([http://www. islamiCity.com](http://www.islamiCity.com) date accessed: March 2006).

They concentrated on physiological optics, burning mirrors, reflection on mirrors and geometrical and physical optics. The great contributors in optics

were Ibn Miskawayh, Ḥunayn ibn Ishāq, Qusta ibn Luqā al-Balabākki and Ya`qūb ibn Ishāq al-Kindī (Dallāl :1999:191).

The greatest work on optics by a Muslim in the eleventh century was *Kitāb al-Manāzir* by Ibn al-Haytham. He is also known as Alḥazan in the west. He rejected Hellenistic theories of vision and introduced a radically different theory. One of his famous discoveries was to find the point of reflection on the surface of a concave or convex spherical mirror, given the fixed positions of the visible object and the eye. His works was much appreciated by European scholars later (Dallāl: 1999:191).

The basics of optics developed by the Muslim did not only help them in warfare e.g. they could use burning mirrors to defend their coastal areas by burning incoming ships, but it contributed to the manufacture of binoculars as well as the development of spectacles.

Abū Rayhān Al-Birūnī (970-1038) who was an astronomer, geometrician, physician, historian and logician produced works on a variety of subjects. One of his famous works was *Tarikh al-Hind* which was written at the beginning of the eleventh century in the early Ghaznavid period.

Engineering contributed significantly to material prosperity and the production of raw materials as well as finished commodities to Muslim societies during the Middle Ages. This is evident if one still sees the high quality that is still to be found in today's twenty first century.

The Muslims developed practical statistics which included the art of designing ingenious mechanical devices. Famous writers on statistics were Abū Mūsa in the ninth century and ibn al-Razzāz al-Jazari (Dallal:1999:194). Their works described several mechanical devices and automatic machines and contained illustrations on how these devices worked. Muslims also focused on theoretical and hydrostatics and the best example of this is Abd al-Rahman al-Khazāni's twelfth century encyclopedia on medieval statistics, *Kitāb Mizān al-Hikma* (The book of the balance of wisdom) (Dallāl :1999:194). Scientists such as al-Khazāni provided theories on the specific weights of metals and minerals. (Dallāl :1999:194).

The first mechanical engineering handbook was al-Jazari's *Kitāb fi Marifat al-Hiyal al-Handasiyaya*. (The book of knowledge of ingenious mechanical devices) (Dallāl 1999:194). According to Dallāl (1999:194) many of these works gave rise to what currently is known as mechanical engineering. This includes the invention of conical valves, the use of complex gears to transmit a high torque, the introduction of double-acting pumps with suction pipes, the

use of a crank mechanism in a machine, and the invention of sensitive control mechanisms. The technological knowledge which the Muslims acquired was used in the field of irrigation engineering.

Muslim sciences redefined, deconstructed, expanded and superseded Greek traditions. The basic characteristics of the Muslim sciences were the generation of syntheses and the related creation of new sciences (Dallāl 1999:212).

There was a high literary rate amongst the Muslim. Arabic literature, especially poetry and rhymed prose, held a position of honor not accorded to any other arts. Their interest in literature is evident from the number of libraries which were in existence in Baghdad at the time. The quest for education was so universally diffused in the Muslim world, that it was said to be difficult to find a Muslim who could not read or write (<http://www.Muslimheritage.com>. Date Accessed: February 2006).

The availability of many bookshops is another indication of the high literary level in the society. Al-Ya'qūbi says that at the beginning of the tenth century there were over a hundred book dealers in one street (Hitti: 1986:414). The booksellers were themselves calligraphers, copyists and literati.

At Qarawiyyīn, Morocco there were three separate libraries, the most prestigious being the Abu Inān library, founded by the Merinid Sultan, Al-

Mutawakkil Abū Inān. An avid reader and collector, the Sultan deposited in his newly founded library, books on various subjects that included religion, science, intellect and language, and he also appointed a librarian to take charge of the affairs of the library. When the Spaniards occupied Tunis between 1534 and 1574, they ransacked its mosques and libraries, and removed many of the precious books and manuscripts (<http://www.Muslimheritage.com>. Date Accessed: February 2006).

Muslims acquired learning, and they themselves gave considerable support to educational institutions and to learning in general. *'It was this great liberality,'* says Wilds *'which they [the Muslims] displayed in educating their people in the schools which was one of the most potent factors in the brilliant and rapid growth of their civilization'* (<http://www.Muslimheritage.com>. Date Accessed: February 2006).

The 'Abbasids promoted learning to a great extent. Iranians, Berbers, Syrian Christians Copts and others began to speak Arabic in their daily lives. Science, philosophy, literature, and books of knowledge were rendered into the Arabic language. The result was that an Arab civilization emerged in which scholars, poets, merchants and soldiers considered themselves cultural Arabs and little heed was given to parentage and birthplace (Fisher 1966:90).

In Muslim Spain, according to Scott, there was not a village where 'the blessings of education' could not be enjoyed by the children of the most

indigent peasant, and in Cordoba were eight hundred public schools frequented alike by Muslims, Christians, and Jews, and where instruction was imparted by lectures. The Spanish Muslims received knowledge at the same time and under the same conditions as the literary pilgrims from Asia Minor and Egypt, from Germany, France, and Britain. In the great Muslim University of Cordoba, both Jews and Christians attained to acknowledged distinction as professors. So high was the place of learning that both teachers and pupils were greatly respected by the mass of the population; and the large libraries collected by the wealthy landed and merchants showed that learning—as in the Italian Renaissance (six hundred years later)—was one of the marks of a gentleman. ([http://www. Muslimheritage. com](http://www.Muslimheritage.com). Date Accessed: February 2006). By the tenth century, Cordoba had 70 libraries, one reportedly housing 500,000 manuscripts and employing a staff of researchers, illuminators, and book binders (<http://www.islamiCity.com> date accessed: March 2006).

Engineering contributed significantly to material prosperity and the production of raw materials as well as finished commodities to Muslim societies during the Middle Ages.

One of the Mali rulers of the fourteenth century, Mansa Mūsā, encouraged the development of learning and expansion of Islam. In the early years of his reign, Mūsā sent Sudanese scholars to the Moroccan university of Fez. By the end of his reign, Sudanese scholars were setting up their own centres of

learning and Qur'ānic learning, particularly in Timbuktu, later to become an important centre for Muslim traders and scholars, Sudanese as well as Berber (Awan: 1996: <http://www.aliasoft.com/themes/colonisation.html> #Intro Date Accessed: May 2006).

Leo Africanus, writing for an Italian audience early in the sixteenth century, described Timbuktu as a city of learning and letters where there are 'many magistrates, learned doctors and men of religion.' *'Here in Timbuktu'*, he noted, *'there is a big market for manuscript books from the Berber countries, and more profit is made from the sale of books than from any other merchandise'* (Davidson 1992:73).. The reputation of their schools of theology and law spread far into Muslim Asia. This central age of Mali was afterwards remembered as a golden age of prosperity and peace (Davidson:1992:76-77).

Timbuktu developed a great centre for learning. One of the great scholars of that time Shaykh Muhammad al-Sabbāgh (d. 1655) described the learning he endeavored there. He included exegesis of the Qur'ān, the Law, prophetic tradition, grammar, syntax, philology (study of the development of language) study of grammar particle, Names of Allāh, knowledge of Qur'ān recitation, the science of rhyme and metre (Hiskett:1984:17). In the present year (2006) South Africa is trying to analyze manuscripts from Timbuktu to understand the background of African culture and history.

The Mamlūks ruled Egypt from the end of the thirteenth century and the Ottomans from 1517. During this period but especially under Mamlūk rule there developed a high quality of learning. Mamlūk rulers were often patrons of learning and builders of schools, and the system of education in Egypt was the most highly developed at that time. The Mamlūk and Ottoman period witnessed the development of the two-tier system of Islamic education. That system was based on the *katātib* i.e. the primary school which taught literacy in Arabic and memorization of the Qur'ān. The madāris were schools of higher Islamic education of which the Azhar was the finest example. This same system was imitated in Central and West Sudan, Timbuktu and Hausaland. (Hiskett:1984:17).

The Al-Azhar University in Cairo was situated at the centre of the Islamic world and always had a rich endowment and unrivalled supremacy. In 1798 when the French invaded Egypt there were fifty senior teachers apart from junior assistants. The student number was three thousand students, whom were from local and abroad (Tibāwi:1979:47). The great numbers is an indication of the high standard of education in the Muslim world at that time.

In Western Sudan Qur'ānic education was widespread and it had been established for many centuries. The society had a system of education designed to enable its children to participate fully in its life. Education

consisted of a wide range of instruction such as education about environment, the practice of agriculture, technical knowledge such as how to build houses, how to make pots, forge of tools, weave of baskets; athletic skills such as hunting, fishing, canoeing, swimming; the art of warfare, household management; instruction in the social norms of society with particular emphasis on religion and government Children would be given instruction in trading which would include understanding not only of barter but also of rates of exchange since apart from cowries there were different units of currency in use. (Crowder:1968:372).

In many of the societies the recitation of the Qur'ān by heart was a top priority. Additional instruction included reading and writing in Arabic and elementary mathematics. Usmān don Fadio introduced intensive education in the Sokoto calīphate with the help of scholars such as Mallam Jibrīl of Agades. Don Fodio's education consisted of the traditional Islamic sciences of grammar, law, exegesis, theology, rhetoric and prosody (Crowder 1968:373).

All over Western Sudan there were scholars to whom pupils would attach themselves to gain increased knowledge in the subject in which the teacher had gained fame. The education which the students gained was responsible for the large body of literature that existed in the Western Sudan (Heussler cited in Crowder 1968:373). "Negroes of a much greater number than is

usually thought know how to comment with great insight and feeling on the most difficult text of Arab authors, translate them at sight and devote themselves to writing poetry, literature and theology” (White:199 cited in Crowder:1968:373).

Works by indigenous Negro Muslims on philosophy, law, theology, history and medicine existed all over Western Sudan. Lugard in his annual report in 1902 for Northern Nigeria suggested building up the existing Muslim schools (Orr 65 cited in Crowder 968:373). In 1945 it was estimated that 80 235 learners attended traditional Muslim schools in French West Africa. These schools were never given any support by the French even though on the eve of the conquest in areas like Bondou and Futa-Jallon there was hardly a village without a school (Gorer 1936:107 cited in Crowder 1968:373).

The ‘*ulamā*’ combined trade with learning. They would move along pilgrimage or trade routes and would implement what was known as a walking or traveling system of education. They would stop from time to time and set up schools. They would either use existing schools or set up a temporary establishment for a year or two before they moved on (Hiskett 1984:57).

Students would flock to that area in their droves to learn at the feet of the learned *shaykh*. This was the way high quality learning was spread in Muslim Empire at that time.

Before colonialism in Algeria in 1830, Algerian students had access to superior schools that were equivalent to Western secondary schools. In these schools (*madāris*) students followed courses in Islamic law, jurisprudence and theology. In addition the better schools taught geography, history, mathematics and astronomy. The best schools offered medicine. If a student desired to pursue more advanced studies, he would have to travel to al-Azhar in Cairo, al-Zaituna in Tunis or al-Qarāwiyyīn in Fez (Heggoy 1975:149).

Damascus in Shām (Syria, Jordan, Lebanon and Palestine) had fifty *madāris* (schools) at a time. The city was an important assembly station on the pilgrim route to Mecca. Other seats of learning in Shām were Jerusalem, Nabulus, Acre, Sidon, Tripoli and Aleppo. Progress of students were marked by license by one of the teachers of the institution (Tibāwi 1979:47).

Before the French mandatory system took over in Syria, state primary schools consisted of seventeen thousand pupils. In the city of Aleppo there was a school of medicine as well as a school of law (Tibāwi 1979:141). There was also an agricultural school at Salmiyyah (Tibāwi: 1969:357). The founding of all these specialized schools is an indication of the advanced system of education that existed in Syrian society before French influence came in to the country.

Before World War 1 and before the British mandate over it, Palestine contained flourishing institutions in the form of schools, hospitals, hostels and agricultural settlements (Tibāwi 1956:7).

In 1914 the Turkish authorities estimated the total population of Palestine, Arab (Muslim and Christian) and Jewish to be 689 275 (Handbook of Palestine:39 cited in Tibāwi 1956:8). There were 95 state elementary schools with 7 758 pupils (including 13 schools for girls with 1 480 pupils). There were also two lower and one higher (Sultāni) secondary schools in the principal cities with 471 pupils. During World War I the Salāhiyya College was established in Jerusalem as a modern institution that laid stress on Islamic studies. It also served as a training centre for teachers (Tibāwi 1979:104).

There were also the *Kuttāb* which were conducted in private houses or in the *masjid*. Children between the ages of 5 and 12 were taught to learn the whole Qur'ān by heart. They were also taught reading, writing and arithmetic. Parents paid a small fee for the teachers and, therefore, the majority of children attended the *Kuttāb*. The Turkish administration never had control over these schools and by the outbreak of the first world war there were 379 private schools with 417 teachers and 8 705 pupils (Tibāwi 1956:56-7).

In Libya there were well established traditional Muslim schools in the urban areas as well as in the villages, oases and tribal settlements. The most organized of these schools belonged to the Sanūsi *sūfī* order. The highest form of Sanūsi schools was at Jaghabub where Arabic and Islamic studies were pursued (Tibāwi 1979:149).

When the Italians invaded Libya in 1911 they found on the coast alone seventeen primary schools, secondary schools, schools of arts and crafts, a training college as well as a military school (Tibāwi 1979:149).

Tunisia in the time of Ottoman rule established a strong traditional school system with its apex at the Zaitūnah Mosque College in the city of Tunis (Tibāwi 1979:158). In 1875 the Sadīqi College was established in the city of Tunis. Its curriculum combined the traditional Arabic and Islamic subjects with modern languages and science. The aim was to train students for modernized state services. Before the French protectorate over Tunisia the modern Sadīqi College had two hundred students. At the same time Zaitūna together with the primary *Kuttāb* (schools linked to the mosque) schools below it had a population of twenty thousand students. (Tibāwi :1979:158). This is an indication of the high quality of education in Tunisia in the nineteenth century. Zaitūna was an important institution in the then Muslim world and many students from abroad traveled to study there.

Morocco had its *msid* (corruption of the word *masjid*) schools which was very much like the *Kuttāb* in other countries in the Ottoman empire. There was the traditional primary school and it was followed by the *Madrassah*. Above all these schools was the *Qarāwiyyīn* at Fez. The curriculum followed in Moroccan schools was similar to the other schools in the Muslim world (Tibāwi :1979:171).

3.9 Good Governance

Good governance which includes justice and freedom from corruption is fundamental to attaining sustainable development. Here we will cite instances from Muslim history which reflect the justice of various rulers – though we are aware that there were rulers who were despotic and unjust.

The second *khalīfah* ‘Umar ibn al-Khattāb, is well-known for his justice. All men were treated equally before him. Once the son of ‘Amr ibn al-‘As, the governor of Egypt struck an Egyptian commoner with a whip. The matter was brought before *khalīfah* ‘Umar who did not take into consideration the high status of the offender’s father and ordered the Egyptian to avenge himself for the harm done unto him (Ibn Jauzi cited in Nadwi 1977:77).

‘Umar was very strict in implementing fairness in the market place. He adhered closely to the regulations established by Muslim jurists which stipulated that the seller should not praise his goods for the qualities they do not possess, that he should disclose the qualities (good or bad) of his stock to the prospective buyer, that he should not hide the weight and quantity of his goods, and that he should not keep his price a secret in such a way that if the buyer comes to know of it he will refuse to buy the product (Ghazālī:144 cited in Ra’ana 1970:23).

‘Umar used to roam about in the bazaars and sometimes gave the sellers a beating with his cudgel saying: *‘Only those should sell in our bazaars who know the rules of marketing, otherwise undue profit will be charged, whether they have done it consciously or not’* (Ghazālī 120 cited in Ra’ana:1970 :23).

Areas such as Syria and Palestine were dominated by Christian inhabitants before the coming of Islam. They were suppressed by their former occupiers the Byzantium Empire. The Muslim conquest of Jerusalem in 637 C.E. put an end to the centuries of instability, religious persecution and colonial rule once by the Egyptians, then by the Greeks, followed by the Persians and finally by the Romans.

The indigenous Palestinians were pleased, that the Muslim conquerors turned out to be different from all those who conquered their country before. The territories under Muslim rule became safe havens to which many Jews and Christians fled to escape persecution in their own homelands. It was in Muslim metropolis that many Christians and Jews found the opportunity to acquire learning, and to excel in various fields of knowledge and expertise. Many of them had become historic figures who benefited from as well as contributed greatly to Muslim civilization (Tamimi 1999 cited in Halim: <http://www.Islamonlinenet/english/Contemporary/2003/05/Article01b.shtml>: date accessed: April 2006).

Thus, the Muslim rulers were just and honest in their dealings with all their subjects, even with those who did not follow the Islamic faith.

When 'Umar took control of Shām, he gave the Christians and Jews religious freedom and imposed low taxes. This is why Fisher says that the "*Arabs had little difficulty in obtaining co-operation from the local people*" (Fisher:1966:51).

In Egypt 'Umar instructed 'Amr bin al-'Ās that *jizyah* (a tax paid by Non-Muslims as a price for the protection given to them, their families and property by Muslims) according to their paying capacity. The rate of *jizyah* was 4 dīnārs for the rich, 2 *dīnārs* for the middle class and one dīnār for the poor (Ra'ana :1970:73).

'Umar had a sound and just administration. In terms of his philosophy the foundation of the state is a sound economic system. He gave strict orders that public money was meant for the public and not for the *khalīfah*. To him the *khalīfah* is an administrator not an owner. His share from the public treasury (*Bait al-Mā*) was only as much as that of an ordinary member of the community, thus his stipend was enough food and clothing for him only. If he needed honey for his sickness permission from the people had to be sought (Ra'ana:1970:xviii). He said regarding the wealth: "*Everyone has a right in this wealth; whether it is paid to him or not is another thing, and a slave has a prior right to it. I am your equal in this respect but the stages Qur'ān has set and preferences the Prophet has made will be observed*" (Abū Yūsuf:1964:212 cited in Ra'ana:1970:116).

'Umar's economic system was based on equity and equality. He got the rich to distribute among the poor so that economic quality was maintained and no class difference arose (Ra'ana:xix).

'Umar was very just when his army took over lands. In his time the Muslim army took possession of many lands especially in the north i.e. Shām. He never allowed his soldiers to take possession of those lands for tilling purposes; instead the original owners could keep their lands but had to pay *kharāj* (land revenue). People who fled their homes at the time of the invasion

were invited back by public proclamation. Once a man came to complain that his crops were destroyed when the Muslim army invaded Syria, and the *khalifah* compensated him with ten thousand *dirhams* (Ra'ana:20).

Muslim rulers were just to their occupants therefore they were welcomed to certain areas by their non-Muslim inhabitants. This can be seen in the following passage from the book 'The Preaching of Islam' by Prof. T. W. Arnold : "When the Muslim army reached the valley of the Jordan and Abu Ubaidah pitched his camp at Fihl, the Christian inhabitants of the country wrote to the Muslims saying: 'O Muslims, we prefer you to the Byzantines, though they are of our own faith, because you keep better faith with us, and your rule over us is better than theirs, for they have robbed us of our goods and our homes'. The people of Amessa closed the gates of their city against the army of Heracles and told the Muslims that they preferred their government and justice to the injustice and oppression of the Greeks (Arnold:55 cited in Halim : <http://www.islamonline.net/english/Contemporary/2003/05/Article01b.shtml> : date accessed: April 2006).

When Mu'āwiyah headed the Umayyads he implemented a sound administration. His government was organized along three functional lines: political and military affairs; tax collection and religious administration which included courts and endowments (Fisher 1966:77).

The Muslim caliphate was divided into five great states each with a viceroy appointed by the *khalifah*. Judges (Qadis) were chosen by provincial governors for the various cities. The judges were also guardians for the orphans and incompetents as well as managers of religious foundations. They were usually well trained in theology. The *khalifah*, generals, viceroys and governors held court and gave judgment on matters pertaining to political and governmental affairs (Fisher 1966:77).

During Ummayyad rule when 'Umar ibn 'Abdul 'Aziz became the *khalifah* one of the first issues he tackled was the dismissal of provincial governors who were known to be cruel or unjust to people (Nadwi :Vol.1: 1976:19). All the jewellery and valuable presents brought before him on accession to the throne were deposited in the State treasury (Ibid:20). Whenever a state official came to see the *khalifah* him about his private affairs he would promptly put off the candle provided by the State and ask for his own candle to be brought in (Ibid:21). He always reminded state officials to be extremely cautious in their dealings involving State property (Ibid:22).

The *khalifah* 'Umar ibn 'Abdul 'Aziz was also known as 'Umar II. He introduced many reforms in the Muslim State. Weights and measures were standardized ('Abdul Hakam:99 cited in Nadwi :Vol.1: 1976:23), state officials were precluded from entering into any business or trade (Ibid:98), unpaid

labor was made illegal (Ibid:100), pasture lands and game reserves reserved for the royal family or other dignitaries were distributed to the landless cultivators or made public property (Ibid:97), strict measures were taken to stop illegal gratification of state employees who were forbidden to accept gifts (Ibid:162). Once he was told that the revenues of the Empire had dwindled as a result of the reforms he had introduced his reply was that the Holy Prophet was sent as a guide and not as a tax collector. In that brief sentence the Caliph summed up the entire philosophy of a theocratic state (Nadwi: 1977:144).

As a result of the financial reforms which 'Umar ibn 'Abdul 'Azīz implemented there was no poverty in the Muslim Empire. During his rule it was difficult to find a destitute or beggars who would accept Zakāh. (Nadwi :Vol.1: 34).

Yahyah ibn Sa'id relates that due to the Caliph's economic policy everybody became a man of substance and therefore the Caliph had no alternate but to purchase a number of slaves and then emancipate them on behalf of the Muslim population ('Abdul Hakam:69 cited in Nadwi :Vol.1: 1976:34),

The 'Abbasids developed a system of a *muhtasib* (http://www.islamicweb.com/history/hist_west.htm Date accessed: April 2006). He was an inspector who observed in the markets in the business world who oversaw that there was honesty in manufacturing and selling, protection of the client from fraud,

and of the manufacturer from competition (Cahan:1980:529). He also made sure that proper weights and measures were given and that dishonest practice of all sorts were avoided.(http://www.islamicweb.com/history/hist_west.htm Date accessed: April 2006). In the Maghrib area the *muhtasib* was transformed into a magistrate in many areas and he acted as 'watchman' to see that the "holy Law" was implemented with regard to trade (Journal of the Society for Moroccan Studies 2 :1992:63)

In September 1187, the Muslim army under Salāhuddin took over the city of Jerusalem. After their conquest they showed battle savvy and were merciful in victory. The mercy of Islam was reflected by Salāhuddin's act of allowing the Christians of the city safe passage back to Christian lands. The Christian occupiers were given forty days to vacate the city of Jerusalem. They also had to pay a ransom when they left the city.

Lane- Poole (1906: 230) says that '*never did Saladin show himself greater than during this memorable surrender*'. His guards who were commanded by responsible emirs, kept order in every street, and prevented violence and insult, insomuch that no ill-usage of the Christians were ever heard of (Ernoul:227 cited in Lane- Poole 1906: 230).

Every exit of the holy city was in the hands of Salāhuddin and a trusty lord

was set over David's gate to receive the ransom as each citizen came forth. For forty days the citizens of the city trooped forth through the gate of David. After the expiry date there still remained thousands of poor people whom the niggardly burghers and religious houses had left to slavery. The slaves were eventually set free. Salāhuddin ordered his guards to announce that all the old people who could not pay were free to go forth (Lane- Poole 1906: 232).

The dames and damsels of the dead Christian knights pleaded to Salāhuddin for help and mercy. He ordered that to the dames and damsels whose lords were dead should be handsomely distributed from his own treasure (Lane- Poole 1906: 232). He gave them so much that they published abroad the kindness and honor which Salāhuddin had done to them (Ernoul:227 cited in Lane- Poole 1906: 233).

When Muslims ruled over Indian Territory from the thirteenth century they treated their Hindu subjects fairly. They did not molest their persons or property and they did not interfere in their religious practices. They even used the Devanagari script and Hindu symbols on their coins for a long time. Hindus accepted Muslim rule and a considerable understanding grew between the two peoples (Mahmud:285:1960).

During Muslim rule the Hindus always remained the majority in the old quarters of Delhi, the seat of the Mogul dynasty. The Hindus held prominent position in Mogul courts, from Emperor Babur to Awrangzib and thrived in all fields of knowledge, from music to military craft. Awrangzib punished the grandson of his Prime Minister Azad Khan, Mirza Tafakhur who outraged the modesty of a non-Muslim woman. Awrangzib wrote: "It is my duty to prevent oppression on the people who are a trust from the Creator (Sarkar:109 cited in Halim : <http://www.islamonlinenet/english/Contemporary/2003/05/Article01b.shtml> : date accessed: April 2006).

Mansa Mūsa who ruled Mali in the fourteenth century established a country of peace and stability. This was confirmed by the globe trotting Berber, Ibn Battūta when he visited Mali. He wrote: 'the Negroes possess some admirable qualities. They are seldom unjust, and have a greater abhorrence of injustice than any other people... E.W.Bovill wrote in 'The Golden Trade of the Moors'. There is complete security in their country. Neither traveller nor inhabitant in it has anything to fear from robbers or men of violence' (Awan: 1996: <http://www.aliasoft.com/themes/colonisation.html#Intro> Date Accessed: May 2006).

The Sultan who was the head of state in the time of the Ottomans, appointed the bazaar inspector also known as the *muhtazeb*. The maximal price system (*narh*) and the constant inspection of prices and weights and measures in the

bazaar were some of his responsibilities. He also had to see to state price controls on local products. (İnalçik: 1996:46).

The Ottomans always accommodated refugees. When tens of thousands of Jews were expelled from Spain, Portugal and Italy they sought protection under the Ottoman Sultans during and after 1492. Groups of Moriscos expelled from Andalusia in the sixteenth century settled in Galata (İnalçik 1996:31). Hundreds of thousands of refugees who fled Russian invasions of the Balkans, Circassia and Crimea settled under the Ottoman government in Anatolia (Karpas 1985 cited in İnalçik 1996:46). Many of these refugees knew they will not face persecution under the Muslim Ottomans. They regarded Ottoman rule as a safe haven for their survival.

In the nineteenth century Mahdist State of Sudan there was established a police station under the command of the inspector of the market. His prime duty was to supervise the standards of weights, measures and prices. This was similar to the *muhtasib* in the earlier Islamic states. The Khalīfah also established a treasury of the market police station known as the *Bayt mal dabtīyat al-suq* for financing the judges of the market court and the inspector of the market and his men. It derived its revenue from the shop tax and from the property confiscated for gambling and from fines which were imposed on drinkers of alcohol and users of tobacco (Abu Shouk: 1996:xiv). The inspector

of the market was the overseer of a just order in the society. He also implemented ways and means of eradicating corruption by confiscating the use of alcohol and other related usages.

Infighting among the early Muslim leadership, leading to the assassination of 'Uthmān (RA) the third *khalīfah*, was one of the greatest problems which faced the nascent Islamic state at that time. His killing led to the first civil war among Muslims – between the fourth *khalīfah*, `Ali and 'A'ishah, wife of the Prophet (SAW). This battle which was known as the battle of the Camel (Hitti: 1986: 181) rocked the foundation of the newly founded Islamic state.

Mu'āwiyah, the governor of Syria, was determined to avenge the death of 'Uthmān (RA). He refused to give his pledge to `Ali (Kennedy 1981:35) until his murderers were tried and punished. This led to another civil war known as the battle of Siffīn (Hitti: 1986:181) in which many Muslims were killed.

In 61 A.H the grandson of the Prophet, Hussein, and many of his relatives were slain in Karbala. He had refused to swear allegiance to Yazīd, son of Mu'āwiyah. The army of Yazīd later sacked the city of the Prophet (SAW), Madīnah, and also damaged the Ka'bah in Makkah. (Hitti: 1986:181)

Many of the *Khulafāh* also practiced questionable leadership. There grew an elite group of leaders. Conquered lands were to be used to provide income for all Muslims, but in reality much of the wealth landed in the hands of the ruling class. Referring to the Umayyad period, Kennedy (1981:35) holds that: "*for the poor Arab and non-Arab convert, the ideal of a community based on Islam, justice and the equality of all believers was a very long way off*".

During Umayyad rule the ruling elite remained predominantly Arab. In Iraq many non-Arabs converted to Islam. The non-Arabs, known as *mawālī*, were denied the privileges as their co-religionists. The *diwān* which was constituted of Arabs was closely connected to the ruling class and they were fortunate to receive salaries from the state (Kennedy 1981:35). Large numbers of Arabs were allowed to settle in the fertile areas of Basra and Kufa. There were always tensions between them and the local population. These immigrants were subsidized by the caliphate to erect new cities. (ibid). It is evident that the Umayyad rulers discriminated against non-Arab populations.

Khalīfah Mansūr (754-775) had the following to say about some of the Umayyad leaders:

AbdulMalik was a tyrant who took no thought of what he did, Sulayman only cared for his belly and his private parts...their authority passed to their

pampered sons, whose only care was the pursuit of passion and the quest for pleasure in those things which are forbidden by Almighty Allāh....

(Lewis:1987:25).

When religious issues arose the *khalīfah* turned to the '*ulamā*' for advice. In many instances, however, the *khalīfah* accepted only those things which suited his purpose. Eventually secular activity came to be seen as independent of religion or religious values (Nadwi:1977:94). The result was that the ruling class began to ignore the advice and guidance of religious scholars and many rulers became unethical and immoral in the way they administered the caliphate.

The Abbāsīd caliphate started controversially when right from the beginning they clashed with the '*ulamā*'. A classical case is that of Imām Abu Hanīfa, one of the great Islamic jurist who was offered the post of Grand Qādī (chief judge) by the second Abbāsīd *khalīfah*, Mansūr. When Abu Hanifah declined the offer he was thrown into a dark prison in 146 A.H. It is claimed that he died from the effect of poison (Jamil Ahmad: Imām Abu Hanīfa. <http://www.renaissance.com.pk/feletfor96.html> Date Accessed: January 2009))

Mansour points out the corruption of the twelfth-century Abbasid caliphate in the following words:

It was riddled with criminal gangs, corrupt officials and shadowy figures who spanned both, with underworld figures such as the notorious Karahanli family able to operate with virtual impunity. (Wisam Mansour (www.informaworld.com/ampp/siteindex?request=%2Findex%2F790581162.pdf) Date Accessed: January 2009)

Guisepi (1992) makes the following comparison between the rulers of the Abbasid Dynasty and the Ottoman Empire:

At the center of both empires, the forces that sapped their strength included the decreasing ability and reduced powers of the rulers, court intrigues and succession disputes, the growing involvement of mercenary soldiers in politics, and bureaucratic corruption. Away from the capitals at Baghdad and Constantinople, revolts by peasants and townsmen oppressed by the landed classes, the loss of territory to internal rebels..... (Robert Guisepi 1992 history-world.org /ottoman %20empire.htm Date Accessed: January 2009)

3.10 Poverty Alleviation

The *bayt al-māl* was the term used for the Public Treasury of the Muslim state. It was established in the time of the Calīph 'Umar (634-644 C.E.) in

response to the growing problem of the booty acquired as a result of the Muslim conquest (Encyclopedia 2nd ed. Vol. 1:1141-47 cited in Abu Shouk: 1996:xi).

Bayt al-māl means the house of wealth (Encyclopedia 2nd ed. Vol. 1:1141-47 cited in Abu Shouk: 1996:xi). Initially it was a room in a masjid or in the house of the governor-general in the countries conquered by the Muslims where money or other valuables of the Muslim community were stored. The valuables were considered as common property of all Muslims (<http://www.takafol.ru/eng/rubrika>. date accessed: April 2006). The ruler is not allowed it for his personal expenses, but only for public good (Hughes:1885:35).

The sources of *bayt al-māl* were: *Zakat*, legal tax raised for Muslims and which goes for the destitute and the poor; *jizya* capitation from the non-Muslims; land tax (*Kharaḥ*); one-time voluntary contributions (*Sadaqa*); one fifth of the war trophy (*ghanīma*); ownerless property; share of the yield of mines; share of trade taxes and customs duties, fines, ransoms for prisoners paid to the Muslims. *Bayt al-māl* also included revenues from waqf property and all accidental revenues and property that under Sharīḥ cannot be made private property (Hughes 1885:35; <http://www.takafol.ru/eng/rubrika>.date accessed: April 2006).

'Umar, the second *khalīfah*, had a census taken in Arabia and he had a *diwan* (register) made to calculate how much each person who was entitled to receive from the public treasury should get. These people included the Prophet's family down to the lowliest women and children of non-Arab warriors (Fisher:1966:52).

In the time of the 'Abbasids, Al-Mahdi took great care of the poor. He provided pensions for the lepers and prevented them from begging and roaming the streets (Husaini 1970 :241). Muslim rulers had to develop a system to collect revenue to support the needy. They formed the *bayt al-māl*.

The Ottoman Sultans frequently distributed alms by slaughtering thousands of sheep on certain occasions and distributing them to the poor, sometimes with their own hands. Soup kitchens (*imaret*) were one of the most widespread institutions attached to the religious endowments in the cities. Ottoman sultans had difficulty in curbing beggars in Istanbul during the month of Ramadaan (İnalçik 1996:46). The belief that charity pleases Allah and brings Allah's blessings determined the behavior in many basic acts of economic importance in Islamic states and the Ottomans were very zealous in that regard.

Institutions which were derived from charity played a significant role in distributing wealth in the society. There were large groups of the destitute and unemployed in the Ottoman cities and towns were maintained through such charity institutions. (Yediyilduz 1985; Barnes 1986; Akunduz 1988:438-443 cited in İnalçik 1996:47).

The Ottomans introduced the *çift-hane* system to eliminate poverty among the peasants. Under this system the state organized rural society and economy by appropriating grain-producing land and distributing it under the *tapu* system to peasant families (*hane*). The *tapu* system means that there is a permanent patrilineal lease of state-owned land to a peasant family head in turn for his pledge to cultivate it continuously and meet all obligations of tax or services. Each family in theory had a pair of oxen and was given a farm (*çiftlik*) sufficient to sustain the family and to meet its tax obligation. Families with less than half a *çift* (pair of oxen) or *çiftlik* or unmarried peasants were separately categorized as *bennak* and *mücerred* (or *kara*), and they were subjected to lower rates of *çift*-tax (İnalçik 1996:996-1001).

The *çift-hane* unit consisted of three basic elements i.e. a field which was workable and used to grow grain, the family household which provided the labor and a team of oxen which provided the pulling power. These three elements formed a indissoluble agrarian and fiscal unit (İnalçik 1996:146).

The peasant gained many advantages under this system. The peasant gained perpetual tenancy from the regime. The peasant's lease on the land gave him hereditary rights of possession through the direct male line. The state strictly forbade its agents (*sipahis*) from occupying and cultivating the land for peasant households (İnalçik 1996:146).

The Mahdī in the eighteenth century Mahdist state in Sudan, imposed Islamic taxes on each Muslim who 'believed in Allah, and the Mahdship to purify their property' (Abu Shouk 1996:xviii). The *zakāt* was imposed on animals (camels, sheep, goats and cattle) and the produce of land. The *zakāt al-fitr*, was to be paid at the end of the month of Ramadaan. This tax constituted regular annual revenue. (Abu Shouk 1996:xviii). In this way the requirement for the poor were seen to.

Ottoman officials were responsible for seriously undermining the economy. In 1600, the size of the Janissary (infantry units that formed the Ottoman Sultan's household troops and bodyguards) was increased from 12,000 to 36,000 men, placing a huge burden on the finances. The Ottomans decided to encourage imports and discourage exports, believing that this would resolve the problem of shortages and keep prices down. This policy proved to be detrimental to the Ottoman economy. Unemployment increased and the

population doubled in the 16th century (Paul Shoebottom 1996-*esl.fis.edu/learners/support/hum/text/wc2-516.htm* Date Accessed: January 2009)

Many local Ottoman officials, who controlled large landed estates, squeezed the peasants and the laborers who worked their lands for additional taxes and services. At times the oppressive demands of local officials and estate owners sparked rebellions. They caused the hard-pressed peasantry to abandon their holdings and flee and become vagabonds, bandits, or beggars in the cities.

(Robert Guisepi 1992 *history-world.org /ottoman %20empire.htm* Date Accessed: January 2009). This resulted in many peasants joining the ranks of the poor.

3.11 Chapter summary

In this chapter I have demonstrated that the major elements of sustainable development are identifiable in early development in the Muslim World. This illustrates that the focus of development was not confined to economic growth (though it was given its due prominence) at the expense of the overall quality of life. Muslim rulers in general were conscious of their responsibility to fulfill the primary needs of their people, though some of them were corrupt or oppressive and paid scant regard to the needs of their people.

I have also pointed out the negative influence that some Muslim rulers had on development due to infighting, corruption or self-centered interests.

Not only did this impact negatively on economic growth, Muslims with great skills and knowledge were killed during the numerous civil wars. Kennedy (1981:44) details the battles that took place between the Umayyads and the Abbāsids for political supremacy.

The fact that the Muslim World was saddled with a number of rulers who had a negative impact on sustainable development indicators especially in terms of governance, agriculture, poverty alleviation and education cannot be ignored.

On a positive note, however, a number of rulers did pay serious attention to the provision of education and health care, protection of animals and natural vegetation, promotion of agriculture and trade coupled with the eradication of poverty. These constitute the major components of the “pillars” of sustainable development identified in chapter four.

In conclusion, it could be argued that the goal of improving the general quality of life -in terms of Allen’s definition of sustainable development – was the primary motivating factor for development in the Muslim World. Hiskett’s (1984:31) declaration that the rulers of Mali had

incorporated Islamic ideas into their own administration and employed foreign Muslim experts and advisers is but one example that supports this contention.

In the next chapter we will examine the effects of current development on the environment in select Muslim countries.

CHAPTER 4

IMPACT OF CURRENT ECONOMIC DEVELOPMENT IN THE MUSLIM WORLD ON THE ENVIRONMENT

4.1 Introduction

In this chapter I will attempt to highlight the impact of current economic development on the environment in select countries with a majority Muslim population. I will identify the major factors that contribute to environmental degradation in Muslim countries as well as some of its consequences.

In the past few centuries, the Muslim World has undergone rapid economic changes, accompanied by strong urbanization, growing industrialization and huge transformation in terms of lifestyles. .

We have established in chapter 2 that the major tenets or pillars of sustainable development are economy, environment and equity. While recognizing the fact that equity is a fundamental component of sustainable development, and that environmental, social and economic systems are inextricably linked, I have confined myself to analyzing the impact of development on the environment only for two main reasons.

The first is the assumption that integration of economic development with environmental management will contribute to achieving the goals of equity.

This is based on the following pronouncement:

“We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill-health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our well-being. However, integration of environment and development concerns and greater attention to them will lead to the fulfillment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future” (United Nations, 1992).

The other reason for confining this chapter to the influence of economic development on ecology is a practical one. The area of development is so vast that it is simply not possible to encompass all its elements in this study.

Furthermore, the study had to be restricted to a few select countries; it is simply not possible to discuss developments in all or even the majority of Muslim countries.

4.2 The influence of industrialization

The effects of human production on the environment after the Industrial Revolution are quantitatively and qualitatively different from earlier periods.

Nineteenth Century industrialization presupposed an inherent conflict between human progress and the natural world. It was taken for granted that the way to economic growth is through the subordination of nature; there was little or no consideration for its consequences.

Friedrich Engels, having recognized the dangers inherent in this approach, cautioned against exulting in the domination over nature and advised establishing a bond with nature:

“Let us not, however, flatter ourselves overmuch on account of our human victories over nature. For each such victory takes its revenge on us...we are reminded that we by no means rule over nature, like someone standing outside of nature, but that we...belong to nature, and exist in its midst, and all our mastery consists that we have the advantage over all other creatures of being able to learn its laws and apply them correctly” (Engels: 2001:18)

Muslims were not immune to the influences of industrialization, including its impact on their attitude to nature. Fazlun Khalid (http://ifees.org.uk/index.php?option=com_content&task=view&id=39&Itemid=58. Date Accessed:

November 2007) captures the alienation of Muslims from nature as a consequence of their obsession with economic advancement succinctly in the following words:

“As what we now understand by modernity advanced, as the secular ethic progressively seeped into the Muslim psyche and as industrial development, economic indicators and consumerism became the governing parameters of society, there has been a corresponding erosion of the Muslim perception of the holistic and a withering of its understanding of the sacred nexus between the human community and the rest of the natural order.”

Many Muslim countries have contributed directly to environmental degradation. The methods employed to effect economic development particularly in the wealthier oil-producing states have invariably led to economic degradation. Yet, it has not received the desired public attention in the media.

Batir Wardam (<http://www.arabenvironment.net/archive/2007/8/303464.html>

Date Accessed September 2007) sums up the reasons for this as follows:

- There are weak professionals and specialists for environmental media personnel in general
- The Arabs have a weak command of the English language, and English is the dominant technical language
- Governments control most public media institutes, resulting in a trend towards producing propaganda material rather than critical coverage on environment

- There are no incentives for environmental journalists, since most of those who cover environmental issues are considered second-rate journalists, compared to those who cover politics, economics or even sports and art
- Researchers do not have the skills and capacity to utilize modern information technology tools which provide a rich source of environmental information for journalists.

Mawil Izzi Dien in his paper *Islam and the Environment, Theory and Practice* in which he discusses the effects of industrialization on the natural environment in the Middle East, contends that the main cause of environmental problems is that industrial policies, which do not recognize spiritual or ethical values as commercially significant, have led to a severe cultural rupture that has alienated the human inhabitants from the earth that supports them (Dien: 2003:http://www.theamericanmuslim.org/tam.php/features/print/islam_and_the_environment_theory_and_practice/ Date Accessed: November 2007)

While Izzi Dien agrees with Khalid that the major cause of environmental degradation in the Muslim World and the resultant alienation of Muslims from the natural environment can be explained by the advent of industrialization, he

goes further to identify the absence of ethical or spiritual values as the core of the problem

This could explain, at least to some extent, the general apathy that exists among Muslims in general regarding environmental issues. To what extent this is true will be demonstrated in the next chapter dealing with the impact of development on the environment in select Muslim countries.

4.3 Impact of economic development on the Environment

4.3.1 Pollution of the Atmosphere

Out door air pollution problems are caused by industries. In many Muslim countries industrial managers do not take initiatives to adopt cleaner technologies. The lack of environmental regulations also plays a role.

Obsolete vehicle engine technology, low fuel efficiency, leaded gasoline, and high sulphur fuels exacerbate outdoor air pollution. The use of biomass fuel for cooking and heating can give rise to indoor air pollution.

The destruction of the oil and petroleum industry in Iraq due to the Iran–Iraq War (1980-1988), the Gulf War (1991), and the current conflict in Iraq has

resulted in much burning which in turn has led to a huge amount of air pollution.

According to research conducted in 1994, most of the air pollution in Lebanon originates from the transport and energy sector. Lebanon's per capita CO₂ emissions are 4.55 tons which is 3 times as much as the average for India. The CO₂ emissions of vehicles was calculated to be 1,030,275 t/year, and CO₂ emissions from power plants to be 1225,750 t/year in 1993/4 (<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date Accessed : August 2007).

Severe air pollution is a problem in Azerbaijan's major cities due to unregulated emissions from petroleum and chemical industries, therefore addressing of air pollution and atmospheric problems is central to achieving sustainable development. (http://www.un.org/esa/sustdev/csd/csd14/statements/azerbaijan_air_04 Date Accessed: December 2008)

In Brunei the practice of clearing land through the use of fires such as slash-and-burn agriculture has contributed to loss of vegetation cover and erosion problems in addition to causing localised air pollution (<http://rainforests.mongabay.com/20brunei.htm> Date Accessed: December 2008).

Even though the rate of annual increment of vehicles has declined since 1995, the total number of vehicles has nevertheless continued to increase

from 167,790 in 1995 to 202,244 in 1999. The trend of an increasing number of diesel vehicle ownership warrant special attention as it is widely recognised that diesel vehicles exhaust emissions are potentially more polluting as compared to petrol vehicles. Diesel fuel registered vehicles comprised 15% of total vehicles registered in 1995 whilst in 1999 diesel fuelled registered vehicles comprised 25.5% of the total vehicles registered in that year.

Therefore, tighter controls on vehicular exhaust emissions need to be in place, especially for diesel vehicles ([http://www.env.gov.bn/link/domestic/case%20studies/brunei%20darussalam %20environmental %20outlook%202001-2005.htm](http://www.env.gov.bn/link/domestic/case%20studies/brunei%20darussalam%20environmental%20outlook%202001-2005.htm) Date Accessed: August 2007).

In Malaysia in the year 2000, the combined air pollution load from mobile sources, stationary sources and burning of municipal and industrial waste was approximately 3.2 million tonnes (Department of Statistics. Compendium of Environmental Statistics 2003. Malaysia, 2003 cited in Sangaralingam et. al. :2007: 4).

In Pakistan airborne particulate matter exceeds safe levels in all major cities and causes 22,700 deaths per year. Indoor air pollution causes the deaths of more than 30,000 children per year. ([http://www.dailytimes.com.pk/default.asp? page =2007%5C09% 5C05%5Cstory_5-9-2007_pg5_13](http://www.dailytimes.com.pk/default.asp?page=2007%5C09%5C05%5Cstory_5-9-2007_pg5_13). Date Accessed: August 2007).

Urban air pollution in Algeria is caused by the transport sector in the large cities like Algiers, Oran and Constantine; by burning municipal waste in Oued Smar Alger and Oran, and by heavy industries in Annaba, Skikda, and Gazaouet (<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

Many Turkish cities, including Istanbul have a smog problem. Rising energy consumption and the increase in car ownership have increased air pollution (<http://www.nuce.boun.edu.tr/turkey.html> Date Accessed: August 2007).

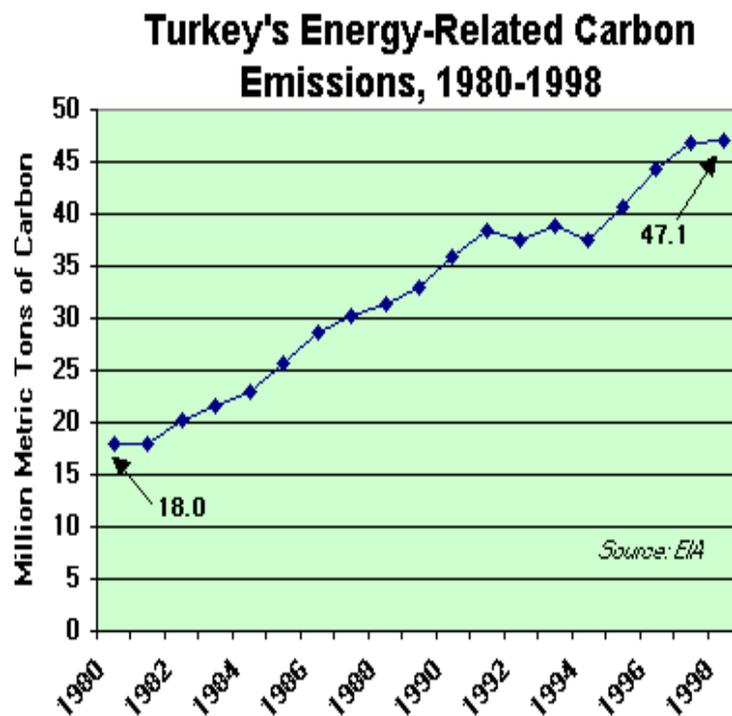


Fig 4 Courtesy: <http://www.nuce.boun.edu.tr/turkey.html> Date Accessed: August 2007).

The graph shows the sharp rise of carbon emissions by Turkey over a short span of eighteen years.

The wind pattern influenced by the air streams carries toxic emissions from The Tajikistan Aluminum Plant (TAZ) to the three neighboring districts of Uzbekistan: Sariasisky, Uzun and Denau, with a population of over half a million. The Tajik Aluminum Plant discharges hundreds of thousands of [metric] tons of hydrogen fluoride, sulfur dioxide, nitric oxide and other pollutants into the atmosphere. (Yegorov : August2000:<http://www.fluoridealert.org/pollution/1194.html>. Date Accessed: August 2007).

Air pollution is a big environmental issue facing Iran. This problem is especially threatening in its capital city, Tehran. The major cause of air pollution here is exhaust fumes from 2.4 million motor vehicles. The majority of these vehicles are over 20 years old, with poor fuel efficiency and no catalytic converters. Most of these cars are domestically produced. Cars spewing black smoke are a common sight in the streets of Tehran. The problem in Teheran is compounded by topographical conditions around the city. Mountains are to the north and east of the city. Climatological factors such as sunshine and frequent temperature inversions trap pollutants over the city. Tehran's high altitude also makes fuel combustion less efficient. The index of air pollution, Pollutant Standard Index (PSI) 24, reported 282 "unhealthy" days in the year 2000. On January 2, 2005, the pollution index

reached 168 - close to “very unhealthy” levels. The result was that schools were closed and children, the elderly and the sick were advised to stay indoors (Sarraf M, Owaygen M; Croitoru L; Ruta G;: 2005 earthmind. net /marine/docs/wb-2005-iran-cost-environmental-degradation.pdf Date Accessed: August 2007).

The biggest air pollution problem in most Muslim countries is CO2 emissions from motor vehicles, especially in the urban areas. This causes many deaths as well illnesses. It also hinders the growth of many of the cities’ children. Muslim countries whose winters are very cold also contribute to this problem. This is because fires are stoked inside houses for cooking purposes as well as indoor heating. .

4.3.2 Degradation of Land

Land degradation is a consequence of intensive cultivation, overgrazing of agricultural land and chemical pollution from excessive use of agricultural chemicals.

Land degradation is a common problem throughout most of West Asia, (Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates (UAE), West Bank and Gaza, and Yemen) resulting

both from natural environmental factors and from the misuse of land.

Extensive pressure from overgrazing, uncontrolled cultivation, fuel wood gathering, wind-blown soil materials, inappropriate use of irrigation water, uncontrolled urbanization, and sand encroachment have all contributed to the process of land degradation in the region.

More than three quarters of West Asia is desert, and an increasing part of the permanent pasture areas is subject to erosion because of reduced vegetation cover. Much of the cropland is losing its inherent productivity due to poor agricultural practices. The direct loss of agricultural land is most acute in Jordan, Iraq, Lebanon, the Syrian Arab Republic, and Yemen, where fertile land is scarce and concentrated in the narrow coastal strip and river valleys. In the irrigated areas close to the main urban centers in Jordan, Iraq, Yemen, Lebanon, and the Syrian Arab Republic, established agricultural land is being lost to alternative uses, including urbanization, industrialization, and transport infrastructure (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

In Pakistan overgrazing, particularly by goats, threatens the ecological balance of many areas.

In Bangladesh agricultural activities that cause land degradation include shifting cultivation without adequate fallow periods, absence of soil conservation measures, cultivation of fragile lands, unbalanced fertilizer use, and a host of possible problems arising from faulty planning or management of irrigation (Marcoux:1996: www.fao.org/sd/wpdirect/wpan0011.htm - 16k. Date Accessed: August 2007).

Niger is one of the countries that form the Sahel Region which has seen recurring drought, food insecurity, and increased desertification over the last 30 years, a result partly also due to global climate change and overuse of scant natural resources (Robert Fraser, Senior Officer, Water and Sanitation Unit, Geneva Date: 21 March 2007 <http://desertification.wordpress.com/2007/04/11/climate-change-and> Date Accessed: December 2008)

In Mauritania, desertification threatens to wipe out livelihoods and communities. Environmental degradation, responsible for the dangerous displacement of sand dunes in Mauritania, has wiped out homes, livestock and livelihoods throughout the desert country. Some scientists have linked desertification, or land degradation in arid and semi-arid regions, to increasing global temperatures, while others emphasise human activities such as farming techniques and tree cutting which they say have heightened the pace of degradation (<http://www.irinnews.org/report.aspx?ReportId=81782> Date Accessed: December 2008)

In Mali soil degradation takes place damage to the land's productive capacity and because of poor agricultural practices such as the excessive use of pesticides or fertilizers, soil compaction from heavy equipment, or erosion of topsoil. Eventually this results in reduced ability to produce agricultural products. Soil erosion (which refers to the removal of soil by the action of water or wind), is compounded by poor agricultural practices, deforestation, overgrazing, and desertification (http://www.indexmundi.com/mali/environment_current_issues.html Date Accessed: January 2009)

In Senegal over 60% of the population depends directly or indirectly on soil for a living. Unfortunately the soils have been on a degrading trend for a long time due to harsh climatic conditions, geographic features and man-made causes. The phenomenon of soil degradation in Senegal was first reported in 1906 by M. Gaudy, Secretary of the Bureau of Soils in French West Africa (AOF). At the time, he highlighted the fact that the regions in Senegal were drying out, the forest coverage was reducing and the soil was getting progressively fragile. In Senegal's 1984 National Plan for Town and Country Planning, a classification of soils by their pedological capacity suggests that 47% of soils are unfit or barely suitable for farming, and that 36% of soils have poor to average capacity for farming and contain deterrent factors that limit productivity. While soil degradation can be defined in several ways, the loss of productivity emerges as its most symptomatic consequence because this links

directly with food security. The problem is even more serious in a context where farmers lack material and financial resources to restore soil fertility. Among the numerous signs of soil degradation in Senegal, some such as water erosion, wind erosion, chemical degradation, are outstanding just by the sheer scope of the harm they inflict on bio-diversity and sustainable farming.

.(Dr. Fatou Lo Planchon, Amadou Moctar Dieye, Centre de Suivi Ecologique: Land Degradation in Senegal ftp://ftp.fao.org/agl/emailconf/lada/lada2_fatou_planchon.doc Date Accessed: January 2009)

In Egypt desertification takes valuable agricultural land. Agricultural lands are being lost due to urbanization and windblown sands. Rapid population growth is straining natural resources and depleting agricultural land. Most of the agricultural production relies on irrigation. Salinization of soil is becoming a problem e.g. there is increasing soil salinization below Aswan High Dam (http://www.indexmundi.com/egypt/environment_current_issues.html Date Accessed August 2007).

There are seven major factors promoting land degradation and desertification in Egypt, says a report titled 'Egypt State of the Environment Report 2005' that was released in 2006 by the Ministry of State for Environmental Affairs. These are detailed in the table below.

Table 9

1. Urbanization	From an agricultural point of view land that was once used for biomass production, including food and medicine, is transformed to accommodate residential settlements and/or infrastructures for different purposes such as office buildings, factories and domestic farms.
2 Water Logging and Soil Salinity:	Agricultural practices in Egypt lack water management techniques with emphasis on conventional surface irrigation systems that do not surpass 60% efficiency.
3. Pollution:	As a result of atmospheric pollution many contaminants tend to precipitate into the River Nile. In addition to this contamination there is treated sewage water and agricultural drainage water that is fed to the Nile containing fertilizers and pesticides and therefore deteriorating the major source of irrigation water which consequently has an effect on the lands that will be irrigated.
4. Soil Fertility Depletion:	Ever since the Aswan Dam was built a decline in Nile alluvium carrying basic nutrient elements had occurred. This in turn led to a decrease in organic fertilizer passively transported by the Nile and has been one of the reasons

	<p>as to why soil fertility has worsened. As a result vegetation production has also declined. This lack of agricultural production due to insufficient quantities of basic nutrient elements and degradation of fertility had reached nearly 15%.</p>
<p>5. Physical Land Degradation:</p>	<p>Intensive agriculture in agrarian lands has caused over exploitation where farmers attempt to undertake most agricultural practices such as surface plowing, pest control and harvesting all of which have been carried out with inappropriate tools and under conditions that are not suitable leaving land with degraded soil and plow pans that constrain growth, deepen plant roots and lessening the efficiency of agricultural drainage. As a result productions in the areas of the north and northeast Delta region have decreased by approximately 8%.</p>
<p>6. Soil Erosion:</p>	<p>Due to Egypt's arid nature it is constantly threatened by wind erosion which amplifies the desertification process especially in the eastern, western and Sinai deserts that are categorized as sensitive and fragile habitats having very little vegetation and experience severe droughts. Some studies have concluded that the wind erosion ratio in Egypt is 5.5 tons/hectare a year in oases areas in</p>

	<p>the western desert and 71-100 tons/hectare a year in areas where agriculture is rain fed such as the northwest coast. This exemplifies how wind erosion poses a threat on soils in these areas ranging from moderate to severe. Rainfall in addition to wind can also serve as an erosion factor where areas in the north coast, Red Sea, Aqaba Gulf, south Sinai and some eastern desert valleys experience what is known as water erosion also have serious impacts on soil that bring about desertification.</p>
7. Sand Dunes:	<p>Sleeping giants many of us do not wish to awaken; and they cover 16.6% of the states area! Just as wind causes soil erosion it can also displace these mountains of sand and bring them closer to agricultural lands and endanger residents in both urban and rural areas. Some active dunes have already taken the course in threatening several areas in Egypt such as the west Delta, Fayoum and Wadi El Rayan, western Minya, Assyout and Beni Swaif, El-Kharja Oasis, northwest High Dam and to the east Delta and north is Sinai with stress on some sites around Al Salam Canal.</p>

(Ahmed Zedan : Land Degradation in Egypt: Community Times; June 2008
<http://www.ct-egypt.com/news/295/ARTICLE/1187/2008-06-01.html> Date
Accessed: January 2009)

In Somalia, clearing forest for charcoal, cutting graze, trucks travelling back and forth collecting charcoal and graze for transport to ports — all these contribute to land degradation (Feysal Ahmed Yusuf Environmental degradation in Somalia. www.cru.uea.ac.uk/tiempo/floor0/archive/issue26/t26art1.htm Date Accessed: January 2009).

Sudan is threatened by a serious deforestation problem. Overgrazing and poor land management practices all speed the process of desertification, as the Sahara encroaches on to previously arable and forested land.
(<http://ideas.repec.org/a/kap/enreec/v2y1992i4p359-371.html> Date Accessed: December 2008)

In Kyrgyzstan the factors that impact on soil cover are cattle grazing and agriculture. Urbanization of territories, construction of transport systems, hydro-engineering structures and mining enterprises completely destroy the soil cover. The deterioration of a state of used land resources occurs also owing to erosion and salinisation of soil irrigated by a wrong way. There are all kinds of soil erosions on the territory of the republic: pasture, wind, water, irrigation surface, and ravine erosion. In the rural areas, unrestrained use of

agricultural chemicals has severely degraded soil quality, and excessive irrigation has raised soil salinity. Overgrazing by livestock has also contributed to soil degradation, and much of Kyrgyzstan's available grassland has disappeared. A large portion of the country's land area has suffered so much soil pollution and degradation that the damage is believed to be irreparable (<http://enrin.grida.no/htmls/kyrgyz/soe2/english/landf.htm> Date Accessed: December 2008).

In Oman the coastal plains have suffered a particularly severe loss of vegetation as a result of off-road vehicles, construction, and tourist activities. Overgrazing in desert areas is a major cause of plant cover loss, particularly southern parts of the country (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

Soil degradation in Algeria is caused by erosion, salinization and desertification. The impact of soil degradation was evaluated on the basis of losses in agricultural productivity resulting from water and wind erosion. Water erosion threatens 12 million hectares (ha) in northern and western Algeria. Wind erosion threatens more than 7 million ha of arid and semi-arid land. Salinization occurs mainly in irrigated plains located in the western part of the country where many surface areas are fully degraded. The land is also damaged due to conversion of steppe habitat to arable land. Soil erosion

takes place due to overgrazing and poor farming practices

(<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

Bahrain has also lost substantial vegetation cover as a result of urbanization in the country (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

In the northern regions of Saudi Arabia overgrazing in desert areas is a major cause of plant cover loss. (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

In the Senegal River valley there is abundant agricultural land, but much of it suffers from high to severe wind and water erosion, loss of nutrients, salinization because of over irrigation, and soil compaction caused by intensification of agriculture (Homer-Dixon : 1994: <http://www.library.utoronto.ca/pcs/evidence/evid1.htm> Date Accessed: September 2007).

Iraq's farmland is declining in productivity due to soil salinization. This is caused by insufficient drainage and saturation irrigation practices. In the year 1997, 8 per cent of Iraq was irrigated, and in the same year 12 per cent of its land was arable. Dry land salinity, mainly due to high evaporation, is another serious problem, particularly in the low-lying parts of West Asia. In Iraq, for

example, salinity and water logging are problems in more than 50 percent of the lower Rafidain Plains (El-Hinnawi, 1993. http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed : August 2007).

Erosion during irrigation contributes to soil degradation in irrigated farming. In Turkmenistan, the erosion is most widespread on the inclined terrains of the northern and western parts of the Kopetdag piedmont plain. A territory is considered under the threat of erosion if its slope is more than 0.002. Here, runoff contributes to the displacement and removal of the fine soil particles. Extensive irrigation has severely degraded soil quality in the country. Irrigation of the naturally saline soil has brought underground salts to the surface, making the soil even more saline and thereby making irrigation more necessary. The country's soil has become heavily contaminated with agricultural chemicals, such as pesticides and herbicides that have been applied in large doses to the cotton crops (enrin.grida.no/htmls/turkmen/soe2/english/ecology/soilp.htm Date Accessed: December 2008)

Syria's environmental concerns are deforestation, overgrazing, soil erosion, desertification. Syria's farmland suffers from desertification and soil erosion. This is due to the country's rapid rate of deforestation. About 2.2 per cent between 1990 and 1996 of the country's forests were felled each year to clear land for farms and housing. For many years, the fertility of Syria's farmland

declined because many of the country's farmers did not practice crop rotation(<http://www.elca.org/countrypackets/syria/desc.html>. Date Accessed: August 2007).

Soil salinity in Syria is critical in the Euphrates basin, where more than 40 percent of total irrigated land is affected to varying degrees. Overall, it is estimated that 125,000 hectares suffer from high soil salinity, resulting in a 37 percent decline in yields of cotton and wheat, the main irrigated crops. The total annual loss in agricultural productivity is estimated at around 0.45 percent of GDP. (Sarraf M :April 2004. No.9. www.worldbank.org/environmentstrategy Date Accessed: August 2007).

In Lebanon, land degradation is most acute on fragile steep lands with extensive deforestation and soil erosion (Government of Lebanon, 1996 cited in UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

The main reasons of soil erosion in Lebanon are deforestation, overgrazing, and the deterioration of the agricultural terraces. Soil erosion is affecting approximately 25% of Lebanon's total surface area. The rate of soil loss is estimated to be around 317 ton / hectare each year with an approximate cost of US \$ 10.3 million per year. With the increasing move of the rural population to the urban centers, many of the terraces that once covered the Lebanese

mountains are collapsing. When the stone walls break down, the soil is washed away, resulting in the irreversible loss of topsoil (<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date Accessed : August 2007).

Lebanese land degradation is most acute on fragile steep lands with extensive deforestation and soil erosion http://www.unep.org/geo/geo1/ch/ch2_13.htm . Date Accessed : August 2007).

Uncontrolled quarrying in Lebanon in the past has caused major destruction of natural vegetation and habitat. A survey undertaken to assess the impact of three abandoned quarries on the surrounding environment revealed that the price of nearby land and apartments overlooking the three quarries were lower than prices for comparable properties further away from the quarries by US\$90 million. In general, land degradation estimates are understated because they do not include damage to natural habitats and ecosystems or losses in forestland and biodiversity. (Sarraf.M . :April 2004. No.9 Date Accessed : August 2007).

In Afghanistan widespread overgrazing and soil erosion, of vast areas, of once-arable land are now neglected. Due to the nature of the topography and the arid climate, vast areas are subject to soil erosion. Loss of vegetation and soil humus has created ever more arid conditions. Abandoning the lands, poor reclamation schemes, overgrazing and destruction of vegetation for wood for fuel have all caused desertification. Soil salinization and waterlogged lands

are common (Daud S. Saba [http://www.mindfully.org/Heritage/Afghanistan - Environmental-Degradation-Saba.htm](http://www.mindfully.org/Heritage/Afghanistan-Environmental-Degradation-Saba.htm) Date Accessed : August 2007).

Soil erosion in Yemen is increasing as a result of the removal of vegetation and unsustainable land-use and farming practices. The development of large-scale irrigation schemes and the deterioration of terraces due to inadequate maintenance also play a role. The areas most seriously affected by soil erosion are Anas, Bani Matter, Wadi Serbah, Hamman Ali, Wadi Afk, Raymah, Wadi Shiras, Wesab, and Wadi Bani. Damage to lands also occurs as a result of indiscriminate construction of roads and other infrastructures in Aden and Sana'a. (siteresources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf Date Accessed: September 2007).

Climate change is one of the major factors responsible for land degradation in Muslim countries. This can be attributed to global warming which is fostered by highly industrialised countries. There is, unfortunately, little that Muslim governments can do about this and so this could be considered a mitigating factor. However, Muslim countries are guilty of weak land management e.g. overgrazing and excessive use of chemicals such as pesticides and fertilizers, are burdened by rapid urbanization, and are careless in the development of the transport infrastructure. This is one area which I believe they have to address as a matter of urgency.

4.3.3 Pollution of Oceans, Seas and Coasts

Coastal regions are the most fragile and endangered ecosystems in the world.

They are affected by stress through deliberate and accidental oil spills, by sewage and industrial wastewater discharges, and by commercial shipping.

Other contributors are household waste, sewage and agricultural chemicals.

The coastal waters in the Atlantic and Mediterranean Seas of Morocco are polluted from the wastewater discharge of major cities (Rabat, Sale,

Mohammedia, Safi, Tanger, Al Hoceima and Tetouan). Polluted beaches

along these coastal zones affect public health, marine ecosystems and fish

catches (<http://lnweb18.worldbank.org/mna/mena.nsf/Attachments>

[/COED+Morocco+Profile/\\$File/COED+Morocco+profile+June+19.A4.doc](http://lnweb18.worldbank.org/mna/mena.nsf/Attachments/COED+Morocco+Profile/$File/COED+Morocco+profile+June+19.A4.doc).

Date Accessed: September 2007).

In the Maldives coral mining for housing is a cause of environmental degradation. It has adverse impacts on the reefs itself. Coral reefs offer strong coastal protection against ocean currents, waves and tides. Thus mining of corals has resulted in the destruction of this protection layer in some islands causing considerable amount of beach sand to wash away from the island into the sea. As the protection layer is destroyed, waves and tides directly enter into the island causing damage to the vegetation and intruding into the

freshwater aquifer. Reef loss causes migration of residential reef fish communities and other living organisms, loss of bait fish that are important for the local tuna fishery, and reduced coral percentage cover. Reefs may take several years to recover (www.rrcap.unep.org/reports/soe/maldives_biodiversity.pdf Date Accessed: September 2007).

In Malaysia human activities continued to pose a threat to the fragile ecosystems of the marine environment. The main contaminants in the coastal waters in 2001 were *Escherichia coli* bacteria, total suspended solids, and oil and grease. All these contaminants as well as mercury exceeded the Interim Marine Water Quality Standards (Department of Statistics. Compendium of Environmental Statistics 2003. Malaysia, 2003 cited in Sangaralingam et. al. :2007: 4).

Pollution from the Egypt's oil sector threatens coral reefs, beaches, and marine habitats. Raw sewage and industrial and agricultural by-products pollute the country's coastal waters (http://www.indexmundi.com/egypt/environment_current_issues.html Date Accessed August 2007).

Marine ecosystems, such as the coral reefs around Hurghada, Egypt, on the Red Sea, have suffered irreversible damage. This is due to untreated industrial and municipal discharge, and port activities which have contributed

to this coastal pollution (Sarraf Maria : :April 2004. www.worldbank.org/environmentstrategy Date Accessed: August 2007)

The Lebanese coastal sea water areas suffer from heavy bacteriological and chemical contamination. A research on fish in 1997 has shown that 30 % of all the fish caught along the Lebanese coast had plastic in their stomachs. Divers complain about the presence of plastic under the sea. Traces of mercury and pesticides have been found in measurable concentrations in fish offshore.

Major sources of pollution are effluent from tanneries, fertilizer production, soap and paint factories as well as food processing facilities. Disposed oil and waste disposal is dumped into the sea water from ships and tankers.

Sediment from soil erosion or stirred up during coastal construction has destroyed or deteriorated many of the fish breeding grounds

(<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date Accessed : August 2007).

Coastal degradation around Beirut, Jounieh and Tripoli is due to sewage and municipal waste which result in ecosystem losses along the coast. Many Lebanese industries continue to pollute waterways and coastal areas.

(<http://Inweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

The Caspian Sea is the largest inland body of water on earth, but by the beginning of the 21st century it became in danger of turning into an environmental dead zone. Oil has been produced in what is present-day Azerbaijan since the 19th century. The dissolution of the Soviet Union in 1991 led to heightened interest in the region. A new oil bonanza has seized the capital city of Baku but Azerbaijan's oil facilities are among the worst in the world. In some parts of the sea, oil pollution levels are 12 times the maximum permissible concentration. Petroleum waste is routinely dumped into the Caspian, and dilapidated and leaky pumps added to the problem. With the prospect of increased oil drilling in coming years, the industry may continue to pose an environmental hazard (<http://www.remibenali.com/issues-caspian-sea/index.php> Date Accessed: December 2008)

The potential damage from waste oil is exacerbated by a sea level rise of more than 10 centimeters each year. This transgression causes extensive coastal flooding, land loss, and dispersal of toxic pollutants in sensitive regions. Pollution from the oil industry is pervasive both in the Caspian Sea and on the Apsheron Peninsula surrounding Baku. (<http://www-ocean.tamu.edu/Quarterdeck/QD4.3/rowe-4.3.html> Date Accessed: August 2007)

In Bangladesh seas have too often been used as free waste dumping areas. Repositories and refuse from firms, farms and houses have often been dumped in salt waters. This waste disposal has led to serious pollution. For e.g. Bay of Bengal has been used as a convenient dumping ground for industrial and toxic wastes. (Pathania:2003: <http://www.saag.org/papers8/paper799.html> Date Accessed: August 2007)

In the Persian Gulf, surrounded by Muslim countries, the marine environments have come under increasing pressure. This is due to the degradation of the ecosystem. Oil pollution in the region is very pronounced. In addition to the danger of oil spills from ship and pipeline accidents, chronic pollution occurs from disposal at sea of oil-contaminated ballast water and dirty bilge, sludge, and slop oil. Some 1.2 million barrels of oil are spilled into the Persian Gulf annually. It has been estimated that in 1986 alone, nearly 3 billion tons of wastes mostly ballast waters were discharged into the Persian Gulf (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

The Red Sea and the Kuwait/Oman areas probably receive more oil pollution than anywhere else in the world. The Mediterranean Sea which engulfs Muslim oil producing countries, accounts for 17 per cent of global marine oil pollution, even though it constitutes only 0.7 per cent of the global water

surface (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

Mangroves and associated inter tidal areas and marshes are under increasing threat in Saudi Arabia as well as the Persian Gulf area as a result of infilling and reclamation. The geographic concentration of industrial complexes in coastal and estuarine areas around the Arabian Peninsula means that many pollutants are deposited directly into the sea. (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

With regards to pollution on the Saudi Arabian coast, Ibrahim Al-Fahmi, a member of the National Plan for Sea Pollution, argued that many seaside projects negatively affect the environment due to the solid and liquid waste that is dumped there. He added that the old planning of the Saudi seaside was inappropriate and did not take the environment into consideration (Wardam : Marine Environment, Saudi Arabia <http://www.arabenvironment.net/archive/2007/4/205271.html> Date Accessed September 2007)

Algeria experiences coastal degradation primarily due to coastal erosion which affects 250-300 kilometers of beaches, sand extraction of 10 million cubic meters over the last 10 years, dredging a volume of 20 million cubic meters of soil from 18 ports, and over-exploitation of fisheries by increasing catches from 91,000 tons to 113,000 tons over the last decade

(<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

On the Yemeni coast critical habitats such as mangroves are being threatened by the disposal of raw sewage and untreated industrial waste. Extensive wood cutting also destroys mangrove vegetation Oil spills occur frequently in the Gulf of Aden - ten spills were recorded in 1985 ([site resources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf](http://resources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf). Date Accessed: September 2007).

The development of industrial scale fisheries in Yemen has a potential for disrupting ecosystems upon which fish, shrimps, and another marine fauna depend. Trawling in shallow coastal waters destroys the egg deposits of the cuttlefish and damages sea grass vegetation which provides an important habitat for shrimp site resources. (worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf. Date Accessed: September 2007).

The coasts of Lattakia and Tarous are polluted in Syria with municipal and industrial waste and sewage. The coastal water pollution affects fisheries and coastal ecosystems. (<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

The Aral Sea, formerly the fourth largest inland sea in the world, has now lost over a third of its area (currently below 44,000 sq km), the surface level has dropped by 13 m, and the volume has been reduced by some 790 cu k.

(Akiner:1993 <http://www.hq.nato.int/docu/colloq/1993/eco9331.txt> Date

Accessed: August 2007). The drop in sea level mainly occurred due to the

non-feeding of the Syr Darya (which flows through Uzbekistan, Tajikistan, and Kazakhstan) and Amu Darya (which flows through Tajikistan, Afghanistan,

Turkmenistan and Uzbekistan) rivers, whose water is almost dried up as a result of the high increase in irrigation activities along these rivers.

The fishing industry in the Aral sea, which until recently supported thousands of fishermen, as well as a large canning factory in the "port" of Muinak (now 60 km from the shore), has been destroyed; the rusting trawlers lie stranded and useless on the ever-widening beaches, the fish stocks having been decimated by rising salinity and diminishing volumes of water

(Akiner:1993 <http://www.hq.nato.int/docu/colloq/1993/eco9331.txt> Date

Accessed: August 2007).

Once the world's fourth largest lake, the mighty Aral Sea is now in its death throes. Starved of its lifeblood of the waters of the Syr Darya and the Amu Darya rivers, the sea has been shrinking since the 1930s, when the former Soviet Union started building large scale diversion canals to irrigate vast

cotton fields in a grand plan to make cotton a great export earner. This was achieved, and even by the turn of the 21st century, Uzbekistan is still a large exporter of cotton. The cost in ecological and human terms has been astronomical.

By 1960, 25 to 50 cubic kilometres of river water was being diverted annually for irrigation, and naturally enough, the shoreline began to recede. The mean sea level dropped 20cm (8") per year for 10 years, then the drop rate accelerated to 60cm/year in the 70s, then to almost a meter per year in the 80s.

By 1990, as a result of the continuing water diversion and evaporation, the shrinking Aral divided in two and its salinity increased from 10 grams per litre to 45. In some parts of the south Aral, salinity tops out at 98 g/litre (2001). Average seawater salinity is 33 g/litre. The once thriving fishing industry has been destroyed along with the fish and most of the flora and fauna. Salt pans and contaminated runoff lakes have appeared, and winters have become harsher and longer, summers hotter and shorter.

Attempts in 1992 and 1997 to build the 14 km long Karateren-Kokaral dyke between the north and the south Aral (the south being abandoned, the north reflooded) was successful for 9 and 12 months until they were both breached by the weight of the water, and the fact that only enough money was available

to build an inherently weak sand structure. This same plan, using concrete, has been revived in 2003 by the Kazakh government.

Vozrozdniya Island, growing larger since 1960, joined the mainland in 2001, and added another cruel ingredient to the Aral disaster. Vozrozdniya was a Soviet Army research and biological weapons facility until 1992, dealing reportedly in anthrax and other “nasties” that now have the potential to migrate. Ironically, Vozrozdniya is Russian for 'rebirth' or 'renaissance'.

The area is now constantly subject to toxic dust storms and desertification, the people of the area have 9 times the world average rate for throat cancer, and infant/maternity mortality is the highest in all of the former Soviet Union's republics. Respiratory complications, tuberculosis and eye diseases are also rising alarmingly.

In a desperate attempt to keep their vessels in the shrinking Aral, channels were dredged to the open sea. It was a futile exercise, as the sea receded faster than the channels could be built. The fishing industry was effectively gone by 1982, and the canning plant processing frozen fish brought in from other areas to keep fishermen employed, folded in 1991. Of the region's 73 species of birds, 70 of mammals and 24 of fish, most have either perished or moved on.

Vast cotton fields, irrigated by the Kara Kum canal and others, boosted Soviet cotton production by an impressive 70% between 1960 and 1980 when alarming degradation to the Aral basin was noticed, although not officially acknowledged by the central government.

All the canals were built on the cheap, most were never lined, consequently between 35 to 70% of the water is lost to evaporation and seepage -even today, only 12% of Uzbekistan's canal length is waterproof.

Runoff from the irrigated land has formed artificial lakes contaminated with pesticides, fertilisers and heavy metals, some so large they have been named. These lakes -and the salt pans are steadily growing.

The future looks bleak for the south Aral, but dependant on the desire of the nations bordering the Aral -and how much cash is available, the north Aral may have a chance. Preserving or restoring the Aral depends on limiting water use, a volatile issue in a region of ethnic tensions (<http://unimaps.com/aral-sea/index.html> Date Accessed: December 2008)

The Iranian coast in the Persian Gulf is a victim of oil pollution and environmental degradation. About 1.2 million barrels of oil are spilled into the Persian Gulf and Gulf of Oman annually. Oil pollution may be found anywhere in the marine environment and results from operational discharges due to

shipping, river run-off, natural seeps, atmospheric inputs, coastal refineries, the petrochemical industry, offshore operations and tanker accidents. Such inputs are a great threat to the marine environment. Other major polluters are the ballast water of oil tankers, off-shore oil exploration facilities, heavy metal pollution which is caused by import and export activities and thermal pollution from the return water in cooling systems of large industrial facilities such as power plants (Sarraf M, Owaygen M; Croitoru L; Ruta G;: 2005 earthmind.net/marine/docs/wb-2005-iran-cost-environmental-degradation.pdf Date Accessed: August 2007).

It is reported that factories along the Hann Bay in Senegal discharged industrial waste water into the bay (JICA, 1999). Tourism facilities, such as hotels and restaurants, and fertiliser-intense agriculture were also identified as causes of water pollution. The water pollution, in turn, contributes to the degradation of coastal habitats and marine biodiversity. (http://www.issafrica.org/index.php?link_id=14&slink_id=5789&link_type= Date Accessed: January 2009).

A huge amount of world marine pollution occurs in Muslim countries as this chapter has proven that fact. Muslim countries are in most cases themselves responsible for many of the coastal degradation that takes in their areas. Since the discovery of oil in the Middle East which affects many Muslim

countries, a high activity of oil industries sprang up in this region. Export of oil to the rest of the world from these areas by means of shipping was started.

This resulted that the coastal areas began to be affected by the dumping of oil and grease, port activities in terms of disposed oil and waste disposal dumped into the sea from ships and tankers as well as oil-contaminated ballast water, oil spill offs, oil tanker accidents and coastal petrol refineries and petro-chemical industries which dump their waste into the sea.

Other discharge into the sea includes industrial and agricultural by-products, raw sewage and wastewater discharge as well as contaminated river run off.

All the discharges into the sea affect the marine eco system. The fauna and the flora in the sea is affected by another problem and that is the over – exploitation of the fish industry in which fish catching has increased dramatically in the last few years especially since gill nets were introduced.

,4.3.4 Contamination of Freshwater

Water is the basic resource for the survival of life on this earth. Water is a scarce, finite and invaluable commodity. The increasing pressure on all the water resources in the world in terms of quality and quantity, combined with the increasing demand for water, will lead to serious water shortages in the

near future. The two most widespread problems water pollution resources are industrial discharges, household waste, sewage or agricultural chemicals.

These days water scarcity is also induced by mounting population density and growing economic activity which are in need of water usage.

Iraq is a country blessed with two abundant natural water sources, in the name of the famous ancient Tigris and Euphrates rivers. But national water networks have suffered grievously as a result of Iraq's long economic deprivation and have been allowed to fall into disrepair.

Even before the Iraq war began in 2003, millions of people were struggling with broken pipes and faulty systems. But since then, Iraq's water problems have multiplied.

In the chaotic aftermath of the initial conflict, Iraq's main pumping stations and water-treatment plants were stripped of vital equipment by looters. Acts of sabotage damaged infrastructure even further. Municipal water became dirty and contaminated exposing children to dangerous and health-sapping waterborne diseases.

Diarrhoea, a common consequence of drinking unsafe water, is already the second biggest killer of Iraq's young children and contributes significantly to malnutrition rates. Most water is currently brought into the country aboard

tankers (http://www.unicef.org/infobycountry/iraq_39172.html Date Accessed: December 2008)

Water crisis in Qatar threatens future progress and impedes efforts to alleviate poverty. Qatar is rated among the 10 most water scarce countries in the world. Fresh water resources in the region are extremely limited. The demand for it is increasing. As a consequence, much of the available freshwater resources have been depleted, and in some cases polluted. Ground water levels are falling in many areas, and often lead to seawater intrusion into coastal aquifers. Due to these stresses on existing freshwater resources, seawater and brackish groundwater are now considered essential resources for freshwater production through desalination ([http://www.arab environment.net /archive/2006/12/130975.html](http://www.arabenvironment.net /archive/2006/12/130975.html) Date Accessed: August 2007).

Qatar has overcome its water scarcity through desalination because it is one of the few options which they have. On the other side desalinated water only benefits those who can afford it. The poor who are the lowest paid guest workers in Qatar suffer as they cannot afford this expensive product.

Oil production and refining are major industries in Syria. It generates about 45 percent of the country's export revenue. Wastes generated during the refining process have polluted the Euphrates, Oronte, and Barrada river basins. Raw sewage flowing from urban centers is also degrading Syria's supply of fresh water.

(<http://www.unccd.int/actionprogrammes/asia/regional/tpn3/website/syria>.

Date Accessed: December 2008)

In Egypt the rapid growth of the population overstrains the Nile and natural resources. (http://www.indexmundi.com/egypt/environment_current_issues.html Date Accessed August 2007)

Lebanon has a high annual rainfall. There are hundreds of springs which feed seventeen rivers year round. The steeper eastern slopes of the Lebanon Mountains receive a significantly lower quantity of precipitation. They contain only a few seasonal streams, which are fed by the melting snow. Most of Lebanon's water resources are polluted by untreated sewage, dumped waste and industrial effluents. Untreated wastes are discharged into waterways or pumped into deep holes, sometimes contaminating underground aquifers

(<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date

Accessed : August 2007).

Research done in the years 1990 and 1994 showed that at least 70% of all fresh water resources were exposed to bacteriological contamination and that 80 % of the well water must be considered unsafe for consumption. The city inhabitants of Tripoli suffered from a drinking water crisis when city's water sources were contaminated. In addition, sea water intrusion due to the over pumping of groundwater by private wells has rendered a lot of the

groundwater near the coast unusable. (<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date Accessed : August 2007).

The Nahr Ibrahim and the Nahr Litani are considered to be two of the most polluted rivers in Lebanon. The Karaoun Lake which is fed by the Nahr Litani , was put off limits for fishermen, due to the high concentrations of heavy metal and pesticide residues found in fish. Studies also show that all rivers in Lebanon suffer to varying degrees the effects of solid waste and effluents. (<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date Accessed : August 2007).

The pollution of water resources in Mali is increasingly a matter of concern. Although the most visible aspect of the problem is the pollution of surface water, the pollution of groundwater is a real threat. The degradation of the quality of water is shown by biological, chemical pollution and physical pollution. The discharge of untreated sewage into rivers and estuaries contributes most to this type of pollution. The discharge of industrial wastes with a high toxic material content (tanneries, gold mines) is also dangerous for surface and groundwater (because of drainage and infiltration), just as much as domestic sewage. Moreover, the establishment of the agro-food industry and mining developments tend to aggravate the situation. It is estimated that 55% of the population of Bamako uses wells for its water supply. These wells are often poorly constructed and are situated close to latrines and sewers.

Besides this, the high level of permeability of the soil over time allows wastes to infiltrate and pollute the groundwater. Laboratory tests carried out by the National Water and Energy Department have shown that groundwater in Bamako is highly polluted by pesticides, metals (above all mercury and lead) and other chemical substances. The nitrate content ranges from 0.1% to 1.7%, i.e. three times the WHO standards (NEAP/CID 1997). Despite the low industrialization of the country, it should be noted that the treatment of industrial wastes is insufficient or non-existent: eight industrial units alone in the city of Bamako daily discharge an average of 2,200 m³ of waste water with chemical pollutants, heavy metals and organic pollutants, i.e. an annual volume of 770,000 m³, infiltrating annually into aquifers or directly discharged into the river Niger. An additional 1,600 m³ of waste water per year from the 300 dyeworks in Bamako adds to the pollution. Food-processing factories, factories making cloth, candles, drills, chemical products, with each one of them discharging wastewater into drains directly connected to the river. (Dr. Aboubacar Diara: Pollution in Mali www.chem.unep.ch/pops/POPs_Inc/proceedings/bamako/eng/Mali.html Date Accessed: January 2009).

Prior to the discovery of arsenic contamination in Bangladesh, groundwater used to be considered a safer source of drinking water. Arsenic contamination of groundwater in Bangladesh is now (9 September 2008) considered the world's largest case of water pollution. Groundwater in Bangladesh is also

polluted by a number of anthropogenic and natural sources. The most widespread anthropogenic sources are the infiltration of industrial and urban wastes disposed on the ground or in surface water bodies. Also intrusion or infiltration of saline water contaminates groundwater. (banglapedia.search.com.bd/HT/W_0030.htm Date Accessed: January 2009).

In Kyrgyzstan, central Asia, the environmental issue is mostly water related. The country's issues include water pollution and the fact that many people get their water directly from contaminated streams and wells. As a result of this, water-borne diseases are prevalent. In addition, there is increasing soil salinity from faulty irrigation practices. (<http://geology.com/world/kyrgyzstan-satellite-image.shtml> Date Accessed: December 2008)

In the past 25 years, wetlands in the Kabul area of Afghanistan have been drained. These ecosystems were always the most important factors in normalizing the dry climate and feeding the groundwater system of the region. At the same time, these drained lands were handed over to developers or to the most hazardous industrial developments, namely the animal skin and intestine processing mills that spew hundreds of tons of chemicals and biological agents right at the edges of the city every day. This policy has changed the once beautiful wetlands of the southeast of Kabul city into the dirtiest chemical dumping grounds that holds enormous amounts of chemical and biological pollutants (Daud S. Saba <http://www.mindfully.org/Heritage/>

Afghanistan-Environmental-Degradation-Saba.htm Date Accessed : August 2007).

Morocco faces a serious challenge in the 21 century in terms of water resources management over the near- and medium-terms, both in terms of quantity and quality. The quality of superficial and groundwater resources are currently affected by pollution from rejected domestic and industrial wastewater, leakage of fertilizers and phytosanitary products and soils erosion and transport of sediments.(<http://www.springerlink.com/content/mm3t680q14976287/> Date Accessed: December 2008)

In Brunei, industrial and agricultural effluents and domestic effluents pose a threat to river water quality. The pollution threat to river water quality especially within the vicinity of Kampong Ayer has become a matter of major concern ([http://www.env.gov.bn/link/domestic/case%20studies/brunei %20 darussalam %20environmental%20 outlook%202001-2005.htm](http://www.env.gov.bn/link/domestic/case%20studies/brunei%20darussalam%20environmental%20outlook%202001-2005.htm) Date Accessed: August 2007).

Out of 120 river basins in Malaysia monitored in 2001, 39% were found to be polluted, and 11% were very polluted (Department of Statistics. Compendium of Environmental Statistics 2003. Malaysia, 2003 cited in Sangaralingam et. al. :2007: 4).

In Yemen ground water is being mined in many areas. Uncontrolled drilling has resulted in lower water tables especially in the south of the country. In Sana'a for example the ground water level is dropping by more than 4 meters per year. This is clearly unsustainable and a threat to future prosperity of the country. It is estimated that critical aquifers are expected to reach the end of their useful life within twenty years.

Another problem in Yemen is that land rights are privately held and controlled by the owner. The owner of the land believes that he has unlimited rights over tube well water on his land. This has led to the construction of numerous tube wells. This resulted in over-irrigation, wasteful energy use, and depletion of ground water. ([site resources. worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf](http://site.resources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf). Date Accessed: September 2007).

Water pollution is becoming a problem in Yemen. Shallow aquifers, especially in urban areas, are becoming polluted. Coastal aquifers are subject to saline intrusion. Water resources are contaminated by industrial and residential waste, seepage of wastewater, and low pressure, back siphonage and cross connections. Wells, especially those drawing water from shallow aquifers, are contaminated with viruses and bacteria. Ground water used in public water supplies is not filtered. ([site resources. worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf](http://site.resources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf). Date Accessed: September 2007).

Only about 60% of the population in Tajikistan has access to treated water, which does not always comply with health norms. The rest of the population uses surface water, which is sometimes contaminated because of the low level of sewage treatment and the proliferation of uncontrolled rubbish dumps (<http://ekh.unep.org/?q=node/626> Date Accessed: August 2007).

In Uzbekistan, the area under irrigation was raised within a few years from 2.28 million ha in 1950 to 3.48 million ha. Uzbek cotton yields were more than doubled in the same time. The cultivation of rice was also substantially increased during this period. The result was that ever greater quantities of water were drawn off from the Syr Darya and Amu Darya in order to feed the gigantic new irrigation networks. As a result of this relentless over-exploitation the flow of these rivers had been so depleted that the former petered out some distance from the Aral Sea, while the latter was reduced to little more than an uncertain trickle in its lower reaches. (Akiner: [1993http://www.hq.nato.int/docu/colloq/1993/eco9331.txt](http://www.hq.nato.int/docu/colloq/1993/eco9331.txt) Date Accessed: August 2007).

There was a drastic increase in water extraction in Iran over the past three decades. In 2002-2003, water extraction (from wells and canals) reached about 53.2 BCM. Over extraction of ground water in Iran takes place in about one-fourth of plain aquifers, mostly those located in the Central Plateau, such as Mashad, Kerman, Rafjsanjan, Esfahan and Qum. In extreme cases such

as in the Hamedan aquifer the ground-water table has dropped by 20 meters. Severe decreases in underground water levels in some areas such as Zarand have damaged farms, gardens and residential areas. In other areas, this has led to the penetration of salty waters into the aquifers and the destruction of soil quality. Over the past 30 years, excessive exploitation of underground water primarily through wells has resulted in a decrease in water levels. Based on information provided by the Groundwater Department of the Ministry of Energy, the average long-term annual decrease in water levels is 0.41 meters. ([Sarraf M, Owaygen M; Croitoru L; Ruta G;: 2005earthmind.net /marine/docs/wb-2005-iran-cost-environmental-degradation.pdf](http://www.earthmind.net/marine/docs/wb-2005-iran-cost-environmental-degradation.pdf) Date Accessed: August 2007).

Groundwater contamination is also due to several factors including surface water pollution, untreated wastewater discharge through bores, and leachate from un-silted landfills (Sarraf M Owaygen M; Croitoru L; Ruta G;: 2005earthmind.net /marine/docs/ wb-2005-iran-cost-environmental-degradation.pdf Date Accessed: August 2007).

The refinery in Bandar Abbas is known to be the largest refinery in the world. Some of Iran's largest heavy industry plants are located in five industrial complexes and five cities in the Karun basin. The amount of industrial effluent discharge varies from 0.03 cubic meters per hour for Fakr Khorramshahr

chemical company to 14,640 cubic meters per hour for the Abadan refinery, which discharges waste into the Arvand River. The most polluting industries in order of quantity of industrial sewage discharged into the Karun Basin are cellulose-processing industries, chemical and petrochemical plants and most significantly, food processing and steel industries. About 15 1.7 million cubic meters per day of sewage enters the Karun and Dez rivers by cities. The contamination load ranges from 277 tons per year for nitrates to 448,500 tons per year for total dissolved solids. (Sarraf M, Owaygen M; Croitoru L; Ruta G;; 2005 earthmind.net /marine/docs/wb -2005-iran-cost-environmental-degradation.pdf Date Accessed: August 2007).

Tunisia has 2500 olive oil extraction factories. These factories produce 25000 to 30000 m³ of an industrial waste called *margeen*. The *margeen* is characterized by its high content of organic and inorganic pollutants, such as phenols, and some heavy metals, which remain intact in the natural environment for a very long time. The traditional way of disposing of this waste is simply to bury it in the ground or pour it into the nearest wadi (ephemeral river channels) both of which end up polluting the ground water (Baban, S M J ; Foster, I. D. L. and Tarmiz, B : 1999: Sust. Dev. 7, 191–203).

Contamination of surface water in Muslim countries is caused by industrial discharges, household waste, agricultural chemicals, untreated sewage and agricultural effluents. Many of these factors causes that surface water is contaminated with bacteria. Water-borne diseases due to contaminated water cause many illnesses in many Muslim areas. Over irrigation dry rivers causes poverty to populations along the rivers.

Wetlands drained are in many cases drained and this causes that there is no feeding of rivers in dry periods. Many projects like construction of roads and industrial sites destroy wetlands.

Ground water is contaminated due to mining activities. Over exploitation from wells causes a drop in water table. This results in salty waters into creeping into the aquifers.

4.3.5 Destruction of Biodiversity

The destruction of biodiversity is caused by shrinking forests as well as exploitation of marine and wetland ecosystems.

In Afghanistan dynamite fishing is a trend that has become very popular during the past few years and is common practice all over the country. This not only endangers the population of endemic fish species of the mountain

streams, but threatens the life and existence of many other species of animals that live in or around the waters. This contributes to the sharp decline in numbers of animals and plants and a contraction in their ranges, with the result that a disturbing number are now listed as endangered. The Asiatic wild ass (*Equus hemionus*) that was a common wild species in the Badghis province a few decades ago has almost disappeared from the landscape. Some wild plants that have commercial value are overexploited and disappearing at a very fast rate, and soon will become extinct if not protected. (Daud S. Saba <http://www.mindfully.org/Heritage/Afghanistan-Environmental-Degradation-Saba.htm> Date Accessed : August 2007).

Dr. Joshua Ginsberg, Asia Director of the Wildlife Conservation Society claims that the country's legendary Caspian tigers have completely disappeared, but he still has hopes that environmentalists will find traces of bears, Marco Polo sheep, various rare birds, and endangered snow leopards, of which there are thought to be fewer than 100 in Afghanistan. All of these animals have been hunted for food or profit by refugees and unemployed villagers during years of warfare. (http://www.motherjones.com/news/feature/2002/03/afghan_enviro.html Date Accessed : August 2007).

Most of the Muslim countries in the Persian gulf region are responsible for the over exploitation of fish resources, inadequate fisheries management,

inadequate land reclamation, coastal dredging, excessive trawling, increased marine pollution from waste discharge and oil pollution and destruction of habitat (from land reclamation and filling in of wetlands). All this has had a negative impact on marine biodiversity in the Persian Gulf region. As a result, declining fish and shrimp harvests have become a common feature in this region. (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

In Jordan the Azraq Oasis was declared a wetland under the RAMSAR Convention because it was endangered due to the over extraction of ground water. The over extraction is not only depleting the ground water, it is leading to increased salinity, which in turn negatively affects wildlife and plant species in the area (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

There are threats to an estimated 200 to 300 endemic bird species known in Yemen (including three globally threatened species), an unknown number of endemic coral reef fish species, and wildlife such as ibex and gazelles. The threats occur as a result of indiscriminate hunting of birds and mammals. Collection of shells, corals, and coral reef fishes likewise leads to reduction in their number. ([siteresources.worldbank.org/INTYEMEN/ Overview/ 20150250/YE-Environment.pdf](http://siteresources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf). Date Accessed: September 2007).

In the Surkhan-Darya Province of Uzbekistan cows with missing teeth are a common sight in the areas exposed to the effects of air pollutants from the neighboring country's Tajik Aluminum Plant (TAZ). Agriculture is suffering enormous damage. Silkworm cultivation is almost at a standstill. Vineyards, the famous Dashnabad pomegranate orchards and stone fruit crops have perished, and cattle have been affected. The milk and meat of these diseased animals are unfit for consumption (Yegorov : August 2000: <http://www.fluoridealert.org/pollution/1194.html>. Date Accessed: August 2007).

In Tajikistan uncontrolled urbanization, agricultural expansion and human activity have diminished biodiversity. The country experienced the 1990 civil war which took its toll on biodiversity too, as one of the nature reserves (Romit) was virtually destroyed and another housed 20,000 internally displaced people. Land degradation, deforestation and desertification are threatening rich flora and fauna. Probably the most forceful expressions of the consequences of loss of biodiversity and environmental degradation are natural disasters. Owing to its geography the country is particularly prone to water-related disasters. Steep mountain slopes and unstable soils contribute to the 50,000 landslides that occur annually. These fragile and unstable conditions make the land all the more susceptible to damage caused by human activity. (<http://ekh.unep.org/?q=node/626> Date Accessed: August 2007).

In Uzbekistan the unique flora and fauna of the delta regions have already been ravaged. The forests have been reduced to a fifth of their original size and over three quarters of the native animal species are now extinct. The profitable musk-rat farms have ceased to exist (Akiner:1993: <http://www.hq.nato.int/docu/colloq/1993/eco9331.txt> Date Accessed: August 2007).

During the 1990-2005 interval, Gambia lost 2.6% of its forest and woodland habitat. In terms of biodiversity Gambia has some 740 known species of amphibians, birds, mammals and reptiles according to figures from the World Conservation Monitoring Centre. Of these, 0.3% are endemic, meaning they exist in no other country, and 0.8% are threatened. Gambia is home to at least 974 species of vascular plants. (<http://rainforests.mongabay.com/deforestation/2000/Gambia.htm#3-type> Date Accessed: January 2009)

In Malaysia endemism is high, with 2,199 species found nowhere else on earth. An alarming 18 per cent of species are threatened and 3.2 per cent are endangered, including at least 78 endemic plant species. This is due to deforestation mainly in terms of logging. Endangered animal species include the Indian tapir and the orang-utan, of which only a few small populations survive. Malaysia has some 1671 known species of amphibians, birds, mammals and reptiles according to figures from the World Conservation Monitoring Centre. Of these, 13.9% are endemic, meaning they exist in no other country, and 9.3% are threatened. Malaysia is home to at least 15500

species of vascular plants, of which 23.2% are endemic. 4.1% of Malaysia is protected under IUCN categories (<http://rainforests.mongabay.com/deforestation/2000/Malaysia.htm> Date Accessed: August 2007)

Saudi Arabia is a country where many of the ecosystems have small numbers of species and hence little in-built redundancy. As far as biodiversity is concerned, Saudi Arabia has some 636 known species of amphibians, birds, mammals and reptiles according to figures from the World Conservation Monitoring Centre. Of these, 1.4% is endemic, meaning they exist in no other country, and 4.4% are threatened. Saudi Arabia is home to at least 2028 species of vascular plants. (http://rainforests.mongabay.com/deforestation/2000/Saudi_Arabia.htm type Date Accessed: January 2009) Present (May 16, 2008) environmental issues in the country that affect the biodiversity include desertification; depletion of underground water resources; the lack of perennial rivers or permanent water bodies has prompted the development of extensive seawater desalination facilities; coastal pollution from oil spills (www.indexmundi.com/saudi_arabia/environment_current_issues.html type Date Accessed: January 2009)

Biodiversity in Algeria has some 582 known species of amphibians, birds, mammals and reptiles according to figures from the World Conservation Monitoring Centre. Of these, 1.0% are endemic, meaning they exist in no

other country, and 4.5% are threatened. Algeria is home to at least 3164 species of vascular plants, of which 7.9% are endemic. (<http://rainforests.mongabay.com/deforestation/2000/Algeria.htm> Date Accessed: January 2009)

Environmental degradation has reached serious proportions in Algeria where oil wealth has masked failings of agricultural production and, together with industrialization, has provided a 'veneer' of economic development. The vulnerability of Algeria's natural environment and the fragility of its ecosystems have been stressed by Cte (1983). Once cleared, Algeria's woodlands and forests are slow to re-establish and surface deposits are easily erodable. Soils were largely formed under past climatic conditions, and so cannot be restored naturally by present pedogenetic processes. Such an environment is difficult and delicate to exploit to any high degree of agricultural intensification and is under increasing demographic pressure.\ (S. E. Zaimeche, & K. Sutton :The degradation of the Algerian environment through economic and social [] development[] in the 1980s :Land Degradation & Development Volume 2 Issue 4, Pages 317 – 324 Published Online: 8 Jan 2008(<http://www3.interscience.wiley.com/journal/114044071/abstract?CRE> Date Accessed: January 2009)

In addition, increased siltation is becoming a problem in some wetlands. Siltation and erosion are caused by deforestation and overgrazing in water catchments. In some wetlands, heavy grazing of marsh vegetation by domestic livestock is inhibiting natural plant succession, and causing permanent damage to aquatic plant communities as highly palatable species are grazed to extinction. Some mangroves in the Persian Gulf have been degraded by excessive utilization for fuel wood and fodder. Many wetlands, especially those downstream of large urban centers and major farming areas, have been polluted with domestic sewage, herbicides, pesticides, fertilizers, industrial effluents and other waste products. Many wetlands in Iran (like the Ramsar sites of Anzali Mordab, the Shadegan Marshes and other internationally important wetlands such as Lake Zaribar, Ghara Gheshlaq Marshes, *Akh Go1* and Hashelan Marshes) are being damaged by pollution. Sources are sewage pollution, agricultural drainage with high salinity, sedimentation resulting from deforestation in upper lands, fish farming and mining activities. The total estimated degraded areas of these wetlands amount to 250,000 hectares (Sarraf M, Owaygen M; Croitoru L; Ruta G; 2005 [earthmind.net /marine/docs/wb-2005-iran-cost-environmental-degradation.pdf](http://earthmind.net/marine/docs/wb-2005-iran-cost-environmental-degradation.pdf) Date Accessed: August 2007).

Oil, industrial and residential pollution along the southern coast of Iran is one of the major causes of habitat destruction and biodiversity reduction.

Estuaries and coastal wetlands such as mangrove forests are very vulnerable to water pollution. Habitat destruction is an increasing problem in the coastal regions due to human activities(Sarraf M, Owaygen M; Croitoru L; Ruta G;: [2005 earthmind.net /marine/docs/wb -2005-iran-cost-environmental-degradation.pdf](http://2005.earthmind.net/marine/docs/wb-2005-iran-cost-environmental-degradation.pdf) Date Accessed: August 2007).

As far as Iranian fishing is concerned, major fishing grounds are near oil production areas and transportation routes. Iranian fishing grounds are affected by oil pollution and other human and industrial activities. Destruction of spawning grounds and nurseries are one of the major threats to biological resources in the Persian Gulf and the Gulf of Oman. Over-fishing and illegal fishing by international fishing vessels is a major source of concern. Limited bottom trawling is still used for shrimp catches, which seriously threaten seabed habitats (Sarraf M, Owaygen M; Croitoru L; Ruta G;: 2005 [earthmind.net /marine/docs/wb -2005-iran-cost-environmental-degradation.pdf](http://earthmind.net/marine/docs/wb-2005-iran-cost-environmental-degradation.pdf) Date Accessed: August 2007).

Tunisia provides suitable habitats for some 5500 vegetation types including 307 rare species and 99 very rare species. Degradation of natural habitats, urbanization, clearing for fuel wood and overgrazing are having a damaging effect on vegetation diversity. Tunisia contains some 80 types of mammal, 362 types of bird and over 500 types of reptile, fish and invertebrate. Many

types of animal have become extinct such as the Almaha and Abu Hirab gazelles. Other species which are also endangered are the Atlas deer, Durkas gazelle, ostrich, water buffalo, Mediterranean Sea seals and tortoises. Factors causing this damage include the destruction of biological habitats, contamination, urbanization and overgrazing (Baban, S M J ; Foster, I. D. L. and Tarmiz, B : 1999: Sust. Dev. 7, 191–203).

In Muslim countries land degradation and desertification are threatening rich flora and fauna. Deforestation mainly in terms of logging in Muslim countries that are in the equatorial and tropical forest regions kills many of the biodiversity in those regions.

Wetlands are rich in biodiversity. There are many species that rely on wetlands for shelter, food and water. In the countries we have studied, siltation which is caused by deforestation and overgrazing in water catchments is becoming a problem in some wetlands. Other wetlands are being damaged by pollution such as untreated sewage. Construction of roads through wetlands and urbanization also diminish their biodiversity.

Some Muslim countries sell off their indigenousness plants for a high commercial value. These plants are in many cases over exploited

Sadly, in many Muslim countries, wildlife is hunted to extinction.

Wildlife is hunted for food especially in the poor areas.

Many Muslim countries are surrounded by coasts. Fish industries in these countries are responsible for the over exploitation of fish resources due to inadequate fisheries management. Sensitive marine habitats are damaged due to oil pollution. The destruction of spawning grounds and nurseries as well as mangrove forests is under threat.

4.3.6 Deforestation

Deforestation is caused due to the impact of clearing of forests for shifting agriculture, overexploitation for fuel wood and timber collection, and overgrazing. In the developing world, deforestation is worsened by the cutting of firewood for domestic use.

At the beginning of the twentieth century Lebanon was almost completely covered by forests. In the last twenty years the area had been reduced to 15%. In 1991, the Food and Agriculture Organization of the United Nations (FAO) executed a land cover map for Lebanon. It showed that Lebanon has only 2.9 of its coniferous and 4.2 of its deciduous forest left. Other reports cite the forest cover as being less than 5 %. According to international standards, 20% is the minimum forest cover for a healthy environment. The main

reasons for the recent sharp decrease are the illegal and uncontrolled cutting of trees, forest fires and overgrazing. Forest fires, which are practically an annual occurrence, have turned large areas into degraded scrubland. The fires are often caused by farmers who burn weeds on their fields or terraces, by the burning of garbage dumps or by hot charcoal left carelessly by people after a picnic. In other cases, glass litter can act as a magnifying lens for the sun and ignite a fire. Some fires are started on purpose. After a fire, the soil is quickly washed away by rain and replanting in the depleted soil becomes a difficult endeavor. (<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date Accessed : August 2007).

The destruction of the forests in Afghanistan to create agricultural land, logging and forest fires are all causes of the reduction in forest coverage. The most important factor in this destructive process is illegal logging and clear-cuttings by timber smugglers. According to a report in 1997, two and half million cubic feet of lumber were smuggled out of Afghanistan between 1995 and 1996. (The News: 1997 cited in Saba:2007).

Deforestation in Afghanistan has accelerated as a result of firewood collected by citizens for cooking and heating. As for the trees, "after very few years the forest will all be gone," says Adil of the Peshawar, Pakistan-based Society for Afghanistan's Viable Environment. In their place, the nearly barren land is seeded with mines and unexploded bombs.

(http://www.motherjones.com/news/feature/2002/03/afghan_enviro.html

Date Accessed : August 2007). Many forested areas were burned during the war. Farmlands were also burned and degraded by heavy war machinery and chemical residues (Daud S. Saba <http://www.mindfully.org/Heritage/Afghanistan-Environmental-Degradation-Saba.htm> Date Accessed : August 2007).

Deforestation is taking a great an effect on Pakistan and Bangladesh. If absolute annual losses were to continue at their current pace, the forests of Bangladesh would be entirely gone by 2011 and those of Pakistan by 2015.

(Marcoux:1996: <http://www.fao.org/sd/wpdirect/wpan0011.htm> Date Accessed: September 2007).

Logging and development projects in Malaysia which include construction of dams and roads, often involve forced resettlement. Inevitably, such resettlement schemes entail the destruction of a community's social fabric and economic security and force it into deplorable living conditions.

In Sarawak (a Malaysian state located in Borneo) the activities of Malaysian logging companies have caused great hardship to the indigenous communities, especially the Penans, who were originally hunter-gatherers. In 1999, 10,000 indigenous peoples from five ethnic communities were relocated

against their will to make way for the financially unviable Bakun Dam in Sarawak. Presently they now live in appalling housing conditions with little access to clean water, electricity, education, agricultural support and healthcare. Their forest resources destroyed and their rivers and air polluted, insufficient food supply, malnutrition and disease are common. With the best part of Sarawak's virgin forests gone due to extensive logging, the oil palm, pulp and paper plantations are bent on eradicating what little is left and converting self-sufficient landowners into low-level laborers. (Sangaralingam et. al. : 2007: 1). Rampant development in hills, wetlands and forests continue to plunder these sensitive ecosystems. Deforestation and land clearance not only compromise the quality of rivers and wetland reserves, but also influence climatic changes (Sahabat Alam Malaysia. Malaysian Environment Alert 2001. Penang, 2001. cited in Sangaralingam et. al. :2007: 2).

Overgrazing and mismanagement of rangelands have led to the loss of natural plant cover. Deforestation is affecting the highlands of Yemen, Oman, and Jordan. (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

Iran practices excessive cutting of vegetation to obtain timber, fuel wood and other products in semi-arid environments, where fuel wood shortages are

often severe. (Marcoux:1996: www.fao.org/sd/wpdirect/wpan0011.htm - 16k.

Date Accessed: August 2007).

Up to 1966, seventy five percent of Indonesian territory or 144 millions hectares were still covered by forest. In the beginning of forest resources exploitation that started the 'timber boom' era in the seventies, it was also known as the 'Forest Development Olympiad' era. In this era, Indonesia with the assistance from foreign companies (the involvement of the companies was possible due to Foreign Investment Law in 1967), has become the biggest log exporter in the world. In the year of 1982, when the oil was declined in price, forestry sector became the second highest contributor to foreign exchange in Indonesian economy after oil and gas sector. In 1983, five hundreds and sixty private companies held the Forest Concession for 65.14 million hectares of the forest area (this area exceeded the total area of production forest as allocated in the Forest Land Use Allocation).

In 1980, government restricted log export and begun to promote plywood industry development. In the end of the nineties, Indonesia was the biggest producer in the world for plywood and managed to fulfill 75% of the world market demands at the time. Meanwhile, the overestimate on forest resources, the weakness in management and law system, and the overcapacity of plywood industry, caused even higher acceleration rate of primary forest exploitation.

In 1982, satellite aerial photos taken by Indonesia government showed that the forest coverage in Indonesia has decreased to 92,4 millions hectares (this area covered the after cutting forest of Private Concessionaires (HPH) and the Timber Estate which were developed by clearing the natural forest). From those 92.4 millions hectares of forest area , the 20.6 millions hectares of permanent forest were left open.

From the data above, deforestation rate estimated from 1982 to 1993, have reached 2.4 millions hectares per year. This rate were considered higher, compared to the rate estimated by Forestry Department and FAO in 1990; which was expected to be 900,000 to 1.3 millions hectares per year. The deforestation rate in Indonesia was also higher than the average rate of tropical forest in the world which was only 987,000 per year.³ Primary forest coverage left nowadays are only 53 millions hectares or 37% of total forest area before (WALHI, 1998).

(Underlying Causes of Deforestation and Forest Degradation. Summary of Indonesian Case Study:Prepared by Indonesian Working Group on Underlying Causes of Deforestation and Forest Degradation<http://www.wrm.org.uy/deforestation/Asia/Indonesia.html> Date Accessed: January 2009)

The rate of deforestation in Malaysia is the highest in the world. In 1983, Malaysia accounted for 58% of the total global export of tropical logs, with over 90% of the wood going to Japan, Taiwan, and South Korea. By 1985, three acres of forest were being cut every minute of every day (<http://www.wildernesscommittee.org/campaigns/historic/WILD/report> Date Accessed: December 2008).

Between 1990 and 2000, Malaysia lost an average of 78,500 hectares of forest per year. The amounts to an average annual deforestation rate of 0.35%. Between 2000 and 2005, the rate of forest change increased by 85.1% to 0.65% per annum. In total, between 1990 and 2005, Malaysia lost 6.6% of its forest cover, or around 1,486,000 hectares. Measuring the total rate of habitat conversion (defined as change in forest area plus change in woodland area minus net plantation expansion) for the 1990-2005 interval, Malaysia lost 5.4% of its forest and woodland habitat. (<http://rainforests.mongabay.com/deforestation/2000/Malaysia.htm> Date Accessed: December 2008).

Muslim countries who borders the equator are the most highly forest areas in the world. At the same time they are the highest suppliers of wood.

Unfortunately this goes along with deforestation legally as well as illegally. In many impoverished areas many of the forest are diminished on big scale for

the use of firewood for heating and cooking purposes. Deforestation in the tropical and other areas has a big influence on the present climate change in the twenty first century.

4.3.7 Dangers of Waste

Waste poses dangers of various sorts. These are discussed under the sub-sections below.

4.3.7.1 Hazardous Waste

Hazardous waste is caused due to unplanned growth and inability to tackle waste management on the required scale.

Tens of thousand barrels of waste from Italy were dumped in Lebanon. The problem of how to deal with local hospital and hazardous waste is still not solved. The existing hospital incinerators continue to emit dangerous dioxin, paradoxically threatening public health. Medical waste and toxic waste from polluting industries such as tanneries still end up in dumps and landfills (<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date Accessed : August 2007).

In Jordan, phosphate residue is reported to cover up to 60 per cent of the total area. The phosphate industry is associated with environmental problems such as the contamination of water as a result of wastewater from the washing of phosphates. This could potentially contaminate ground water. Gypsum, a by-product of the fertilizer industry, contains radioactive elements that affect ground water, as well as harmful heavy metals such as cadmium.

(UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

Some industries in Yemen incinerate their solid hazardous waste in open pits. Some hazardous waste is dumped on open dump sites, or on private and municipal landfills, where supervision is inadequate. Due to lack of proper municipal structure it is difficult to monitor dumping and ensure that disposal workers are protected or to control the hazards that toxic waste poses to the environment, in particular to fresh water. Liquid hazardous waste is disposed of into the sewerage system or, as is the case in some industries, disposed of with the wastewater which is discharged into the surroundings without any treatment. There is no regular separation of medical, toxic, and domestic waste. Often, chemicals from laboratories, blood banks, and x-ray departments as well as used oil and oily sludge are discharged directly into sewerage systems or disposed locally in the soil ([site resources. worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf](http://site.resources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf). Date Accessed: September 2007).

Mining and cotton-growing in Tajikistan generate large quantities of waste and contaminate land with chemicals. Mining waste makes up 77% of total accumulated waste and the cotton industry saturates the land with chemical fertilizers. Harmful levels of toxic pesticides, herbicides and defoliants are found throughout the country. (<http://ekh.unep.org/?q=node/626> Date Accessed: August 2007).

4.3.7.2 Radioactive Waste

There is potential risk of radioactive waste resulting from armed conflict in the Middle East, and this cannot be underrated. Possible accidental radioactive leakage from nuclear reactors in the region, such as from the Daimora reactor in Jordan, could have serious impact on regional environmental (UNEP:1997 http://www.unep.org/geo/geo1/ch/ch2_13.htm Date Accessed: August 2007).

According to official sources, there are more than 230 million tons of radioactive waste in Kazakhstan, with a total activity of more than 13 million Ci. The main sources of radioactive waste in Kazakhstan are the following: nuclear explosions (12 million tons at 13 million Ci); uranium mining, milling, and processing facilities and nuclear reactors (218-225 million tons of low-activity waste totaling 230,000 Ci and 1.17 million tons of medium-activity waste totaling 57,600 Ci); and industries using radioactive isotope products (100,000 irradiation capsules in use, of which 20,000, with a total activity of

80,000 Ci, require disposal). This waste is stored in 529 different locations as follows: 127 sites at uranium mining and processing facilities; 76 at uranium ore milling and processing enterprises; 16 at the locations of past nuclear explosions; five at nuclear facilities; and 301 at plants using sealed radiation source products. Kayrolla Yerezhepov, vice-president of KATEP, indicated in 1995 that Kazakhstan did not have an integrated system for dealing with radioactive waste, raising serious environmental concerns. Additional sources of radioactive contamination in Kazakhstan include traces from the Chornobyl and Mayak nuclear accidents. According to Viktor Slavgorodskiy, vice-president of the enterprise Kazizotop, the Chornobyl nuclear accident caused a considerable increase in the global fallout of cesium-137 in Kazakhstan in 1986. (www.nti.org/e_research/profiles/Kazakhstan/Nuclear/facilities_radioactive_waste.html Date Accessed: December 2008)

4.3.7.3 Solid Waste

One of the biggest environmental problem Muslim cities faces today is waste management. Populations grow at an unsustainable rate, sewerage and other waste disposal systems are unable to cope with the volume. The crowding of the poor in communities lacking infrastructure and decent housing leads to an accumulation of waste, which leads to contamination and attendant health hazards. Environmental degradation sets in. Uncollected municipal and

household waste attracts rodents and flies and other insects. These may carry infectious diseases that put children and individual trash pickers at risk.

Most waste in Lebanon is dumped anywhere by the municipalities. Leachate is polluting the soil and groundwater. Currently approximately 150 tons of slaughter house waste is produced daily. It is simply thrown in dumps or at best treated with lime and then land filled into landfills (<http://www.geocities.com/CapitolHill/Parliament/2587/env.html>. Date Accessed : August 2007).

In Brunei solid waste continues to be a persistent issue for most urban areas in the country. A growing population and an increase in development activities have been accompanied by an increase in the amount of domestic and industrial wastes generated. As a consequence, some existing disposal sites have already surpassed their capacity. ([http://www.env.gov.bn/link/domestic/case%20studies/brunei %20darussalam%20environmental% 20outlook% 202001-2005.htm](http://www.env.gov.bn/link/domestic/case%20studies/brunei%20darussalam%20environmental%20outlook%202001-2005.htm) Date Accessed: August 2007).

In Yemen waste management is disorganized in the cities as well as the small towns and villages. In the low-income neighborhoods, most of the waste is dumped into wadīs (watercourses that are dry except in rainy seasons), streets, and open dumps. In many cases, accumulated refuse and the stagnant water cause clogging of drainage systems and this serves as

breeding grounds for rats and insects. (siteresources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf. Date Accessed: September 2007).

Untreated urban sewage is a problem in Tunisia. It is contaminating water supplies and causing eutrophication of the country's Mediterranean waters. In rural areas, only 52 per cent (1990-1998) of the population has access to adequate sanitation.

In Malaysia, the significant environmental quality deterioration because of pollution and excessive use of resources are becoming a major issue of concern. The amount of waste generated in Malaysia is increasing from year to year in response to the rapid population growth and escalating urbanization and industrialization in most municipalities. The amount has increased from 16,200 tonnes per day in 2001 to 19,100 tonnes per day in 2005, an average of 0.8 kg per capita per day (<http://web.utm.my/today/index.php?option=content&task=view&id=483> Date Accessed: December 2008)

Many Muslim countries did not do proper investigations right up to the twenty first century how to facilitate and how to deal with local hospital and hazardous waste. Medical, toxic, and domestic waste in many Muslim countries land up in dumps; sewerage systems and eventually it is disposed

locally in the soil. The result is that ground water could potentially be contaminated.

Radioactive waste is used in very few Muslim countries but in those that it is found like former Soviet Union States the areas are still contaminated with radioactive waste.

Since the dawn of the twentieth century urbanization has increased dramatically in many Muslim countries. The result is that many Muslim countries face a problem to cope with solid waste. The demand for facilities for urban waste disposal cannot cope with the volume of waste that is produced daily. Ground water contamination is one of the biggest problems that arise from dumping of solid waste in areas not suited for dumping. It affects the health potential of many Muslim countries.

Here I will present the cost of environmental degradation in Muslim countries in the Mediterranean region (courtesy of <http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

Table 6 Overall Estimated Cost of Environmental Degradation in Morocco in 2000

Environmental Category	US\$/year (millions)	Moroccan Dirham per year (billions)	Percentage of GDP
Water	410	4,354	1.2%
Air	340	3,635	1.0%
Coastal zone	170	1,835	0.5%
Waste	160	1,725	0.5%
Soil	150	1,560	0.5%
Sub-total	1,230	13,109	3.7%
Global Environment	300	3,166	0.9%
Total	1,530	16,275	4.6%

Table 7 Overall Estimated Cost of Environmental Degradation in Egypt in 2001

Environmental Category	US\$/year (millions)	Egyptian Pounds/year (billions)	Percentage of GDP
Air	1,890	6.4	2.1%
Soil	1,060	3.6	1.2%
Water	860	2.9	1.0%
Coastal Zones	290	1.0	0.3%
Waste	180	0.6	0.2%
Sub-total	4,280	14.5	4.8%
Global Environment	560	1.9	0.6%
Total	4,840	16.4	5.4%

Table 8 Overall Estimated Cost of Environmental Degradation in Algeria in 1999

Environmental Category	US\$/year (millions)	Algerian Dinars /year (billions)	Percentage of GDP
Land	541	31	1.2%
Air	446	26	0.9%
Water	367	21	0.8%
Coastal zones	287	16	0.6%
Waste	52	3	0.1%
Sub-total	1,693	97	3.6%
Global Environment	568	33	1.2%
Total	2,261	130	4.8%

Table 9 Overall Estimated Cost of Environmental Degradation in Lebanon in 2000

Environmental Category	US\$/year (millions)	Lebanese Pounds /year (billions)	Percentage of GDP
Air	170	256	1.0%
Water	175	264	1.1%
Land and wildlife	100	151	0.6%
Coastal Zones	110	166	0.7%
Waste	10	15	<0.1%
Sub-total	565	852	3.4%
Global Environment	90	136	0.5%
Total	655	986	3.9%

Table 10 Overall Estimated Cost of Environmental Degradation in Tunisia in 1999

Environmental Category	US\$/year (millions)	Tunisian Dinars /year (millions)	Percentage of GDP
Water	128	153	0.6%
Air	121	143	0.6%
Soil	109	129	0.5%
Coastal zone	54	65	0.3%
Waste	28	33	0.1%
Sub-total	440	522	2.1%
Global Environment	124	148	0.6%
Total	565	670	2.7%

Table 11 Overall Estimated Cost of Environmental Degradation in Syria in 2001

Environmental Category	US\$/year (millions)	Syrian Pounds/year (billions)	Percentage of GDP
Land	230	12	1.3%
Air	218	11	1.2%
Water	152	8	0.8%
Waste	12	0.6	0.1%
Coastal Zones	12	0.6	0.1%
Sub-total	624	32	3.5%
Global Environment	228	12	1.2%
Total	852	44	4.7%

Table 12 Environmental Degradation of Some Muslim Countries:

Courtesy (Sarraf: World Bank:<http://gd.tuwien.ac.at/soc/undp/environment.htm>.: Date Accessed: September 2007

	Land area (1,000 ha) 1995	Forest and woodland (as % of land area) 1995	Internal renewable water resources per capita (cubic meters per year) 1998	Annual fresh water withdrawals as % of water resources 1987-95	Annual fresh water withdrawals per capita (cubic meters) 1987-95	Annual rate of deforestation (%) 1990-95	Annual rate of reforestation (%) 1980-90	CO ₂ emissions per capita (metric tons) 1995	Loss of mangroves (%) 1980-90
35 Brunei Darussalam	577	..	..	..	..	-0.6	..	28.1029	17
43 Bahrain	68	..	..	..	..	0	..	26.6373	0
48 United Arab Emirates	8360	0.72	64	1405.33	953.85	0	47	30.9242	..
54 Kuwait	1782	0.28	11	2690	306.73	0	34	28.799	..
57 Qatar	1100	..	..	..	..	0	..	52.9448	..
60 Malaysia	32855	47.09	21259	2.07	768.48	-2.4	15	5.2762	32
64 Libyan Arab Jamahiriya	175954	0.23	100	766.67	880.38	0	7	7.2914	0
66 Lebanon	1023	5.08	1315	30.79	443.57	-7.8	..	4.4334	0
69 Turkey	76963	11.51	3074	16.12	544.22	0	..	2.7114	0
70 Saudi Arabia	214969	0.1	119	709.08	1003.18	-0.8	..	13.9232	..
71 Oman	21246	..	393	124.16	656.12	0	..	5.1662	..
78 Iran, Islamic Rep. of	162200	0.95	1755	54.63	1079.02	-1.7	10	3.8472	..
81 Syrian Arab Republic	18378	1.19	456	205.86	1068.67	-2.2	15	3.2243	0
82 Algeria	238174	0.78	460	..	..	-1.2	5	3.261	0
83 Tunisia	15536	3.57	371	87.27	376.38	-0.5	8	1.6854	0
87 Jordan	8893	0.51	114	144.71	200.98	-2.5	5	2.4915	0
95 Maldives	30	..	..	..	..	..	..	0.7328	..
96 Indonesia	181157	60.61	12251	0.66	95.53	-1	18	1.5022	45
112 Egypt	99545	0.03	43	1967.86	921.16	0	2	1.4656	..
120 Gabon	25767	69.31	140171	0.04	70.26	-0.5	5	3.2976	50
125 Morocco	44630	8.59	1071	36.17	433.48	-0.3	4	1.0992	0
126 Nicaragua	12140	45.8	39203	0.51	368.23	-2.5	27	0.6595	..
127 Iraq	43737	0.19	1615	121.59	2367.52	0	..	4.9098	..
135 Equatorial Guinea	2805	63.49	69767	0.02	15.02	-0.5	..	0.3298	60
138 Pakistan	77088	2.27	1678	62.74	1269.35	-2.9	3	0.6229	78

141 Comoros	223	..	..	..	..	-5.6	..	0.1099	..
145 Benin	11062	41.81	1751	..	..	-1.2	5	0.1099	..
147 Bangladesh	13017	7.76	10940	1.66	217.03	-0.8	7	0.1832	73
149 Mauritania	102522	0.54	163	407.5	922.99	0	24	1.3557	0
151 Yemen	52797	0.02	243	..	..	0	..	0.9526	..
157 Sudan	237600	17.51	1227	50.86	666.49	-0.8	6	0.1466	0
158 Senegal	19253	38.34	2933	5.15	201.57	-0.7	25	0.3664	..
162 Djibouti	2320	..	..	..	..	0	..	0.0366	70
163 Chad	125920	8.76	2176	1.2	34.48	-0.8	6	..	0
164 Guinea- Bissau	2812	82.11	14109	0.1	16.87	-0.4	..	0.2198	70
165 Gambia	1000	9.1	2513	0.67	29.5	-0.9	..	0.1832	..
167 Guinea	24572	25.91	29454	0.33	141.79	-1.1	5	0.1466	60
168 Eritrea	10100	..	789	..	..	0	..	..	..
171 Mali	122019	9.49	5071	2.27	161.85	-1	27	0.0366	0
172 Burkina Faso	27360	15.61	1535	..	..	-0.7	8	0.0366	0
173 Niger	126670	2.02	346	14.29	68.9	0	10	0.1099	0
174 Sierra Leone	7162	18.28	34957	0.23	98.35	-3	3	0.1099	..

4.4 Effects of Environmental Degradation

4.4.1 Increasing Poverty

There is a link between poverty, environmental degradation, and resource depletion. Environmental degradation usually targets poorer communities and indigenous peoples who rely on the sustenance provided by forests, rivers and seas. Not only rural populations are affected; the urban poor also suffer from pollution, ill health, unsanitary living conditions and limited earnings potential.

In Yemen, rural area households are living at levels well below subsistence levels. The poor use soils, forest, and other resources at rates that exceed

sustainable limits for recovery or renewal. They have no other option than to adopt short-term survival strategies which do not incorporate longer term resource management considerations. If the poor have no alternatives, they will continue to use land and water resources in ways that will threaten their future productivity. The conditions that exacerbate these trends include: unclear land and water rights, the use of modern technology (e.g., water pumps) without adequate knowledge of its impact on natural resources, and population pressure.

In the urban areas the poor experience substandard living conditions that do not shield them from human excreta and other wastes and natural hazards. The poor lack the financial resources to afford adequate housing in safe locations. In Sana'a for example the poor have no access to safe water. The poor coming in the city are often forced to occupy illegal settlements on hazard or environmentally sensitive land. Occupation of these lands has resulted in health hazards, injuries, property damage and loss of natural resources. (siteresources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf. Date Accessed: September 2007).

Environment, economic development and poverty in Tajikistan are clearly interlinked. Tajikistan's poor are highly dependent on natural resources for their livelihood and are amongst the most affected by environmental

imbalances, in particular desertification, contamination of water sources and the consequences of natural disasters, including droughts and floods.

Tajikistan's poor are often the unwitting agents of environmental degradation.

They have a lack of alternatives. People pollute water resources with household rubbish and waste water. They cut already scarce forest resources for firewood, and attempt to keep herds of livestock that exceed the carrying capacity of the land. The poor who constitute a large part of the population lack knowledge and education related to ecological matters, and there is a lack of specialized personnel to work in the sector. (<http://www.untj.org/principals/sector.php?sid=3&id=45> Date Accessed: September 2007). It is due to these factors that human activities cause environmental degradation in Tajikistan.

4.4.2 Deterioration in Health

Premature deaths, chronic bronchitis, respiratory disorders, and even cancer are caused by indoor and outdoor air pollution. Women and young children suffer illnesses from indoor pollution because they spend disproportionately more time indoors men. Diarrhea disease is caused by water supply problems such as substandard quality and insufficient quantities. Many victims of these illnesses are found in Muslim countries.

In Malaysia the health of the population is deteriorating. About 40,000 new cases of cancer are detected every year. In terms of risk, after correcting for unregistered cases, one in four Malaysians can be expected to get cancer in his or her lifetime. One alarming revelation is that Malaysians have among the highest rates of nasopharyngeal, laryngeal and cervical cancers in the world. With the number of senior citizens above the age of 60 rising to about 11% by 2020 and the growing prevalence of unhealthy habits associated with an affluent lifestyle, such as smoking, inappropriate diet, excessive weight gain and lack of exercise, the incidence of cancer is expected to increase (Department of Statistics. Compendium of Environmental Statistics 2003. Malaysia, 2003 cited in Sangaralingam et. al. :2007: 4).

Due to a high concentration of air pollution in the Moroccan major cities such as Casablanca, Mohammadia, Rabat and Safi, it was estimated that the number of premature deaths were 2,300 persons annually. The lack of potable water and sanitation facilities as well as poor water quality and hygienic practices cause diarrhea diseases which could lead to the deaths of 6,000 children per year under the age of 5 ([http://inweb18.worldbank.org/mna/mena.nsf/Attachments/COED+Morocco+Profile/\\$File/COED+Morocco+profile+June+19.A4.doc](http://inweb18.worldbank.org/mna/mena.nsf/Attachments/COED+Morocco+Profile/$File/COED+Morocco+profile+June+19.A4.doc). Date Accessed: September 2007).

In Algeria air pollution has triggered on a yearly basis 353,000 cases of bronchitis, 544,000 asthma attacks and could be the cause of the 1,500 cases of lung cancer (<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

Poor water quality in Yemen has led to outbreaks of diseases such as cholera, bacterial dysentery, infectious hepatitis, salmonellosis, and typhoid. It is estimated that about 70 percent of infant mortality (or 107 deaths per 1,000 life-births) is due to waterborne diseases ([site resources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf](http://site.resources.worldbank.org/INTYEMEN/Overview/20150250/YE-Environment.pdf). Date Accessed: September 2007).

Outdoor air pollution in the Greater Cairo area and Alexandria is very high. It kills 20,000 people annually. Lack of water supply and sanitation and water pollution in Egypt causes diarrhea diseases in children. This represents more than 20 percent of child deaths and severe cases of morbidity. Uncollected municipal and household waste in Egypt attracts rodents, flies and insects that may be carriers of infectious diseases that put children and individual trash pickers at risk. (<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

In Jordan there is a lack of safe water and sanitation facilities. This leads to diseases, resulting in an estimated 2,500 cases of diarrhea in children under five each year. Air is monitored in the Amman and Zarqa urban areas. It is estimated that over 600 people die prematurely each year due to urban air pollution. The Amman landfill is affecting the quality of life of surrounding residents due to odors, rodents and smoke (<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

Monitored air of Greater Beirut and Greater Tripoli areas in Lebanon, gives an estimated figure of 350 people that die prematurely each year due to urban air pollution. Water pollution causes diarrhea diseases. This results in the death of 260 children each year which is 10 percent of all child deaths. A lack of water and sanitation facilities as well as poor water quality, leads to poor hygiene and infectious diseases such as intestinal worm infections and non-fatal diarrhea smoke (<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

Air monitored in Damascus, Aleppo, Homs, Hama, Lattakia, Dier-Azzour, Al-Raka, Al-Sweida and Tartous in Syria gives an estimated amount of 3,400 people that die prematurely each year due to urban air pollution (<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

A study based on PM10 concentrations in major cities such as Tunis, and Sfax in Tunisia, reveals that approximately 590 persons die prematurely each year due to urban air pollution. Tunisia lacks adequate water supply and sanitation and much of its water is polluted. The result is that an estimated 520 children under five die each year, or 10 percent of under five child mortality (<http://lnweb18.worldbank.org/mna/mena.nsf/METAP>. Date Accessed: August 2007).

An air pollutant from the Tajikistan Aluminum Plant (TAZ) is taking a toll on public health in the Surkhan-Darya Province of Uzbekistan. The affected regions have seen several fold increases in the incidence of metabolic disorders, diseases of the endocrine system, and disorders of blood and hematopoietic organs, the pulmonary organs and the musculoskeletal system. Birth defects and tumors are on the rise. Research conducted among TAZ workers by the Tajik Research Institute of Epidemiology and Hygiene have shown that environmental conditions at the plant itself are taking a toll on the health of the workers and other personnel. Studies by the Tajik State Medical Institute's department of obstetrics and gynecology indicate extremely poor health among female TAZ workers. Researchers examined a large group of women and found that 82% had gynecological disease. (Yegorov : August 2000: <http://www.luoridealert.org/pollution/1194.html>. Date Accessed: August 2007).

In Kazakhstan, over the last few decades, there were several instances of nuclear testing. This has resulted in a high incidence of cancer in the region; horrendous congenital deformities in humans and animals have been recorded. The population's immune system has been damaged and the general level of health is poor. The water and vegetation have also been severely contaminated, affecting the food intake. It is believed that the effects of this prolonged exposure to radiation will continue to be felt for several generations (Akiner:1993: <http://www.hq.nato.int/docu/colloq/1993/eco9331.txt> Date Accessed: August 2007).

4.5 Challenges of implementation

Muslim governments have identified what they consider to be the major obstacles or challenges to sustainable development in the Muslim World. The sections of the documents detailing these obstacles and challenges are reproduced below:

Constraints identified by the Arab Ministerial Declaration on Sustainable Development (2001)

The Arab Ministerial Declaration on Sustainable Development (2001) identified the following major constraints:

- Instability resulting from the lack of peace and security in the region and the inability of the world community to resolve the occupation of the Palestinian and other Arab territories on just and equitable bases and in accordance with the relevant UN resolutions.
- Escalating poverty, illiteracy, high population growth rates, unemployment and the debt burden and increased debt servicing, as well as the continued unsustainable pattern of natural resources management.
- Continued population increase and the unbalanced distribution between rural and urban areas, spreading of slums around major cities, increased pressure on the natural resource base, as well as on the public utilities and services, air pollution, and solid waste accumulation.
- The severe arid nature of the region, with little and sparse rainfall, very high temperatures in the summer months with high evaporation and evapotranspiration leading to frequent droughts and spread of desertification.
- Limited areas available for agriculture, water scarcity shortage of non-renewable sources of energy.

- The limited capacity of academic and research institutions and the inability to keep up with the advances in providing technologies for sustainable development.
- The relatively limited experience of the civil society in participating in the process of development and implementation of sustainable development programmes and activities.
- The adoption of technologies and approaches that are not suitable for the social, economic and environmental conditions of the region.
- The embargo inflicted on some of the Arab countries

The Arab Ministerial Declaration listed the following as its objectives:

- Establishing peace and security and abolishing foci of tension and weapons of mass destruction in the Middle East on just bases.
- Curtailing poverty and unemployment.
- Achieving balance between population growth rates and the available natural resources.
- Eradicating illiteracy and enhancing educational curricula and scientific research in accordance with the need to achieve sustainable development.

- Supporting and further strengthening development and environment institutions, capacity building and environmental citizenship programmes.
- Halting the degradation of natural resources and the environment and strive towards the sustainable management of these resources with a view of achieving water and food security, conservation of ecosystems and combating desertification.
- Developing and integrating Arab production sectors and adopting cleaner production procedures with a view of enhancing the competitiveness of the Arab products in the world markets and increasing preparedness for industrial and natural disasters.
- Supporting the private sector and the civil society, giving special attention to the role of women, to insure their participation in the implementation of sustainable development.

Constraints identified by the Islamic Declaration on Sustainable Development

(2002)

The Islamic Declaration on Sustainable Development adopted in Jeddah

(2002) identified the following as the major constraints on sustainable development:

- Poverty is responsible for many health and social, as well as psychological and moral problems. The local, national and international communities need to devise development policies and plans for economic reforms in order to address those problems, by offering job opportunities, ensuring natural, human, economic and educational development of the poorest and most underdeveloped regions, and eradicating illiteracy.
- Debts: Public debts, natural disasters, including drought, desertification and social backwardness resulting from ignorance, diseases and poverty all constitute the major constraints that stand in the way of successful sustainable development plans and adversely affect poor communities most particularly and the international community at large. Everyone is duty-bound to be supportive, in order to surmount these difficulties and spare humanity these hazards.
- Wars, armed conflicts and foreign occupation, which have a harmful effect on environment and environmental safety and necessity to lay down legislation and commitments that forbid and penalize polluting the environment or cutting trees or exterminating animals; and observing the principle of dignity in dealing with prisoners according to international law, and not

maiming the death or destroying houses or civil facilities or water sources.

- Over population, particularly in cities of developing countries and the deterioration of living conditions in shanty towns and an increase in the demand for resources, health and social services.
- Deterioration of natural resources basis and their continuous over utilization to bolster local production and consumption patterns which add to the depletion of natural resources and hampers sustainable development in developing countries.
- Absence of modern technologies and technical expertise necessary for the implementation of sustainable development programmes and plans.
- Insufficiency of expertise necessary for Islamic countries to allow them to fulfil their commitment towards world environmental issues and to participate with international community in the efforts designed to work out solutions to those issues.

Challenges identified by the Jeddah Commitment for Sustainable Development (2006)

The Jeddah Commitment for Sustainable Development adopted at the Second Islamic Conference of Environment Ministers (2006) identified the following challenges facing Muslim countries

- The social, economic and environmental impact of conflicts, wars and the failure of the international community to address their root causes on a basis of justice and within the framework of the relevant international resolutions;
- The increasing rates of poverty, famine and food insecurity in some Islamic countries, in addition to the pervasiveness of illiteracy, the increase in population and unemployment rates, low salaries, poor living standards, low income and mounting debts and their interests;
- The increasing rates of population growth, urban expansion, rural exodus and poor housing which deviate from the relevant urban laws and norms;
- The burden of the major environmental challenges, including climate changes as well as natural and man-made disasters, such as floods, earthquakes, forest fires, burial of harmful and poisonous waste dumped by industrial activities, chemical weapons and insecticides;
- Shortage and scarcity of water resources, low water quality, unbalanced use of underground water tables, and irrational and excessive use of waters, especially in agriculture;

- Soil and arable land degradation leading to a decrease in biodiversity, loss of many plant and animal species, and desertification in many of our countries;
- Degradation of coastal and sea environment, depletion of fish stocks, and spread of all forms of pollution that affect water, soil and air in settlements, especially in the urban areas;
- Burden of debt on many Islamic countries, which hinders the possibility to find the right opportunities and atmosphere for sustainable development
- Inadequate sources of funding necessary for sustainable human development and capacity building, lack of integration, bilateral trade exchange and investments through an effective partnership among the States of Islamic world;
- Disproportionate performance of education and research systems in the area of keeping pace with scientific and technological progress in the world, and meeting the requirements for sustainable development and transfer of technology to the countries of Islamic world;
- Globalization at the levels of economy, culture and media; and the need to preserve the Islamic original cultural and architectural heritage, consisting of archaeological sites and cultural heritage in the fields of architecture, arts and culture;

- The nascent experience of the civil society and the lack of effective involvement in the development and implementation of strategies and programmes on sustainable development

To summarize, the following issues are seen as the major challenges by the Muslim World in its efforts at achieving sustainable growth and development:

- Poverty and debt burden
- war and conflict
- lack of skills or capacity
- lack of appropriate technology
- poor economic conditions
- lack of adequate natural resources
- degradation of land and coastal regions
- lack of funds
- illiteracy
- poor housing
- burdens of population growth
- lack of civil society involvement

When examining the obstacles identified above, it becomes evident that (a)

Most of the obstacles constitute what we might call “standard” obstacles

which confront virtually every country in the process of implementing sustainable development, and

(b) They cover the major dimensions of sustainable development: environment, economy and equity.

We may conclude that the sustainable development strategies and objectives of Muslim countries differ very little from those of other countries. As we have noted above, Muslim scholars, while endorsing sustainable development in principle suggest its adaptation to render it more suitable for the Muslim World.

This is in line with Warburton's argument above about the need to recognize the role of values, norms and culture in providing strength for members of a society to deal with their daily life situation

4.6 Measures to facilitate sustainable development

To begin with, Muslims should categorically support the general goals of sustainable development. These goals are in keeping with the teachings of Islam on environmental care and the promotion of equity as discussed in the previous chapter.

Next, Muslim governments must take into account the various proposals that have been made to achieve the goals of sustainability.

The nine principles required for building a sustainable society are framed in general terms and are perfectly compatible with the principles that were identified in the last chapter. These are:

- Respect and care for the community of life.
- Improve the quality of human life.
- Conserve the Earth's vitality and diversity.
- Minimize the depletion of non-renewable resources.
- Keep within the Earth's carrying capacity.
- Change personal attitudes and practices.
- Enable communities to care for their own environments.
- Provide a national framework for integrating development and conservation.
- Create a global alliance. (IUCN, UNEP, WWF :1991:9-11 cited in Voges :31)

The same is true of the following principles proposed by the Brundtland commission to guide national policies (Clark 1995:42-43 cited in Voges 1999:29).

- revive growth, because poverty is a major source of environmental degradation
- change the quality of growth to achieve sustainability, equity, social justice and security

- ensure a sustainable level of population through population policies which are integrated with programs of education, health care and raising standards of living, especially for the poor
- re-orientate technology to pay greater regard to environment factors and costs
- integrate environment and economics by requiring decision-makers to be responsible for the impact of their decisions upon the environment resource capital (i.e. the true costs of resource depletion and pollution should be calculated rather than just short-term costs and profits)
- reform international economic relations to help developing countries to diversify their economic trade bases and build self-reliance; and
- strengthen international co-operation for sustainable human progress

Members of the Islamic Conference of Environment Ministers have resolved to implement the commitments listed below:

- Formulating a common, integrated Islamic strategy for sustainable development
- Fostering the efforts of peace and security and raising awareness about their role in promoting sustainable development
- Combating illiteracy, poverty and unemployment, and improving the quality of life for Muslim peoples

- Improving and generalizing the level of health services
- Developing educational services and supporting capacities in the field of education and transfer of technology
- Supporting participation of women, the youth and civil society in Sustainable Development
- Enlarging scope for democracy from an Islamic perspective as well as participation in decision-making
- Preserving and rationalizing water resources
- Preserving soil, land and biodiversity
- Taking interest in the quality of air, energy and the impact of climate change
- Encouraging production and sustainable consumption
- Updating and enforcing special legislation

The fact that Muslim governments have committed themselves to strive towards achieving the above objectives is a positive development and gives cause for optimism. Nonetheless, there are a number of issues that need to be addressed as a matter of urgency. These include the following:

- Adopt a clear strategy for sustainable development based on the principles and values of Islam.

Given the fact that numerous scholars have already written on sustainable development from an Islamic perspective, it is not difficult to arrive at a common strategy.

- Increase the level of awareness about sustainable development issues among all sectors of the population in Muslim countries.

There is clearly a need to promote the concept as well as importance of sustainable development vigorously through the media and other means such as the school curriculum.

Education is considered to be a key component of sustainable development. Not only is education a means to a better quality of life, it is also an important instrument in promoting the concept of sustainable development.

- Promote the participation of women in development issues

While there is a commitment in principle to encourage the participation of women in development, this will not be achieved as long Muslim women continue to be marginalized or excluded from the public domain and from debates on development issues in many Muslim countries.

- Initiate and encourage meaningful participation by civil society in issues of development.

Unless this happens, the commitment to promote democracy from an Islamic perspective is nebulous. Promoting *shūra* (people participation in the decision-making process) in matters related to development is critical. Participation of communities in development issues has, in fact, been recognized as integral to the process of Sustainable Development. The Human Development Report of 1991 describes the basic objective of human development as making development “more democratic and participatory” (UNDP :1991:1). Islam encourages Muslims to conduct their affairs on the basis of *shura* or mutual consultation. Unfortunately, civil society participation in the development of public policy is either weak or non-existent in most Muslim countries. Muslim rulers will have to go beyond mere commitment to actively involve their citizens in decision-making in this very significant matter. Without public participation, the prospects of success are limited.

- Establish a benchmark for sustainable consumption as a means of conserving resources.

The following options should be considered :

- (i) reducing the pace of development of wealthier Muslim states as suggested by Hasan above.
- (ii) curbing affluence and extravagance

Both these options which are in keeping with the principles of moderation discussed in the last chapter would require wealthy Muslim states or societies to curb their zest for the latest comforts that modern technology can offer – in deference to environmental and equity concerns.

Realistically speaking, these measures are extremely difficult to implement. If were to judge by the current pace of development in the Gulf States, it hardly seems plausible that they would willingly cut back on development or reduce their levels of consumption in the foreseeable future. For this reason, it will require a change of mindset on the part of wealthy individuals, societies and countries.

- Put in place a monitoring system along the lines of the *hisbah* (as suggested by Amery).

This could play an important role in the implementation of Sustainable Development principles at the community level. It implies the introduction of special legislation to ensure compliance, and penalties in the case of violations.

- Emphasise values related to respect for nature, obligations to the poor (in terms of provision of basic needs), etc.

The inculcation of values which encourage love for nature, compassion for humankind (in particular the less privileged), sense of responsibility to all of creation, etc. is critical.

4.7 Chapter Summary

In this chapter I have also indicated how Muslim states are contributing to environmental degradation on a large scale. This is occurring in spite of their participation in the United Nations Conferences on Sustainable Development - the Rio de Janeiro Earth Summit in 1992, Kyoto accord which took place in Japan in November 1997 and the Johannesburg Summit on Sustainable Development in 2002 – and their numerous declarations endorsing the goals of sustainable development which are discussed in chapter six. This reflects that while they do recognize the urgency of the situation, they are constrained by one or other factor from implementing sustainable development policies in terms of their agreements. These will be dealt with in chapter six.

What is of fundamental importance for the purpose of this thesis is that Muslims have clearly lost their bearings in terms of understanding their obligations to the environment as custodians and guardians of natural resources as attested to by Fazlun Khalid and Mawil Izzi Dien. This is the subject of the next chapter.

CHAPTER 5

SUSTAINABLE DEVELOPMENT PRINCIPLES IN ISLAMIC SOURCES

5.1 Introduction

Sustainable development requires that humankind improves its quality of life in such a manner that it does not affect the balance of the ecosystems. This chapter will demonstrate that the primary sources of Islam, namely the Qur'ān and the *hadith*¹ (Prophetic Tradition), contain the essential principles of sustainable development.

Contemporary Muslim scholars establish a nexus between Islamic texts and sustainable development, either because they are convinced that early development in the Muslim World (as discussed in chapter 3) was inspired by Islamic teachings or as a strategy to encourage Muslim states to implement the principles of sustainable development as we will see in the next chapter.

Islam is against the revering of nature or natural objects and permits people to utilize natural resources for their own development. On the other hand it is

¹ Hadith (pl. ahadith) literally means a saying of the Prophet of Islam, Muhammad.

against harming the natural environment. It encourages the caring for plants and the animals, regarding this as an act of *'ibādah* (worship).

The Islamic approach to nature can be appreciated by understanding the concepts of *Tāwhīd*, *Khilāfah*, *Amānah*, *'ibādah* and *'Ilm*.

Tāwhīd which literally means “the Oneness of Allāh” includes the notions of Allāh as the Creator, Owner and Sustainer of the universe.

Khilāfah refers to representation. Technically, it refers to the appointment of man/woman as a representative of Allāh on earth.

Amānah, is the trust vested in humankind to undertake certain responsibilities.

'ibādah implies the worship of Allāh Alone. Whatever men and women do to please their Creator is considered an act of *'ibādah*.

'Ilm means knowledge. People must use their knowledge to implement *ḥalāl* i.e. those things which are permitted and beneficial. Under *ḥalāl*/we can place *'Adl*/i.e. to act with justice and equity e.g. good governance. On the other hand, they must use this knowledge to abstain from *ḥarām* i.e. that which is prohibited. Under *ḥarām* could be included *ẓulm* i.e. oppression and *ḍiyā* i.e. waste.

Istislah means to do what is in the public interest. This includes the alleviation of poverty.

Human beings have been endowed with a free will, an intellect and a conscience. Islam provides them with spiritual and moral values which distinguishes them from animals. Though humans are the best of Allāh's creation: "**Verily, We created man in the best of form**" (Qur'ān 95:4), they must learn that they share this universe with many other living species and therefore must appreciate and respect their existence.

The components of sustainable development from an Islamic perspective can be summed up as follows:

- Humans are the beneficiaries of development
- Creation is for the benefit of human beings
- Human beings are guardians of resources, not the actual owners
- Humans have a responsibility to protect natural resources
- Excess or wastage should be avoided; moderation is recommended
- There should be wide consultation with people to determine their views on development
- Authorities are obliged to protect lands, etc

In this chapter, I will identify sustainable development principles in Islamic sources.

5.2 Caring for the Environment

Islam is concerned with the environment because a clean and healthy environment ensures healthy citizens. The environment on the planet earth plays an important role in the formation of lives of its inhabitants. According to Karodia (2005:17) the environment can be divided into two: physical and social.

The physical environment comprises all of the natural surroundings: the entire biosphere, along with the constituent parts of the sea, oceans, lakes, rivers (hydrosphere: aquatic/marine ecosystem), mountains, land, valleys (terrestrial: lithosphere), air, gases (the atmosphere) in addition to all its powers and energies. Biotic communities (plant and animal life) form niches and habitats within the vast realm of an intricate relationship between all living (biotic) and non-living things (abiotic elements). Physics, chemistry, geology, botany, zoology and hydrology are some of the sciences which fall within the ambit of the scope of study of the natural environment.

The social environment is created by the interaction of people, groups and nations. Economic, political, professional, psychological and cultural relations

are the components of the social environment. History, geography, sociology, psychology, economics, politics and philosophy relate to a study of the social environment.

Let us examine how the Qur'ān describes the environment and humanity's relationship with it.

The Qur'ān declares that everything that exists between the heavens and the earth belongs to Allāh (4:126), thus establishing that ultimate "ownership" vests in the Creator. The implication is that the Creator has the right to determine to what extent and for what purpose objects in creation may be used.

It also declares that Allāh has created everything in a perfect, balanced order. The creation has no deficiency, no inconsistency and no defect (Qur'ān 67 : 3). For example, the sun and the moon move in their orbits in perfect harmony and their timing is precise (Qur'ān 55 : 5; 36 : 40).

Allāh has favored man by subjugating His creation to Him (Qur'ān 67 : 15).

The earth is made livable because there is air, water, vegetation, fertile soil.

According to the Qur'ān, humankind has accepted the *Amānah* (33 : 72). The exegete, Ibn 'Abbās, in his commentary of this verse explains that Allāh offered the *amānah* to the heavens, the earth and the mountains but when they rejected it, Allāh then offered it to Adam who accepted it. However, he underestimated the responsibility that this entailed (Ibn Kathīr 774 AH : 3: 501). This *amānah* which was given to humanity implies that they must use, maintain and protect the earth in accordance with the Divine Will as contained in the Qur'ān and the Prophetic Traditions.

There are various views on the term *amānah*. According to al-'Awfi , Ibn 'Abbas interpreted *amānah* as obedience while `Alī bin Abi Talhah claims that he understood it to mean *al-Farā'id* (the obligatory duties). (Ibn Kathīr 774 AH : 3: 501). Ibn Kathīr does not believe that there is any contradiction between these divergent views; he is of the opinion that they can be reconciled and that they all refer to responsibility and the acceptance of commands and prohibitions with their attendant conditions, which is that the person who fulfills this responsibility, will be rewarded; while the person who neglects it, will be punished. Human beings accepted this responsibility despite the fact that they are weak, ignorant and unjust (Ibn Kathīr 774 AH : 3: 501). Literally *amānah* means "trusteeship", "guardianship", "custody". (Baalbāki :1988:165). This trust which humanity has undertaken is thus a serious responsibility.

According to Amery, each generation is the trustee of the planet earth. No one generation has the right to pollute the planet or consume its natural resources in a manner that leaves for posterity a polluted planet or one seriously denuded of its resources (Weeramantry 1988, 61) (http://www.idrc.ca/en/ev-93950-201-1-DO_TOPIC.html Date Accessed: December :2008).

Amery interprets the word *fasād* in the Quran (30:41) as mischief. The other meanings of *fasād* include taking something unjustifiably and unfairly (Al Munjid 1994) or spoiling or degrading (natural) resources. Tabatabai (1973:196) views *fasād* as "Anything that spoils the proper functioning of current (natural) regulations of the terrestrial world regardless of whether it was based on the choice of certain people or not.... *fasād* creates imbalance in the pleasant living of humans." The notion of *fasād* is not associated with any specific time and place, and is thus universal and everlasting in scope. *Fasād* is mentioned in the context of "land and sea." (30:41). It is, however, reasonable to assume that this notion also encompasses all other components of the ecosystem because the Qurān states that Allāh is the creator of everything (25:2), to Him belong the heavens and the earth and whatever is between them and what is beneath the ground (20:6). Islam directs Muslims to avoid and prevent *fasād*, which encompasses undue exploitation or degradation of environmental resources, including water. This perspective is especially revealing in light of the Islamic belief that the natural

world is subservient to the human world. Humans are consequently permitted to use and transform the natural environment, with which they are entrusted, to serve their survival needs. For example, Allāh states that humans may use His (good) resources for their sustenance on the condition that they "commit no excess therein, lest My wrath should justly descend on you." (20:81).

(http://www.idrc.ca/en/ev-93950-201-1-DO_TOPIC.html Date Accessed: December :2008).

The Prophet clearly forbade people from acting in a harmful manner under any circumstances. He advised his followers neither to harm others nor to reciprocate the harm they are inflicted with (Mālik 1994: 2: 300 no.1461).

Some of the '*ulamā'*' such as Ibn Habib consider these two words to have the same meaning, and they have been used together as a form of emphasis.

(<http://www.islaam.net/40hadeeth/frames.html>: Date Accessed: December 2008) In summary form one can say that it is forbidden to harm others without any just cause; likewise, transgression against those who harm us is forbidden. Humanity is thus constrained from harming the environment i.e. plant and animal life without justification.

The environment is also a constant reminder of Allāh's Power and Mercy. By observing and reflecting on the natural environment which includes the heavens with its spaciousness, the galaxies and planets, the earth with its wide expanse of mountains, seas, plants, trees, deserts, fruits, animals and

metals, humanity can realize the greatness of Allāh, the Creator of the universe:

Verily, in the creation of the heavens and the earth and the alternation of the night and the day, there are surely signs for men of understanding (Qur'ān 3:190).

Verily in the heavens and the earth, are Signs for those who believe. And in the creation of yourselves and the fact that animals are scattered (throughout the earth), are Signs for those of assured Faith. And in the alteration of Night and Day, and the fact that Allāh sends down Sustenance from the sky, and revives therewith the earth after its death, and in the change of the winds -are Signs for those that are wise (Qur'an, 45: 3-5).

Destruction of the environment is tantamount to destroying these “signs” (*āyāt*). If any species becomes extinct, it is considered a loss of a Sign that reflects the greatness of Allāh.

The above-mentioned verses describe the creation of the human species as among the wonderful “signs” of Allāh. It has been given all the necessary physical features and mental qualities to live a successful life on earth. It

shares the earth with animals and insects and in their creation and behavior are wonderful signs of Allāh.

The Qur'ān also mentions the rotation of the earth on its own axis causing night and day, the sustenance that we get from the sky including rain, snow and hail which gives life to a dead earth and from which plants can grow. The water from the sky infiltrates the ground providing nutrition for the plants and feeding the water streams above and below the ground. The different types of wind that blow over the earth e.g. monsoon, off shore, on-shore, land breezes, sea breezes all have different functions on earth. If man continues to destroy the environment, or “the signs of Allāh” future generations will not be able to benefit from them.

5.3 Avoiding Wastefulness

Wastefulness is an impediment to sustainability. Islam is against wastefulness; the Qur'ān (7: 31, 6: 141)) condemns it in no uncertain terms. The Prophet (SAW) advised his followers against extravagance (Bukhārī 1986 : 7: 454 no. 5783). He stressed that over-eating is part of wastage, and attempted to regulate people's eating habits (Aḥmad: 1991:Vol. 6:93 no.17189). These teachings are aimed at curbing the exploitation of substances out of greed.

5.4 Promoting Agriculture

The Qur'ān affirms that plants are the basic source of the food chain for man and animals:

Then let man look at his food, (and how We provide it): For that We pour forth water in abundance, and We split the earth in fragments, and produce therein corn, and grapes and nutritious plants, and olives and dates, and enclosed gardens, dense with lofty trees, and fruits and fodder- for use and convenience to you and your cattle (Qur'ān 80:24-32).

It is He Who sends down rain from the sky. From it you drink, and out of it (grows) the vegetation on which you feed your cattle. With it He produces for you corn, olives, date palms, grapes and every kind of fruit : Verily in this is a Sign for those who give thought (Qur'ān 16:10-11).

These verses indicate the value of plants for the nutrition of the human and animal species. The plants mentioned all have different nutritional values. The rain is drinkable for both human beings and animals. The water is pure, not salty and undrinkable. It also is nutritious for plants. After the plants have been fed with water which drains into the soil one finds corn or grains which serve as staple food. Olives are used as food as well as to extract oil. Dates

are an important type of food and its juices can be used for vinegar. Fruits are also eaten by people for their nutritional value and they are an important part of the diet of livestock animals.

The Prophet (SAW) encouraged the planting of trees and the cultivation of crops which are considered as good acts (Bukhārī 1986 Vol. 3 : 295 no. 2320; 309 no 2341). The planting of trees was particularly recommended if they provided nourishment to humans and animals (Muslim 1993: Vol. 3A : 31 no. 1552).

According to al-Qaradāwi (1960:129) the reward for the person who plants a tree or a crop continues even after his death as long as the produce of this tree or crop is eaten or used, even though he may have sold it to someone else.

The Prophet (SAW) understood the value of planting and cultivation.

Planting of trees results in more nutritious food for people and animals, it serves as a shade from the burning sun especially in hot areas, it supplements the oxygen in the atmosphere. In certain areas it prevents soil erosion and prevents mudslides. It is also home to several insects and animals.

Islam is against the cutting or destruction of plants and trees unnecessarily. One *hadīth* warns of severe punishment for those who cut down a lote-tree (Abū Dāwūd -Abī Tayyib 1990: Vol. 7: book no 14: 102: no. 5228). The lote-tree grows in the desert and is very precious in an area which has scarce vegetation. Al-Qaradāwi understands this *hadīth* in terms of protecting the natural resources and preserving the balance that exists between the creatures in the environment (Al-Qaradāwi 143-144 cited in Abū-Sway 1998: <http://admin.muslimsonline.com/bicnews/Articles/environment.htm>. Date Accessed: March 2005).

Destruction of plants on a big scale can lead to an imbalance in the ecosystem. In certain areas it can affect the rainfall; it can also lead to erosion of soil due to flooding and wind.

5.5 Conserving Water

All living species are dependant on water. Water is a life-sustaining and purifying resource. According to the Qur'ān the origin of every living thing is in water (Qur'ān, 21:30). Another interpretation of this verse is that all living objects are constituted primarily of water.

Allāh sends the water as sustenance to his creation. Subsequently, humans and animals will benefit from the vegetation (Qur'ān 6:99)

It is a matter of fact that life on earth will not be possible without the presence of water. Human beings only realize the value of water when there is a shortage. The Qur'ān describes how water resuscitates the earth:

And Allāh sends down water from the skies, and gives therewith life to the earth after its death... (Qur'ān, 16:65)...

And you see the earth barren and lifeless, but when We pour down water upon it, it is stirred (to life) and it swells, and it puts forth every kind of beautiful growth (in pairs) (Qur'ān, 22:5)

..and He (Allāh) sends down water from the sky and with it gives life to earth after it is dead..."(Qur'ān, 30:24)

...And We send down pure water from the sky, that with it, We may give life to a dead land, and slake the thirst of things We have created - cattle and men in great numbers (Qur'ān, 25: 48 – 49).

Without rain the earth is lifeless. When the rain comes the earth becomes alive. Plants start to grow, flowers begin to bloom, human beings and animals can quench their thirst and benefit from the plants. A whole life cycle starts to bloom.

Often people do not appreciate the preciousness and the benefits of water.

The Qur'ān urges them to be grateful that rain water is not salty (56: 68-70).

Had the water been salty (or sour or bitter) it would have been unfit for drinking purposes as well as for the growing of plants. The Dead Sea in the Middle East is a good example where no plant or animal life is possible due its high salt content.

Every living species on the earth must have a right to water. The Prophet directed his followers to supply and preserve fresh water (Ibn Mājah :1990 : Vol. 2: 820; no. 2472; Abū-Dāwūd -Abī Ṭayeb: 1990: Vol. 5: book no 9: 268: no. 3473), and ever since water has been regarded as of fundamental importance by Muslims. In fact, according to Muslim jurists, it is incumbent on rulers to make provisions for people to have access to water.

The Prophet (SAW) gave suggestions on how water should be conserved and used for irrigation. He advised that water flowing from the Mahzūr stream should be blocked till it reached the ankles, and then should be allowed to flow from the upper to the lower levels (Abū-Dāwūd -Abī Ṭayeb:1990: Vol. 5: book no 10: 49: no. 3634).

In Islam it is not permissible to withhold excess water if there are people who require it. Excess water should also not be withheld from usage by animals (Al-Nawawī 1995:193-194) and from plants so that their growth is not hindered (Muslim:1993 :Vol3A: 38 no. 1566).

If water is withheld then it will hinder the growth of herbage, which is important for the fodder of animals.

Extravagance in using water is forbidden; this applies to private use as well as public, and whether the water is scarce or abundant. The Prophet (SAW) disparaged wasting of water. He even condemned using too much water for ablution in preparation for prayer (Ibn Mājah 1990 : Vol. 1: 147: no.425).

Not only did the Prophet encourage others to conserve water, he set an example for his followers. He used to take a bath with one *sā'a* (equal to 2.4 litre) of water and used to take ablution with one *mudd* (equal to 2/3 litre) of water (Bukhārī:1986: Vol.1:135 no.201).

Muslim scholars have cited these examples in their writings to illustrate the importance of water conservation (Abū Bakr al-Jaza'irī, 1991: 267 cited in Abū-Sway 1998: <http://admin.muslimsonline.com/bicnews/Articles/environment.htm>. Date Accessed: March 2005).

Wastage of water causes deficiency in nature and it affects the ecological balance. It violates the rights of forthcoming generations to live in a healthy environment. All living beings are affected by water wastage.

Imām Al-Ghazālī said that if one were to have a shower, one should not keep pouring water continuously, but should restrict oneself to the amount needed

(Al-Ghazālī, The Revival of Islamic Sciences, vol. 1, p. 139 cited in Abū-Sway : 1998: <http://admin.muslimsonline.com/bicnews/Articles/environment.htm>. Date Accessed: March 2005).

5.6 Avoiding pollution of the atmosphere

The atmosphere plays a vital role in the weather patterns of the earth and precipitation. Sustainable development can be hampered if the atmospheric conditions are not stable for precipitation to take place. If there is any unnatural interference with the atmospheric conditions, it can affect precipitation. Islam advocates that humans must not interfere with the natural laws of the Creator.

The Prophet Muhammad (SAW) discouraged or prohibited activities that result in offensive smells and odours and which will influence the air. There are several reports indicating that he actively discouraged people from attending the mosque for prayers if they had consumed food whose odor may cause offence to worshippers such as garlic (Bukhārī:1986: Vol. 1 :451 no. 853-854) and onion (Bukhārī:1986: Vol1:452 no.855).

Dr. Yusuf Al-Qaradawi explains that onion and garlic are plants which are lawful to eat, but the Prophet (SAW) discouraged the person who ate it to come into public due to its smell. It is on this basis that he believes that

smoking, which is harmful to the mental and physical body, should be prohibited (Al-Qaradawi 1977: 286 cited in Abū-Sway 1998: <http://admin.muslimsonline.com/bicnews/Articles/environment.htm>. Date Accessed: March 2005).

Abu Sway interprets these *ahādith* to mean that any substance that pollutes the air and which is detrimental to the health of the inhabitants of the earth should be prohibited. This includes CFC which depletes the ozone. (Abū-Sway 1998: <http://admin.muslimsonline.com/bicnews/Articles/environment.htm>. Date Accessed: March 2005)

It is interesting that the Prophet encouraged his followers to keep the surrounding atmosphere pure from foreign substances, despite the fact that in his time there were no industries and pollutants which could damage the air and atmosphere.

5.7 Caring for Animals

Sustainable development demands respect and love for the animal kingdom. Animals and insects play a vital role in the ecosystem of the earth. The various species should be respected, protected and not be destroyed. If a species becomes extinct it can never be replaced and a whole ecosystem

with many lives depending on it can be affected. It is important for humanity not to become a perpetrator of this great crime. The animals and the insects have a right to share mother earth with humans.

According to the Qur'ān, all birds and animals form "communities" (6:38). The fact that animals are a "community" like human beings (Naṣr:2003: 97) means that we cannot take away their *ḥaqq* (right) given to them by Allāh to sustain themselves. This verse also indicates the important role animals play in the ecology.

It is the duty of humankind to protect the animals. Animal abuse should be prevented. The Prophet (SAW) clearly forbade beating (animals) on the face (Bukhārī 1986: Vol. 7:318 no. 5541). He promised a reward for those who care for animals and narrated an incident where a man, on seeing a thirsty dog reached down the well and filled his shoe with water which he gave the dog to drink. This act of kindness was rewarded by forgiveness for his past transgressions (Muslim 1993: Vol. 3 B: 479 no. 2244).

The Prophet (SAW) advised his followers to have mercy on those who inhabit the earth (both human and animal), so that they may in turn be shown mercy by Allah (al-Tirmidhī : 1987 : Vol. 4: 285:no.1924)

Animals are allowed to be killed for purposes of food only. Even in this case Islam has prescribed strict conditions. The Prophet (SAW) warned that meticulous care should be taken during slaughtering so that the animals are not injured (Muslim: 1993: Vol. 3B:314 no. 1955).

While hunting for food is allowed it has its limitations. The Prophet (SAW) ordered his followers not to “ride on silk and tiger fur” (Abu-Dawūd -Abī Tayeb: 1990: Vol. 6: book no11: 126: no. 4123). This *hadīth* refers to those who kill animals for sport or souvenirs, and to the senseless killing of animals for their skins, like crocodile.

Any killing of animals without justification in Islam is not allowed even if the victim is a very small animal or bird like a sparrow, and hunting for any reason other than for food is strictly prohibited (An- Nisāī : 1990: Vol. 4 Book no.7 : 206: no. 4329, 209 : no 4427).

Ibn Taymiyyah’s ruling on hunting is as follows: Hunting out of necessity is permitted; if it is for fun and playing, it is detested (not desirable) and if it causes injustice to people, by destroying their fields and property, it is prohibited (Ibn Taymiyah : Al Fatāwa : cited in Abū-Sway : 1998:

<http://admin.muslimonline.com/bicnews/Articles/environment.htm>. Date

Accessed: May 2005).

When one analyses the above *fatwa* (ruling), one can conclude that killing of animals unnecessarily can lead to extinction of certain species, and in the long run can impact on the ecological systems.

Islam is also against the indiscriminate killing of ants as attested to by an incident (reported by the Prophet), where one of the earlier prophets was chided for burning a colony of ants, simply because they had bitten him (Muslim 1993:Vol 3B:477 no. 2241).

Islam allows one to kill ants which become a danger, but it is against the killing of a whole nest of ants which commits no harm. Insects which are on the lower part of the food chain should also be respected.

Torturing and mistreatment of animals are not allowed in Islam. The Prophet (SAW) cited a case where a woman was punished because she had kept a cat tied without food, or drink until it died (Muslim:1993:Vol 3B:478 no. 2242).

Abuse of animals like bull fighting or cockfighting for sport is prohibited in Islam. The Prophet (SAW) prohibited the provoking of beasts for fighting (Abū-Dāwūd -Abī Ṭayeb: 1990: Vol. 4: book no 7:165: no. 2559).

Animals which are weak should not be used for domestic functions. This principle was established by the Prophet (SAW) who, when he came across an emaciated camel, ordered that animals should be ridden only if they are in

good condition and should be properly fed (Abū Dāwūd -Abī Ṭayeb: 1990: Vol. 4: book no 7: 158: no. 2545).

5.8 Avoiding environmental pollution

Islam is against polluting the environment. Human beings are not allowed to consume and pollute nature as they wish, without care or concern (Ozdemer: 2003:29).

The Prophet (SAW) warned people against defecating in “watering places, on the thoroughfares and in the shade (of trees) (Abū-Dāwūd -Abī Ṭayeb: 1990: Vol. 1: book no 1: 31: no. 26).

This *hadith* prohibits humans from defecating at places frequented by others and also teaches them that human waste has its specific place. If it is dropped at unguarded areas it can cause a health hazard and can lead to many illnesses.

5.9 Maintaining personal and environmental hygiene

Human beings have to be healthy and strong, both physically and mentally, so that they may be able to make use of the facilities provided to them by nature.

If a nation is healthy and productive, there is greater likelihood of socio-economic development. A weak and sick society will be detrimental to the economy. It is for this reason that the Prophet (SAW) emphasized the importance of health. One has to eat a balanced diet which comprises of the correct food and drink, in order to attain a healthy body and prevent illnesses.

The Qur'ān prescribes honey as a cure for illnesses (Qur'ān 16:69).

The Prophet also recommended the consumption of honey (Bukhārī 1986: Vol. 7: 396 no. 5680) and black seed because of their curative properties (Bukhārī: 1986: Vol.7: 400 no 5688).

Among the benefits of honey is that it cleans the veins, which improves blood flow, clears the intestines, and acts as a fibre which improves digestion.

Recent research has shown that the black seed contains the following vitamins: thiamin, riboflavin, pyridoxine, niacin, folacin. It also contains the following minerals: calcium, iron, copper and zinc (www.barakaoil.com accessed June 2004).

Black seed controls cholesterol levels and the blood sugar level. It helps in the resistance of coughs and flu, and the development of good eyesight and healthy bones and teeth. It improves skin complexion, and assists in the

prevention of skin rashes, asthma, aches and pains. It slows ageing and increases body immunity. It serves as a supplement for nasal congestion (www.barakaoil.com accessed June 2004).

The above verses and traditions indicate that Islam places a great premium on maintaining and improving health by consuming health-inducing foods.

In keeping with this objective, Islam prohibits the consumption of food which it considers harmful such as carrion, blood and swine flesh (Qur'ān 2: 173).

An animal which has died of causes other than slaughtering or hunting, may have died due to illness. This means that its meat may be contaminated. The drinking of blood could lead to illness. Pork has also been prohibited because its flesh contains a deadly parasite, *trichnia* (Al-Qaradāwi: 1960:44).

The Qur'ān (5: 90) and Prophetic Tradition (Muslim 1993: Vol 3B: 346 no:2001) prohibit the consumption of intoxicants. This includes alcohol and drugs. The strict prohibition of intoxicants is due to the fact that alcohol and drugs affect the nervous system, the liver as well as the brain cells.

Intoxicants not only have a negative effect on the consumer's health but also break down the social and moral structures of society.

The Prophet advised that good health should be considered a blessing and should be appreciated (Bukhārī 1986: Vol.8 : 282: no. 6412). He promoted health to prevent illnesses, plague and diseases (Abū Dāwūd -Abī T̄ayeb: 1990: Vol. 5: book no 10: 251: no.3865).

The Prophet (SAW) taught his followers the importance of physical cleanliness of the body as well as cleanliness of the environment. He described cleanliness as half of faith (Muslim 1993: vol.1: 163 no. 223).

With regards to personal hygiene the Prophet (SAW) taught his followers the importance of washing themselves regularly (Bukhārī 1986 : Vol. 2 :10 no. 896).

This command was issued by the Prophet (S.A.W.), in spite the fact that his people lived in a desert where water is scarce. Ablution which refers to washing certain exposed parts of the body is a prerequisite for the five daily prayers (Qur'ān 5 : 6). Furthermore, anyone in a state of ceremonial impurity is required to bath his/her whole body (ibid).

Personal hygiene is the first step towards a healthy body. It is for this reason that the Prophet (SAW) taught his companions how to keep their bodies clean (Bukhārī 1986: Vol. 7: 516 no. 5889).

A clean environment is important to the health of a community. It prevents the breeding of germs which can result in various types of illnesses. The Prophet (SAW) stressed the importance of a clean environment. One example of this concern was his strong condemnation of spitting in public places (Muslim: Vol. 1B:317 no.553). Spitting is one way in which germs are spread. These germs contain infectious bacteria and are spread by flies. Eventually they cause diseases.

Cleanliness of the land in terms of garbage, offal and sewerage plays an important part in establishing a healthy environment. The Prophet (SAW) advised his companions to keep their courtyards clean (al-Tirmidhī 1987 :Vol. 5:418:no.3358)

Cleanliness in homes and surroundings will eventually lead to a clean environment. If every individual adopts a positive attitude towards cleanliness, it will benefit the whole community and the environment. Good habits of garbage disposal and clean surroundings will result in a clean, healthy and beautiful environment.

5.10 Governing with justice

One of the essential features of good governance is building political and legal

structures based on justice and fairness. The Qur'ān enjoins justice (16:90).

Good governance is an important aspect of sustainable development because it eliminates state corruption and mismanagement, both of which have a debilitating effect on socio-economic development. What is required is good, honest leadership.

After the Prophet (SAW) migrated to Yathrib (today known as Madīnah) he established an Islamic State with himself as the leader. This state was built on justice and equality. The Qur'ān commands justice in all circumstances, even if it means providing incriminating evidence against one's parents or kin, and against rich or poor (Qur'ān 4:135).

The Prophet (SAW) himself stressed the importance of having just rulers (Bukhārī 1986:1: 356:no.660). The ruler must deal fairly with his/her subjects, and establish laws which are beneficial for the community. The Prophet (SAW) also taught his companions that every leader is like a shepherd who is responsible for his "flock" (Muslim 1993: vol. IIIA: 243: no. 1829).

This *ḥadīth* could be interpreted to mean that the leader in charge is morally and legally responsible for the socio-economic conditions of his people.

Good governance also requires government institutions in which there is public participation. The Qur'ān advises the Prophet (SAW) to consult his companions for advice on various matters (Qur'ān 3:159). The Prophet (SAW) established the practice of *shūrā* i.e. consultation or counsel (Baalbakī 1988:1050). In his commentary on this verse ibn Kathīr (774h: Vol 1:397) gives some examples of the Prophet's consultation with his companions.

Before the battle of Uḥud he consulted with his companions on whether they should fortify themselves in al-Madīnah or meet the enemy outside al-Madīnah. The majority of the companions favored the latter decision and he followed their wishes. On the day of the battle of the Trench he wanted to conduct a peace treaty with some of the tribes of the Confederates by giving them one third of the fruits of Al-Madīnah. This was rejected by Sa'd bin 'Ubadah and Sa'd bin Mu'adh. The Prophet (SAW) followed their advice (Hamidullāh:1970:116).

Shūrā must be applied in all aspects of life, including governance. The head of a state cannot act as an autocrat or dictator because people's democratic rights cannot be denied.

5.11 Promoting peace and reconciliation

Peace and stability are important aspects of sustainable development. Good governance in terms of justice and equality will result in peace amongst the citizens of a country. Islam offers this value system of peace and stability and this was proven in the prophetic era when peace and stability prevailed in Arabia just before the Prophet's (SAW) death. There was no more fighting between the Arab tribes. All were united under the banner of Islam and they were now brothers of the same faith.

Before the advent of the Prophet (SAW), the desert Arabs had a warlike temperament. There were innumerable inter-tribal wars which lasted for many years. One such conflict raged for forty years between the descendants of Wa'il Bakr and Taghlib. This war resulted in so many casualties that in the end both tribes became extinct (Nadwi: 1977:32). This was known as the period of *jāhiliyah* (ignorance). Stealing, plunder, looting, highway robbery of caravans, attack, counterattack, revenge, vendetta and slavery were the order of the day (Alfahim 1989:19; Iqbal 1965:16).

In order to bring about peace the Prophet (SAW) changed the social structure of the Arabs. In conformity with the Qur'ānic declaration that the believers constitute a brotherhood (Qur'ān 49:10) he established *ukhuwwah*

(brotherhood) amongst his companions, thereby eradicating tribal loyalty (*'unsuriyah*) which was the primary cause of conflict among Arabs of the peninsula prior to Islam.

By promoting brotherhood among his early followers (Muslim : 1993: Vol4A:180: no. 2580) he eradicated selfishness, hatred, enmity amongst them and inculcated in them love and concern for each other (Bukhārī:1986: Vol. 1:19:no. 13).

The Qur'ān orders that peace must be established between Muslims who are engaged in conflict (49:9), even by the use of force if necessary (Qur'ān 49:9). When there was fighting between the Aus and Khazraj tribes of Madīnah the Prophet (SAW) sent someone to make peace between them. (Ibn Kathīr 774 AH: Vol 4:213).

Islam is against persecution and oppression. According to the Qur'ān if persecution or oppression exists then force could be used to eradicate that persecution (Qur'ān 8:39, 2: 193).

Islam prohibits murder, pillage and looting. It has been reported that when the Prophet (SAW) appointed anyone as leader of an army or detachment he would specially exhort him not to break his pledge, not to mutilate (the dead) bodies and not to kill children (Muslim : 1993: Vol.3A:163 no. 1731 R1). It is

reported that when a woman was found killed during one of the Ghazwat (military expeditions) of the Prophet (SAW) he expressed strong disapproval of the killing of woman and children in battle (Bukhrārī:1986: Vol.4: 159 no.3014).

The Qur'ān regards releasing people from oppression (Qur'ān 4:75) as very significant. This verse refers specifically to the poor and helpless children, men and women who had accepted Islām, but did not have the means to migrate to Madīnah with the Prophet (SAW). They were being oppressed in different ways by their people and they invoked Allāh to deliver them from the difficult state they found themselves in. (Maudūdi 1971: Vol 2: 348). This directive, however, can be applied generally to all those who are oppressed.

At the first pledge of 'Aqabah the Prophet (SAW) met representatives of both the Aus and Khazraj tribes from Madīnah. He requested them to make a pledge. This pledge consisted of creating a situation of peace and stability in Madīnah, because both tribes were represented at the pledge. It cancelled out any hostility which may have existed between them. Iqbal (1965:16) argues that this treaty stresses the importance of unity of the *ummah* in war and peace.

After the Prophet (SAW) reached the city of Madīnah he had to establish a strong mutual bond between the *Al-Muhājirūn* (the Emigrants) who came with

him from Makkah and *Al-Anṣār* (the Helpers) who were inhabitants of the city of Madīnah.

The atmosphere of comradeship and fellow-feeling created a spirit of selflessness infused deeply in the hearts of the followers of the Prophet (SAW). In one incident, Sa'd bin Ar-Rābi', a Helper, offered to share his property with his "brother" in faith, 'Abdur Rahman bin 'Awf. But the latter was not prepared to accept either the offer, and asked Sa'd to direct him to the market so that he work for his own living (Al-Mubārakpūri:1996:188).

The Helpers were extremely generous to the Emigrants. In one occasion the Helpers approached the Prophet (SAW) with the request that their orchards of palm trees should be distributed equally between the Muslims of Madīnah and their co-religionists from Makkah. But the Prophet (SAW) was reluctant to put this heavy burden upon them. It was, however, decided that the Emigrants would work in the orchards along with the Helpers and the yield would be divided equally amongst them. Such examples point directly to the spirit of sacrifice, altruism and cordiality on the part of the Helpers, and also to the feeling of appreciation, gratitude and self-respect that the Emigrants held close to their hearts. They took only what helped them attain a reasonable living. In short, this policy of "mutual brotherhood" was so wise and timely, that many difficult problems were resolved reasonably (Al-Mubārakpūri:1996:189).

The Prophet (SAW) established a code of brotherhood (*ukhuwwah*) between the Emigrants and the Helpers. The document included provisions stipulating the following :

1. They constituted one community
2. They were not to rebel or spread enmity and sedition
3. They were not to kill one another nor support their enemies against one another
4. They were to support one another
5. They were to maintain peace under all circumstances

It was solely by his wisdom and dexterity that the Prophet (SAW) erected the pillars of the new society. He brought them up in the light of Islamic teachings, sanctified their selves, enjoined them to observe righteousness and praiseworthy manners and was keen on infusing into them the ethics of amity, glory, honor, worship and first and foremost obedience to Allāh and His Messenger (Al-Mubārakpūri 1996:189).

By preaching “brotherhood” between the Muhājirūn and Ansār and prohibiting them from oppressing each other (Bukhāri 1986: Vol. 3: 373) the Prophet (SAW) established peace and stability in Madīnah.

Another task which the Prophet (SAW) had after his arrival in Madīnah, was to establish peaceful co-existence with the Jews who were staying in the Madīnah area. He was set on establishing peace and security, and to bring about a spirit of rapport and harmony within the region.

The Prophet (SAW) then decided to conclude a treaty with the Jews of Madīnah in which there were clauses that provided them full freedom to worship and acquire wealth (Al-Mubārakpūri:1996:197).

After this treaty Madīnah turned into a coalition state. Peace and tranquility existed among the people of Madīnah and its surrounding areas. The Prophet (SAW) preferred a peaceful solution to fighting. In 6 A.H. the Quraish wanted to make war on the Muslims to prevent them from entering Makkah to perform the 'Umra. The Prophet (SAW) diverted his people from the planned route when he heard that the Quraish army was waiting for him.

Later at Al-Hūdaibiyah he sent a message to the Quraish stating that the Muslims had not come to fight them, but to perform the 'Umra, and that he was willing to conclude a truce with them (Bukhārī:1986:Vol. 3 : 562 no. 2731). The Quraysh accepted this proposal and the Treaty of Hūdaibiyah was agreed to by the two parties. This treaty was a victory for the Muslims because after years of hostility the Quraish entered into negotiations and thus

recognized the Prophet (SAW) and his followers as a power to be reckoned with.

When the Prophet (SAW) conquered Makkah in 8 AH (630), Muslims who were oppressed in Makkah, and were denied their freedom by the Quraysh were freed. Despite the fact that they had persecuted the prophet and his followers in Makkah he did not take revenge on them. (Askalāni:1989:Vol 8:22)

Muslims never intended to kill people through bloody wars, or to take their property by force or to coerce people into religion, but their sole ideal was to create an atmosphere of freedom and peace.

5.12 Alleviating poverty

One of the major objectives of sustainable development is poverty alleviation. Poverty is the root cause of economic, social and health problems in society. Islam is concerned about human welfare and progress and advocates poverty alleviation. Caring for the less fortunate of society is part of the believer's duty (Qur'ān 107 :1-3). Denying financial assistance to the orphan and the needy, not feeding them and not being kind to them, are seen in Islam as denial of faith.

Islam teaches its followers not to let orphans go astray and become a problem of society. It is preferred that the orphans be taken up in people's homes and cared for. The Prophet encouraged his followers to look after orphans (Muslim : 1993:Vol.4B:381 no. 2983).

Islam encourages its followers to give assistance to the poor and the downtrodden, so that they may be uplifted, removed from poverty and prevented from sinking into degradation.

In Islam there are specific directives for dealing with poverty alleviation and the upliftment of society. Islam promotes economic activity, on condition that it is legitimate and does not conflict with Islamic norms and values.

Islam makes it mandatory for man to earn a livelihood for himself and his family. The Qur'ān tells human beings to seek sustenance through Allāh's bounties (Qur'ān 29:17). Islam encourages a person to take the initiative to work, as well as to become self sufficient in order to become a productive member of the community. The Prophet (SAW) discouraged begging (Ibn Mājah :1993 : Vol.3: 107 no. 1836; Ibn Mājah : 1990 : Vol. 1: 588:no.1836).

One strategy to eradicate poverty is the system of *zakāt* which could be translated as alms tax. *Zakāt* means to purify, to increase or to grow

(Baalbakī: 1988:607). Sabiq defines *zakāt* as the portion of a person's wealth which Allāh has claimed as a right of the poor (Vol. 1:287: 1995). It amounts to 2.5% of the person's surplus wealth which is in his possession for a full (lunar) year. The payment of *zakāt* becomes obligatory on attaining *nisāb* (it is the amount of wealth one must have before one shall compulsorily pay the *zakāt*) (Toffar:1977:54).

Zakāt is a way of wealth distribution. The Qurān commands that individuals take material responsibility for the poor and the suffering in the Muslim community *Zakāt* is regarded as so important in Islam that it is usually mentioned in the Qur'ān along with prayers (Qur'ān 2: 43). *Zakāt* constitutes one of the five pillars of Islam (Bukhari Vol.1:17 no. 7)

The wealthy are held responsible for looking after the poor. The Prophet (SAW) said:

Verily Allāh (T.A.) has made incumbent on the rich of the Muslims a due to be taken from their properties corresponding to the needs of the poor among them. The poor will never suffer from starvation or lack of clothing unless the rich neglect their due. If they do so, Allāh will surely hold them accountable and punish them severely. (At-Ṭabarāni :1996: Vol. 4 : 179 no. 3579).

Neglecting the poor is perceived as disobeying the fundamentals of Islam and is a punishable act.

Zakāt could promote investment and, therefore, economic growth. For the wealthy not to reduce from their capital balance annually it is an incentive to invest their wealth and pay *zakāt* from their profits. Investments are necessary to make a nation economically independent, foster economic growth and create more job opportunities. *Zakāt* also prevents crime and anti-social behavior. When people have their basic needs fulfilled they are not forced by the drive of hunger to steal or commit prostitution.

Zakāt must not dampen work incentives and encourage parasites. Islam teaches that there is great dignity in working for your own livelihood if you can and support your family. The Prophet (SAW) described that which is consumed through a person's own earnings as the purest (Tirmidhī:1987 : Vol. 3: 639 : no.1356).

Among the recipients of *zakāt* according to the Qur'ān are the poor and the needy (Qur'ān 9:60).

Zakāt could be used to empower individuals to become self-sufficient.

I can cite two examples of the ways in which the South African National *Zakāt* Fund organizes projects in the twenty first century using *zakāt* so that people may become self-sufficient.

A facilitator who works for a *zakāt* organization can teach people certain skills so that they may become self-reliant. If a person falls under one of the eight categories of the recipients of *zakāt* then instead of giving him/her money, he/she is requested to join a self-sufficient project. These projects include: learning how to sew, computer literacy or candle-making. All the educational facilities are paid from the *zakāt* money (Interview: 'Abdurrahman George & Muhammad Shafiq Barendse: 13 December: 2006: South African National *Zakāt* Fund).

The Self Development Project (SDP) is another project organized by the South African National *Zakāt* Fund. In this case, a person who qualifies for *zakāt*, instead of receiving a handout, is requested to start a business with the *Zakāt* Fund to get off the ground. His/her business is monitored for a period of six months in which he/she must supply the *Zakāt* Fund documents in terms of buying, selling, costing and bank statements. He/she is helped until he/she becomes independent (Interview: 'Abdurrahman George & Muhammad Shafiq Barendse: 13 December: 2006: South African National *Zakāt* Fund).

Voluntary alms (*ṣadaqāt*) is encouraged by Qur'ān (34 :39) and the hadīth encourages feeding the hungry, and clothing them (Tirmidhī : 1987 : Vol. 4: 546:no.2499)

Muslims give *ṣadaqāt* not only to poor individuals or families but also to educational institutions so that it might afford better opportunities to those who cannot afford to learn. They may go on to become productive members of society. In this sense *ṣadaqāt* plays a role in sustainable development.

The principle of giving whether it is the compulsory alms like the *zakāt* or voluntary alms like *ṣadaqāt* instills in the Muslims the core principles of sustainable development. In this way it makes them conscious of their responsibilities to the poor and weak members of society. At the same time it empowers the poor and the weak.

5.13 Engaging in Industry, Trade and Commerce

A close relationship exists between sustainable development and business and industry. This relationship can be influenced positively, depending on the process of production, distribution, sales, and economic market conditions. However, the opposite will be true if inequitable distribution, poverty and economic uncertainty influence sustainability, business and industry.

The Prophet (SAW) encouraged people to earn their own living (Bukhārī 1986: Vol.3:162 no. 2072). This inspired Muslims to invent, devise various ways of workmanship and manufacture articles and commodities of common and extraordinary use.

Trade which fosters sustainability is encouraged through the Qur'ān and interest clearly condemned (Qur'ān 2:275). Trade is also referred to as “sustenance from Allāh” (Qur'ān 62:10).

One of the key aspects of trading is honesty and Islam strongly emphasized this for good economic relations. The seller must not practice fraud or deceit when he sells a commodity to the buyer. The Prophet (SAW) strongly condemned the actions of a merchant who was found to be deceiving customers by putting the good food on top and the bad food ruined by rain at the bottom (Muslim : 1993:Vol.1A:67 no. 102).

Islam wants to develop a feeling of cooperation, help, sacrifice, love, brotherhood, and justice through the means of trade. Islam allows delay in payment to a customer who cannot pay immediately, but if there is an extreme inability to pay the rest a remission is encouraged (Muslim: 1993:Vol. 4B:391 no. 3006).

A seller may not deceive a buyer by swearing a false oath that his products are in good condition (Muslim: 1993:Vol.3A:63 no. 1606).

The seller should be very strict with regard to his weight and measure and the Qur'ān warns against deceptive and dishonest practices (26:181-182.)

The interest of the buyer is more highly regarded than the seller, and in no way must the buyer be disadvantaged.

By implementing these teachings one gets the maximum productive effort from the whole society leading to prosperity and betterment for all. If these elements are absent from trade then there will be a decline in the economy. On the contrary, if they are present, it will be good for sustainable development.

5.14 Educating and disseminating information

Education is one of the basic pillars of sustainable development. Through education man comes to understand his environment, and he is taught how to live. Education and training change the outlook of a person.

Allāh is said to have been man's first teacher, having taught Adam the first human the essence (literally "names") of all created things (Qur'ān 2:31).

Allāh taught human beings how to conceptualize and speak. The very first verses revealed to the Prophet (SAW) concerned reading, writing and teaching – all contained in the word *iqra'* (Qur'ān 96:1-5).

It is this directive to human beings to educate themselves that later led to Arabs being transformed from a life of ignorance to the most civil society on earth at the time. The Prophet (SAW) made it obligatory for human beings to seek knowledge (Ibn Mājah 1993 Vol.1: 127 no.224; Ibn Mājah : 1990 : Vol. 1: 81: no. 224).

The seeking of knowledge will increase a person's status (Qur'an 58:11 and Muslim: 1993:Vol1B:454 no. 817).

The seekers of knowledge were promised highly worldly status due to their knowledge of the Qur'ān. Ibn Abzā a freed slave was appointed the deputy due to his knowledge of the Qur'ān. (Ibn Kathīr 774h: Vol. 4:326). This showed where class played a dominant role, the acquisition of knowledge replaced the discrimination of the class system.

5.15 Chapter Summary

In this chapter I have demonstrated that sustainable development principles or elements – as identified in chapter 2 - are to be found in Islamic teachings, though the notion of sustainable development has emerged fairly recently. It is precisely because of this that one would expect Muslim countries to be amenable to the implementation of sustainable development in principle, though they may differ about some of its goals and strategies.

One must also be cognizant of the fact that with the dawn of the twenty first century many new issues in terms of sustainable development arose. In the next chapter I will discuss how Muslim scholars approach these sustainable development issues on the basis of Islamic texts. I will also investigate how Muslim countries have responded to sustainable development initiatives.

CHAPTER 6

THE CHALLENGE OF SUSTAINABLE DEVELOPMENT FOR MUSLIM COUNTRIES

6.1 Introduction

This chapter will focus on the challenges that confront Muslim countries in relation to sustainable development.

I will begin by looking at the approaches of Muslim governments to sustainable development. The various declarations relating to sustainable development which have been endorsed by Muslim governments and are contained in public documents will provide the data for this section. These declarations appear as appendices in this thesis.

I will then present the approaches of a select number of scholars who have published on sustainable development from an Islamic perspective. The idea was to present the diversity of views and approaches that are currently obtain on the subject.

Finally, I will reflect on what I consider to be some of the major challenges that sustainable development poses to Muslim countries. This reflection will be based on an analysis of the obstacles that Muslim countries themselves have identified, as well as of the proposals by Muslim scholars to initiate and promote sustainable development.

6.2 The Approach of Muslim governments

Arab/Muslim countries have issued a number of declarations relating to Sustainable Development including the following:

- Arab Declaration on Environment and Development (1986)
- The Arab Communiqué on Environment, Development and Future Horizons (Cairo-1991)
- Jeddah Declaration – outcome of the First Global Forum on Environment from An Islamic Perspective (2000)
- Arab Ministerial Declaration on Sustainable Development issued by the Arab Environment Ministers (Cairo, October 2001) – also referred to as Sustainable Development Initiative in the Arab region
- The Tehran Declaration on Religions, Civilizations and the Environment (2001)

- The Abu Dhabi Declaration on the Future of Environmental Action in the Arab World (2001)
- The Rabat Declaration on the Opportunities of Investment for Sustainable Development (2001)
- Resolutions of the Oman International Forum on the Environment and Sustainable Development (Muscat 2001)
- The Islamic Declaration on Sustainable Development (Jeddah 2002) – outcome of the First Islamic Conference of the Environment Ministers in 2002 –
- The Abu Dhabi Declaration on Environment and Energy (2003)

What this indicates is that sustainable development has been recognized as an important issue by many Muslim governments who have held a number of conferences and meetings to discuss relevant issues relating to sustainable development. These responses which have been documented could provide blueprints for future development in the Muslim World.

Furthermore, some Muslim governments (specifically the League of Arab States) adopted a comprehensive regional approach based on the Ministerial Declaration on Sustainable Development mentioned above. They also committed themselves

to implement Agenda 21, the objectives included in the Millennium Declaration and the outcome of the World Summit on Sustainable Development.

The one aspect of sustainable development that has been “embraced” with enthusiasm, by the wealthier Muslim countries in particular, is restoration of the natural environment. Another is water conservation. As for the other elements of sustainable development, it will require a country by country analysis to arrive at some definitive assessment.

The positive response of Muslim governments, in my view, confirms Murphree’s theory that people seek to manage the environment for mainly two reasons:

- (a) because its management improves the conditions of their livelihood
- (b) because its degradation is perceived to be threatening (Murphree:1991:1)

What this indicates is that while Muslim rulers are aware of issues relating to sustainable development and about their own contribution to environmental degradation to the extent that they adopted policies and endorsed documents promoting the essential principles of sustainable development, they generally ignored the concerns of environmentalists until they were confronted by conditions that threatened their mode of living.

Two critical questions that need to be examined are :

(a) If Islam does advocate a respectable attitude to the environment and the use of natural resources as I have argued in the previous chapter, why have Muslim countries been involved in environmental degradation as evident from chapter 4?

(b) What has prompted them now to endorse sustainable development? Is it a greater awareness of the environmental crisis or pure self-interest?

In my view, the concept of *knowledge-constitutive human interests* expounded by Jürgen Habermas provides the answers to these questions. Habermas contends that “ideas serve often enough to furnish our actions with justifying motives in place of the real ones” (1968: 311). I understand this to mean that Muslim rulers endorse the “ideas” (in the context of our discussion, the various declarations on sustainable development) to justify their “actions” (sustainable development initiatives), though they are not necessarily motivated by the altruistic principles contained in them; rather, they are driven by self-interests (the “real” motives).

Islamic teachings relating to the responsible use of natural resources and humankind’s trusteeship over nature did not prevent Muslim countries from embarking on development patterns that proved to be damaging to the

environment. There is no doubt in my mind that Muslim countries were virtually compelled to reconsider their approach to development.

6.3 The Approaches of Muslim Scholars

In this section, I will look at the approaches of several scholars to sustainable development. For purpose of convenience, I have listed these approaches under various headings

6.3.1 Supporting Sustainable Development in principle

There is general consensus that sustainable development is supported by Islamic sources in principle.

To begin with, in an article *The New Alliance: Faith and Ecology*, which forms part of a book-in-progress, Marjorie Hope and James Young demonstrate that the Qur'ān and the *Aḥadith* are rich in proverbs and precepts that speak of God's design for creation and humanity's responsibility for preserving it. This, in their view, is sufficient evidence that Islam has always embraced an environmental ethic. ([http://www. crosscurrents.org/](http://www.crosscurrents.org/) Date Accessed: November 2007). The previous chapter on sustainable development principles in Islamic sources bears this out.

I agree with the contention of Marjorie Hope and James Young that the primary sources of Islam - the Qurān and Ḥadīth – promote an environment ethic. I have demonstrated this in chapter 5.

Zubair Hasan believes that the notion of sustainable development which seeks to create a balance between economy, environment and society marks a significant shift of emphasis from growth to social justice and implies more than a mere conservation of natural resources and hence needs to be supported. A “sustainable” rate of growth implies that the pace of development should be reduced. This would contribute to a conservation of natural resources and reduce environmental degradation. Equity implies a more even spread of resources and concomitantly a reduction in consumerism (Hasan:http://mpra.ub.uni-muenchen.de/2784/1MPRA_paper_2784.pdf. Date Accessed: November 2007)

What I find significant about Zubair Hassan’s approach to sustainable development is his emphasis on equity and social justice. This would require slowing down the pace of economic development and, consequently, the conservative usage of natural resources.

In his paper *Islam and the environment* Hussein A. Amery argues that humans are equal partners with everything else in the natural world but have added responsibilities. They must not view themselves as lords and masters but as friends and guardians of the natural world. As trustees, they do not have the right to pollute the planet or consume its natural resources in a manner that leaves for posterity only a polluted planet or one seriously denuded of its resources. He contends that pollution and wastefulness of natural resources are prohibited because they are unjust in the way that they jeopardize current and future generations' ability to meet their own needs (http://www.idrc.ca/en/ev-93950-20-1-DO_TOPIC.html. Date Accessed: November 2007)

Amery is of the view that though the word *fasād* (meaning corruption, dissension) is used in the Qur'ān (30:41) in the context of land and sea, it can be assumed to encompass all other components of the ecosystem because the Qur'ān states that Allāh is the creator of everything (25:2), and to Allāh belongs the heavens and the earth and whatever is between them and what is beneath the ground (20:6). Islamic teachings, which command Muslims to avoid and prevent *fasād*, encompass exploitation or degradation of environmental resources. The other meanings of *fasād* include taking something unjustifiably and unfairly (Al-Munjid:1994 cited in Amery) or spoiling or degrading (natural) resources.

Tabatabai (1973:196 cited in Amery) views *fasād* as "Anything that spoils the proper functioning of current (natural) regulations of the terrestrial world regardless of whether it was based on the choice of certain people or not" (ibid).

I find the notion of justice in relation to the use of natural resources in a manner that ensures the availability of resources to future generations intriguing. It implies that people can be sanctioned if found guilty of injustice in their use (rather abuse) of natural resources. Extending the meaning of *fasād* to include environmental degradation – and not confining it to the destruction of natural resources such as trees during war – is another compelling argument for introducing harsh penalties for abusing natural resources or harming the natural environment.

Amery presents his understanding sustainable development from an Islamic perspective. His reference to trusteeship of the environment is consonant with the position of earlier classical scholars such as Ibn Abbās. I cannot but agree with Amery that degradation of the environment constitutes *fasād* – as he has interpreted it – and has to be prevented.

Abdur-Razzaq Lubis in his paper *Environmental Ethics in Islam* argues that humankind's rights over nature are rights of sustainable use - of usufruct - based on moderation, balance, and conservation; future generations have a similar and equal right. Nature's rights (*haqq*) over humankind include the rights to protection from misuse, degradation and destruction. Greed, affluence, extravagance, and waste are considered a tyranny against nature and a transgression of those rights (<http://www.xiao-en.org/cultural/life.asp?cat=54&loc=zh-cn&id=1013>. Date Accessed : November 2007).

What we note in this approach is that not only is it considered an obligation for humanity to utilize natural resources responsibly, but nature is invested with the fundamental right to be protected from abuse. This dimension – investing nature with a right – is significant. It differs starkly from the general approach to nature conservation. Humanity is compelled to respect nature's rights whilst enjoying certain privileges over nature.

In *The Islamic World and the Challenges of SD* published by ISESCO in 2007 (www.isesco.org.ma/pub/Eng/Sust_Dev?P4.htm. Date Accessed: November 2007) the following definition of sustainable development is found:

“Sustainable development from the Islamic perspective is a multi-dimensional process that seeks to establish a balance between the economic and social dimensions of development on the one hand, and the environmental dimension on the other. It seeks to achieve the optimal development of resources from an Islamic perspective that affirms man’s role as Allāh’s representative on earth, enjoying the full right to benefit from these resources without owning them totally. In developing these resources, man adheres to the teachings and precepts of the Qur’ān and the Prophet’s teachings, and takes into consideration the rights of future generations in benefiting from the same resources that he develops without waste, in an exercise to raise the qualitative and quantitative aspects of man and matter”.

This definition, as I understand it, echoes the standard definition of sustainable development except for the qualification that resources should be developed from an Islamic perspective. It would be safe to assume, judging from the above, that Muslim scholars in general support the goals of sustainable development.

6.3.2 Giving legal force to Sustainable Development

Some scholars prefer giving legal clout to sustainable development on the assumption that this would provide the necessary incentive for promoting it in the Muslim World.

Hasan Zillur Rahim argues that the challenge facing Muslim scholars and scientists is to formulate, on the basis of Qur'ānic teachings, laws that address environmental issues in the modern context, from deforestation and soil erosion to drought and flood, from the carrying capacity of a habitat to a land ethic, from the application of technology to the preservation of community and culture, from greenhouse effect to acid rain, from nuclear power to genetic engineering, from population and poverty to North-South equity, from stewardship to sustainable development. The Qur'ān teaches that human needs cannot justify transgressing the legitimate needs of other species. (Rahim:<http://www.wrmea.com/backissues/1091/9110065.htm> . Date Accessed : November 2007).

I agree with Rahim that the Qur'ān should be used as a resource in formulating laws to deal with environmental issues. I am surprised, however, that he has not included the Ḥadīth which contains advice and guidance on environmental issues as I have demonstrated in chapter 5.

Mustafa Abu Sway proposes that in addition to the major aims (*maqāsid*) of the *shari'ah* (Islamic law) agreed upon by Muslim scholars, viz protection of religion, life, mind, offspring, and property, the protection of the environment should be considered as a major aim of the *shari'ah*. He argues that this aim is implicit in the original five aims. If the degradation of the environment is unchecked, there will ultimately be no life, no property and no religion. The environment, in a sense, encompasses the aims of the *shari'ah* (AbūSway:1998:<http://admin.muslimsonline.com/bicnews/Articles/environment.htm>. Date Accessed: March 2005).

This can be considered a radical proposal to deal with the issue of environmental protection. While Muslim scholars have begun to pay serious attention to sustainable development, and have attempted to demonstrate the compatibility between sustainable development in principle and Islamic teachings, Abu Sway is the first to suggest that environmental protection should become a fundamental objective of Islamic Law. If this is adopted, I think it will have far-reaching implications.

Abu Sway's view has been endorsed by others. Farooq Hassan in his Presidential Address to the Pakistan Ecology Council in Lahore on 6 October

2006 maintained that the environment encompasses the totality of the aims of the *shari`ah*. The protection of the environment should be regarded as one of the major aims of the *shari`ah* because its destruction will prevent man from fulfilling his mandate as vicegerent (www.greaterdemocracy.org/Archives/category/ethics/+Pakistan+ecology+council&hl=en&ct=clnk&cd=38gl=za. Date Accessed: November 2007).

Under the section “The Mandate of the Governing Authorities” in their study entitled *Environmental Protection in Islam* published in 1993, Abubakr Ahmad Bagader et al suggest that to give sustainable development “legal sanction” the following legal principles must be adopted :

- Damage shall be eliminated to the extent possible.

This could be interpreted to mean that as much effort as possible should be expended in eliminating the harmful effects of current development on the environment on the one hand and in fulfilling the basic social and material needs of people on the other.

- The averting of harm takes precedence over acquisition of benefits.

This could be understood to mean that the benefits of current development must be weighed against its negative impact. If the latter is greater, development practices must be altered so that they support both environmental protection and social justice.

- Exigency does not cancel the rights of others.

The fact that certain classes of people may wish to enjoy the right to a better standard of living, for instance, does not entitle them to adopt such measures that would deny others of a similar right.

- Dire necessity renders prohibited things possible.

This would apply in extreme cases such as starvation. In such instances, restrictions (e.g. on hunting endangered species) may have to be suspended to ensure that people's basic necessity for food is met. Punishment in such cases would be unfair.

- The author of an act is held responsible even if his act is not intentional.

Anyone found guilty of harming the environment, for instance, would be held liable for his action though he may not have intended to cause any harm.

This is important to ensure that people do not escape censure or punishment on the grounds of ignorance.

- Every necessity shall be assessed according to its value.

There is a need to establish benchmarks indicating precisely what constitutes basic necessities. Individuals have different needs and priorities. This makes it extremely difficult to assess if these are being met or not.

- Damage shall not be eliminated by means of similar damage.

If a community, for instance, has caused damage to a section of land belonging to the state through overgrazing or over-cultivation, damaging its land in turn is not a suitable option. It is more important to preserve the land than to punish people in this way (<http://www.islamset.com/env/mandate.html>. Date Accessed : November 2007)

Under Principles Governing Public Policy and Legislation in Islam Bagader et al include the following legal principles:

- There shall be no damage or injury and no infliction of damage or injury.

This simply means that humanity's actions should not be detrimental to other people's interests nor should his interests be prejudiced by other peoples' actions. In respect of the environment, it means acknowledging the significance of what Salih defines as "the natural interdependence of the environmental life support system" on a global scale (Salih:2003:117-121). The impact of any large

scale developmental interventions in the environment would influence the quality of the environmental life support system (ibid).

- Priority is given to preserving the universal interest over particular interests.

The interests of the majority take precedence in most instances. A Muslim country may be constrained from accessing oil reserves if this were to lead to major pollution in the region.

- The general welfare takes priority over individual welfare.

Individual interests are usually subservient to community interests and so the former have to yield to the latter in most cases. Individuals may not act in a manner that will cause harm to the general public. Buying land for entertainment purposes, for instance, would not be permitted if it can be demonstrated that it could be put to better use such as farming.

- A private injury is accepted to avert a general injury to the public.

It may become necessary for an individual to forfeit a right, say, to purchase prime agricultural land if it is already benefiting the public through its produce,

- Severe damage shall be removed by means of lighter damage.

This could apply to a situation where some harm may be caused to individuals or groups (e.g. destruction of their diseased crops) in order to protect the country from an epidemic.

- If one of two opposing detriments is unavoidable, the more injurious is averted by the commission of the less injurious.

This may apply to a situation where the state may be compelled to supply sub-standard food to communities to prevent them from starvation.

- The need to bear a lesser evil as opposed to a greater evil when having to choose between the two.

This could apply in a situation where people may have to make a choice between maintaining a high standard of living at the expense of resource depletion and agreeing to lower their standards in the interests of the nation and of future generations. (<http://www.islamset.com/env/mandate.html>. Date Accessed : November 2007)

These legal principles provide the basis on which Muslim jurists can issue a ruling declaring aspects of sustainable development (such as nature conservation) either an individual or collective (community or state) obligation. This will have the effect of making people in general more

conscious of their social and ecological responsibilities. If the ruling is accompanied by threats of sanction, it may prove to be even more effective.

6.3.3 Focus on Sustainable Living

Muslim scholars and leaders do not all endorse the current dominant goals, models or strategies of sustainable development unconditionally. Some have proposed alternatives.

Fazlun Khalid considers the term sustainable development as wholly inappropriate and prefers sustainable living as an alternative. He affirms the three pillars of sustainable development: social, economic and environmental development. He contends that deep in the matrix of the *sharī'ah* there exist institutions that can effectively deal with problems relating to sustainable development, trade and environmental protection. He points to the system of *awqāf* (trusts) that served Muslims so well over the centuries by providing schools, hospitals and relief to the poor (Khalid:http://ifees.org.uk/index.php?option=com_content&task=view&id=39&Itemid=58. Date Accessed: November 2007).

While Khalid finds parallels between the three pillars of sustainable development and Islamic institutions, he proposes the addition of two pillars - the spiritual and

the political. These, in his view, in combination with the three pillars cited above, define the externalities of the Islamic system.

Khalid suggests an alternative way of approaching the whole issue of development. He believes that sustainable living captures the way people always conducted their daily lives before nature was subjected to a massive assault in the name of development and became an exploitable resource. (Khalid: http://ifees.org.uk/index.php?option=com_content&task=view&id=39&Itemid=58. Date Accessed: November 2007).

This is an echo of Warren Johnson's hope that in moving toward sustainability "we will regain a degree of stability that will permit the deepening of culture and the enrichment of lives lived simply" (Johnson 1978: 370).

I find Khalid's approach attractive, for it implies a challenge to those who uphold the idea of sustainable development as a means of fulfilling only the material needs of people as well as to the notion that the First World provides a benchmark for development. Adding the political and spiritual dimensions lends greater weight to promoting what he calls "sustainable living". Without the support of Muslim rulers, there is little prospect of advancing the positive aspects of the sustainable development agenda. A personal spiritual connection with nature as opposed to viewing nature simply as a material resource is likely to

encourage men and women to be more responsible in the way they utilize natural resources at their disposal.

6.3.4 Development on the basis of *tazkiyyah*

Ziauddin Sardar proposes development on the basis of *tazkiyyah* which he proceeds to explain as follows: “*Tazkiyah* involves preservation of moral and environmental integrity, public interest (*istislah*), cooperation for good, consensus of people (*ijma*), and cultural strength”.

It has the following four basic components:

(1) sustaining society in dynamic equilibrium: Pursuing policies of conservation, fuller utilization of resources, recycling of waste, controlling and avoiding pollution, and providing facilities and regulations for health and safety

(2) support systems : providing social, cultural, educational and informational support systems that are adequate for the achievement of the goals of *tazkiyah*, generate a community feeling and dignity and protect and stimulate cultural creativity and responsibility.

(3) political environment - growth through *tazkiyah* aims at creating political stability, increasing the quantity and quality of participating in decision-making and degree of accountability of political office-bearers, improving efficiency of administering public programmes, and improving the planning and allocation of social capital and resources.

(4) economic environment - growth through *tazkiyah* is based on technological activity that can be easily controlled and provides employment and does not present an environmental and cultural threat. It aims at equality in the distribution of resources, optimum use of human and natural resources, adequacy in quantity and quality of goods and services without undue waste, including administration and working conditions and distribution system, improvements in the level and quality of the accountability of the economic system to the community and political authority for its planning, efficiency, administration and allocation of resources (Sardar: 1999:589-590).

An analysis of Sardar's model reflects that it differs little from the standard model of sustainable development (based on the pillars of ecology, economics, equity and public participation), except in one respect: preservation of moral integrity.

As we will have noted from the views of several scholars, morality, ethics and spirituality are considered vital components of any strategy aimed at attaining sustainable development.

6.3.5 Infusing sustainable development with ethical values

Some scholars, while supporting sustainable development in principle, argue in favor of infusing it with spiritual or ethical values.

The idea that sustainable development must be underpinned by ethics was endorsed by Engel and Warburton.

Engel described sustainable development as “the kind of human activity that nourishes and perpetuates the historical fulfillment of the whole community of life on earth.” (Engel:1990:10-11). This approach to development in effect means that man must be constrained in his actions by giving due consideration to how they may impact on all that inhabits the earth: man, plants and animals

According to Warburton (1998) the social fabric of society includes the values, norms and culture that provide the strength for members of the society to deal

with their daily life situation. These must be taken into account when development policies are formulated.

In his paper on Islam and climate change, Dr Muzammal Hussain argues that the principles of Islamic economics resonate with the notion of economic justice (Hussain:2007: [http://www.lineonweb.org.uk/ Resources/reading.htm](http://www.lineonweb.org.uk/Resources/reading.htm) 2. Date Accessed: November 2007). The implication is that justice should be at the core of economic development, and that economic activities which lead to climate change are tantamount to injustice. This emphasis on justice by Muslim scholars, in my view, sets them apart from other proponents of sustainable development.

I have already noted in chapter four that Mawil Izzu Dien considers the advent of industrialization, which do not recognize spiritual or ethical values as commercially significant as the primary cause of environmental problems in the Middle East and suggests a return to the traditional Islamic relationship between humans and the eco-system (Dien: 2003).

This is echoed by Seyyed Hossein Nasr who observes that "there is near total disequilibrium between modern man and nature as attested by nearly every expression of modern civilisation which seeks to offer a challenge to nature rather than to co-operate with it" (Khalid: <http://ifees.org.uk/index.php?>

[option=com_content& task=view&id=39& Itemid=58](#). Date Accessed: November 2007).

The major concern reflected here is that humankind has drifted apart from nature, with the result that nature is perceived as an object that can be manipulated, controlled and exploited for its benefit, making man in Descartes' words, "master and possessor of nature". It is only through the infusion of ethical/spiritual values that humankind's attitude to nature can be transformed.

6.3.6 Promoting the *shuratic* process

Iyad Abumoghli defines the concept of sustainable development from an Islamic perspective as "the balanced and simultaneous realization of consumer welfare, economic efficiency, attainment of social (distributive) justice, and ecological balance in the framework of an evolutionary knowledge-based, socially interactive model defining the *shuratic* process." (http://rbec.undp.org/WaterWiki/images/8/85/Sustainable_Development_in_Islamic_Law_-_Iyad_Abumoghli.doc. Date Accessed: November 2007).

While this definition encompasses the standard elements of sustainable development – economy, ecology and equity – they are located within the

framework of what is termed a *shuratic* process. The *shura* here is the process of consultation or participatory ruling principle of Islam. It also involves the decision making process at all levels of the Islamic society.

The constant reference to *shura* by Muslim scholars appears to me to reflect the absence of consultation between the majority of Muslim rulers and their people. It is unthinkable that decisions that can impact in a significant way on the lives of millions of people can be taken without any attempt to involve them in the decision-making process. This is an aspect that cannot be ignored any longer and pressure must be brought to bear on rulers to engage with their subjects on all matters that affect them.

6.3.7 Reestablishing the Islamic trading system

Fazlun Khalid says that Muslims' responses and their priorities should be based on the moral authority of being of service to humanity on the basis of the Qur'anic principle contained in verse 3:104. There are between 1.3 and 1.6 billion Muslims in the world today and this can be a massive force for good. Muslim countries need now to breathe fresh life into those parts of the *shari'ah* needed to implement sustainable development. He proposes that the Organisation of

Islamic Countries (OIC) should urgently consider the re-establishment of the Islamic trading system, which served Muslims well for centuries. It should be open to all who want to participate, be anything but hegemonic and decouple trading from the hypnotic effects of the illusory world of global finance. This may set in motion the very moves for a change in direction the world is waiting for.

Islamic trade is sustainable trade for sustainable living. (Khalid: http://ifees.org.uk/index.php?option=com_content&task=view&id=39&Itemid=58. Date Accessed: November 2007).

One can detect Khalid's disillusionment with the negative impact of global trade and finance. He rejects current models of development which he considers to be hegemonic and unsustainable. His suggestion of rekindling the traditional Islamic trading system may, however, be idealistic. One cannot imagine Muslim states making a radical break with the current global financial system. For this to happen will require intense pressure from organs of civil society which, unfortunately, are either non-existent or very weak in most Muslim countries.

6.3.8 Resurrecting the hisba

Amery suggests that the *hisba* (the office of public inspection) should be resurrected throughout the Muslim World. He contends that throughout much of Islam's history, the *hisba* encompassed moral issues as well as those touching

more widely on everyday life. He claims that today the moral aspect of the *hisba* no longer exists, except in a few countries such as Saudi Arabia, Iran, and Sudan. (http://www.idrc.ca/en/ev-93950-201-1-DO_TOPIC.html. Date Accessed: November 2007).

Among the duties of the officer in charge of the *hisba*, the *muhtasib*, is to ensure the proper conduct of people in their public activities, including those involving resources and non-human species. For example, a *muhtasib* is expected to prevent the abuse of animals, protect and manage public land reserves, and regulate water uses (Hamed: 1993: 155 cited in Amery .Dr. H.A. Islam and the Environment (http://www.idrc.ca/en/ev-93950-201-1-DO_TOPIC.html. Date Accessed: November 2007).

Amery's proposal is linked to the idea of giving legal force to sustainable development. I consider it to be practical and viable. I suspect that his approach is influenced by his observation of the general lack of urgency and even awareness of the environmental crisis confronting the world in general.

6.4 Chapter Summary

My research indicates that Muslim governments have acknowledged the need to alter their development patterns and have endorsed the general goals of

sustainable development. Some have gone as far as adopting policies to ensure that these goals are achieved. This has been prompted, as I have suggested above, more by self-interest than a desire to conform to Islamic teachings.

Since this is a new initiative, there has not been - as far as I am aware – any evaluation or monitoring of sustainable development indicators to measure the success of sustainable development in Muslim countries. However, a number of countries have, at least, introduced measures to achieve some of the goals of sustainable development. The desalination project in Saudi Arabia (despite its drawbacks) is a case in point.

I have identified the diverse approaches of Muslim scholars who support the sustainable development concept. These include legal, moral, political and social and economic dimensions. If one examines their views, it is evident that these are contradictory in some respects but that there are also significant points of agreement between them. These will be explored below.

We noted in chapter 3 that in earlier centuries, economic growth in the Muslim World was not necessarily accompanied by environmental degradation (at least on a large scale). I concur with Mawil Izzi Dien that the advent of industrialization

(as has been demonstrated in chapter 4) is the primary cause of environmental problems - not only in the Middle East as he contends, but in Muslim countries globally - because it ignores spiritual or ethical values which are to be found within their own traditions.

Ziauddin Sardar's concept of *tazkiyyah* can be viewed as an attempt to give sustainable development an Islamic face, thereby rendering it acceptable to Muslims in general. I interpret this as his way of demonstrating that sustainable development is not alien to fundamental Islamic values and principles and should, therefore, be supported.

My own study of Islamic texts leads me to endorse Fazlun Khalid's contention that in the matrix of the *sharī'ah* there exist institutions that can deal effectively with issues relating to sustainable development. These have to be identified and applied to achieve a mode of living which is not determined or influenced by the current global trend of consumerism.

Hussein Amery advances the notion of *amānah* (trusteeship) which vests human beings with a responsibility to act as custodians of the environment. This notion needs to be actively promoted to make people more conscious of their

obligations and to encourage them to reflect on how they relate to the environment and utilize natural resources.

As for the most effective strategies to deal with the environment, these must be arrived at through consensus (*shūrā*). In this respect, Iyad Abumoghli's concept of the *shuratic* process needs to be commended. *Shura* should not be confined to the political arena but should include ecological matters because of the threat that faces humankind globally if development continues to ignore environmental concerns and the needs of the poorer sectors of society.

I support Mawil Izzī Dien's idea of reestablishing the traditional relationship between humans and the ecosystem. This is echoed by Seyyed Hossein Nasr who laments the alienation of humanity from the natural environment. The call for a nexus between human beings and the environment, I believe, should not be viewed in isolation from the appeal to infuse sustainable development with spiritual values.

Investing nature with a right to be respected as suggested by Abdur Razzaq Lubis and making damage to the environment a criminal offence as proposed by Abu Bakr Ahmad Bagader, Mustafa Abu Swayy and Hasan Zillur Rahim will, I

hope, serve to discourage practices detrimental to environmental sustainability

It is difficult to conceive that Khalid's proposal of reestablishing the traditional system of trade will achieve much success, in particular in the developed world. However, it could be considered in parts of the developing world which have not been completely absorbed by the global trading system. In my view, it is possible and should be attempted.

Khalid's preference for the term "sustainable living", I believe, must be viewed in the context of the thrust to reduce the rate of economic growth. This theme is evident in the writings of several Muslim scholars, including Zubair Hassan. In this context, Muzammal Hussain's focus on economic justice is significant.

Poverty reduction must remain a priority of policies and procedures relating to the implementation of sustainable development.

The above assessment indicates that the diverse views of Muslim scholars are not at odds as first appears and can be reconciled. They are in agreement about the need for treating the environment with greater respect, for wider consultation and for social justice. They may, of course, differ with respect to priorities but these have not been considered here.

One of the difficulties is that most of the scholars cited above live outside the Muslim World and have little or no influence on policy implementation. So while they may be invited to participate in conferences on sustainable development or contribute to development policies, and may publish on the subject, their impact on policy implementation is minimal at best. Most Muslim regimes believe that they have a monopoly on knowledge and wisdom and are resistant to advice from scholars and the citizenry in general.

While the Muslim scholars cited above have not explicitly declared that by referring to Islamic texts, they hope to encourage Muslim rulers to be more amenable to sustainable development, I suspect this was the intention of at least some of them (in particular, Sardar). In my opinion, being aware of the uncritical approach of wealthier Muslim countries to economic development, they attempted to convince Muslim rulers that sustainable development was in their own best interests in the long run. In this sense, I believe, they share Habermas' idea of knowledge-constitutive interests.

Finally, I have suggested some measures which could facilitate sustainable development. These include :

(a) endorsing what is considered globally as essential principles of sustainable development and

(b) adopting local processes to promote sustainable development.

This does not exclude incorporating elements such as the *hisbah* as suggested by Amery or the traditional trading system as proposed by Khalid in the process of sustainable development.

CHAPTER 7

CONCLUSION: SUMMARY, DISCUSSION, RECOMMENDATIONS

7.1 Summary of chapters

There are many definitions of sustainable development. However, the most common definition is the one that appears in the Brundtland Report where it is defined as '*development which meets the needs of the present without compromising the ability of future generations to meet their own needs*'. The three dimensions of sustainable development are environmental, economic and social development.

While there is general consensus about the desirability of sustainable development, there are serious problems related to implementation of its goals, including the issue of priorities for developing and developed countries.

The excessive use of environmental resources, degradation of land and coastal ecosystems, atmospheric and water pollution, poverty and disease, lack of shelter, poor education, war and conflict, are among the major factors which prevent the attainment of sustainable development goals.

The principles or indicators of sustainable development can be located in early development in the Muslim World. A survey of Muslim history indicates that the majority of rulers paid specific attention to trade, agriculture, education, health, and poverty alleviation.

However, industrialization has had a serious negative ecological impact in most Muslim countries. While Muslim leaders have generally tended to ignore ecological concerns in the past, they have begun to demonstrate an increasing interest in the discourse on sustainable development.

Muslim scholars support the sustainable development initiative in principle but differ in their approach. The infusion of ethical values, legislation, *shura* (consultation) and *hisbah* (monitoring system), and reintroduction of the Islamic trading system have all been suggested. These divergent views, though appearing to be in sharp contrast with each other, can be reconciled.

7.2 Discussion

The hypotheses adopted for this study have been proven.

Sustainable development indicators are to be found in the basic teachings of Islam and can be identified in development in the Muslim World in early Muslim

history. Muslims collectively had at their disposal vast resources, and since agriculture was the mainstay of the economy, environmental degradation did not feature as a critical issue at the time. The existence of educational institutions, health-care facilities and a state treasury which served as an instrument of poverty alleviation indicate that there was generally a strong commitment to social justice – a key factor in sustainable development.

There were, as I have indicated in chapter 3, authoritarian rulers who were driven more by self-interest than the general welfare of their populations. This, naturally, had a negative impact on overall development. The adoption of unsound economic policies also arrested development, as occurred in the Ottoman era.

Since the dawn of the twentieth century, and the introduction of a globalised industrially-dominated economy, the Muslim World began to experience a rapid depletion of key natural resources as well general environmental degradation.

Today, on the threshold of the twenty first century, the world's economy is controlled and influenced by a few economic giants, who make decisions which determine how the world uses its primary resources and who fix the prices. A number of Muslim governments have colluded with this global system by selling oil and other resources at cheap rates, under-investing in local human capital and infrastructure, and saving their surpluses in western banks so that over-

consuming Americans and Western Europeans can buy and consume the world's resources.

Muslim countries are today responsible for environmental degradation on a huge scale. One plausible explanation for this state of affairs is what Fazlun Khalid describes as the “erosion of the Muslim perception of the holistic and a withering of its understanding of the sacred nexus between the human community and the rest of the natural order”. (http://ifees.org.uk/index.php?option=com_content&task=view&id=39&Itemid=58. Date Accessed: November 2007)

Muslim rulers, having realized the significance of sustainable development, have eventually acknowledged that they have a huge challenge in meeting the goals of sustainable development. They have issued or endorsed a range of declarations in support of sustainable development. These declarations outline the major challenges of sustainable development to the Muslim World.

A careful analysis of these declarations reveal that they differ little from standard declarations though some include Islamic texts as justification. Some observers are convinced that most Muslim rulers pay lip service to sustainable development and that their adoption of the declarations is but an attempt to create a positive image of themselves. Nonetheless, a few countries have taken steps in a positive direction, in relation to aspects such as water conservation and restoration of the

indigenous vegetation. Habermas would have argued, no doubt, that they are driven more by self-interests than any other consideration.

Muslim scholars, in trying to restore the “sacred” relationship between humanity and the environment have suggested several approaches. While these are very valuable contributions, they were made in the scholars’ individual capacity and do not carry much weight.

Nonetheless, they represent a start and could contribute to blueprints for future development in the Muslim World. If pursued vigorously, their ideas could form the basis of a new paradigm of economic, ecological, social, political and cultural development based on Islamic principles and values which is one of the goals of sustainable development (Schuurman 1993).

7.3 Recommendations

I would like to make the following recommendations:

1. Representatives of Muslim governments and Muslim scholars should consider the various approaches to sustainable development *collectively* and produce a blueprint for future development. This blueprint should take into account the specific requirements of Muslim societies as well as the proposals which are

encapsulated in the writings of the Muslim scholars on sustainable development. Part of the problem, of course, is that many Muslim governments are undemocratic. In the interests of the Muslim World they should consult experts on development issues.

2. Muslim scholars and environmental activists should actively campaign for sustainable development through their writings and participation in workshops and conferences. While a body of literature on the subject is beginning to grow, it has no or little impact on the policies of Muslim countries. This situation is untenable. Sustainable development protagonists should become more vocal and continue to assert the importance of devising policies and programmes which promote “responsible” development.

3. More in-depth studies on sustainable development must be produced by Muslim researchers to increase the knowledge base of development students and specialists as well as policymakers. I am not aware that universities in the Muslim World are instituting programmes on sustainable development or encouraging students to pursue studies in sustainable development. Most of the scholars working in the field are based outside the Muslim World. The importance of investment in research on sustainable development cannot be over-emphasised.

4. A section on sustainable development must be included in the school curriculum – say under geography and/or economics – in order to create an awareness about the importance of the subject. Education about sustainable

development issues should no longer be optional but must form part of the core curriculum of schools. University departments such as geography and economics should, likewise, incorporate sustainable development as a core theme in their curricula.

5. The general public in Muslim countries must be made aware of issues relating to sustainable development, especially in matters where their involvement is critical. People have to be convinced about the importance of nature conservation, good agricultural practices, etc. This will require a massive awareness campaign. The media could be very useful in promoting awareness of sustainable development issues.

6. Muslim governments must encourage public participation in decision-making on sustainable issues not only because it is their democratic right but also because this has proven to be very effective in achieving goals. It is axiomatic that the broad goals of sustainable development cannot be achieved without public participation. Good governance, of which consultation is a critical component, is considered to be a very significant factor in promoting sustainable development. This would entail establishing a relationship of respect and trust between governments and their people – a factor which is absent in many Muslim countries. It is only when people are consulted that they would be more willing to voluntarily support state policies.

7. While striving to achieve the goals of sustainable development within their own countries, Muslim scholars, activists and government representatives must

participate in global initiatives. The negative outcomes of current economic practices impact on people globally. It requires a combined global effort to meet the challenges of sustainable development. A number of Muslim scholars are already involved in these initiatives, but a greater commitment on the part of Muslim governments to work in tandem with other countries is needed.

8. Muslim contribution to sustainable development initiatives must be tangible. Muslim governments should give strong financial support to organizations such as "Green Peace", for instance. The fact is that most countries' economies are inter-dependent, and by supporting NGO's involved in promoting sustainable development, Muslim governments will benefit as much as anyone else.

9. Muslim governments must introduce legislation relating to environmental protection, including severe penalties for violation of these regulations in the general interests of the majority of citizens. The ministries dealing with economic development, agriculture, environmental affairs, etc. should introduce policies on sustainable development. Contravention of these policies by citizens should be harshly penalized.

10. Muslim governments, organisations and individuals must establish *waqfs* (trusts) in the form of lands dedicated for agricultural research, or real estate of which the proceeds go towards financing sustainable projects and preserving natural resources. The *waqf* system has worked well in the Muslim World for centuries and continues to play a significant role in promoting education, health-care, etc in many Muslim countries. If, for one reason or another, governments

do not co-operate in the establishment of *awqaf*, NGO's can take it upon themselves to set them up. This has been done successfully in several countries, including South Africa.

11. Fulfilling the needs of the poorer sections of society in the Muslim World must be a matter of priority. They cannot be expected to appreciate the urgency of environmental conservation, for instance, if their basic needs (education, health, housing, etc) have not been satisfied. This is a perennial problem in the majority of Muslim countries. The wealthier nations among them should modify their economies to reduce environmental degradation and contribute to poverty eradication by investing in the developing world.

12. Muslim governments must establish a monitoring system to measure the implementation of policies and procedures relating to sustainable development. This could be done by the Organisation of Islamic Conference, for instance. In the absence of regular monitoring, it is virtually impossible to determine the success of sustainable development in any given country.

13. A benchmark for sustainable consumption should be established which balances the specific needs of individuals with national interests and which could serve as a basic needs index. Currently, citizens of wealthier nations generally enjoy a far higher standard of living than that of developing nations. There is an urgent need for equity; failure to address the imbalance in wealth is certain to lead to anarchy and rebellion.

14. Women should be involved in public debates on development issues since they constitute a significant work force in many Muslim countries, and have knowledge, skills and experience on development issues. The past policy of excluding women from decision-making can no longer be sustained. Women must not only be consulted; they should be given the task of driving sustainable development initiatives.

15. A paradigm of sustainable development which reflects the values of Islam and specific needs of Muslim states should be generated by Muslim scholars in conjunction with ministries of environment.

These factors represent what I believe to be fundamental to the whole process of implementing sustainable development in the Muslim World. While some countries have started to implement several of the above recommendations, others have been constrained for various reasons. In the context of the global financial crisis, I believe it is opportune for Muslim countries to reassess their current development practices and generate an alternate model of development that does not favour the rich and powerful as is the case in most countries today, and underpinned by consumerism, but is more sympathetic to the poor and marginalized, is driven by a deep sense of social justice and takes into cognizance the right of the environment to care and protection.



SECOND ISLAMIC CONFERENCE OF ENVIRONMENT MINISTERS

**Jeddah, Kingdom of Saudi Arabia
22nd-24th Zul Qi'da 1427 A.H./13-15
December 2006**

**JEDDAH COMMITMENTS FOR SUSTAINABLE
DEVELOPMENT**

ICEM-2/2006/3.3

**Jeddah Commitments
for Sustainable Development**

We the members of the Islamic Conference of Environment Ministers in the Member States of the Organization of the Islamic Conference, convened for the second session of the Conference, held under the high patronage of the Custodian of the Two Holy Mosques, King Abdullah bin Abdulaziz Al-Saud, Sovereign of the Kingdom of Saudi Arabia, in Jeddah, from 22 to 24 Zul Qida 1427A.H./ 13-15 December 2006,

- **Based on** the resolutions of the First Islamic Conference of the Environment Ministers, held under the patronage of His Royal Highness Prince Abdurrahman bin Abdulaziz, the Deputy Minister of Defence and Aviation and Inspector General, in the city of Jeddah, over the period between 29 Rabii I and 1 Rabii II 1423 A.H 10-12 June 2002;
- **Recalling** Resolution No. 11/9-E, issued by the 9th Islamic Summit Conference on the Environment from an Islamic Perspective, whereby the Islamic Educational, Scientific and Cultural Organization -ISESCO- was mandated, in coordination with the United Nations Environment Programme and all relevant international and regional organizations, to prepare an action programme representing the Islamic perception of the environment and development, to be presented at the World Summit for Sustainable Development in Johannesburg in 2002;
- **Based on** the content of the reference document which was prepared and presented by ISESCO to the Johannesburg Summit under the title of **“Islamic world and sustainable development: specificities, challenges and commitments”**;
- **Also based on the Islamic approach** calling for maintaining man's dignity and fulfilling lieutenancy on earth through good deeds, which are the cornerstone for sustainable development, as well as fostering social solidarity and servicing present and future generations;
- **Having in mind** the orientations, recommendations and outcome of :
 - The Declaration of the United Nations Conference on the Human Environment (Stockholm-1972);
 - The Arab Communiqué on Environment, Development and Future Horizons (Cairo-1991);
 - The Rio United Nations Declaration on Environment and Development, and the Content of the 21 century Agenda (1992);
 - The Earth Charter (1992);
 - First Global Forum on Environment from An Islamic Perspective (2000);
 - The Malmö Declaration, on the occasion of the First Global Ministerial Environment Forum (2000);
 - The Millennium Development Goals (2000);
 - The Tehran Declaration on Religions, Civilizations and the Environment (2001);
 - The Abu Dhabi Declaration on the Future of Environmental Action in the Arab World (2001);

- The Rabat Declaration on the Opportunities of Investment for Sustainable Development (2001);
- Resolutions of the Oman International Forum on the Environment and Sustainable Development (Muscat 2001);
- The Islamic Declaration on Sustainable Development (Jeddah 2002);
- The Outcome and Resolutions of the World Summit Conference on Sustainable Development (Johannesburg 2002).

In an endeavour to respond to the main challenges facing the countries of the Islamic world in the field of sustainable development, particularly:

- The social, economic and environmental impact of conflicts, wars and the failure of the international community to address their root causes on a basis of justice and within the framework of the relevant international resolutions;
- The increasing rates of poverty, famine and food insecurity in some Islamic countries, in addition to the pervasiveness of illiteracy, the increase in population and unemployment rates, low salaries, poor living standards, low income and mounting debts and their interests;
- The increasing rates of population growth, urban expansion, rural exodus and poor housing which deviate from the relevant urban laws and norms;
- The burden of the major environmental challenges, including climate changes as well as natural and man-made disasters, such as floods, earthquakes, forest fires, burial of harmful and poisonous waste dumped by industrial activities, chemical weapons and insecticides;
- Shortage and scarcity of water resources, low water quality, unbalanced use of underground water tables, and irrational and excessive use of waters, especially in agriculture;
- Soil and arable land degradation leading to a decrease in biodiversity, loss of many plant and animal species, and desertification in many of our countries;
- Degradation of coastal and sea environment, depletion of fish stocks, and spread of all forms of pollution that affect water, soil and air in settlements, especially in the urban areas;
- Burden of debt on many Islamic countries, which hinders the possibility to find the right opportunities and atmosphere for sustainable development;
- Inadequate sources of funding necessary for sustainable human development and capacity building, lack of integration, bilateral trade exchange and investments through an effective partnership among the States of Islamic world;
- Disproportionate performance of education and research systems in the area of keeping pace with scientific and technological progress in the world, and meeting the requirements for sustainable development and transfer of technology to the countries of Islamic world;
- Facing the challenges of globalization at the levels of economy, culture and media; and the need to preserve the Islamic original cultural and architectural heritage, consisting in archaeological sites and the cultural heritage in the fields of architecture, arts and culture;

- The nascent experience of the civil society and the lack of effective involvement in the development and implementation of strategies and programmes on sustainable development.

Based on the above, we the members of the Islamic Conference of Environment Ministers assert our resolve to work towards implementing the contents of the commitments hereunder, as well as providing appropriate means and conditions and coordinating with the competent authorities in our Member States for the fulfilment of these commitments:

Commitment I: Formulating a common, integrated Islamic strategy for sustainable development

Through the following:

- Drawing up executive strategies, reference studies, field surveys and periodic reports on environment issues in the Member States, and presenting solutions and proposals regarding environment challenges and future stakes;
- Combining efforts and coordinating positions among the Member States to create a standard regulation wherein converge the common fundamentals of national policies and plans relative to environment protection;
- Setting up an Islamic network of associations operating in the areas of the environment and sustainable development in the Islamic countries to upgrade their capacities in the area of sustainable environment, especially as relates to project development and implementation;
- Setting up the Islamic Executive Bureau for the Environment to assist Islamic countries in procuring adequate funding for the implementation of environment-related projects and programmes.

Commitment II: Fostering the efforts of peace and security and raising awareness about their role in promoting sustainable development

Through the following:

- Defusing tensions and extirpating their root causes through peaceful means and dialogue instead of conflicts and wars and armed confrontation;
- Fostering education in tolerance and human rights, and disseminating the culture of justice and peace in the Islamic world;
- Coordinating efforts and initiatives in the relevant regional and international circles to find just and equitable solutions for the issues of the Islamic world and highlight the environmental situation in Palestine in particular;
- Promoting dialogue among religions and cultures and alliance of civilizations.

Commitment III: Combating illiteracy, poverty and unemployment, and improving the quality of life for Muslim peoples

Through the following:

- Fostering technical and institutional cooperation and solidarity among the states of the Islamic world to provide an open economic system suitable to the creation of adequate opportunities for economic progress and the fight against illiteracy and poverty;
- Fighting exclusion, marginalization and unemployment, especially among the youth, women, and the socially and economically vulnerable categories.
- Catering for the population of rural areas and poor districts in cities, and affording them job opportunities through encouraging medium and small-sized enterprises;
- Preserving and developing handicrafts of great civilizational value, so that they become an economic income-generating activity and a factor in the fight of poverty and unemployment;
- Supporting rich Islamic countries and specialised Islamic funding institutions as well as encouraging investment and facilitated small-loans institutions which allow for more job opportunities, in addition to fighting unemployment, extending educational services, countering illiteracy, especially in rural areas, and providing basic infrastructure services;
- Facilitating the movement of citizens and commodities among Islamic countries (redirecting the flow of emigrating poor Muslim citizens looking for job, from the developed countries towards Islamic countries);
- Transferring debts and their ensuing interests towards funding of sustainable development projects with a view to investing them in the fight against poverty, the protection of the environment and the improvement of life quality in the Islamic world;
- Supporting the setting up and/or the energizing of partnerships among Islamic countries on the one hand, and between the private and public sectors, elected representatives, scientific research institutions, and civil society within each Islamic country, on the other, with the aim of devising and implementing programmes and plans on economic and social development at the local, national and Islamic levels;
- Providing a favourable Islamic environment likely to encourage regional and international institutions to increase investments directed to the States of Islamic world.

Commitment IV: Improving and generalizing the level of health services

Through the following:

- Promoting mutual aid and cooperation among Islamic countries to provide health care and fight epidemics and infectious diseases;

- Providing opportunities to get access to health services and welfare suitable to the individuals and communities, with special focus on children and women during pregnancy and maternity;
- Supporting the efforts being made towards the development of population health through the provision of clean water and proper food, sanitation and control of the dangers of all forms of pollution and chemical material;
- Taking interest in health education programmes through education and communication channels;
- Strengthening human capacities and scientific researches in the field of health at the Islamic level, and enhancing exchange of the relevant scientific researches and discoveries.

Commitment V: Developing educational services and supporting capacities in the field of education and transfer of technology

Through the following:

- Supporting the development of an Islamic strategy on education and literacy as an integral part of an Islamic strategy for sustainable development, in such a way as to ensure full integration of children of school age in basic and secondary education, and heightening interest in vocational and technical education;
- Developing educational curricula and creating specialties in higher education that meet the requirements of the era of knowledge-based society, labour market and the challenges of sustainable development;
- Promoting joint applied scientific research, the exchange of expertise and experiences among Islamic countries in the field of research findings and transfer of technology from and into the Islamic world;
- Supporting the development of a system of information technology through integrated Islamic initiatives, and providing suitable environment to attract investments to Islamic countries;
- Finding an effective mechanism for encouraging the private sector to engage in and support scientific research in the service of sustainable development.

Commitment VI: Supporting participation of women, the youth and civil society in Sustainable Development

Through the following:

- Promoting the role of women and the youth as key partners in sustainable development;

- Empowering women and the youth, and promoting their role in the management of public affairs;
- Redoubling the efforts being made in the field of literacy and vocational education among women and the youth both in cities and in rural areas;
- Strengthening the role and capacities of women in the implementation of income- generating activities that would improve women conditions in rural and urban areas;
- Issuing and developing legislation supporting the issues of childhood and maternity, and applying international legislation and conventions approved by the States of the Islamic world;
- Facilitating participation of committed non-governmental organizations in the efforts towards sustainable development, and providing adequate funding to implement developmental programmes and projects.

Commitment VII: Enlarging scope for democracy from an Islamic perspective as well as participation in decision-making

Through the following:

- Considering the respect for human rights and dignity, as enshrined in Islam- as a key factor in sustainable development;
- Setting up and /or strengthening an effective institutional and legislative mechanism for the respect of human rights in accordance with Islamic principles and teachings, as well as the relevant international commitments, conventions and instruments;
- Encouraging large participation and consultation to reinforce the principle of Shoura in Islam, in line with what has become to be known as good governance concerning decision-making in the economic, social and political fields;
- Commitment to transparency in the flow of information and facts, and harnessing modern communication technology to allow access to information by the majority of citizens in the Islamic world;
- Formulating Islamic reference indicators to evaluate democracy exercise at all levels in the Islamic world.

Commitment VIII: Preserving and rationalizing water resources

Through the following:

- Ensuring the right to have access to water, and preserving and developing water resources for present and coming generations;

- Protecting underground and surface waters, and ensuring good exploitation and rational utilization of these resources;
- Adopting an integrated management of water resources, including water basins;
- Adopting strategies for developing water resources and rationalizing their use, through desalination, rain harvest, recycling of used waters and encouraging more efficient and economical irrigation techniques, guided therein by the Strategy for Management of Water Resources in the Islamic World, which was adopted by the Tenth Islamic Summit;
- Developing environment legislations, in general, and legislations relating to the protection of surface and underground waters from all forms of pollution and waste, in particular;
- Promoting cooperation among States of the Islamic world for optimum utilization of shared waters.

Commitment IX: Preserving soil, land and biodiversity

Through the following:

- Developing and implementing joint Islamic projects on agricultural production, providing food and ensuring solidarity to fight famine among poor Muslim peoples;
- Fostering cooperation among Islamic countries with a view to developing agricultural researches, protecting arable lands and combating desertification and soil erosion, through setting up leading local development projects;
- Encouraging the adoption of organic agriculture methods and expanding the establishment of natural reserves;
- Expanding the establishment of national banks for seeds and genes, redoubling of projects of forestation, and preserving tree cover;
- Protecting oceans, seas and coastal environment from pollution and depletion of fish stocks with a view to preserving biodiversity and ensuring food security;
- Safeguarding the diversity of cultural heritage, using it to promote tourist sustainable and clean development in the Islamic world, as well as preserving vulnerable environmental systems such as mountains, oases, coastal and humid areas, and raising awareness about their importance in the protection of underground water resources;
- Enforcing the conventions adopted by the international community as concerns the fight against desertification, preserving biodiversity and developing cooperation among Islamic countries in the support of institutional, human and material capacities.

Commitment X: Taking interest in the quality of air, energy and the impact of climate change

Through the following:

- Encouraging joint researches and programmes, as well as the exchange of experience as concerns the ways to keep air pollution in check and reduce its effects through the development of adequate urban planning strategies inspired by Islamic architecture, identifying the different areas of land uses and programmes to control air emissions, and organizing traffic in cities;
- Facilitating access to energy for the benefit of rural and urban population as well as encouraging the use of environment-friendly renewable and clean energies, and using modern technologies to better process fuel and reduce emissions;
- Supporting cooperation among Islamic countries concerning the support to the institutional, human and material capacities, in order to benefit from the funding mechanisms and means available at the UN Framework Convention on Climate Change as well as the provisions of the Kyoto Protocol as a clean development mechanism (CDM);
- Laying down strategies and setting up projects for renewable energies and techniques for a better processing of fuel and reduction of emissions in the Islamic countries;
- Encouraging research in the area of absorption and reduction of carbon dioxide.

Commitment XI: Encouraging production and sustainable consumption

Through the following:

- Diffusing the mechanisms and techniques of safe and clean production, and making proper use of the different natural resources through adequate incentives and activities of education, media and communication;
- Supporting the promotion of sustainable consumption patterns among citizens, and industrial, commercial and tourist institutions;
- Encouraging businessmen and Islamic economic institutions to cooperate with a view to establishing a common Islamic market for environment-friendly products.

Commitment XII: Updating and enforcing special legislation

Through the following:

- Enforcing and developing environmental legislation and integration of the environmental dimension in developmental plans, including studying the environmental impact of economic and social developmental projects;

- Strengthening cooperation among Islamic countries in the measures and expertise related to the ways of prevention from natural and technological disasters, and the methods to mitigate its effects on the components of sustainable development;
- Integrating the right of people to balanced environment and sustainable development as a basic right into national laws and constitutions in the States of the Islamic world;

Procedural matters:

In order to fulfil the commitments and objectives hereinabove, action shall be made to:

- Establish the Islamic Executive Bureau for the Environment, under the presidency of His Royal Highness Prince Turki bin Nasser bin Abdulaziz, President of the first and second sessions of the Islamic Conference of Environment Ministers, and to entrust the Islamic Educational, Scientific and Cultural Organization -ISESCO- with the Bureau's General Secretariat in its Permanent Headquarters in Rabat. The Bureau shall be in charge of coordinating action among Islamic states in the field of the environment, and following up the implementation, evaluation and development of these commitments;
- Issue a referential periodic report on the situation of sustainable development in the Islamic world;
- Urge the Member States to integrate the principles and clauses of these commitments into their developmental and environmental policies;
- Develop cooperation and partnership with international and regional institutions and bodies concerned with the support of development and the preservation of the environment;
- Enforce the role of the media, universities and civil society institutions and associations to publicize these clauses and muster support for them;
- Ensure large-scale publication of the principles and contents of these commitments, and make them known in international and regional forums, meetings and conferences;
- Create adequate conditions to help the Islamic States to practically enforce the principles and contents of these commitments.

<http://www.isesco.org.ma/confSpec/MinistresEnvironnement/Documents/Jeddah%20-2nd%20session-%20final%20R%20ENG.doc>

*Abu Dhabi Declaration on
Environment
and Energy*

Date: February 3rd, 2003

“Abu Dhabi Declaration on Environment and Energy”

The Arab Ministers responsible for environment and for energy affairs, meeting in Abu Dhabi within the framework of the Environment and Energy Exhibition and Conference 2003:

Reaffirming the importance of Abu Dhabi Declaration on the future of the Arab Environmental Action 2001, the Arab Declaration on Sustainable Development 202, the Sustainable Development Initiative in the Arab Region 2002, and the importance of crystallising the Arab priorities included in these declarations into achievable programmes and projects under the umbrella of the Arab League, in co-ordination with the relevant regional and international bodies and organisations;

Noting the results of the 7th Arab Energy Conference 2002, the 7th Syrian Energy Conference 2002, the decisions of the Amman International Forum on Sustainable Environment and Development 2001, the Jeddah Declaration on Development from an Islamic Perspective, the Islamic Declaration on Sustainable Development issues, adopted by the 1st Islamic Conference 2002 in Jeddah, the decisions of the UN Conference on Environment and Development in Brazil in 1992, the Agenda 21 and the Rio Declaration and the decisions of the World Summit on Sustainable Development in Johannesburg 2002, which called upon governments, regional and international organisations and other interest parties to apply the recommendations and results of the Sustainable Development Committee regarding contribution of energy in achieving sustainable development;

Following with anxiety the growing atomic programmes of some countries in the region which do not allow the International Atomic Energy Agency, IAEA, to monitor their activities in the military and peaceful fields related to hydro-power generation, these resulting in radio-active impacts harmful to the region's population, and the wildlife and marine life due to leakage of radio-active material into ground water and the other possible trans-border effects that might affect coming generations, and also the negative impacts arising out of the use of atomic energy for power generation;

Noting the recommendations in the Arab statement on environment presented to the World Summit on Sustainable Development in Johannesburg 2002;

Calling upon the industrialised countries to fulfil their obligations towards developing countries to support and facilitate transfer of environmentally safe and sound technology for energy production, according to international treaties;

Taking into account the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol (KP), the results of the 8th Conference of the Parties (COP8) on the Framework Treaty on Climate Change 2002 and the New Delhi Ministerial Declaration on Climate Change and Sustainable Development which reaffirmed the importance of formulating the policies and procedures suitable for the conditions of each party of the agreement for the protection of climate system;

Recognising the fact that the Arab world has made a number of achievements in different and complex health, education, economic, social and environmental fields over recent years, and also recognising the problems resulting from urbanisation and increases in population and the associated growth in terms of demand for and use of energy for economic and social development, this making energy a fundamental element of development in order to achieve more growth and progress in Arab communities;

Aware of the existing challenges and opportunities and the contribution of the energy sector in achieving sustainable development in the Arab world, and the importance of oil and gas as a strategic wealth, as well as of the potential offered by renewable energy resources in the Arab world which could be utilised;

Noting that there is still scientific uncertainty related to the phenomenon of climate change and its results, and that there is no scientific confirmation that this phenomenon is primarily a result of emissions resulting from the consumption of hydrocarbon, and further noting that such unfounded allegations and doubts would make victims of the oil and gas sector and may result in a recession in world demand, thus harming the interests of producers;

Following, with anxiety the growing trends to enforce biased limitations on oil usage on the pretext of environmental protection, such trends having the capacity to have a negative effect upon revenues

arising from oil exports by the producing countries and, therefore, affecting adversely local and related-regional development opportunities;

Reaffirming the importance of using renewable energy resources and adopting environmentally sound technologies including the use of advanced and cleaner fossil fuel technologies, the sustainable use of conventional energy resources which would meet the increasing need of long range energy supplies to achieve sustainable development without obstructing opportunities for development at the regional level for oil-producing countries;

Reaffirming the commitment of the Arab oil-producing countries to make available energy resources to all countries, and stressing that their oil revenues still contribute to economic development and environmental protection in both industrial and developing countries worldwide, and further noting that they promote international co-operation by providing assistance in the form of loans and grants for development projects and alleviation of poverty in other countries;

Reaffirming the necessity of promoting financial and political support to achieve the required balance for development of renewable energies on one hand and conventional energy on the other hand, encouraging the adoption of cleaner fossil energy technologies to contribute in supporting sustainable development and avoiding any negative impact on the economies of the countries whose income depend on oil and gas;

Reaffirming that the ultimate priority of the Arab countries will concentrate on the alleviation of poverty and the achieving of sustainable development in their countries;

Aware of the significant progress achieved in universities and academic and research institutions in the Arab countries in the field of qualified personnel and state-of-the-art equipment, in addition to the potential available in the specialised applied institutions established within the energy sector and the programmes which are linked to the requirements of Arab society which have the capacity to contribute in a significant way to the development of conventional and renewable energy technologies that can serve the sustainable interests of the Arab countries;

Realising the major development made in terms of the efficiency of the environment institutions in the Arab world, and the increase in the numbers of their trained staff, the issuance of environmental legislations, environmental standards and specifications for reducing pollution, the strategies and action plans for preservation and sustainable utilisation of natural resources, the attention paid to combat desertification and the preservation of biodiversity, marine life, and water sources and quality, as well as to air quality, the quality of air, management of chemicals, hazardous waste and drainage, and promotion of clean production methods, in addition to the increasing number of nature reserves, the signature of regional and international treaties and the growing role of civil society in protecting the environment;

Applauding the growing interaction of energy and environment institutions in creating the necessary environmental conditions and specifications to guarantee achievement of sustainable development in the Arab world;

Reaffirming the necessity of encouraging the integration of Arab available energy markets, and the intensification of investment related to development of the infrastructure for available energy sources in the Arab world;

Call for the following:

- Reaffirmation of the right of the Arab countries to undertake the sustainable development of their natural resources, particularly those countries which depend mainly on revenues from the production, processing and exporting of oil and gas, as well as in the preservation of those resources to achieve sustainable development in the Arab world;
- Reaffirmation of the necessity of a continuous and unobstructed supply of oil and gas to international markets to ensure a continuity of sustainable development;

- Urging industrialised countries to adopt policies leading to reduction of differences in energy markets, in particular policies to avoid any discriminatory treatment by consumer countries on oil and gas, through the imposition of taxation or the introduction of any unfair support for other sources and types of energy, which would lead to a reduction in demand for oil and gas and harm the revenues of producing countries and their development;
- Assistance to Arab countries to mobilise adequate resources to adapt themselves to the harmful effects of climate change and harsh weather conditions, the rise of sea level and weather fluctuations, and assisting them to formulate national strategies to deal with climate change, and programmes to reduce the harmful effects of climate change in accordance with the UNFCCC.
- Continuation and promotion of efforts to reform the non-sustainable production of energy and consumption norms, through the encouragement of technological development and a rationing of energy consumption and an increasing of the efficiency of energy use in a variety of different economic and service sectors, as well as promotion of human skills and the technical capacity of the energy sector in related fields;
- Stimulation of efforts by scientific research institutes, so as to accelerate the development of cleaner production technologies for fossil energy in the Arab region and worldwide, and the development of technologies to reduce emissions related to energy use, the cessation of gas flaring associated with the production and manufacturing of crude oil, the giving of maximum strategic priority to the development of technologies to dispose of carbon dioxide gas, and taking the initiative by the delineation of a strategy for the development of technologies appropriate for cleaner fossil energy production, including the following:
 - Supporting Arab and world scientific research centres.
 - Establishment of regional and world partnerships.
 - Guaranteeing mechanisms to provide adequate funds.
 - Co-ordination between scientific centres
- Encouragement of cleaner energy related initiatives such as those related to the use of advanced technologies in oil and natural gas production, which have been reaffirmed by international conferences such as the Johannesburg Summit for Sustainable Development, and the multi-party environmental treaties and the Doha meeting of World Trade Organisation, WTO.
- Encouragement of the development of universities and academic research institutes in the Arab world, as well as co-ordination, through support both from the Arab world and globally, in the undertaking by them of research on conventional, new and renewable energy, as well as related practical applications, particularly in the field of sea water desalination, together with the establishment of links between these institutions and appropriate institutions of renown throughout the world;
- Encouragement for the production and general use of lead-free fuels which contains less sulphur, thereby reducing risks to human health and the environment, and for the promotion of the use of natural gas, wherever possible, and to develop transport strategies that include increased efficiency in terms of vehicular use of energy and use of environmentally cleaner fuels, and encouragement of participation in related global initiatives;

- Recognition of the importance of working with and co-ordinating with other developing countries so as not to accept the imposition of commitments involving quantitative commitments and commitments with relation to time on countries for the reduction of their emissions of global warming gases within the framework of UN Treaty for Climate Change.
- Urging of industrial countries to restructure their tax systems to reflect the carbon content of the fossil energy sources, and the damages resulting from atomic energy, and abolishing all aspects of subsidies provided to coal and atomic energy.
- Recognition of the importance of implementing paragraph (8) of the fourth article of the UNFCCC, which stipulates that the parties shall give full consideration to the actions necessary under the convention, including actions related to funding, insurance, and transfer of technology to countries whose economies are wholly dependent on fossil fuel production, manufacturing and export and other heavy energy related products, as well as of paragraph (3) of the second article of the Kyoto Protocol, which calls upon parties included in Annex (1): “ to implement policies and measures under this Article in such a way as to minimise adverse effects, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on other parties, especially parties that are developing countries, and, in particular, those identified in Article (4), paragraphs 8 and 9 of the Convention;”
- Reaffirmation of the right of the region’s countries affected by nuclear programmes of some countries within the region to protect their people and environment from any potential dangers to which they may be subjected, and the right to take the necessary measures to achieve this, by adopting a policy of revealing the true facts at international meetings and presenting them to world public opinion regarding operations for the disposal of toxic waste in their territories and territorial waters.
- Recognition of the importance of establishing environmental strategies for the preservation of living and other natural resources and their sustainable usage, these strategies including for determining patterns of consumption and of non-sustainable production in different sectors;
- Calling upon the industrialised countries to fulfil their commitments under the terms of international environmental treaties to devote more efforts to the development and transfer of highly sophisticated modern technologies related to the use of cleaner fossils fuels to the Arab world, by activating the financial mechanisms of the said international treaties so as to provide financial assistance for building capabilities and for the development and transfer of energy technologies, such as the Global Environment Facility, GEF, the Climate Change Fund, and the Clean Development Mechanism, CDM, and to work to integrate and apply environmental impact assessment systems wherever and whenever possible and where they are useful; in economic terms in the process of production processing of oil and gas and other sources for energy production;
- Calling upon the industrialised countries to provide compensation with regard to the economic and social damage to and losses of the Arab countries whose economies depend primarily on oil and gas production and export revenues, such damage and losses arising as a result of the measures taken by these countries within the framework of the commitments of the UNFCCC and the Kyoto Protocol;
- Paying attention to environmental awareness in the field of preserving natural resources and increasing efficiency of energy usage and consumption, through special programmes broadcast by the mass media and the introduction of the appropriate education into the school curricula;

- Reaffirmation of the importance of participation by Arab civil society in achieving goals aiming at achieving sustainability of the energy and natural resources sector, so as to ensure popular participation in the execution of policies and decisions according to each Arab country circumstances;
- Promotion of the supply of energy to rural and remote areas in the Arab world and diversification of the sources of such energy;
- Reaffirmation of the importance of executing Arab League decisions on the linking of Arab countries by electricity networks and also to work in the future so as to connect them through an oil and gas transport network wherever and whenever it is seen as being of economic value.
- Continuation of the developing and application of comprehensive environment monitoring programmes in the energy sector and the encouragement of integrated management of the energy sector.
- Establishment of an environmental database at the level of the Arab world as a whole, encouragement of exchanging information and benefiting from the Abu Dhabi Global Environmental Data Initiative, AGEDI, and other existing global initiatives and co-ordination of Arab policies in regional and international conferences and meetings related to environment and energy affairs, so as to secure Arab countries' interests in this field.
- Paying more attention to professional safety activities and monitoring work environment, and promotion of monitoring activities through co-ordination with the Ministries of Health, Labour and Social Security in Arab countries.
- Following-up the implementation of the contents of this Declaration in the regularly held meetings, and through structures for joint Arab action mechanisms and other regional structures.



The Sustainable Development Initiative in the Arab Region

Since the Rio Summit, major accomplishments have been made in the Arab Region towards the achievement of sustainable development, particularly in the areas of education, health and improved standards of living. However, a number of obstacles continue to face the Arab countries in the long-term implementation of sustainable development. Examples are the absence of peace and security, the continuation of foreign occupation in some Arab lands, poverty, illiteracy, population growth, the debt burden, the arid nature of the region, the scarcity of water resources and limited agricultural land, the moderate capabilities of the academic and research centers, in addition to the relatively recent experience of Civil Society.

Based on the Ministerial Declaration on Sustainable Development issued in Cairo on 25 October 2001, the League of Arab States adopted a comprehensive regional approach, through the Council of Arab Ministers Responsible for the Environment and other specialized Ministerial Councils and in cooperation with international, regional and Arab organizations. This approach aims at developing a regional program for sustainable development. The League of Arab States looks towards the international community to assist the Arab countries to face the challenges and the obstacles that exist in the region. The League of Arab States welcomes the readiness expressed by the international community to activate the implementation of Agenda 21, the development objectives included in the Millennium Declaration and the outcome of the World Summit on Sustainable Development.

This initiative aims at addressing the challenges faced by the Arab Countries to achieve sustainable development. It asserts the commitment of the Arab countries to implement Agenda 21 and the development objectives included in the Millennium Declaration and the outcome of the World Summit on Sustainable Development, taking into consideration the principle of common but differentiated responsibility. The initiative seeks to enhance the participation of the Arab countries with the aim of strengthening their efforts in realizing sustainable development, particularly in the light of globalization and its impacts, as well as finding a mechanism for financing the programs for environmental protection and sustainable development.

The initiative is considered as a framework for the implementation of programs and activities using the available resources in the Arab countries, in the relevant Arab regional and international organizations, and in the Arab regional and international financial institutions. The initiative will also be implemented through building partnerships with the other regions, groups and international organizations and institutions, as part of the international framework for achieving sustainable development, and with the involvement of all the stakeholders at the national and regional level, particularly Civil Society, including the media.

The initiative covers the following areas:

Peace and Security:

- Establishment of a suitable environment at the regional level to support the efforts to achieve peace and security, including the termination of occupation and elimination of threats of aggression and interference in the internal affairs of countries, based on the United Nations resolutions, the principle of land for peace and on a just and equitable basis in order to achieve sustainable development.
- Protecting the environment and natural resources of the peoples under occupation and building the economic and social structures destroyed by the occupation.

Institutional Framework:

- Supporting and enhancing the institutional framework in Arab countries in the field of sustainable development, including the development and implementation of the necessary policies and legislations.
- Supporting the efforts of the League of Arab States to establish a mechanism for addressing sustainable development at the regional level.

Poverty Alleviation:

- Supporting the plans of action and programs on the local, national, sub-regional and regional levels, particularly through financing small-sized projects and through technical and institutional cooperation, with the aim of alleviating poverty while giving the role of women due consideration.

Population and Health:

- Supporting the development of integrated population policies and improving primary health services and enhancing programs of awareness for family planning and motherhood and child care.
- Supporting the efforts for the development of population health through the provision of clean water, safe food, sanitary services and the control of chemical hazards and all forms of pollution.

Education, Awareness, Scientific Research, & Technology Transfer:

- Supporting the development of strategies and national programs for education and illiteracy eradication as a part of the strategy for poverty alleviation and also through support to the implementation of the internationally agreed upon objectives on education, including those contained in the Millennium Declaration.
- Encouraging the transfer and adaptation of the appropriate technology in the Arab region and developing the Arab capacities, and those of the institutions of scientific research and technology, to stand up to the challenges faced by the Arab region, as well as benefiting from the technical support provided by international organizations and institutions in this field and calling upon the industrial countries to fulfill their commitments on this matter contained in the relevant international agreements.

- Supporting the development of a system for information and technology through integrated initiatives and the creation of a conducive environment to attract investments to the Arab Region in this field.
- Encouraging initiatives to enhance the national and regional capacities in the field of environmental information, such as the Abu Dhabi Global Environmental Data Initiative (AGEDI).
- Encouraging the programs of Arab prizes related to environment and sustainable development such as 'the International Zayed Prize on Environment' and 'Sultan Qaboos Prize for the Protection of the Environment'.

Resources Management:

- Encouraging the integrated management of water resources, including river basins and water catchments, on the basis of international law and existing agreements. This includes the development of legislation and the maximization of benefits on upstream, middle course and the downstream of existing activities.
- Protecting water resources, including groundwater and the environmental systems of wetlands, from pollution, including supporting the efforts to develop alternative water resources and developing new sources of technology for water desalination, rainwater harvesting and the recycling and reuse of water.
- Supporting the development and implementation of national policies and programs in the field of agricultural research, in particular the agricultural methods suitable for the region and harvest technology for arid lands.
- Supporting the regional and sub-regional implementation of the United Nations Convention to Combat Desertification through the existing mechanisms in the region in order to develop and implement existing action programs.
- Calling upon the international community to support the efforts of the Arab countries to implement the strategies of the integrated management of coastal zones, putting into consideration population concentration in coastal areas in the Arab region and the importance of the regional implementation of the Global Program of Action for the Protection of the Marine Environment from Land-Based Activities and other programs within regional seas regions for the protection and conservation of the quality of the marine environment and biodiversity.
- Calling upon the international community to support the efforts of the Arab countries to achieve sustainable development in mountain areas and in afforestation and reforestation in Arab countries and in capacity building in the field of sustainable management of mountains and forests.
- Calling upon the international community to support the efforts of Arab countries to develop a regional program for the protection of biodiversity, including the establishment of a regional bank for genes and the implementation of the Cartagena Protocol on biodiversity in the region.
- Calling upon the international community to support the efforts of Arab countries to cope with the deterioration of the quality of the air in many Arab cities, including urban planning strategies, the specification of land use areas, programs of control of

air emissions and the establishment of regional and sub regional systems and networks for sustainable transport.

- Calling upon the international community to support the efforts of Arab countries to achieve sound management of chemicals, with special emphasis on hazardous chemicals and waste, through initiatives to identify national focal points for chemicals and wastes and assist Arab countries to establish national databases for chemicals and frameworks and national and regional strategies for the management of chemicals and waste.
- Supporting the promotion of mechanisms, and cleaner and safer production mechanisms and techniques, cleaner and more efficient utilization of oil and natural gas and the development of carbon sinks through afforestation.
- Supporting Arab capabilities to implement the Multilateral Environmental Agreements and their mechanisms, including technical and financial assistance from the international community.
- Calling upon industrial countries to implement their obligations under international environmental agreements through the abolition of all forms of subsidies to the energy sector in their countries, particularly those directed to nuclear energy and coal and the tax bias against petroleum products.
- Providing technical assistance to strengthen the capacities of the Arab countries, including institutional and human capabilities to effectively manage disasters, including inspection and early warning systems.

Production and Consumption:

- The promotion of the concept of sustainable production and consumption in the Arab region and encouraging the use of products that contribute to the protection of the natural resources.

Globalization, Trade and Investment:

- Calling upon the international community to support the efforts of the Arab countries to avoid the negative effects resulting from globalization on the economic, technical, environmental and social levels.
- Supporting the Arab efforts to improve inter-Arab trade through strengthening and supporting the Pan-Arab Free Trade Area.
- Strengthening the competitiveness of Arab commodities and to endeavor to abolish all forms of subsidies, assistance and barriers imposed by the industrial countries to impede the access of Arab commodities to the international markets.
- Aspiring to facilitate and speed up the accession of the Arab countries to the World Trade Organization and to enhance international efforts aiming at the diversification of their economic base.
- Creating a suitable investment environment that would be conducive to international and regional institutions to increase the investments directed to the Arab countries.

The Arab Initiative calls for the support of partnership initiatives between developing countries, as called for in the Joint AMCEN/CAMRE Declaration on Sustainable Development (Cairo 2002), between industrial and developing countries and between the states and the organizations of Civil Society and the private sector. Those partnerships are to be fair and not selective and should not include political or economic conditions.

The establishment of a program of action for this Initiative is to be based on the provisions of the Jeddah Declaration on the Islamic Perspective for Environment (2002), the Abu Dhabi Declaration on Perspectives of Arab Environmental Action (2001), the Oman Declaration on Environment and Sustainable Development (2001), the Abu Dhabi Declaration for Agricultural Development and Combating Desertification, the General Framework of Islamic Agenda for Sustainable Development (2002), and the outcome of the Amman International Forum on Environment and Sustainable Development (2001). It will also take into consideration the outcome of the relevant international and regional conferences and symposiums, such as the Dubai Declaration on the Integrated Management of Water Resources in Arid Zones (2002) and the Muscat Declaration of the Oman International Conference for the Development and Management of Watercourses (2002).

Priority is given to three areas in the implementation process, with projects currently being identified in cooperation with the relevant Arab and regional organizations under the program on the integrated management of water resources, the program on land deterioration and combating desertification and the program on the integrated management of coastal zones and marine resources. The three programs and projects will be ready for adoption by the regional mechanisms at the end of October 2002.

General Framework of Islamic Agenda for Sustainable Development

* * * *

Based on the specialized studies examined by the First Islamic Conference of Environment Ministers held in Jeddah, which reviewed the major challenges faced by the Islamic world in the field of sustainable development, materialized mainly in the poverty, illiteracy, accumulation of foreign debts, degradation of economic and social conditions, disilibrium between population growth and available natural resources, the weakness of technical capabilities, the lack of expertise and skills in environment management, along with the negative impacts left by regional conflicts, foreign occupation of parts of its land and despoiling of its resources, one may chart out the general framework of an Islamic agenda liable to help overcome these obstacles and lay down sturdy foundations for cooperation among the Islamic countries to achieve sustainable development, with a view to being submitted to the World Summit on Sustainable Development in Johannesburg.

The agenda revolves around the following axes which could be translated into field projects and activities, in cooperation with regional and international organizations :

I- Economic growth :

Achieving a level of economic growth enabling the Islamic countries to bridge the gap between them and developed countries by means of mobilizing the available energies, especially through :

- 1- Stimulation of investment in highly profitable sectors.
- 2- Capacity-building in the field of research and transfer of technologies in the following fields :
 - a) Supporting the capabilities of academic and research centers in the Islamic countries, especially with regard to programme development and promotion of priority research facilities.
 - b) Facilitating access to modern information and communication technologies which open new vistas for rationalization of Islamic countries' resources.
- 3) Achieving food security and promoting plant and animal resources in Islamic countries.
- 4) Supporting new partnership for economic development of African countries.
- 5) Developing control mechanisms to ensure flexible management of short-term capital influx, in compliance with the objectives of sustainable development in developing countries.

II- Poverty eradication :

As part of endeavour to eradicate poverty in the Islamic world, the following programmes should be particularly supported, namely :

- 1- Creating employment opportunities through encouragement of the establishment of small and medium-sized enterprises.
- 2- Initiating programmes for vocational training and technical education to step up efforts of literacy and eradication of poverty.
- 3- Promoting Islamic solidarity and mutual support.
- 4- Facilitating access to small, preferential loans to fund local development projects and raise the income of poor families, especially in the countryside and the remote areas.
- 5- Associating local community, and populations in general, in the identification of the needs and the drafting, implementation and evaluation of action programmes.

III- Population and urban development :

Elaborating an integrated population policy striking fair balance between population growth and population characteristics and redressing the imbalances between the towns and the countryside, by means of :

- 1- Drawing up and implementing strategies for countryside development focussing on the most disadvantaged areas.
- 2- Preparing Agenda 21 Programmes and implementing them at the local level.
- 3- Controlling indecent, random housing.
- 4- Developing the infrastructure of the periphery, promoting them and adopting suitable approaches for appropriate development of population agglomerations.

IV- Health and environment :

- 1- Supply of food and adequate potable water.
- 2- Treatment of sewage and hard wastes, and securing their safe recycling.
- 3- Controlling the potential risks resulting from all types of pollution.
- 4- Safe management of toxic, dangerous and radioactive wastes.
- 5- Controlling the use of chemicals.
- 6- Fighting propagation of epidemics and diseases and ensuring basic health care services as part of the initiative of health for all.
- 7- Generalizing assessment of environmental and health impacts of development projects.

V- Natural resources:

1- Water :

- a) Harnessing available water resources, drawing up programmes for their rationalization and exploring new water potentials, including rainwater and non-conventional resources.
- b) Developing desalination techniques and generalizing them to reduce production costs.
- c) Enhancing the legal and technical aspects of water consumption rationalization.
- d) Publicizing success stories in the fields of sanitation and safe processing and recycling of waste waters.
- e) Setting up complementary projects among Muslim countries to help meet their needs in few years.
- f) Securing fair management of natural and biological resources.
- g) Adopting new measures to combat arsenic pollution of ground waters.
- h) Adopting a common stand on water shares of lower river countries in international river waters.

2- Forests and biodiversity :

- a) Setting up an Islamic center for exchange of information on biodiversity.
- b) Taking out an inventory of all plant and animal species in the Islamic world.
- c) Managing joint natural reserves shared by the Muslim countries.
- d) Enforcing the laws on natural reserves and adapting them to fit the commitments of the Islamic countries under relevant international agreements.
- e) Initiating local development projects benefitting to populations residing in the vicinity of forests, to encourage them to rationalize forest resources.
- f) Supporting Islamic countries to prepare and implement national and sub-regional strategies and plans to preserve biodiversity and reduce desertification effects.

3- Combating desertification and alleviating drought effects :

- a) Launching pilot projects on local development to reduce the effects of desertification.
- b) Setting up a comprehensive strategy for identification of sites threatened by desertification in the Islamic countries.
- c) Establishing joint geographical data bases and early-warning systems to monitor desertification.
- d) Supporting Islamic countries to prepare and implement national and sub-regional strategies and plans to combat desertification and alleviate drought effects.

4- Energy and Climate Change:

- a) Developing strategies for the cleanest and most suitable energy production systems fit for energy consumption.
- b) Conducting a comprehensive survey on Islamic countries' capabilities in terms of harnessing solar, water and wind energy.
- c) Establishing renewable energy projects in the Muslim world.
- d) Conducting a study on impact of green house effect on Muslim countries, especially on the health.

5- Coasts and sea water:

- a- Training manpower in emergency intervention in the event of sea pollution with hydrocarbons and chemicals.
- b- Conducting a study on fragile coastal areas in Islamic coastal countries and ensuring their safety.
- c- Developing plans to direct population concentration and economic activities to ward off adverse effects on fragile coastal areas.
- d- Preventing evacuation of untreated sewage and liquid industrial wastes into sea waters.

VI- World Trade and Globalization :

- 1- Training enterprises in the Muslim world to improve their competitiveness and penetration of world markets and promoting trade exchange among Muslim countries.
- 2- Formulating a guide for Islamic countries to environment norms and quality standards to enhance the competitiveness and quality of Islamic countries' products.
- 3- Sustaining international efforts to reform the world financial system and make it more transparent just and comprehensiveness to help Muslim countries take an active part in the global commercial activity and face the challenges posed by globalization.

VII- Legal and Institutional Aspects of Environment :

- 1- Conducting a comparative study on Islamic countries' environmental laws and conferring an Islamic character on their contents.
- 2- Making Islamic countries' environmental laws consistent with their commitments under related international conventions.
- 3- Training human resources in environmental law enforcement.
- 4- Strengthening and supporting the legal framework of governmental institutions in charge of environment.
- 5- Creating environmental associations network to coordinate their activities and programmes.
- 6- Supporting local and regional non-governmental associations operating in the field of environment protection.

VIII- Involvement of civil society :

- 1- Encouraging involvement of the civil society in the elaboration and implementation of strategies and plans destined to sustainable development and environment protection.
- 2- Encouraging the establishment of civil society organizations and drawing up legislations promoting their participation.

IX- Awareness-raising, education and information programmes :

- 1- Incorporating the component of environment from an Islamic perspective in general education curricula.
- 2- Establishing coordination networks between Islamic countries' universities and governmental institutions to exchange experience in environment and sustainable development-related training and scientific research.
- 3- Exchanging radio and television programmes on environmental awareness in Islamic countries.
- 4- Holding training sessions for literacy personnel to incorporate the environmental component in literacy programmes.
- 5- Training media specialists in environmental awareness-raising.
- 6- Organizing media campaigns to enhance population behaviour and attitude towards environment and health, capitalizing on Islamic teachings in this connection.

X- Achieving peace and security :

- 1- Developing programmes and plans to promote justice-based peace culture in the Muslim world, contributing thereby to the promotion of global peace.
- 2- Formulating programmes to highlight the importance of terminating foreign occupation and establishing peace and security in the sustainable development process.
- 3- Sustaining efforts to define terrorism and highlight its difference of resistance-fighting of foreign occupation as admitted by international rules, regulations and customs.

XI- Funding :

- 1- Developing environmental programmes likely to induce financing provided for in environment-related international conventions.

- 2-** Benefiting from opportunities offered by Islamic financing institutions and the Islamic Environment Fund to carry out environment-oriented programmes in the Muslim world, including institutional support programmes and capacity-building of environment protection authorities.
- 3-** Harnessing local financial resources with utmost rationalization and gearing them to specific priority objectives.

Report on ISESCO Efforts in Environmental, Health and Population Education

Introduction

In view of the increasing importance that the international community grants to the issues related to environment, health and population and of their crucial role in achieving sustainable development; and being convinced of the necessity of endeavouring to develop environmental, population and health education - both at the theoretical and the practical levels- so that each individual may benefit from it as part and parcel of his general culture and as an orientation guiding his behaviour and protecting him against the hazards of an unbridled development that is not governed by any ethical values or human virtues and that is only seeking to achieve material profit, the Islamic Educational, Scientific and Cultural Organization has been, since its inception, focusing its attention and care to address these crucial issues and help the Member States find the appropriate solutions, in keeping with the relevant resolutions adopted by the General Conference and the Executive Council. This care has been particularly more evident in the orientations and contents of the cultural strategy for the Islamic World, the strategy for the development of science and technology in the Islamic countries and the 2001-2009 mid-term plan. It was even more concretely obvious in the quality and quantity of programs and projects related to environment, health and population contained in the previous 1998-2000 action plan, and in the present 2001-2003 three-year action which innovated by following a new methodology consisting in adopting a comprehensive approach to deal with environment, health and population issues that takes into account the intrinsic link and complementarity existing between these issues and their direct impact on sustainable development on the one hand and consecration of the Islamic point of view in handling these issues on the other hand, in a way that highlights the Islamic culture's distinction and pre-eminence in the fields and enables the Islamic Organization to disseminate the voice of the Islamic world in specialized international forums and impact on the related decision-making in a way that conforms to Islamic values and ethics.

General Objectives

Based on the Islamic Organization's point of view which has both a global and Islamic perspective regarding the issues of environment, health and population, the following objectives were set in the Organization's activities in these fields:

1. Raise awareness on the issues of environment, health and population and promote them as part and parcel of the general culture of all segments of society, guiding their behaviour and their relationship with their natural and health environment, to preserve and protect natural resources, rationalize their use, promote the prevention against diseases and epidemics and adopt a wise and sound approach toward birth control issues.
2. Consolidate health, environment and population education in both formal and informal education institutions, by incorporating related concepts in education curricula, in accordance with the Islamic world specificities and train specialized human resources in the field.
3. Disseminate knowledge about the Islamic point of view on issues of environment, health and population, emphasize the values of Islam and its pre-eminence in addressing these issues and underscore the conformity of Islamic education and culture with modern times in their approaches to environment, health and population issues
4. Strengthen international cooperation and partnership among the Member States through the exchange of experience and expertise and encourage pioneer experiences as regards developing environment, health and population education, especially concerning the monitoring of the environment situation and control of natural hazards.

Environment, Health and Population Activities carried out at the Initiative or with
the Participation of ISESCO

The Islamic Educational, Scientific and Cultural Organization has carried out a series of activities, programs and projects related to environment, health and education, as part of its successive action plans and cooperation programs with Arab, Islamic and international organizations and bodies, including the United Nations Environment Program (UNEP), the United Nations Fund for Population Activities (UNFPA), the World Health Organization (WHO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Arab League Educational, Cultural and Scientific Organization (ALECSO), the Islamic Organization for Medical Sciences and the Islamic Population Studies and Research Centre of Al-Azhar University. These activities encompassed a series of colloquia, experts meetings, workshops, local and regional training sessions, publication of scientific studies and research works. Furthermore, the Islamic Organization has taken part in several international specialized conferences and encounters held by other organizations.

1. Major International Conferences and Colloquia

Since 1998, ISESCO has organized or taken part in several international conferences dealing with environment, health and population issues both inside and outside the Islamic world, the most important of which are:

- International conference on population and reproductive health (Cairo, February 1998)
- African Forum on solar energy (Bamako, March 1998)
- Sixth Arab conference on solar energy (Oman, April 1998)
- Consultative meeting held in parallel to the international conference on forests (Geneva, August 1998)
- Energy conference (Bahrain, November 1998)
- Sub-regional meeting on Geological Parameters for Environment Protection (Bamako, December 1998)
- First world Forum on Environment from an Islamic perspective (Jeddah, October 2000)
- International Seminar on combating desertification (Chad, October/November 2000)
- Conference of Governmental Experts in charge of sustainable development (Tunis, March 2000)
- International conference on Geo-environment (Oman, March 2000)
- First international conference on energy and water desalination (Tripoli, June 2000)
- Coordination meeting between the United Nations Environment Program and the department of meteorology and environment protection of the Kingdom of Saudi Arabia (Rabat, 2000)
- Fourth international conference on sciences, development and environment (Cairo, March 2001)
- Forum on development of renewable energies in the Mediterranean basin (Marrakech, May 2001)
- International seminar on cities in the face of energy and environment challenges (Lebanon, September 2001)
- Meeting of Arab countries environment ministers (Cairo, October 2001)
- Regional session on renewable energy at the service of development in the rural world (Cote d'Ivoire, November 2001)
- First preparation meeting of Islamic ministers of environment (Rabat, January 2002)
- World conference on globalisation effects on health and social care in Islamic countries (Kuwait, March 2002)
- Sub-regional meeting on geological parameters for environment protection (Bamako, March 2002)

- Meeting to prepare the summit conference on sustainable development (Indonesia, May/June 2002)

2. Experts meetings, training sessions and workshops

- Experts meeting on ocean environment and bio-diversity (Tripoli, June 1998)
- Regional workshop of officials in charge of Islamic education in population education fields (Amman, September 1998)
- National session on the use of renewable energies (Tehran, October 1998)
- Regional workshop on protection of underground water (Burkina Faso, October 1998)
- Experts meetings on bio-diversity (Tunis, November 1998)
- Competition of children's drawings on environment protection (ISESCO's headquarters, 1998)
- International conference on family education in the light of Islamic teachings (Mecca, May/June 1999)
- Regional training session on incorporation of a pilot program of population education from an Islamic perspective in teaching curricula (Damascus, September 1999)
- Regional training session on incorporation of a pilot program of population education from an Islamic perspective in teaching curricula (Benin, September 1999)
- Regional session on environment protection and preservation of natural resources (Tunis, October 2000)
- Regional session on water resources management (Cairo, November 2000)
- Regional experts meeting to prepare ISESCO course on Islamic education in formal and informal education to incorporate population concepts (Cairo, April 2001)
- Study session on environment and health from an Islamic perspective (Syria, July 2001)
- Regional seminar of women leaderships on reproductive health and gender in the Gulf and Middle East countries (Yemen, July 2001)
- Regional workshop of Islamic education experts to incorporate issues of reproductive health in Islamic education curricula (Rabat, September 2001)
- Regional meeting of managers and broadcasters of cultural and religious programs in Arab satellite television channels on population and reproductive health issues and gender (Cairo, September 2000)
- Regional workshop to incorporate reproductive health and gender issues from an Islamic perspective in pre-university education (Tunis, November 2001)
- Session on environmental and health education from an Islamic perspective in French-speaking countries (Cote D'Ivoire, May 2002)

- Contest of children drawings on environment protection

3. ISESCO publications in environment, health and population

Within the framework of its successive plans, ISESCO has published, in its working languages, several books, studies and research works dealing with environment, health and population issues, including the following ones that were published in the period running between 1998 and end 2001.

- Use of solar energy and wind energy in rural and remote areas
- Teacher guidebook on water resources management
- Study on earthquakes control in Indonesia
- Study on floods control in Bangladesh
- Study on environment issues in the Koran and the Sunnah
- Study on environment: analysis of some issues from an Islamic perspective
- Study on rain water storage
- Study on the use of saline water in farming
- Study on the effects of waste on marine environment
- Study on some environment aspects in Maghreb Arab countries
- Study on tele-detection
- Solar energy
- New and renewable energies
- Course on renewable energies - Bachelor level
- AIDS prevention from an Islamic perspective
- Model of population education school program from an Islamic perspective
- Health prevention against Malaria
- Manual of incorporating environment concepts in pre-university curricula
- Simplified guidebook on population concepts, demographic situation and population issues in the Islamic world
- Health prevention against drugs
- Publication of posters and brochures to promote awareness about rational use of water

Future Plans: In accordance with the Islamic organization's charter which calls for the dissemination of educational, scientific, technical, cultural and human values to face the serious stakes accompanying modern times, and based on the orientations and contents of the 2001-2009 mid-term plan and on the strategy to develop sciences and technology in the Islamic countries, which both grant a special importance on environment, health and population issues, the Islamic organization has incorporated in its present 2001-2003 three-year plan inter-disciplinary axes shared between educational, scientific and cultural specialties to deal with these issues in a comprehensive manner within the framework of sustainable development. ISESCO is likewise resolved to conduct more activities and projects

related to the preservation and protection of environment, and consolidate health education to protect humans and natural environment in its future plan for 2004-2006.

Among the axes that have a close link with the fields of environment, health and population which the Islamic organization is implementing, the first axis deals with health and environment education and culture, the second axis is related to population education and culture and the Islamic perspective while the third axis is about the preservation and management of natural resources.

Environment and health education :1Axis

Environment and health education is now one of the priority issues being addressed in all societies in view of its direct impact on the health of the individual and society at large. This is why the Islamic, Educational, Scientific and Cultural Organization has given special consideration to this axis in its action plans and devoted for it several programs and activities that concentrate on making clear the Islamic perception of environment and health education in cooperation with the World Health Organization and the United Nations Environment Program. ISESCO has also published several booklets on health issues such as health prevention from Malaria, health prevention from AIDS and prevention from drugs in cooperation with several specialized regional and international organizations. It has also participated in the publication of a book on health education for teenagers together with the World Health Organization and the Islamic Organization for Medical Sciences. Furthermore, ISESCO has also published research papers presented at the symposium on the incorporation of environmental concepts in pre-university education programs and printed folders and posters on the rational use of water, prepared posters on AIDS, Malaria and drugs and held an international conference on environmental education from an Islamic perspective. The Islamic organization will pursue its efforts under this axis in order to encourage the individual within the school and the society at large safeguard his own future and the future of others. Given the complementarity of views in relation to education, culture and sciences in dealing with the environmental and health issues, there will be coordination between the directorates concerned with the implementation of programs and activities scheduled under this axis.

1. For a purposeful health education

To achieve the above-mentioned objectives, complement the efforts made by ISESCO in the field under its previous action plans and based on the findings of activities evaluations, the Islamic Organization is elaborating a guidebook on incorporating health education in the curricula of formal education and the programs of informal education. The guidebook will be laying a special emphasis on

two matters; first, Islamic guidance in relation to health; second, incorporation mechanisms either by introducing separate subjects or using materials carrying health concepts and information. ISESCO will also hold regional workshops to enable schools plan and carry out health programs in the surrounding environment in order to activate the school's role inside its own social environment and support health projects to be implemented by schools in the Member States.

2. Environmental Education is the foundation

of an Effective Development

To reaffirm ISESCO'S achievements in the field of environmental education, and in order to complement efforts of organizations, institutions specialized in environment, the programme will promote environmental education through curricula and staff training. Therefore, a book on environmental education from an Islamic perspective will be translated and published into English and French. Similarly, regional workshops are held on the incorporation of environmental education in the education curricula at various levels with particular emphasis on informal education institutions and programmes, observe the successful experiments in environment education, prepare and publish reports thereon and proceed with the organization of ISESCO's day for the protection of water, that has been launched under the previous action plan.

Population Education : 2Axis

Population concepts have, over the past few years, generated a growing interest by societies, governments, international and regional organizations, as well as by non governmental organizations and civil society organizations, given its close link with faith and religious values, as well as all aspects of life, including education, health, environment and development. Given the paramount importance of sound awareness about population concepts, the Islamic Organization has under its successive action plans, devoted a special axis on population education, in order to address, from an Islamic perspective, a number of population issues and concepts. In this respect, ISESCO took part in many activities, edited a number of books on reproductive health, human rights in Islam, women's rights in Islam, incorporation of population programmes in education curricula, preparation of a pilot programme on population education, population concepts and democratic status and population issues in the Muslim World. Likewise ISESCO held several sessions, workshops and conference on clarifying and incorporating population concepts, from an Islamic perception, in educational programmes. To further complement those efforts, ISESCO will, through this axis, promote population education in society in compliance with Islamic principles and the specificities of the Islamic civilization.

1. Population Education and Comprehensive Development

Action under this programme is conducted to complement other specialized subjects, while focussing on the educational and cultural dimensions of population and development issues. In this respect, ISESCO encourages the conduct of studies on population characteristics in the Member States and their impact on development. It is preferable here, to select the state that best represents each one of those population characteristics. For instance choice will be made of the State suffering from population increase, another one from population imbalance, a third one representing a migrant repulsive State while a fourth one would represent a migrant attractive State and so on. National and regional workshops are also held on ways of harnessing population characteristics to contribute to comprehensive development. Likewise, material and technical support is provided for holding national workshops for the benefit of population education counsellors, with special emphasis on the Islamic orientation.

2. Population Education and Islamic Specificities

This programme focuses on elaborating and reasserting the Islamic perception of population concepts and issues. It is based, in particular, on the reservations voiced by the Islamic countries at the Population conference in Cairo. To this end, and under the present programme, a comparative study is underway on population education in the Islamic countries and other countries. Regional workshops are also held, assembling senior officials in charge of Islamic education curricula, in order to incorporate information about population concepts and issues in Islamic education curricula. Similarly, support is given to hold national workshops for the benefit of technical supervisors, in order to make clear Islam's point of view on population issues and disseminate a population culture that complies with Islamic values.

Conservation and Management of Natural Resources :3Axis

Under the ISESCO's successive Action Plans, efforts have always been devoted to the conservation, management and sustainable exploitation of natural resources. International, regional and national conferences and meetings were organized with other organizations like UNESCO, the French-Speaking Energy Institute (IEPF), DAWA association, the International Energy Fund (IEF), COMSTECH, the Third World Academy of Sciences (TWAS) and the International Francophony Organization, etc. to exchange knowledge and information on various important issues such as desertification control, forestry, bio-diversity, etc. Appropriate human resources were developed through various training courses in various important areas such as environment protection, urban management and natural resource conservation. The publication of studies like "Environmental Aspects in the Maghreb Countries", "Flood control in Flood Plain country", and "Earthquake Monitoring" and books like "Flora Biodiversity in Iran", proceedings of regional

seminar on "Biodiversity Conservation under the previous 1998-2000 three-year action Plan" contributed towards better management of and protection against natural disasters. Cooperation meetings with international partners such as expert meeting on "Ocean Environment and biodiversity" in Libya (June, 1998) and "Biodiversity" in Tunisia with the Arab League Educational, Cultural, and Scientific Organization (ALECSO), sub-regional training seminar on "Geological Parameters for Environment Protection" in Mali with UNESCO in 1998 and regional training course on "Environment Protection and Conservation of Natural Resources" in 2000 in Tunisia has enabled to tackle important issues.

The outcome of important meetings like the International Seminar on "Combating Desertification" held in October 2000 in Chad and the international conference on "Geo-environment 2000" held in March 2000 in the Sultanate of Oman have provided ISESCO with a new dimension in the implementation of programmes in the Member States. ISESCO will carry on its efforts in the conservation and the management of natural resources, examine and analyse the harmful effects of human activity on environment at various forums and enhance the knowledge and expertise related to the management of natural disasters through various training programs. Topics like destruction of green spaces, deterioration of the built-up environment, deterioration of coastal regions, industrial hazards in the urban context and atmospheric pollution will be considered as a priority. Advanced technologies and equipment will be introduced to further strengthen the capacities of the Member States in these areas.

1. Conservation and management of natural resources

ISESCO will carry on its efforts to strengthen the knowledge through the organization of seminars on preserving and managing natural resources, desertification control, forest management, bio-diversity, marine resources, etc. National workshops on important environment issues as per needs of the Member States will be organized in various regions on a regular basis. Latest information on new management techniques will be published and disseminated widely for sustainable development in the Member States. The information on new methods for environment protection and natural resources conservation will also be disseminated.

2. Environment monitoring and coping with natural disasters

ISESCO will intensify its programs on environment monitoring and coping with natural disasters through the organization of regional seminars. This will enable to develop suitable strategies and programs to this end. The technical assistance and equipment support to Member States will also be initiated to enable them to cope with natural hazards in a better way. The understanding of the latest knowledge will

be enhanced through preparation and publication of studies on state-of-the-art technologies and suitable equipment on coping with natural hazards. Training will also be offered to better cope with natural hazards.

3. Environment protection and wide dissemination of related programs and guidelines

Within the framework of this inter-disciplinary program, ISESCO will enhance its efforts in the protection of the environment through the organization of regional conferences and seminars on environment protection. The know-how of the concerned staff will be enhanced through organizing national training courses and workshops on various issues related to environment protection. ISESCO will also publish and disseminate information and appropriate material to promote environment protection.

http://www.isesco.org.ma/pub/Eng/Sust_Dev/P8.htm

Islamic Declaration on Sustainable Development

The First Islamic Conference of Environment Ministers held in Jeddah, on 29 Rabia I - 1st Rabia II, 1423 A.H. corresponding to 10-12 June 2002 A.D,

- Recalling Resolution 11/9- E issued by the 9th Islamic Summit Conference on environment from an Islamic perspective, whereby the Islamic Educational, Scientific and Cultural Organization- ISESCO- was mandated- in cooperation with the United Nations Environment Programme and all relevant international and regional organizations- to prepare an action programme representing the Islamic perception of environment and development, to be presented at the Earth Summit in Johannesburg, in 2002;
- Having taken cognizance of the results arrived at by the First World Forum on Environment from an Islamic perspective, held in Jeddah, Kingdom of Saudi Arabia, on 26-28 Rajab 1421A.H/ 23-25 October 2000, and the Jeddah Declaration issued by the Forum, the Abu Dhabi Declaration on the Future of Environment Action in the Arab World (2001), the Rabat Declaration on Investment Opportunities for Sustainable Development (2001), as well as the Tehran Declaration on Religions, Civilizations and Environment (July, 2001) and the Resolution of Oman Forum on Environment and Sustainable Development (Muscat, December 2001);
- Recalling further Resolution 11/28- E on Environment from an Islamic Perspective adopted by the 28th Islamic Conference of Foreign Affairs Ministers (Session of Peace and Development), held in Bamako, on 4-6 Rabia II 1422 A.H/ 25-27 June 2001, which affirmed the afore-mentioned resolutions and tasked the Islamic Educational, Scientific and Cultural Organization to make necessary contacts with

OIC Member States and regional and international organizations with a view to holding the First Islamic Conference of Environment Ministers;

- Referring to the Arab Declaration on sustainable development issued by the Arab Environment Ministers (Cairo, October 2001), and the African Ministerial Declaration on Sustainable Development (Nairobi, November 2001) as well as the Joint Ministerial Declaration by the Executive boards of the Arab and African Councils of Environment Ministers;

- Committed to the Islamic approach built on promotion of man's dignity and achievement of his lieutenancy mission on earth through good deeds that conduce to sustainable development, foster social solidarity, raise the care to orphans and the have-nots, induce edification of civilization without any plundering or dilapidation and affirm the organic relationship between man and the earth in terms of existence and development;

- Supportive of the regional and international efforts exerted to promote the standard of the life of all humans through sustainable development of all social, economic, cultural, environmental and health aspects, the ultimate purpose being to achieve a decent human life in a sound environment;

- Keeping in line with the general orientations embedded in the comprehensive study prepared by the Islamic Educational, Scientific and Cultural Organization on environment, health and sustainable development, as part of contribution to the Earth Summit due in Johannesburg, on 26 August - 4 September 2002;

Proclaims the following:

Article 1: Honour bestowed on man

Man is the lieutenant of Allah on earth. He is mandated to build civilization and held responsible for the harnessing and protection of environment. The Muslim, in particular, is duty-bound to take care of the environment, in the general acceptance of the term, and to make every personal and possible effort to achieve sustainable development for the general well-being of each and everybody.

Article 2: Responsibility of man

Indeed, the most beloved by Allah are the pious and the charitable, and the most hated by Allah are the one who wreck havoc in earth. Charity is every good deed that benefits to people and takes care of the environment in which they live. It may be an act of social solidarity, a contribution to the restoration of peace and security or the eradication of poverty and unemployment, in a bid to achieve justice and equity through collective participation in the development enterprise, motivated by religious, cultural and humanitarian drives.

Article 3: Environment from an Islamic perspective

The environment is a gift donated to man by Allah. Therefore, individuals and communities are, all, duty-bound to take care of it and promote all its natural resources, including air, climate, water, seas, flora and fauna, and refrain from any act likely to cause pollution or damage the eco-system or disturb the balance thereto.

Article 4: Human right to environment

The right to education and to a decent life shall be recognized as well as the right to a sound, hygienic environment. The State and the society shall secure these rights to enable the individual to fully enjoy his humanness and contribute to the sustainable development of his community. Women shall also be recognized as full partners in the sustainable development action.

Article 5: Major constraints of sustainable development

Despite the significant progress made during the period of after the Rio Declaration, in the field of environment and sustainable development in the Islamic countries, there still exist some constraints facing many of those countries in adopting sustainable development plans and programmes, chief among these constraints are :.

a- Poverty is responsible for many health and social, as well as psychological and moral problems. The local, national and international communities need to devise development policies and plans for economic reforms in order to address those problems, by offering job opportunities, ensuring natural, human, economic and educational development of the poorest and most underdeveloped regions, and eradicating illiteracy.

b- Debts: Public debts, natural disasters, including drought, desertification and social backwardness resulting from ignorance, diseases and poverty all constitute the major constraints that stand in the way of successful sustainable development plans and adversely affect poor communities most particularly and the international community at large. Everyone is duty-bound to be supportive, in order to surmount these difficulties and spare humanity these hazards.

c- Wars, armed conflicts and foreign occupation, which have a harmful effect on environment and environmental safety and necessity to lay down legislation and commitments that forbid and penalize polluting the environment or cutting trees or exterminating animals; and observing the principle of dignity in dealing with prisoners according to international law, and not maiming the death or destroying houses or civil facilities or water sources.

d- Over population, particularly in cities of developing countries and the deterioration of living conditions in shanty towns and an increase in the demand for resources, health and social services.

e- Deterioration of natural resources basis and their continuous over utilization to bolster local production and consumption patterns which add to the depletion of natural resources and hampers sustainable development in developing countries.

f- Absence of modern technologies and technical expertise necessary for the implementation of sustainable development programmes and plans.

g- Insufficiency of expertise necessary for Islamic countries to allow them to fulfil their commitment towards world environmental issues and to participate with international community in the efforts designed to work out solutions to those issues.

Article 6: Twenty-first century challenges

a- Secure funding sources necessary for sustainable development in developing countries and commit industrialized countries to stepping up support to developing nations (to stand at 1,5% of GNP).

b- Elaboration of developmental, health and educational programmes for the least developed countries for state, local, regional and national communities, as well as relevant organizations share responsibility, albeit in varying degrees, in elaborating . They are also required to help care for childhood and motherhood, build infrastructure and facilities, by financing sustainable development programmes and by designing active political plans in this area. The qualification and competence of all those parties are gaged in the light of services they extend in these vitally important fields, as well as in the light of the consideration they give to developing programmes for developmental action at the governmental, community and institutional levels.

c- Achieving complementarity and promoting internal and foreign investment by putting in place genuine partnership between advanced countries and developing countries and by offering better and greater opportunities for their products to compete in local and world market places through the World Trade Organization.

d- Finding out novel funding means to boost development efforts of the developing countries.

e- Transfer of environment-friendly technology, encouraging research workers and scientific action as they constitute some of the prerequisites for enhancing developmental action, including raising greater awareness about scientific thinking and research in the fields of sustainable development, developing working means in this area and consequently helping society move to advanced levels of development and progress with greater speed and less cost.

f- Preservation of the civilizational heritage given its cardinal role in sustainable development, for it contributes to entrenching the cultural identity, preserves its specificities, protects it from melting, helps shape an independent personality of individuals and groups, provides a powerful impetus to the developmental action to defend the national and religious personality and safeguard the common future, and stresses the spiritual and moral dimensions advocated by the heavenly religions has a positive impact in respect of pushing development towards the good, righteous deeds and social solidarity.

g- Highlighting the prejudice caused to Islamic countries as a result of the measures taken by the international community to face world environment issues and the international community's responsibility in providing assistance to affected Islamic countries.

h- Securing full and effective participation of the developing countries in decision-making and shoring up their presence at international economic institutions, rendering thereby the mechanisms of global economy more transparent, equitable and respectful of the rules and regulations in force, to enable the developing countries to take up the challenges posed by globalization.

Article 7: Islamic perception of sustainable development

Administrative and legal management:

a- Achieve justice advocated by Islam between peoples and between all social categories through a just world system enabling regional and international institutions to discharge their responsibilities and allowing for equitable implementation of international resolutions, termination of foreign occupation and preservation of world peace and security .

b- Building a world system for administrative and legal management to serve as a basis for countries to set up their national systems that promote active participation of all sectors of society in planning and achieving sustainable development.

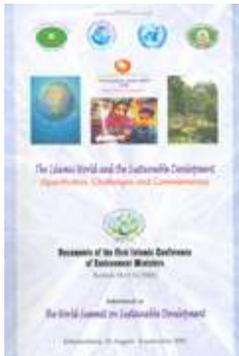
c- Achieving justice among peoples and promoting the role of United Nations agencies, and stimulating a climate suitable for the establishment of a genuine partnership between countries through a just system for world trade to replace the debt system that is depleting the resources of developing nations.

d- Necessity for the international community to rein in the practices, policies and conducts that affect badly the environment and man, and hamper the development of individuals and groups; and which include killing people, destroying houses, threatening natural resources, polluting the environment with deadly weapons, depleting water sources, deliberately breaching international laws and universally recognized customs, and utilizing the natural resources basis for the sake of promoting unsound consumption patterns.

e- Educating righteous youth having a sense of responsibility towards the environment, and the preservation of religious and moral values that hold the family and society together and keep them away from extremism or discrimination on grounds of race, religion or culture.

http://www.isesco.org.ma/pub/Eng/Sust_Dev/P7.htm

**The Islamic World
and the
Sustainable
Development
(Specificities,
Challenges and
Commitments)**



**Documents of the First
Islamic Conference of
Environment Ministers**

Jeddah 10-12/6/2002

- **Foreword**
- **Report on Coordinating Preparatory Efforts of the Second World Summit on Sustainable Development and the Implementation of Agenda 21**
- **Report on ISESCO's Efforts and Future Vision in the Field of Management of Water Resources in the Islamic World**
- **Report on ISESCO Efforts in Environmental, Health and Population**
- **Study on Sustainable Development from the Perspective of Islamic Values and Specificities of the Muslim World**
- **The Islamic World and the Challenges of Sustainable Development**
- **Study on Environment and Sustainable Development in the Islamic Countries (Sustainable Development from an Islamic Perspective)**
- **General Framework of Islamic Agenda for Sustainable Development**
- **Islamic Declaration on Sustainable Development**

http://www.isesco.org.ma/pub/Eng/Sust_Dev/Menu.htm

**Report on Coordinating Preparatory
Efforts of the Second World Summit on Sustainable
Development and the Implementation of Agenda 21**

I. Introduction

The United Nations (UN) General Assembly (GA) in its resolution 55/199 decided on the organization of a ten-year review of the progress achieved in the implementation of the outcomes of the United Nations Conference on Environment & Development (UNCED) at a summit meeting called World Summit on Sustainable

Development (WSSD). The summit is to be convened in Johannesburg, South Africa from 26 August to 4 September 2002. The main objectives of the WSSD is to reinvigorate, at the highest political level, the global commitment to Sustainable Development (SD) by identifying accomplishments and areas where efforts are needed to implement Agenda 21 and other outcomes of UNCED, addressing new challenges and opportunities. This should result in a renewed political commitment and support for SD, consistent, inter-alia, with the principle of common but differentiated responsibilities.

The General Assembly called on the Commission on Sustainable Development (CSD), established in 1993 and charged with monitoring implementation of Agenda 21, to act as the Preparatory Committee and to launch a preparatory process.

The resolution also encourages effective contributions from and the active participation of all major groups, as identified in Agenda 21, at all stages of the preparatory process, in accordance with the rules and procedures of the Commission on Sustainable Development, as well as its established practices for the participation and engagement of major groups.

The GA also decided that the Summit, including its preparatory process, should ensure a balance between economic development, social development and environmental protection, as these are interdependent and mutually reinforcing components of sustainable development.

This will not seek to re-define Agenda 21, but to identify the requirements and mechanisms for its implementation, especially in the face of the continuing environmental degradation being experienced the world over. To prepare for this event, a thorough review of the status of implementation and the challenges it faces has been carried out, with focus on regional preparations.

II. Preparation for the WSSD

The preparations for the Johannesburg Summit have been well under way for more than a year. Countries agreed that preparations would begin at the national, sub-regional and regional levels, moving towards the global stage. This allows governments and other major players to join forces effectively in Johannesburg with a view of addressing the challenges of sustainable development, in light of such global forces as globalization and international trade liberalization. The issues to be considered in Johannesburg are being identified and agreed at each level through a participatory process involving governments and other stakeholders, who are known as the Major Groups.

II.1. National Preparations

Most countries have convened their own National Preparatory Committees to review the successes and the challenges they are facing to achieving sustainable

development, and to contribute their views to the assessment of progress. National Preparatory Committees have normally involved representatives of government, local authorities, professional associations, major groups, media and other partners, including local offices of relevant UN Organizations. These Committees have two primary functions:

- (i) Undertake national reviews/ assessments, and
- (ii) Raise awareness and mobilize stakeholders at the national and local levels.

National Councils for Sustainable Development (NCSD), if they exist, are also used as a key preparation mechanism, particularly in terms of conducting broad-based stakeholder consultations. The national preparatory process has included a series of independent stakeholder consultations with a wide spectrum of civil society actors.

II.2. Regional Preparations

Regional preparations have been instrumental of shaping the inputs in preparation for the WSSD. Intergovernmental Sub-regional and Regional Preparatory Committees (known as PrepComs) has been set up since late 2001 to lead regional preparation in each the world regions: Africa, Asia, Asia and Pacific, Europe and North America, Latin America and the Caribbean, and West Asia. The regional PrepComs have been assessing the key challenges, opportunities and constraints relating to sustainable development that each region has faced over the past ten years, and identifying future priorities, new initiatives and the commitments needed to make progress in the coming years. They have undertaken the following main tasks:

1. Conduct a regional assessment of progress, taking into account national reports and country profiles. This include:
 - Main achievements in the region since UNCED in the implementation of Agenda 21 and other outcomes of UNCED, including major regional, sub-regional and national initiatives towards achieving sustainable development.
 - Progressive outlooks and main constraints faced by countries in the region, including:
 - + Common constraints faced by countries in the region;
 - + Specific constraints faced by the region (or by the sub-regions); and
 - + Constraints resulting from global developments and changing conditions (e.g. globalololization, trade liberalization and political instability/ military conflicts)
 - New initiatives and commitments within the region and its sub-region towards overcoming constraints and fostering further progress
2. Provide an opportunity for interaction and dialogue with major groups and other stakeholders
3. Share experiences and provide an opportunity to better prepare and understand the concerns and positions of the countries involved

The reports of the Regional PrepComs represent an input into the global PrepCom meetings being held during the first half of 2002.

In the Arab region, a joint secretariat, comprising the Council of Arab Ministers Responsible for the Environment (CAMRE), ESCWA and UNEP was formed to coordinate the regional preparatory effort. A series of regional roundtables of eminent /persons experts took place in mid-2001. Major groups also played a key and integral role in the discussions, through a multi-stakeholder dialogue process in which leaders from industry, NGOs, parliamentarians and government officials provided input into the regional evaluations. The regional Prepcom for the Arab region was held in Cairo on 24 October 2001, followed by a meeting of the Bureaus of AMCN (African Council of Environmental Ministers) and the Bureau of CAMRE (Arab Council of the Ministers Responsible for the Environment).

II.3. Global Preparations

The tenth session of the United Nations Commission on Sustainable Development (known as CSD10) is acting as the global Preparatory Committee (PrepCom) for the Johannesburg Summit. Four inter-governmental PrepCom meetings are being held during 2001-2002 to agree on the agenda for the Summit.

The First Summit Preparatory Committee (PrepCom 1) was held at the United Nations Headquarters in New York from 31 April to 2 May 2001. The Second Summit Preparatory Committee (PrepCom 2) was held from 28 January to 8 February 2002 in New York, followed by the Third Summit Preparatory Committee (PrepCom 3), also in New York, from 25 March to 5 April 2002 and the final PrepCom (PrepCom 4), at the Ministerial level, in Bali, Indonesia from 27 May to 7 June 2002.

Representatives from each of the major groups, including leaders from NGO and business communities, are also participating in these meetings.

Based on the resolution of the Islamic Conference of Foreign Ministers issued at its 28th Session held in Bamako in June 2001, which adopted the resolution of the Secretary General of the Organization of the Islamic Conference and the resolution of the Coordination Meeting between the United Nations and the Organization of the Islamic Conference (Vienna, June 2000) designating ISESCO as a focal point for coordination meetings of the United Nations and the Organization of the Islamic Conference's institutions and agencies in the field of developing science and technology, environment, health and population and entrusting ISESCO with the preparation of a working programme representing the Arab Islamic perception of environmental development, to be submitted to the Johannesburg Summit 2002 and holding the first Islamic Conference of Environment Ministers, and within the framework of preparation for World Summit on Sustainable Development (Johannesburg 2002), the Islamic Educational, Scientific and Cultural Organization

held jointly with the Organization of the Islamic Conference a number of activities in this regard, namely a conference of governmental experts of the Islamic countries on sustainable development (Tunis, March 2001), a coordination meeting between the United Nations Environment Programme and the Meteorology and Environment Protection Authority of the Kingdom of Saudi Arabia (Rabat, 2000), the First World Environment Forum from an Islamic Perspective (Jeddah, October, 2000), and the First Preparatory Meeting of the Environment Ministers of the Muslim World (Rabat, January, 2002). ISESCO also organized the First Islamic Conference for Ministers of Environment (Jeddah, June 2002), in cooperation with the Meteorology and Environment Protection Authority in the Kingdom of Saudi Arabia, and in coordination with the OIC Secretariat. It also participated in the Fourth Summit Preparatory Committee Meeting for the World Summit on Sustainable Development (Indonesia, May/June, 2002).

III. Implementation of Agenda 21

The United Nations Conference on Environment and Development (UNCED) was a landmark event to secure economic, social and environmental well-being for present and future generations. A major outcome of the Conference is that the world leaders defined and adopted a clear agenda for sustainable development "Agenda 21", "the Rio Declaration on Environment and Development," "the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management," "Conservation and Sustainable Development of All Types of Forests (Forest Principles) and the UNCED-related conventions (UN 1992).

A powerful long-term vision of the outcomes of UNCED is to have development balanced between humanity's economic and social needs and the capacity of the Earth's resources and ecosystems to meet current and future needs (UN 2002).

Ten years after the 1992 Earth Summit, an assessment of the state of the world indicates that neither environment nor development has fared well (World Watch Institute 2002). Despite initiatives by governments, international organizations, business, civil society groups and individuals to achieve sustainable development, progress towards the goals established at UNCED has been slower than anticipated, and in some respects conditions are actually worse than they were 10 years ago (UN 2002). While awareness of environmental issues has increased and remarkable progress can be cited in niches such as wind power and organic farming, nearly all global environmental indicators continue to be headed in the wrong direction (World Watch Institute 2002). The state of the world's environment is still fragile and conservation measures are far from satisfactory. In most parts of the developing world, there has been at best limited progress in reducing poverty. Some progress has been made in some areas of health, but other problems have surfaced, such as HIV/AIDS (UN 2002).

21 The Gap in Implementing Agenda .1.III

While Agenda 21 and the UNCED principles remain as valid as they were in 1992, that they are not open for reconsideration in WSSD 2002, they have been suffering from obvious implementation gap. This is most visible in four major areas. First, the fragmented approach that has been adopted towards sustainable development has been inadequate to integrate between social and economic development and the environment. Policies and programmes, at both national and international levels, have generally fallen far short of that level of integration in decision-making (UN 2002).

Second, there have been no significant changes in the unsustainable patterns of consumption and production since UNCED. To progress towards sustainable development, it is imperative to make a change in such pattern, even with the difficulty of changing the value systems which stand as a major driving forces in the use of the natural resources.

Third, the lack of mutually reinforcing, coherent and integrated policies and approaches in areas such as finance, trade, investment, technology and sustainable development, have greatly hindered the implementation of agenda 21. These policies and approaches have become a prerequisite in a globalize world requiring greater consistency and coherence.

Fourth, financial resources unfortunately have been a bottleneck in implementing Agenda 21. It has not been forthcoming. Since UNCED, official development assistance (ODA) -contrary to expectation- has declined steadily, and the debt burden has constrained poor countries options for sustainable development. The expanding flows of private investment have also been volatile and directed only at a few countries and sectors. On the other hand, mechanisms for the transfer of technology have not improved.

The implementation of Agenda 21 must be considered together with implementation of other outcomes of the major United Nations conferences held since 1992, which have been particularly effective in articulating an agenda for social development and human rights. Those outcomes have come together in the development goals articulated in the United Nations Millennium Declaration (General Assembly resolution 55/2). Since then, the Third United Nations Conference on Least Developed Countries (Brussels, 2000) and the seventh meeting of the Conference of the Parties to the United Nations Framework Convention on Climate Change (Marrakech, 2001) have marked further important steps in the field of sustainable development.

At the economic front the success of the fourth ministerial meeting of the World Trade Organization (WTO), held in Doha in November 2001, in putting development at the centre of further trade negotiations, augurs well for the future of the trading

system and the potential it offers to developing countries. Also the outcomes of the International Conference on Financing for Development, held in Monterrey, Mexico, in March 2002, is important in discussing ways and means of promoting coherence and consistency in the global financial system. One of the primary objectives is to bring a development orientation to the world of finance. The outcome of the Summit needs to draw on these and other related processes.

In spite there has been some progress on putting the principles of sustainable development into action, there remain many fundamental challenges to be addressed. The impacts of globalization for instance were not addressed at all in Rio. Much more need to be done by both rich and poor countries to place sustainable development as a central policy objective at all levels, and to implement the plans agreed previously. Access to resources, technology, markets to develop and good governance systems are necessities for poor countries to progress toward sustainable development. Rich countries will need to show real commitment to changing unsustainable patterns of consumption and production and moving towards far greater efficiency in resource use. Civil society and private sector action is central to these needs, and means to integrate it, into what was once a government-heavy agenda, are sorely needed. This is a challenge for society as a whole, thus governments needs to show greater commitment and must create or allow the creation to the climate in which real change is possible (IIED 2002).

Governance and the WSSD .IV

"Governance is the framework of social and economic systems and legal and political structures through which humanity manages itself" World Humanity Action Trust (WHAT). Governance and sustainable development are intimately tied together. The future role and architecture of institutions, from local to international levels, will be crucial determinants of whether future policy and programmes for sustainable development will succeed.

Effective sustainable development governance at all levels is key to the realization of the goals of sustainable development. To achieve these goals and to meet the emerging challenges, the sustainable development governance architecture needs to be strengthened at the international, regional and national levels, as these are inextricably linked and mutually interdependent (Anaedu and Engfeldt, 2002)

General Framework

1. To achieve these objectives, actions are required at all levels on the following aspects of sustainable development governance architecture:

a) Promoting effective arrangements and mechanisms that integrate in a balanced manner the three dimensions of sustainable development i.e.: economic, social and environment.

- b) Ensuring coherence and consistency in policy formulation and implementation.
- c) Promoting transparency and effective involvement of all relevant parts of government and of civil society in decision-making.
- d) Strengthening institutional mechanisms dealing with policy formulation, coordination, implementation and review as well as reinforcing inter-linkages among these mechanisms.

Priorities for WSSD based on The Regional Preparatory Meetings .V

There were five regional inter-governmental preparatory meetings, including a number of sub-regional that took place in preparation for the World Summit on Sustainable Development in the period from September-November 2001. The meetings addressed a wide array of issues ranging from region specific to general global actions. From those meetings emerged some areas of common concern or priority issues for the World Summit.

The following is a summary review of the outcomes of the Regional Preparatory Meetings focusing on the areas for future action as summaries by the World Summit Secretariat issued in December 2001 (CSD 2001). Full reports of the meetings can be accessed through the UN official website for WSSD (www.johannesburgsummit.org).

Overview .1.V

The regional meetings underscored five main points. Firstly, the international community should concentrate on expeditious implementation of Agenda 21. Secondly, the three pillars of sustainable development must be integrated. Thirdly, the emerging trends and new realities, like globalization, should be addressed to promote equity and inclusion. Fourthly, the Summit should focus on certain key areas and on deliverables that can accelerate progress towards the realization of the goals of sustainable development. While doing so, it should build on the goals agreed at various UN Conference/meetings, particularly the Millennium Summit goals. Finally, there is an obvious need to strengthen international institutional arrangements (within the frame of international governance) for sustainable development.

It is noted that each of the region has its own peculiarities and priorities for future actions; nevertheless the following areas seem to be emerging as issues of common concern:

Implementation of the Rio Principles: Reaffirmation of Rio principles, particular emphasis on the implementation of polluter-pays principle and the principle of common but differentiated responsibilities.

Globalization: There are calls for making globalization equitable, sustainable and inclusive. The Summit should focus on ways and means of making globalization

work for sustainable development. Some regions have mentioned specific initiatives in the areas of trade, finance, investment and technology, including information technology.

Poverty eradication: The Summit is expected to contribute towards the realization of the Millennium Declaration goal of halving poverty by 2015. It is also expected to promote better understanding of linkages between environment, poverty, trade and human security.

Sustainable Consumption and Production: Measures to encourage sustainable production and consumption, particularly increasing energy efficiency. Decoupling of economic growth from pressures on the environment or natural resource base.

Management of Natural Resources: The Summit should develop specific initiatives in areas such as fresh water and sanitation, oceans and seas, coastal zones, mountains, land use, forests, biodiversity, desertification, minerals and metals. Some regions mentioned air quality and climate change with particular emphasis on implementation of international commitments.

Agriculture and Food Security: Doubling agricultural production in Africa within five years. Some regions emphasized the need to promote sustainable agriculture and rural development (SARD).

Energy: The Summit should deliver a deal that promotes global access to energy. Special initiatives for promoting the share of renewable and affordable energy should also be launched.

Fresh Water and Sanitation: Achievement of the Millennium Declaration target on access to water and sanitation services. Measures to promote integrated water management.

Sustainable Human Settlements: Initiatives on effective urban planning and management. Some regions referred to the issues of mega-cities.

Health: Initiatives to strengthen health services should be part of the overall poverty reduction and sustainable development strategies.

Human Development: Education, training, employment, gender mainstreaming and development of youth.

Financing of Sustainable Development: Mobilization of all sources of finance; Developed countries should endeavour to meet the target of 0.7% of GNP as ODA as soon as possible; Cancellation of debt of the poorest countries; innovative sources of financing should be identified by ICFFD.

Trade and Market Access: Greater market access to developing countries' products, particularly in the areas of agriculture and textiles; elimination of market distorting subsidies and export support measures; reduction of environmentally damaging subsidies.

Transfer of Technology and Capacity Building: The Summit should foster the establishment of effective means of facilitating transfer of technology, and measures to promote capacity building.

Governance/Institutional Structure for Sustainable Development: The Summit should discuss ways of improving institutional framework for sustainable development at the national, regional and international levels. Some regions emphasized the importance of national governance issues, including promotion of effective partnership arrangements. Peace and security were identified as a pre-requisite for sustainable development.

- Decision Making and Information Requirements: Need for further efforts in developing sustainable development strategies and policies, effective participation and development of measures for monitoring progress towards sustainable development.

For the Arab region, security ranked as the first priority for achieving sustainable development. The Prpcom as well as the AMCEN/CAMRE joint Declaration emphasized that peace and security is prerequisite for development in the region. Poverty eradication, water and land degradation also were high among the list of priorities.

The expected contribution of the Organization of the Islamic Conference (OIC), through ISESCO is to strongly introduce, the Deceleration of the Environment Ministers of Islamic Countries, the ethical and moral aspect of sustainable development. It would a serious attempt to put a human face to sustainable development. Building on the Jeddah Declaration (2000) and the Tehran Declaration (2001), ISESCO should try to lead the discussion to weave in the principles of Islamic values and teachings into the new the world new governance systems and to seek through the dialogue among cultures a universal code of ethics for guiding development and the relationships among nations of our planet, and between man and the universe.

Summit Outcome .VI

To structure the outcomes of the of the WSSD, the Summit Secretariat has proposed a framework or 'package' of Summit outcomes, comprising of two types of documents:

Type 1: negotiated outcomes in two documents, for adoption by all Member States at the Summit:

1. Assessment of overall progress achieved since Rio, identifying major constraints and suggesting measures to overcome these constraints; including ways of strengthening the institutional framework for sustainable development
2. Reinvigoration of political commitment, addressing new challenges and opportunities and revising the world governance system, which will effect not only

the framework of social and economic systems and the legal and political structures, including the UN system, through which humanity manages itself but also environmental governance. This may also influence the future of UNEP and other institutions addressing the environmental component of sustainable development, including that of the Multi lateral Environmental Agreements (MEAs). The intergovernmental, negotiated documents will include a focused, detailed Programme of Action that includes

- Introduction to the issue
- Programme areas
- Basis for action
- Objectives
- Activities (at all levels)
- Means of implementation – including capacity building, technology sharing, education and training)
- Roles of stakeholders
- Financial resources (appropriate resource mix, e.g. ODA, FDI, etc)
- Timetable and targets
- Indicators

These documents are to reaffirm governments' leadership and provide all stakeholders and citizens with clear information on actions to be taken by governments and desired actions by stakeholders, and enhance everybody's ability to contribute to the Programme of Action (PoA) as well as to monitor implementation.

Type 2: non-negotiated outcomes of two kinds, for announcement at the Summit:

1. Regional, sub-regional and inter-regional initiatives / plans of action / partnerships / commitments; initiated and developed in the lead to the Summit by respective regions and/or interested groups of countries, and should actively involve and solicit support from relevant international organizations, donor community and stakeholders.

2. Commitments, initiatives and partnerships aimed at practical implementation in specific sectors / areas / communities that would be initiated and developed by major groups (private sector, trade unions, local authorities, NGOs, scientific community, etc), including public-private partnerships with interested governments and/or international organizations.

The suggested framework for this type of documents calls for contributions by governments, governments + stakeholders, and stakeholders.

Governments' contributions

A focused and detailed draft PoA (type 1) would allow for individual governments or groups of governments to develop their commitments and initiatives to be announced at the Summit.

Stakeholders

Aiming to include partnership initiatives in the overall Summit outcome challenges governments and all stakeholders to develop concrete implementation initiatives for the future. The concept also provides important opportunities to acknowledge the specific conditions and needs at regional and national which require specific measures, the need for multi-stakeholder partnerships, and stakeholders' roles and responsibilities in sustainable development (Stakeholder Forum 2002).

Initiatives to strengthen the implementation of Agenda 21/Partnerships

Partnerships and initiatives to implement Agenda 21 are expected to become one of the major outcomes of the World Summit on Sustainable Development. These "second type" of outcomes would consist of a series of commitments and action-oriented coalitions focused on deliverables and would contribute in translating political commitments into action. Specific modalities of such partnerships (including targets, timetables, monitoring arrangements, coordination and implementation mechanisms, arrangements for predictable funding and technology transfer, etc.) need to be elaborated in the lead up to the Summit by potential partners from governments, international organizations and major groups (Summit Secretariat 2002)

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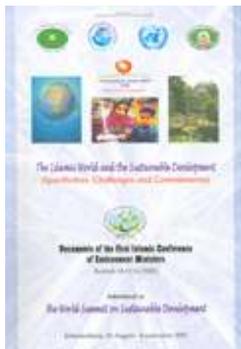
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« Engaging The Difficult Task Of Cultivating Brotherhood: Thoughts on al-Ghazzali's work Ust. Abul Hussein

The Spiritual Method of Revivalism: On Hasan al-Banna and His Legacy, By Andrew Booso [parts three & four] Andrew Booso »

The Islamic World and the Challenges of Sustainable Development



First: Major Obstacles to Sustainable Development in the Islamic World

1. Poverty and Debt Accumulation: Poverty is a multi dimensional concept that is mainly the result of an unequal division of the world's wealth. Poverty leads to the overexploitation and irrational use of limited natural resources resulting in reduced agricultural production capacity and forest depletion. This didactic of poverty and overtaxing of natural resources may also be the result of the pressure of foreign debt of which the servicing may reach important percentages of a country's exports of goods and services, and thus constitute a heavy burden on its economy.

Islam has through its principles endeavoured to fight against poverty. This fight can either occur through employment which provides a source of income for a person and his dependants, or through government assistance and the zakat fund that is unique to Islam and that ensures that man is freed from the shackles of poverty.

2. Wars, lack of stability and safety: During the 20th century and since the start of the Arabo-Israeli conflict, most Islamic countries have experienced conflicts and civil wars caused by the desire to control land and natural resources and that have hindered their

development march. Of these conflicts and wars we can mention the Arab-Israeli conflict, the land mines left from wars, border wars among Arabs and Muslims, the first and second Gulf Wars, the sanctions against Libya and Iraq and many others.

3. Lack of technical means and expertise and of modern techniques as a result of low financial resources. Many Islamic countries are still way behind in education in spite of compulsory schooling. This can only widen the gap between developed and developed countries in terms of the quality of education, leading ultimately to a widening educational gap between North and South and between rich and poor.

4. Deterioration of Economic Conditions: This deterioration, a result of a low GDP per capita and investment capitals in most Islamic countries, unemployment, illiteracy, demographic growth, economic dependency and many other factors, impacts on a given country's commitment to world sustainable development.

5. Discrepancy between population growth and available natural resources: Population growth has resulted in the expansion of agricultural lands, overgrazing, and desertification and in the depletion of potable water resources. Many Islamic countries had to adopt programmes that aim at developing renewable water resources.

6. Failure of Developed Countries to provide the aid promised to developing countries. During the Rio Earth Summit, developed countries undertook to extend 0.7% of their local GDP to assist emerging countries considering that industrialized countries are more responsible for environment pollution than developing ones. Unfortunately only some Scandinavian countries fulfilled their promise. In the Johannesburg Earth Summit, Islamic countries aspire to obtain the conversion of their debts and interests into financial resources for serving sustainable development.

Second: What do developing countries (including Islamic countries) aspire to from the Johannesburg Sustainable Development Summit?

Fields where support is required from the developed world to achieve sustainable development in the Arab and Islamic world

1. Peace and security (resolution of the Arab-Israeli conflict)
2. Eradication of poverty (aid to developing countries, abolishing all types of economic sanctions)
3. Debt alleviation (cancellation of debts and use of additional resources to finance sustainable development)
4. International trade (more WTO commitment, liberalization of trade..)

5. Globalisation (assist developing countries face up to globalisation and benefit from equal opportunities in globalisation)
6. Capacity building in research and technology transfer (support of academic and research institutions in developing countries in priority fields, assisting the private sector in converting to cleaner technology and ensuring access to information technology)
7. Arbitration and participation in decision making (consolidating the role of the United Nations and calling for closer cooperation with the Arab League and the OIC)
8. Population, urban development, health and environment (devising an integrated population management policy, supporting the efforts of developing countries in achieving complementarity between all their strategies)
9. Integrated management of natural resources (assisting developing countries to devise policies and plans to halt environment degradation and urging developed countries to stop destructive consumption lifestyles)
10. Industry and tourism (supporting the endeavours of developing countries to obtain modern technologies suitable for their development and supporting efforts that aim at consolidating the concept of tourism as based on the rational development of natural resources)
11. Civilizational and natural heritage (invite the world to establish partnerships with the Islamic and Arab world on the basis of the moral and cultural heritage of our civilization that the UN attempts to safeguard it through dialogue among civilizations and religions)
12. Financing (ensuring funds for the implementation of UN decisions and conventions, the commitment of donor parties and developed countries and ensuring follow-up of the results of the Summit through available international instruments)
13. Reinforcing the role of national associations and the civil society in achieving the objectives of sustainable development at the Arab, Islamic and international level and persevering in the efforts to support and establish the principle of partnership between international institutions and NGOs.

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2 Responses to “The Islamic World and the Challenges of Sustainable Development”

1. [Sumaya](#) Says:
[August 9th, 2007 at 6:54 am](#)

Masha'Allah. This was excellent. A clear, concise, and thorough review. I enjoyed it.
Jazakumullahu Khayran!

2. *Ibraheem* Says:
August 9th, 2007 at 4:45 pm

I think there, in addition to all that, is a spiritual problem.

As for tourism, one of my lecturers here at Cambridge, who had been to Syria, said that had all those sites in Damascus been in Italy they would be swamped [with tourists].

Allah knows best

<http://www.suhaibwebb.com/blog/2007/08/07/the-islamic-world-and-the-challenges-of-sustainable-development/>

Arab Ministerial Declaration on Sustainable Development

1. The Arab Ministers Responsible for Development, Planning and Environment, in their meeting held at the League of Arab States in Cairo, on 24th of October 2001 (8th of Shaaban 1422 Hijri) in preparation for the WSSD.
2. Recalling: relevant declarations especially the Stockholm Declaration of the UN summit on Human Environment (1971), the Rio Declaration of the UN Conference on Environment and Development (UNCED, 1992), the Barbados Declaration on Sustainable Development of Small Island Developing States (1994), the Arab Declaration on Environment and Development (Tunisia, 1986) the Arab Statement on Environment and Development and the Future Outlook (1991), the Malmo Declaration on the occasion of the first Global Ministerial Environment Forum (2000), the Jeddah Declaration concerning the Islamic Perspective on the Environment (2000), the Tehran Declaration concerning Religions, Cultures and Environment (2001), the Abu Dhabi Declaration: Perspective of Arab Environmental Action (2001).
3. Having discussed the Perspective Report on the Arab Environmental Programme, and the reports of the GEO, the Beirut Roundtable of Eminent persons, the NGOs, Industry, and Parliamentarians Forums, and the Bahrain Stakeholders Roundtable.
4. Renewing: their commitments to work with the international community within the framework of common but differentiated responsibility between developed and developing countries to achieve sustainable development.
5. Looking forward to the World Summit on Sustainable Development, which will assess the progress made towards the implementation of Agenda 21 in the past decade, and will provide another opportunity for the international community to develop a doable programme to achieve sustainable development by taking measures that will lead to the implementation of countries commitments and strengthening international cooperation in meeting global challenges.
6. Desirous of insuring effective participation at the Summit, a Joint Secretariat comprising of CAMRE Technical Secretariat, ESCWA and UNEP was established to coordinate regional preparations including roundtables and forums, in cooperation with governments, the civil society, and other regional and UN organizations. This is to review progress made in the implementation of Agenda 21, identifying constraints, challenges, and future goals, drawing up strategies, platform for priority actions, and developing a framework and mechanism for international cooperation.
7. Emphasizing that achievements have been made towards sustainable development covering the economic, social and environmental areas with clear implications in the daily life of Arab Citizens in terms of health, education and economic conditions, including increase of per capita income, better health care and

urban services, reduced illiteracy rates, increased women share in education and job opportunity, reduction in the population growth rate, increased life expectancy, strengthening of environmental and development institutions , issuing and upgrading legislation, improved capacity building, positive participation in the implementation of regional and international conventions and agreements, as well as the strengthening of regional cooperation in various fields, such as the establishment of the Greater Arab Free Trade Zone, transportation, gas and electricity networks, strengthening the Arab specialized councils and the role of civil society organizations.

8. Recognizing that the efforts to achieve sustainable development in the Arab Countries are facing major constraints, some will have impact for years to come. The main constrains include:
 1. Instability resulting from the lack of peace and security in the region and the inability of the world community to resolve the occupation of the Palestinian and other Arab territories on just and equitable bases and in accordance with the relevant UN resolutions.
 2. Escalating poverty, illiteracy, high population growth rates, unemployment and the debt burden and increased debt servicing, as well as the continued unsustainable pattern of natural resources management.
 3. Continued population increase and the unbalanced distribution between rural and urban areas, spreading of slums around major cities, increased pressure on the natural resource base, as well as on the public utilities and services, air pollution, and solid waste accumulation.
 4. The severe arid nature of the region, with little and sparse rainfall, very high temperatures in the summer months with high evaporation and evapotranspiration leading to frequent droughts and spread of desertification.
 5. Limited areas available for agriculture, water scarcity shortage of non-renewable sources of energy.
 6. The limited capacity of academic and research institutions and the inability to keep up with the advances in providing technologies for sustainable development.
 7. The relatively limited experience of the civil society in participating in the process of development and implementation of sustainable development programmes and activities.
 8. The adoption of technologies and approaches that are not suitable for the social, economic and environmental conditions of the region.
 9. The embargo inflicted on some of the Arab countries.
9. Realizing that there are also a large number of challenges and opportunities that could be utilized to achieve sustainable development including:

1. Combating poverty that represents a basic challenge to the efforts of achieving sustainable development in the Arab Region. This requires judicious utilization of available resources and the establishment of conducive environment for investment at the national and regional levels, a mechanism for achieving social security at the national level, in addition to establishing an integrated mechanism between the Arab countries, giving priority for employment Arab labor force.
2. Addressing the rapid increase in population in the Arab countries, which in spite of the observed reduction over the last 10 years still remains high. Giving greater emphasis on the education of women, strengthening of religion and social programmes, which will raise the level of awareness of the importance of family planning, childcare and the uncontrolled population increase.
3. Dealing with the increase in the young people component of the population as a positive indicator of human resource, raising the challenge of providing the suitable environment for their education, training and employment.
4. Curbing the increased immigration from rural to urban areas which should be giving priority in development planning such as when planning for development in the areas of infrastructures, health and education services to meet the needs of the rural areas and thus discourage immigration.
5. Sound management of the use of natural resources, especially water resources and energy that requires promoting of sustainable production and consumption, cooperation and integration between Arab countries towards the rational use of these resources and achieving Sustainable Development.
6. To set the foundations of the Arab common market and work towards the integration of national economies, which would create a Pan Arab market and provide strong support for the negotiations with other economic groupings, including the WTO.
7. Transfer, integration and ownership of modern technologies suitable for the economic, social and environmental conditions in member states. This also means assessment of new technologies before importing while insuring that any negative impact is mitigated before adopting in the region.
8. Maintenance and investing in the cultural and religions heritage that is unique to the Arab region towards achieving SD.
9. Dealing wisely with globalization and the impacts that may constraint achieving sustainable development in the Arab Region. The countries of the region are to adjust their economic and institutional arrangements to deal with globalization and to establish a regional economic block on the bases of the cultural and economic background to utilize the advantages that may be associated with globalization.

10. Accordingly, the Arab Ministers responsible for Development, Planning and Environment declare that:

First

Achieving sustainable development requires the development of an integrated Pan Arab strategy that takes into account the historical and current conditions in the region and forecasts future changes and global developments with a view of achieving the following objectives:

1. The establishment of peace and security and abolishing foci of tension and weapons of mass destruction in the Middle East on just bases.
2. Curtailing poverty and unemployment.
3. Achieving balance between population growth rates and the available natural resources.
4. Eradicate illiteracy and enhance educational curricula and scientific research in accordance with the need to achieve sustainable development.
5. Supporting and further strengthening development and environment institutions, capacity building and environmental citizenship programmes.
6. Halting the degradation of natural resources and the environment and strive towards the sustainable management of these resources with a view of achieving water and food security, conservation of ecosystems and combating desertification.
7. Development and integration of Arab production sectors and the adoption of cleaner production procedures with a view of enhancing the competitiveness of the Arab products in the world markets and increase preparedness for industrial and natural disasters.
8. Supporting the private sector and the civil society, giving special attention to the role of women, to insure their participation in the implementation of sustainable development.

Second

Achieving Sustainable development requires setting of priorities of the joint Arab work programme as follows:

1. Strengthening cooperation with regional and global organizations and groupings, i.e. OIC countries and G77 and China, which creates a better chance for negotiations at global forums.
2. Implementation of integrated policies to eliminate poverty, most important of which is facilitating adjustment with economic reform policies, upgrading the level of general and vocational education, creation of job opportunities for citizens, conservation and judicious utilization of natural resources, enhancement of social security, identification of practical solutions for the national debt burden and strengthening of the role of the private sector and civil society in

the formulation and implementation of sustainable development plans.

3. Development of a comprehensive and integrated population policy, and addressing the imbalance of population distribution between rural and urban areas.
4. Issuing of legislations and development and implementation of integrated policies at the national and regional levels and the periodic evaluation of their effectiveness. Raising awareness among all sectors of the society to take into consideration the limitation of resources in quantity and distribution when planning for development.
5. Applying an integrated approach for water resources management and the development of alternative water resources such as desalination and reuse of treated effluents, water harvesting, and use of schemes that reduce water losses.
6. Development of economic and environmental policies that take into account the conservation and development of non renewable energy, rationalize energy use, and mitigate the negative impacts on the environment and human health.
7. Giving greater attention to human development through applying policies that emphasize human health, child and mother care, caring for the elderly, people needing special care, to conserve the family institution. Developing and strengthen educational curricula at all levels, support scientific research and technology centers, and raise the level of public awareness and culture.
8. Exerting greater effort towards the integration between the strategies of health and environment, specially regarding the provision of safe drinking water and food, treatment of municipal waters and solid waste, controlling and reducing the risk associated with chemicals and pollution in all its forms, as well as genetically modified materials, and the establishment of nuclear safety in the Arab Region.
9. Encouraging investment and attracting capital to the Arab region taking into consideration the social economic and environmental objectives in preparing plans, policies and programmes for sustainable development and the reduction of negative impacts on human health and environment.
10. Upgrading legislations and encouraging intra-Arab trade and development of procedures for production and marketing of Arab products and protecting its rights in order to be able to compete in the world markets as small and medium enterprises.
11. Making tangible improvement in the institutional set up, infrastructure including transport and communication to facilitate the transfer of information, personnel and capital between member states, with the view of achieving integration and establishment of a true partnership between the private and public sectors.
12. Emphasizing the importance of joining MEA's in accordance with the interests of the Arab Region, and strengthening the regional

cooperation on environmental protection, assist the Arab and developing countries in dealing with social and economic impacts of implementing policies and programmes of the MEAs and compensating them in order not to strain their development programmes.

Third

Achieving sustainable development within the context of globalization, international trade liberalization, the information technology revolution, and the strengthening cooperation between nations on the bases of dialogue and integrations of cultures requires more opportunities for developing countries and the agreement on a new mechanism for governance taking into consideration the principle of international law and people's rights in reaching sustainable development within the Rio declaration particularly through:

A. World Trade Organization

Negotiations at the WTO should work towards the objectives it was established for, i.e. opening the markets for exports without allowing obstacles that would limit developing countries ability to compete for these markets.

B. Informatics

The world community is urged to facilitate and provide information technology and advanced communication facilities which would enable developing countries to reduce their use of resources, transportation and energy, and enable them to effectively follow up and implement the policies of sustainable development.

C. Governance

1. Strengthening the role of the League of Arab States, and its organizations and ministerial councils related to sustainable development, and develop their working mechanisms in order to implement their strategies and programmes in an integrated manner.
2. Development of institutions in the Arab Region and support their activities at the national and regional levels in order to consolidate the various societal sectors with related government institutions to ensure proper planning, implementation of sustainable development programmes.
3. Strengthening partnership with civil society and private sector to widen the base for the decision-making process related to sustainable development.
4. Enhancement the role of the UN and its specialized agencies relevant to sustainable development and upgrading its working mechanisms with a view of enabling them to implement strategies and programmes of sustainable development in an integrated manner and urging them to strengthen cooperation with LAS and its specialized agencies.

D. Financial means of implementation at the regional level

1. Further develop Arab and Islamic funds to participate in financing sustainable development.
2. Give priority in funding allocation at the national level to sustainable development projects and improving environment conditions.
3. Focus on social security, support and catalyze non-governmental organizations to contribute to sustainable development.

E. Financial means of implementation at the International level

1. Developed countries to fulfill their commitment to the United Nations according to the Rio summit to increase its official assistance to the developing countries to be 0.7% of their GDP.
2. Augment GEF fund in accordance with the official level of financial assistance to developing countries, as an important mechanism to fund development and environment activities, assign additional financial assistance to the implementation of related Multilateral Agreements Programmes and give an equal and fair opportunity to all developing countries to benefit from GEF, and simplify funding procedures.
3. Encourage foreign direct investment to support national financing resources and efforts of the private sector to achieve sustainable development.
4. Strengthening the linkage between the secretariats of MEAs and specialized regional and international organizations in support of sustainable development programmes in developing countries.

F. Means of evaluation and monitoring

1. Establishment of means for monitoring and evaluation of sustainable development programmes and assess the degree of the harmonization and effectiveness in achieving the goals.
2. Development of harmonized indicators and criteria for monitoring and follow up on sustainable development in the Arab Region, and periodic assessment to readjust the course of development to ensure sustainability

<http://www.escwa.org.lb/divisions/sdpd/wssd/arab.html>

Islamic Declaration on Sustainable Development, Johannesburg, august-september 2002

United Nations World Summit on Sustainable Development

Islamic Declaration on Sustainable Development

The original draft of the first official Islamic statement was entitled, the "Jeddah Environment Declaration." This statement was later renamed the "Islamic Declaration on Sustainable Development." This statement is included in the United Nations (UN) World Summit on Development (Johannesburg, South Africa) paper entitled, "General Framework of Islamic Agenda for Sustainable Development Islamic Declaration on Sustainable Development : Background Paper No.5."

United Nations
World Summit on Sustainable Development
Johannesburg, South Africa
26 August to 4 September 2002
General Framework of Islamic Agenda for Sustainable Development

Islamic Declaration on Sustainable Development Background Paper No. 5
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General Framework of Islamic Agenda for Sustainable Development

Based on the specialized studies examined by the First Islamic Conference of Environment Ministers held in Jeddah, which reviewed the major challenges faced by the Islamic world in the field of sustainable development, materialized mainly in the poverty, illiteracy, accumulation of foreign debts, degradation of economic and social conditions, disequilibrium between population growth and available natural resources, the weakness of technical capabilities, the lack of expertise and skills in environment management, along with the negative impacts left by regional conflicts, foreign occupation of parts of its land and despoiling of its resources, one may chart out the general framework of an Islamic agenda liable to help overcome these obstacles and lay down sturdy foundations for cooperation among the Islamic countries to achieve sustainable development, with a view to being submitted to the World Summit on Sustainable Development in Johannesburg. The agenda revolves around the following axes which could be translated into field projects and activities, in cooperation with regional and international organizations

I-Economic growth

Achieving a level of economic growth enabling the Islamic countries to bridge the gap between them and developed countries by means of mobilizing the available energies, especially through :

1. Stimulation of investment in highly profitable sectors.
2. Capacity-building in the field of research and transfer of technologies in the following fields :
 - a) Supporting the capabilities of academic and research centers in the Islamic countries, especially with regard to programme development and promotion of priority research facilities.
 - b) Facilitating access to modern information and communication technologies which open new vistas for rationalization of Islamic countries' resources.
3. Achieving food security and promoting plant and animal resources in Islamic countries.
4. Supporting new partnership for economic development of African countries.
5. Developing control mechanisms to ensure flexible management of short-term capital influx, in compliance with the objectives of sustainable development in developing countries.

II- Poverty eradication

As part of endeavour to eradicate poverty in the Islamic world, the following programmes should be particularly supported, namely :

1. Creating employment opportunities through encouragement of the establishment of small and medium-sized enterprises.
2. Initiating programmes for vocational training and technical education to step up efforts of literacy and eradication of poverty.
3. Promoting Islamic solidarity and mutual support.
4. Facilitating access to small, preferential loans to fund local development projects and raise the income of poor families, especially in the countryside and the remote areas.
5. Associating local community, and populations in general, in the identification of the needs and the drafting, implementation and evaluation of action programmes.

III- Population and urban development

Elaborating an integrated population policy striking fair balance between population growth and population characteristics and redressing the imbalances between the towns and the countryside, by means of :

1. Drawing up and implementing strategies for countryside development focussing on the most disadvantaged areas.

2. Preparing Agenda 21 Programmes and implementing them at the local level.
3. Controlling indecent, random housing.
4. Developing the infrastructure of the periphery, promoting them and adopting suitable approaches for appropriate development of population agglomerations.

IV - Health and environment

1. Supply of food and adequate potable water.
2. Treatment of sewage and hard wastes, and securing their safe recycling.
3. Controlling the potential risks resulting from all types of pollution.
4. Safe management of toxic, dangerous and radioactive wastes.
5. Controlling the use of chemicals.
6. Fighting propagation of epidemics and diseases and ensuring basic health care services

as part of the initiative of health for all.

1. Generalizing assessment of environmental and health impacts of development projects.

V- Natural resources :

1. Water
 - a) Harnessing available water resources, drawing up programmes for their rationalization and exploring new water potentials, including rainwater and non-conventional resources.
 - b) Developing desalination techniques and generalizing them to reduce production costs.
 - c) Enhancing the legal and technical aspects of water consumption rationalization.
 - d) publicizing success stories in the fields of sanitation and safe processing and recycling of waste waters.

e) Setting up complementary projects among Muslim countries to help meet their needs in few years.

f) Securing fair management of natural and biological resources.

g) Adopting new measures to combat arsenic pollution of ground waters.

h) Adopting a common stand on water shares of lower river countries in international river waters.

1. Forests and biodiversity
 - a) Setting up an Islamic center for exchange of information on biodiversity.
 - b) Taking out an inventory of all plant and animal species in the Islamic

world.

- c) Managing joint natural reserves shared by the Muslim countries.
- d) Enforcing the laws on natural reserves and adapting them to fit the commitments

of the Islamic countries under relevant international agreements.

e) Initiating local development projects benefitting to populations residing in the vicinity of forests, to encourage them to rationalize forest resources.

f) Supporting Islamic countries to prepare and implement national and sub-regional

strategies and plans to preserve biodiversity and reduce desertification effects.

1. 3- Combating desertification and alleviating drought effects
 - a) Launching pilot projects on local development to reduce the effects of desertification.
 - b) Setting up a comprehensive strategy for identification of sites threatened by desertification in the Islamic countries.
 - c) Establishing joint geographical data bases and early-warning systems to monitor desertification.
 - d) Supporting Islamic countries to prepare and implement national and sub-regional strategies and plans to combat desertification and alleviate drought effects.
2. Energy and Climate Change :
 - a) Developing strategies for the cleanest and most suitable energy production systems fit for energy consumption.
 - b) Conducting a comprehensive survey on Islamic countries' capabilities in terms of harnessing solar, water and wind energy.
 - c) Establishing renewable energy projects in the Muslim world.
 - d) Conducting a study on impact of green house effect on Muslim countries, especially on the health.
1. Coasts and sea water ;
 - a-Training manpower in emergency intervention in the event of sea pollution with hydrocarbons and chemicals.
 - b-Conducting a study on fragile coastal areas in Islamic coastal countries and ensuring their safety.
 - e-Developing plans to direct population concentration and economic activities to ward off adverse effects on fragile coastal areas.
 - d-Preventing evacuation of untreated sewage and liquid industrial wastes into sea waters.

VI- World Trade and Globalization

1. Training enterprises in the Muslim world to improve their competitiveness and penetration of world markets and promoting trade exchange among Muslim countries.
2. Formulating a guide for Islamic countries to environment norms and quality standards to enhance the competitiveness and quality of Islamic countries' products.
3. Sustaining international efforts to reform the world financial system and make it more transparent just and comprehensiveness to help Muslim countries take an active part in the global commercial activity and face the challenges posed by globalization.

VII- Legal and Institutional Aspects of Environment

1. -Conducting a comparative study on Islamic countries' environmental laws and conferring an Islamic character on their contents.
2. Making Islamic countries' environmental laws consistent with their commitments

under related international conventions.

1. Training human resources in environmental law enforcement.
 2. Strengthening and supporting the legal framework of governmental institutions in charge of environment.
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1. Creating environmental associations network to coordinate their activities and programmes.
 2. Supporting local and regional non-governmental associations operating in the field of environment protection.

VIII- Involvement of civil society

1. Encouraging involvement of the civil society in the elaboration and implementation of strategies and plans destined to sustainable development and environment protection
2. Encouraging the establishment of civil society organizations and drawing up legislations promoting their participation.

IX- Awareness-raising, education and information programmes

1. Incorporating the component of environment from an Islamic perspective in general education curricula.
2. Establishing coordination networks between Islamic countries' universities and governmental institutions to exchange experience in environment and sustainable development-related training and scientific research.
3. Exchanging radio and television programmes on environmental awareness in Islamic countries.

4. Holding training sessions for literacy personnel to incorporate the environmental component in literacy programmes.
5. Training media specialists in environmental awareness-raising.
6. Organizing media campaigns to enhance population behaviour and attitude towards environment and health, capitalizing on Islamic teachings in this connection.

X- Achieving peace and security

1. Developing programmes and plans to promote justice-based peace culture in the Muslim world, contributing thereby to the promotion of global peace.
2. Formulating programmes to highlight the importance of terminating foreign occupation and establishing peace and security in the sustainable development process.
3. Sustaining efforts to define terrorism and highlight its difference of resistance fighting of foreign occupation as admitted by international rules, regulations and customs.

XI- Funding

1. Developing environmental programmes likely to induce financing provided for in environment-related international conventions.
2. Benefiting from opportunities offered by Islamic financing institutions and the Islamic Environment Fund to carry out environment-oriented programmes in the Muslim world, including institutional support programmes and capacity-building of environment protection authorities.
3. Harnessing local financial resources with utmost rationalization and gearing them to specific priority objectives.

Islamic Declaration on Sustainable Development The First Islamic Conference of Environment Ministers held in Jeddah, on 29 Rabia I -1st Rabia II, 1423 A.H. corresponding to 10-12 June 2002 A.D, Recalling Resolution 11/9-E issued by the 9th Islamic Summit Conference on environment from an Islamic perspective, whereby the Islamic Educational, Scientific and Cultural Organization- ISESCO- was mandated in cooperation with the United Nations Environment Programme and all relevant international and regional organizations- to prepare an action programme representing the Islamic perception of environment and development, to be presented at the Earth Summit in Johannesburg, in 2002 ;

Having taken cognizance of the results arrived at by the First World Forum on Environment from an Islamic perspective, held in Jeddah, Kingdom of Saudi Arabia, on 26-28 Rajab 1421A.14/ 23-25 October 2000, and the Jeddah Declaration issued by the Forum, the Abu Dhabi Declaration on the Future of Environment Action in the Arab World (2001), the Rabat Declaration on Investment Opportunities for Sustainable Development (2001), as well as the

Tehran Declaration on Religions, Civilizations and Environment (July, 2001) and the Resolution of Oman Forum on Environment and Sustainable Development (Muscat, December 2001) ;

Recalling further Resolution 11/28-E on Environment from an Islamic Perspective adopted by the 28th Islamic Conference of Foreign Affairs Ministers (Session of Peace and Development), held in Bamako, on 4-6 Rabi'a 11 1422 A.H/ 25-27 June 2001, which affirmed the afore-mentioned resolutions and tasked the Islamic Educational, Scientific and Cultural Organization to make necessary contacts with OIC Member States and regional and international organizations with a view to holding the First Islamic Conference of Environment Ministers ;

Referring to the Arab Declaration on sustainable development issued by the Arab Environment Ministers (Cairo, October 2001), and the African Ministerial Declaration on Sustainable Development (Nairobi, November 2001) as well as the Joint Ministerial Declaration by the Executive boards of the Arab and African Councils of Environment Ministers ; Committed to the Islamic approach built on promotion of man's dignity and achievement of his lieutenancy mission on earth through good deeds that conduce to sustainable development, foster social solidarity, raise the care to orphans and the have-nots, induce edification of civilization without any plundering or dilapidation and affirm the organic relationship between man and the earth in terms of existence and development ;

Supportive of the regional and international efforts exerted to promote the standard of the life of all humans through sustainable development of all social, economic, cultural, environmental and health aspects, the ultimate purpose being to achieve a decent human life in a sound environment ; Keeping in line with the general orientations embedded in the comprehensive study prepared by the Islamic Educational, Scientific and Cultural Organization on environment, health and sustainable development, as part of contribution to the Earth Summit due in Johannesburg, on 26 August - 4 September 2002 ;

Proclaims the following :

Article 1 : Honour bestowed on man

Man is the lieutenant of Allah on earth. He is mandated to build civilization and held responsible for the harnessing and protection of environment. The Muslim, in particular, is duty-bound to take care of the environment, in the general acceptance of the term, and to make every personal and possible effort to achieve sustainable development for the general well-being of each and everybody.

Article 2 : Responsibility of man

Indeed, the most beloved by Allah are the pious and the charitable, and the most hated by Allah are the one who wreck havoc in earth. Charity is every good deed that benefits to people and takes care of the environment in which they live. It may be an act of social solidarity, a contribution to the restoration of peace and security or the eradication of poverty and unemployment, in a bid to achieve justice and equity through collective participation in the development enterprise, motivated by religious, cultural and humanitarian drives.

Article 3 : Environment from an Islamic perspective

The environment is a gift donated to man by Allah. Therefore, individuals and communities are, all, duty-bound to take care of it and promote all its natural resources, including air, climate, water, seas, flora and fauna, and refrain from any act likely to cause pollution or damage the eco-system or disturb the balance thereto.

Article 4 : Human right to environment

The right to education and to a decent life shall be recognized as well as the right to a sound, hygienic environment. The State and the society shall secure these rights to enable the individual to fully enjoy his humanness and contribute to the sustainable development of his community. Women shall also be recognized as full partners in the sustainable development action.

Article 5 : Major constraints of sustainable development

Despite the significant progress made during the period of after the Rio Declaration, in the field of environment and sustainable development in the Islamic countries, there still exist some constraints among many of those countries in adopting sustainable development plans and programmes, chief among these constraints are :

1. Poverty is responsible for many health and social, as well as psychological and moral problems. The local, national and international communities need to devise development policies and plans for economic reforms in order to address those problems, by offering job opportunities, ensuring natural, human, economic and educational development of the poorest and most underdeveloped regions, and eradicating illiteracy.
2. Debts : Public debts, natural disasters, including drought, desertification and social backwardness resulting from ignorance, diseases and poverty all constitute the major constraints that stand in the way of successful sustainable development plans and adversely affect poor communities most particularly and the international community at large. Everyone is duty-bound to be supportive, in order to surmount these difficulties and spare humanity these hazards.

3. Wars, armed conflicts and foreign occupation, which have a harmful effect on environment and environmental safety and necessity to lay down legislation and commitments that forbid and penalize polluting the environment or cutting trees or exterminating animals ; and observing the principle of dignity in dealing with prisoners according to international law, and not maiming the death or destroying houses or civil facilities or water sources.
4. Overpopulation, particularly in cities of developing countries and the deterioration of living conditions in shanty towns and an increase in the demand for resources, health and social services. e-Deterioration of natural resources basis and their continuous over-utilization to bolster local production and consumption patterns which add to the depletion of natural resources and hampers sustainable development in developing countries.
5. Absence of modern technologies and technical expertise necessary for the implementation of sustainable development programmes and plans.
6. Insufficiency of expertise necessary for Islamic countries to allow them to fulfil their commitment towards world environmental issues and to participate with international community in the efforts designed to work out solutions to those issues.

Article 6 : Twenty-first century challenges

1. Secure funding sources necessary for sustainable development in developing countries and commit industrialized countries to stepping up support to developing nations (to stand at 1,5% of GNP).
2. Elaboration of developmental, health and educational programmes for the least developed countries for state, local, regional and national communities, as well as relevant organizations share responsibility, albeit in varying degrees, in elaborating . They are also required to help care for childhood and motherhood, build infrastructure and facilities, by financing sustainable development programmes and by designing active political plans in this area. The qualification and competence of all those parties are gaged in the light of services they extend in these vitally important fields, as well as in the light of the consideration they give to developing programmes for developmental action at the governmental, community and institutional levels.
3. Achieving complementarity and promoting internal and foreign investment by putting in place genuine partnership between advanced countries and developing countries and by offering better and greater opportunities for their products to compete in local and world market places through the World Trade Organization
4. Finding out novel funding means to boost development efforts of the developing countries.
5. Transfer of environment-friendly technology, encouraging research workers and scientific action as they constitute some of the prerequisites

- for enhancing developmental action, including raising greater awareness about scientific thinking and research in the fields of sustainable development, developing working means in this area and consequently helping society move to advanced levels of development and progress with greater speed and less cost.
6. Preservation of the civilizational heritage given its cardinal role in sustainable development, for it contributes to entrenching the cultural identity, preserves its specificities, protects it from melting, helps shape an independent personality of individuals and groups, provides a powerful impetus to the developmental action to defend the national and religious personality and safeguard the common future, and stresses the spiritual and moral dimensions advocated by the heavenly religions has a positive impact in respect of pushing development towards the good, righteous deeds and social solidarity.
 7. Highlighting the prejudice caused to Islamic countries as a result of the measures taken by the international community to face world environment issues and the international community's responsibility in providing assistance to affected Islamic countries. h-Securing full and effective participation of the developing countries in decision-making and shoring up their presence at international economic institutions, rendering thereby the mechanisms of global economy more transparent, equitable and respectful of the rules and regulations in force, to enable the developing countries to take up the challenges posed by globalization.

Article 7 : Islamic perception of sustainable development Administrative and legal management :

1. Achieve justice advocated by Islam between peoples and between all social categories through a just world system enabling regional and international institutions to discharge their responsibilities and allowing for equitable implementation of international resolutions, termination of foreign occupation and preservation of world peace and security.
2. Building a world system for administrative and legal management to serve as a basis for countries to set up their national systems that promote active participation of all sectors of society in planning and achieving sustainable development.
3. Achieving justice among peoples and promoting the role of United Nations agencies, and stimulating a climate suitable for the establishment of a genuine partnership between countries through a just system for world trade to replace the debt system that is depleting the resources of developing nations.
4. Necessity for the international community to rein in the practices, policies and conducts that affect badly the environment and man, and hamper the development of individuals and groups ; and which include killing people, destroying houses, threatening natural resources, polluting the environment with deadly weapons, depleting water sources, deliberately

breaching international laws and universally recognized customs, and utilizing the natural resources basis for the sake of promoting unsound consumption patterns.

5. Educating righteous youth having a sense of responsibility towards the environment, and the preservation of religious and moral values that hold the family and society together and keep them away from extremism or discrimination on grounds of race, religion or culture.



Fig 1 Ottoman Empire Trade Routes; İnalçik (1996:220-221)