

UNIVERSITY OF KWAZULU-NATAL

**AGRICULTURE AND POVERTY REDUCTION: A CRITICAL ASSESSMENT
OF THE ECONOMIC IMPACT OF AVOCADO INDUSTRY ON
SMALLHOLDER FARMERS IN GIHETA – BURUNDI.**

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OF THE ECONOMIC IMPACT OF AVOCADO INDUSTRY ON
SMALLHOLDER FARMERS IN GIHETA – BURUNDI.***

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ABSTRACT

The role of agriculture in rural development is widely documented in literature. Many analysts regard agriculture, specifically small-scale agriculture, as the cornerstone for viable and sustainable economic growth. Furthermore, the agricultural sector is seen as an effective instrument for poverty reduction, particularly in rural communities of developing countries where a large amount of poor people are concentrated. Indeed, analysts now agree that developing the agricultural sector is perhaps one of the most effective ways to address high levels of poverty evident in the developing world, and call on the world leaders to commit themselves to direct more investment into this sector.

Using the avocado industry in Giheta-Burundi, this dissertation argues that some emerging crops (such as avocados) present enormous opportunities to income generation for small-scale farmers with the potentiality of diversifying cash crop farming in Burundi, an area currently dominated by coffee, tea and cotton. This study further suggests that avocado farming presents the economic, market and health potentiality to contribute to a viable and sustainable rural economy in Giheta Burundi, thereby reducing levels of poverty in this area. The main research question is as follows: “To what extent does the production of avocados benefit the income and wellbeing of small-scale farming households in Giheta?”

Accordingly, the main policy concern is that if avocados are playing a crucial role for income generation, wellbeing and diet of the small-scale farmers in Giheta, the avocado sector needs to be substantially supported by both the private and public sectors in order to increase the capacity of avocado production in this area and subsequently enable small-scale farmers to gain greater income from this sector. All of which will contribute significantly to reducing levels of poverty in Giheta.

This dissertation is 42 266 words in length excluding references and appendices.

DECLARATION

I declare that this dissertation is my own unaided work. All citations, references and borrowed ideas have been duly acknowledged. It is being submitted for the degree of in the Faculty of Humanities, Development and Social Science, University of KwaZulu-Natal, Durban, South Africa. None of the present work has been submitted previously for any degree or examination in any other University.

Student signature

Date

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GLOSSARY OF ACRONYMS

\$ US	dollar
API	Agence Burundaise de Promotion des Investissements
DPAE	Direction Provinciale de la' Agriculture et de l' Elevage
FAO	Food and Agriculture Organization
Fbu	Franc burundais
GDP	Gross Domestic Product
HDI	Human Development Index
HPI	Human Poverty Index
ISA	Institut Superieur d' Agronomie
ISABU	Institut des Sciences Agronomiques du Burundi
MFN	Most Favorite Nation
MPI	Multidimensional Poverty Index
ODAG	Organization de Development pour l' Archi-diocese de Gitega
OECD:	Organization for Economic Co-operation and Development
OPHI	Oxford Poverty and Human Development Initiative
PCDC	Plan Communal de Developpement Communautaire
PRSP	Poverty Reduction Strategy Paper
RN2	National Road 2
UNDP	United Nations Development Programme
USA	United States of America
UEPB	Uganda Export Promotion Board
UK	United Kingdom
VND	Vietnamese Dong

CHAPTER ONE

INTRODUCTION

“Most of the people in the world are poor, so if we knew the economics of being poor we would know much of the economics that really matters. Most of the world’s poor people earn their living from agriculture, so if we knew the economics of agriculture we would know much of the economics of being poor” (Acceptance speech for the 1979 Nobel Prize in Economics of Theodore Schultz, quoted in Cervantes-Godoy and Dewbre, 2010).

1.1 Background

There is substantial theory and evidence in development literature showing that agriculture is an important strategy for economic growth and poverty reduction, especially, during the early stages of development. The OECD (2006:18) report entitled “Promoting Pro-Poor Growth Agriculture”, for instance, indicates that very few economies around the world have achieved sustainable economic growth without agricultural and rural growth preceding or accompanying it. Agriculture is regarded by many analysts as an engine of growth in that it can generate the resources needed in other sectors of the economy to feed and sustain the whole process of the economic growth. Food is arguably the main contribution of agriculture to the rest of the economy. Tiffin and Irz (2006) argue, for instance, that growth in the agricultural sector increases food consumption, improves nutrition, and ultimately raises labor productivity in other sectors of the economy. They further contend that the agricultural growth drives down the price of food and this increases the profitability and competitiveness of the industrial sector through the payment of lower wages, raises households incomes through savings on food and allowing resources to be allocated to other consumer items or to savings. This increased income raises, in turn, the consumption of the locally made industrial goods and services.

Additionally, both theory and empirics have also shown that agriculture can play a crucial role in poverty reduction, especially, in poor countries. The key argument put forward in the literature in this regard is that, given the fact that the majority of poor people in the developing world depend directly or indirectly on agriculture for their livelihood, it follows that agricultural growth potentially has a higher return in terms of poverty reduction than an equal amount of growth in non-agriculture (Christiansen and Kuhl 2006; Thirtle et al. 2003; Gallup et al. 1997; Mellor

1999; Ravallion and Datt 1996; Fan et al. 2005; Bresciani and Valdes 2007; Bourguignon and Morrison 1998). The OECD (2006:10) report goes even as far as to argue that growth in agriculture tends to be pro-poor as it harnesses poor people's key assets such as the land and labour, and creates a viable economy in rural areas where the majority of poor people live. The literature indicates that the impact of agriculture on both rural economic growth and poverty reduction is derived from the growth linkages in rural area of which, according to Haggblade and Hazell (2007), the consumption linkages dominate. The consumption linkages consist of farm households' spending on locally produced consumer goods and services and the impact of these expenditures on generating employment in rural labour-intensive industries (Haggblade and Hazell 2007:143). These consumption linkages account for 80 percent of the agricultural demand linkages whereas the production linkages which consist of forward linkages to agricultural processing and backward linkages to input-supply industries, account only for 20 percent (Haggblade and Hazell 2007:158).

However, the literature suggests that it is not "any kind of agriculture" which can achieve a sustainable rural economic growth and its associated poverty reduction. Ellis and Biggs (2001:441) argue that only the "agricultural growth based on small-farm efficiency" could achieve this end (see also Lipton 2006). Likewise, the World Development Report (2008:1) indicates that "using agriculture as the basis for economic growth in the agriculture-based countries requires a productivity revolution in smallholder farming". In similar vein, Katz (2006:6) also echoes the same view that "not all agricultural growth is pro-poor". She argues that there exists enough evidence which shows that growth in export agriculture has only limited poverty reducing effects if compared to the impact that growth in domestic agriculture has on poverty. The domestic agriculture consists of both food crops such as grains and beans and cash crops for local markets such as vegetables and fruits. However, there seems to be no consensus among the proponents of the importance of the domestic agriculture for poverty reduction as to which component of the domestic agriculture which has more impact on poverty. As Katz (2006:6) put it, "some emphasize the importance of productivity gains in staple food crops, while others see more potential in diversification into cash crops for local markets". Despite some opposing voices, the dominant view in the literature seems then to suggest that agriculture,

especially the small-scale farming, remains the main driving force for growth and poverty reduction particularly in poor countries.

Identifying the characteristics and context of those agricultural activities that can contribute towards poverty reduction is then a critical issue and is the focus of this dissertation. The avocado industry in Giheta, Burundi is used in this study to illustrate the role that agriculture could play in poverty reduction especially in the context of high levels of poverty. Burundi has been classified by the Multidimensional Poverty Index (MPI) among the ten poorest countries in the world and Giheta is one of the eleven communal districts of Gitega province, the second poorest province in Burundi (Bundervoet 2006). Employment in small-scale production is one of the most important livelihood activities in this district and the cultivation and sale of avocados is widespread in this district and has included commercial production and beneficiation in the form of oil extraction.

The few available studies have confirmed the avocado crop's economic and market potentiality to stimulate rural development in developing countries (Van Wijk 2006; FAO 2000). Avocado production also represents an opportunity to diversify the rural agricultural sector which is, very often, dominated by one or two crops such as coffee, cocoa or tea in most developing countries. These traditional cash crops are subject to declining prices and when not exported, are of little use to either the producers or consumers in the countries in which they are produced (Van Wijk 2006). Further, unlike most other cash crops, studies have demonstrated the avocado crop's high nutritional value which makes the avocado "an important nutritional food source and one of the most nutritious and healthiest fruit in the world" (Van Wijk 2006:9); a quality that positions this crop to also contribute towards the reduction of malnutrition in poor countries.

Van Wijk (2006), for instance, has argued that avocado is the only fruit known so far that contains all the main nutrient elements in big proportions such as proteins, lipids, vitamins, minerals, salt, sugars, carbohydrates and water. Bergh (1992) argues that there is substantial evidence to suggest that eating avocados may contribute significantly to resolving many major health problems in the world today such as overweight, heart disease, cancer, and stroke. For instance, Bergh (1992:5) indicates that avocado "provides about twice as high a proportion of our daily needs for three potent antioxidants vitamins C, E, and beta carotene" and it is also "rich

in copper and iron, two mineral constituents of antioxidant enzymes” that the human body needs to defend itself against cancer, heart disease, arthritis, and eye cataracts. Further, Bergh (1992:6) mentions the results of a study which was jointly conducted by the School of Medicine of the University of California and Cambridge University in England which show that “a 40 percent reduction in stroke risk was associated with an average daily increase in potassium consumption of about 400mg, the amount supplied by less than half an avocado”. Likewise, an Italian epidemiological survey of 4903 people, quoted in Bergh (1992:6), shows that the monounsaturated fat which can be found in avocado in big quantity is also associated with lower blood pressure. In addition, Van Heerden (2008:1) indicates that the results of the study conducted at the Potchefstroom Institute of Nutrition at Potchefstroom University also show that avocados can be used successfully in weight-management programs. This excellent nutritional value of avocado has led the Australian Heart Foundation to certify this fruit as a “heart-healthy” food (Perez-Jimenez 2008). Avocado was hailed by the Heart and stroke foundation of South Africa as “heart mark” and was classified by the American Dietetic Association as a “functional food” that has many health benefits (Van Heerden 2008:1). Moreover, writing about the contribution of avocados to the baby food, Sears (1988), quoted in Bergh (1992:8), notes that “avocados contain more potassium than 45 other fruits, juices or vegetables ... and they are one of the only fruits or vegetables which contain monounsaturated fats, essential for baby’s development”. Sears (1988), quoted in Bergh (1992:8), further indicates that avocados contains more other important nutrients needed for infant development such as vitamin B1B2, niacin, folacin, potassium and magnesium per 15 gram intake than “any of the other frequently recommended fruits and vegetables and are second to the highest in many other vitamins and minerals”. In similar vein, the results of the study by Slater et al. (1973), quoted in Bergh (1992:4), shows that for instance one half of a “Hass” avocado contains a substantial percentage of the daily nutritional needs of a child aged seven to ten. Additionally, Knight (2002), quoted in Perez-Jimenez (2008), contends that avocado oils are highly valued in the cosmetic industry. They are used as a skin moisturizer, cleansing cream, makeup base, sun screen, lipstick, bath oil, and hair conditioner (Bergh 1992:1).

These attributes partly explain the reason why the avocado market and production have been rapidly increasing for the past four decades. The majority of researchers working on this crop

seem to believe that this rapid expansion of avocado production and consumption is likely to continue even in the future as new avocado markets are being developed in the fastest emerging economies in the world such as China and Brazil. The study takes place in one of the few African countries where avocados are produced and consumed – Burundi. Burundi experienced four decades of political instability and violent social conflict, two factors which have greatly deteriorated its economy and agricultural system. Detailed information about the country and its economy will be provided in chapter three.

1.2 Objectives of the dissertation

This dissertation documents the impact of the avocado industry on the quality of life and livelihoods of small-scale farming households in the Giheta district of Burundi. More specifically, the study investigates the perceptions of small-scale farmers, most of whom live in households with low incomes and which have limited access to assets, about both the opportunities and challenges that this industry presents to them. The study focuses on the period following the construction of an avocado oil firm (2006) in the study area (Giheta). Of particular interest is how the benefits from avocado production (if there are any) are distributed among the members of producing households and who bears the challenges and costs of this production within these households. This information will provide insight into the question of whether the avocado industry helps small-scale farmers in Giheta and if so, how this can be enhanced. Hence, the main research question for this study is: To what extent does the production of avocados benefit the income and wellbeing of small-scale farming households in Giheta? Subsequently, the following specific research questions are addressed in this dissertation: 1) what is the scale and nature of avocado production and processing in Giheta? 2) To what extent does the avocado industry generate income and other benefits for small-scale farming households in Giheta and how is this distributed among the members of these households? 3) Who carries the costs of avocado production in terms of labour and other direct and indirect costs within the small-scale farming households, and why? 4) To what extent does the production of avocados contribute to the diet of small-scale farming households and what benefit is this perceived to bring? From a policy perspective, an important broader question to ask is: What can be the role of both private

and public sectors in ensuring that the avocado industry does, indeed, benefit the small-scale farming households in Burundi in terms of income generation, wealth creation and wellbeing?

1.3 Importance of the dissertation

To date, much research work has been done to augment the knowledge about the positive link between agriculture and economic growth in developing countries and to draw attention of the policy makers on the important role that agriculture could play in reducing poverty in these countries. However, research efforts seem to have been concentrated more on agriculture as a sector in general or on the specific traditional cash crops such as coffee, cacao, tea, or cotton. Few researchers have actually tried to work on the possible diversification of the rural agricultural sector, especially in Africa, by raising awareness about some emerging crops which present economic, market and health potentiality to contribute to the viability and sustainability of the rural economies, thereby reducing the levels of poverty. One of these crops is the avocado. Few studies have investigated the crucial role that this crop can play in stimulating rural development and improving health of the rural population, particularly in developing countries. Those studies that are available have been conducted in developed regions such as the USA, in Europe and in Australia and New Zealand and these tend to be written from an agricultural or business promotional perspective not necessarily from a development perspective. This also applies to South Africa which is the most significant producer of avocado in Africa. The present study seeks to fill this gap.

1.4 Limitations of the dissertation

Language was one of the biggest challenges that I experienced in this study, especially, during the collection of the quantitative data. The questionnaire was written in English and given the fact that Burundi is a French speaking country; the research assistant who is a graduate of the University of Burundi in Economics needed the questionnaire to be translated in French. During the collection of the data, the research assistant translated then the questionnaire (which had already been translated in French) in Kirundi. This whole process of translating the questionnaire into two languages have left some terms unclear especially for the small-scale farmers. For instance, it emerged in the interviews that small-scale farmers struggled to understand what the

research assistant meant by “farming avocados”. Accordingly, small-scale farmers who own one or two avocado trees and who use their avocados for households’ consumption only did not see themselves as “farming avocados”. This resulted in the situation whereby the number of small-scale farming households which reported that they consume their own avocados slightly exceeded the number of small-scale farming households which mentioned farming avocado as one of the agricultural activities taking place on their farms. The language barrier also manifested itself during the open-interview with the owner of the avocado oil firm who is an Italian speaker. I could not find the interpreter for the Italian language and the interview was conducted in French. This affected negatively the quality of this interview as the interviewee speaks little French.

Another limitation is that the questionnaire was designed in such way that little information was asked about coffee, partly because the main purpose of this dissertation was not really the comparison of the economic potentialities between these two crops. Consequently, this limits me to draw any conclusion about the comparison between these two crops in terms of the economic and market potentialities and opportunities that they present in the area of study. Further, the dissertation would have been more improved if I was able to interview some key players in avocado chain such as the importers and exporters of the avocado oil produced in Giheta and the firm workers. But due to the fact that the avocado oil firm was no longer operating by the time the data was collected because of the lack of inputs (avocados), it was impossible to interview these people. I could not even manage to know the identities of the importers and exporters of the avocado oil produced in this area before it stopped operating due to the poor quality of the interview with the owner of the firm for the reasons mentioned above.

1.5 Structure of the dissertation

This dissertation comprises six components in total. The introductory chapter outlines the main aspects which will be explored in the remaining parts of the dissertation. It highlights the background, the objectives, the significance, the limitations, and the structure of the dissertation. An attempt is made in Chapter two to review the relevant literature on the subject under investigation in this dissertation. At least three main bodies of literature have been drawn upon for this dissertation. These are: 1) the role of agriculture in economic growth, 2) the role of

agriculture in poverty reduction, and 3) the contribution of smallholder agriculture to agricultural development. The literature on poverty, encompassing the conceptualization, measurement of poverty, and poverty profile was also consulted. In chapter three, the literature on avocado industry and the research site will be discussed. Here, firstly, the focus will be on the global outlook of the avocado production as very little has been written on avocado production in Burundi in general and in Giheta in particular. Secondly, the research site will be described. Thirdly, the methodology used for conducting this dissertation will be discussed in detail and the reason (s) for using the combined methods (qualitative and Quantitative methods) will be provided, how and where this combination will be used will also be discussed. Further, the theoretical frameworks used to collect and analyze the qualitative data, namely the value chain analysis and participatory learning and action (PLA) techniques will also be discussed. The results from the quantitative and qualitative methods will, then, be presented separately in chapter four and five respectively. According to Sandelowski (2000), linking the results of qualitative and quantitative analysis is accomplished by treating each data set separately with the techniques appropriate to each method and then the results of qualitative analysis and that of quantitative analysis are combined at the interpretive level but each data set remains analytically separate from the other. In chapter six, as Sandelowski (2000) recommends, both qualitative and quantitative results will be linked in the discussion of the main conclusions for this dissertation. More specifically, the qualitative results will be used to interpret the quantitative results in answering the research questions. The policy implications will be also discussed in this chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Three main bodies of literature have been drawn upon for this dissertation. These are: the role of agriculture in economic growth, the role of agriculture in poverty reduction, and the contribution of smallholder agriculture to agricultural development. The literature on poverty, encompassing the conceptualization and measurement of poverty, and poverty profile was also consulted. It is necessary to start with the last as the introduction to this literature review.

2.2 Poverty profile

Kakwani (1993) makes a case that the effective and efficient strategies and programs to combat poverty in the world today should be informed by and based on a proper and comprehensive identification of the poor and the intensity of poverty which needs to be addressed. The empirical research on poverty, however, shows that poverty is, indeed, a complex concept. Nolan and Whelan (1996) argue that there is remarkably little consensus among scholars on how best to conceptualize and to measure this phenomenon. Nonetheless, relative and absolute approaches are some of the conceptualizations of poverty commonly used in the current literature on poverty reduction. For the former, Mellor (1999) argues that it is mainly used in high income countries and the key issue in this approach is the distribution of income. Here, the focus is on the inequality of distribution of resources in a particular society. For the latter, the emphasis is put rather on the proportion of people falling under a particular poverty line. According to Nolan and Whelan (1996), poverty, from this perspective, is measured by a poverty line which is an income line that distinguishes the poor from the non-poor by measuring how many households have incomes below that line. Various procedures have been suggested for setting a particular line as “a poverty line” all of which have their own merits and demerits.

Although important these debates are beyond the scope of this dissertation and instead I will make use of an absolute approach to the measurement of poverty while remaining mindful of its limitations. Likewise, I am aware that there remain many things that could be said about the

nature, conceptualization, measurement and composition of poverty, but these too are beyond the scope of this dissertation and I will confine the discussion to a brief overview of some of the more commonly used approaches to understanding poverty.

It is further stipulated in the literature that poverty cannot only be defined in terms of income and expenditure. Subsequently, a conceptualization of poverty in relation to human living conditions in terms of nutritional status, education attainment and health status was suggested (Kanbur and Squire 1999; World Bank 2000; Leibbrandt et al. 2005). The United Nations has reinforced this view by introducing the Human Development Index (HDI) particularly the Human Poverty Index (HPI) which consists of various indexes focusing on longevity, literacy and standards of living (Kanbur and Squire 1999). Recently, the Oxford Poverty and Human Development Initiative (OPHI) in partnership with the United Nations Development Programme (UNDP) have developed a new measure of poverty – the Multidimensional Poverty Index or MPI (Alkire and Santos 2010). The MPI reflect the multiple deprivations that a poor person experiences with respect to three dimensions – Education, health, and living standard. 10 indicators are used to measure these dimensions. First, the indicators used to measure the household's deprivations in education are the years of schooling and the children enrolment. Accordingly, for the former, a household is deprived if there is no member of the household who has completed at least five years of schooling. For the latter, a household is deprived if there is any school-aged child who is not attending school in years 1 to 8. Second, deprivation in health is measured using two indicators. These are the child mortality and nutrition. For the former, a household is deprived if any child has died in the household. For the latter, a household is deprived if available nutritional information about members of the household shows that there is any adult or child who is malnourished. Third and lastly, the deprivation in the standard of living is measured using six indicators: Electricity, drinking water, sanitation, flooring, cooking fuel, and assets. Accordingly, a household is deprived if it has no electricity; it does not have access to clean drinking water; it does not have a toilet or if it does, the toilet is shared; it has dirt, sand or dung floor; it uses the wood, charcoal or dung for cooking; and finally it does not own assets such as radio, TV, telephone, bike, car, or tractor (Alkire and Santos 2010).

In similar vein, it is also highlighted in this literature that the poor are not only deprived of income and resources, but also of opportunities (World Bank 2000). Hence, the human capability concept of poverty, emphasizing the empowerment of the poor and their participation in the economy, has been also proposed (Lok- Dessallien 2001). Likewise, it is argued in this literature that poverty could be a result of social exclusion of some groups of people who are pushed into poverty through different forms of discrimination based on class, gender, race, ethnicity or factors such as region of residence and family configuration (Lok- Dessallien 2001; Kanbur and Squire 1999). The Natural Resources Institute (2010) at the University of Greenwich notes, for instance, that although women play a key role in agriculture in Sub-Saharan Africa, they are more likely to be hungry and living in poverty because they are, very often, excluded from acquiring agricultural support or skills in farming that they need dearly to improve their livelihoods. This is exacerbated by the fact that women in many African cultures are not allowed to inherit their parents' properties such as the land and other assets. The inheritance system only privileges the male children in these patriarchal societies. This has a negative impact on the women's ownership of the productive assets which they can use as the sources for their livelihoods. In similar vein, Hall et al. (2008) observes that, although the so-called Green Revolution during the 1960-1970s in Brazil brought about improved agricultural output and exports, it pushed, however, at the same time a significant number of small-scale farmers into deep poverty as millions of small subsistence farmers were dislocated and many of these were forced to migrate into the big cities seeking for other opportunities that they did not find and subsequently ended up sinking into poverty at the peripheries of the big cities known in Brazil as "favelas" which are characterized by high levels of crime and other social ills. Gutberlet (1999) also echoes the same view when he argues that the rural modernization which started in 1960s in Brazil has created a situation where the rural communities have remained marginalized and powerless in the face of the ever advancement of the capitalist agribusiness.

Additionally, poor households could experience chronic poverty or transient poverty. Aliber (2003:476) defines chronic poverty "as poverty that is transmitted from one generation to the next, meaning that children from poor households are likely to become poor adults, whose children will in turn risk remaining in poverty and so on". The transient poverty refers to those households who find themselves always navigating in and out of poverty. In their study in

KwaZulu-Natal province of South Africa, for instance, May et al. (2000) find that in urban KwaZulu-Natal, 29 percent of the households were chronically poor and 19 percent of the households were moving always in and out of poverty. The situation looks alarming in rural KwaZulu Natal where 63 percent of the households were found to be chronically poor and 36 percent of the rural households were moving always in and out of poverty.

With regard to the global outlook of a poverty profile, the World Bank's 2008 World Development Report indicates that almost half of the world's six billion people live on less than \$2 per day and about 1.2 billion people are living in absolute poverty using the poverty line of \$1-a-day. This corresponds to 29.3 percent of the world's population (Besley and Burgess 2003). More than 90 percent of these 1.2 billion live in South Asia, East Asia and Sub-Saharan Africa. Using the MPI, the OPHI analyzed data from 104 countries and finds that about 1.7 billion people in the countries covered, that is, a third of their entire population, are poor. This study also finds that a half of the world's poor (844 million people or 51 percent) live in South Asia and over one quarter (458 million people or 28 percent) live in Africa (Alkire and Santos 2010). It is interesting to realize that the finding of this study portrays a slightly different picture of the global poverty comparing to that provided in the World Bank's report discussed above. The latest Millennium Development Goals Report (2010), however, shows that the situation of the global poverty has much improved in the current decade although there still remains much to do to significantly reduce the stubborn levels of poverty at the global scale. This report shows that, for instance, the number of people in developing countries living on less than \$ 1.25 a day has fallen from 1.8 billion in 1999 to 1.4 billion in 2005, and at the same time, the poverty rate declined from 46 per cent to 27 percent (Millennium Development Goals Report 2010:6). The literature shows that three quarters of the world's poor live in rural areas (Thirtle et al. 2003; Wolz 2005). This lends support to the view that fighting poverty today means first and foremost transforming rural lives and livelihoods (Wolz 2005). Since all rural households depend to some extent on agriculture, whether directly as producers or indirectly as wage laborers or consumers, and given the large contribution of this sector to the overall economy, there is a strong case that agriculture should play a leading role in poverty reduction (Diao et al. 2006). To this I shall now turn.

2.3 The role of agriculture in the process of economic growth

In the OECD (2006:17) report, agriculture is understood to include,

“Households engaged in farming, herding, livestock production, fishing and aquaculture. Also included are other producers and individuals employed in cultivating and harvesting food resources from salt and fresh water and cultivating trees and shrubs and harvesting non-timber forest products – as well as processors, small-scale traders, managers, extension specialists, researchers, policy makers and others engaged in the food, feed and fibre system and its relationships with natural resources. This system also includes processes and institutions, including markets that are relevant to the agriculture sector”.

This report also indicates that the contribution of agriculture to the economy of the developing countries averages about 13 percent, ranging from 8 percent in Latin America and the Caribbean to about 28 percent in South Asia, of course with differences among countries in the different regions. In Sub-Saharan Africa, agriculture accounts for 20 percent of GDP and it employs 67 percent of the total labour force (OECD 2006). In 1993, agricultural products made up 33 percent of the value of exports from low-income, non-oil-exporting Sub-Saharan African countries. In 1994, the agricultural sector accounted for 40 percent or more of GDP in a third of all Sub-Saharan African Countries. In 1996, the agriculture accounted for an average of 34 percent of GDP in low-income and 8 percent of GDP in middle-income Sub-Saharan African countries (Delgado et al. 1998:17). Table 2.1 shows the contribution of three main sectors to the GDP in the regions of the world.

Table 2.1: Sectoral shares of GDP by regions in the world

Region	Agriculture			Manufacturing			Services		
	70-79	80-89	90-99	70-79	80-89	90-99	70-79	80-89	90-99
High Income Countries (non - OECD)		3.4	2.0	-	27.6	22.4	-	54.0	64.7
East Asia and the Pacific	29.4	22.8	16.2	25.5	29.4	31.0	33.5	36.5	40.5
Europe and Central Asia	-	17.3	12.1	-	-	-	-	36.4	50.6
Latin America and Caribbean	12.5	10.2	8.1	27.8	28.6	21.7	49.4	49.4	59.0
Middle East and North Africa	11.3	12.5	13.5	8.9	10.3	12.9	35.6	45.6	46.2
South Asia	41.0	33.6	29.0	15.1	16.1	16.3	37.2	41.1	44.8
Sub-Saharan Africa	20.2	18.6	17.8	15.8	16.6	15.7	48.0	46.7	50.5

Source: World Bank (2001)

Table 2.1 shows that agriculture contributes more to the GDP in Sub-Saharan Africa and South Asia than manufacturing sector. However, the contribution of the manufacturing sector towards the GDP in high income and middle income regions seems to be higher than that of agricultural sector and this seems to support the view that the role of agriculture decreases as countries develop (OECD 2006). By the period 1990-1999, the services sector is to be the main contributor towards the GDP in all regions of the world.

There is a significant body of literature on the role of agriculture in the process of economic growth. The key question in this literature is whether agriculture could rightly be regarded as an engine of the overall economic growth. There is no consensus in this debate as the literature provides conflicting evidence in answering the question. Some argue that the export of the output from agriculture makes the agricultural sector the driver of the economic growth especially at the early stage of economic development (Tiffin and Irz 2006:79). Others contend that increases in the non-farm wage lead to relocation and increases in agricultural productivity and, this has led them to conclude that it is, rather, the economic growth which causes the agricultural growth (Tiffin and Irz 2006:79). This section will focus on the literature on these two opposing views on the role of agriculture in the process of economic growth.

The underpinning argument for the advocates of agriculture as an engine of growth is that the agricultural sector can generate the resources needed in other sectors of the economy to feed and sustain the whole process of the economic growth. Food and labour are arguably two crucial resources which are exported from the agricultural sector to the rest of the economy. For the former, the proponents of this view contend that agricultural sector produces food for the workers engaged in other sectors of the economy (Tiffin and Irz 2006). A study by Wichman (1995) investigates the relationship between agricultural growth, nutrition, and labor productivity. This study finds that the agricultural growth increases food consumption, improves nutrition, and ultimately raises labor productivity in other sectors of the economy. The study also reaches another important conclusion: that better nutrition does not only raise labor productivity but also improves learning.

Further, the proponents of this view also argue that the increase of the agricultural output results in low price of food which, in turn, spurs the economic growth in various ways. First, it allows

the owners of the means of production to pay lower wages and this “boosts the profitability and competitiveness of the industrial sector and might result in increased savings and investments, as well as the creation of non-agricultural jobs” (Tiffin and Irz 2006:80). In this vein, Rangarajan (1982) argues that a low and stable price for food may create a conducive environment to an increased private corporate investment due to the increased profitability for industrial products resulted from low and stable price for wage goods of which food is very important. Second, closely linked to the above argument is the fact that the low price of food increases the savings of the net-purchasers of food (Tiffin and Irz 2006) and this raises incomes of these households which, subsequently, provide a market for domestically produced goods and services (Byerlee et al. 2005). According to Murphy et al. (1989), the demand generated by agriculture for these services and industrial products is crucial in growing the services and industrial sectors which make the whole economic growth process viable and sustainable. Third, they also contend that agriculture can supply the capital through direct and indirect taxes collected from the agricultural sector which can enable the state to finance industrial development, provides public goods, and develops effective infrastructures that the industrial sector needs to grow sustainably and competitively (Tiffin and Irz 2006). To illustrate this, Tiffin and Irz (2006) note, for instance, that the creation and development of industrialization in Japan at the early stage of its industrialization development were largely financed by a land tax which represented over 80 percent of fiscal revenues of this country at the time. Rangarajan (1982) takes this argument a step further by arguing that the infrastructural development and public investment may generate the demand for the output of local basic and capital goods industries, and this can greatly contribute towards the industrial growth and the economic growth as a whole. Fourth, the contenders of this view make a strong case that the scarcity of foreign exchange that poor countries experience and which restricts them to purchase capital goods and other imports needed for investment could be overcome by the agricultural surplus which can either substitute food imports or increases the exports (Tiffin and Irz 2006). Finally, the advocates of this view argue that agriculture could serve as a reliable source of raw materials for other agricultural processing industries (Tiffin and Irz 2006). This creates strong linkages especially in the rural economy as a whole with great impact on poverty reduction in rural areas. These linkages and their effects on poverty reduction will be discussed in great details in the next section.

As an example of the evidence that supports these views, Rangarajan (1982) investigates the ties between agricultural performance and industrial growth in India. This study demonstrates that a rise in agricultural production leads to a rise in households incomes, which in turn leads to increased demand for industrial consumption goods as it was pointed out above. The study also finds that a 1 percent growth in agricultural output increases industrial production by about 0.5 percent and the national income by more than 0.7 percent. Rangarajan (1982) illustrates these ties in the Indian industrial history. From this historical perspective, the study shows that when the agricultural sector performed well, the industrial sector also fared very well. Conversely, when the agricultural productivity was disrupted for various reasons, the industrial performance also slowed down. For instance, when the industrial production rose at an average annual rate of 6.2 percent between 1950 and 1960, the agricultural sector also registered a rapid growth of agricultural output of annual rate of 5.3 percent. And when the drought hit the agricultural sector between 1965 and 1966, the study notes that the industrial production which had been growing steadily at about 9 percent per year in the previous five years stagnated dramatically in this period.

These ties between agricultural performance and the overall economic growth are also explicitly acknowledged by the policymakers. For example, in Madagascar in their 1986 National Agricultural Plan it was stipulated that:

“Agriculture has generally stagnated in the course of the last decade, inducing a serious breakdown of the national economy. Because of the stagnation of production and its consequences – the decline in food availability – agricultural surplus declined and commerce between farmers and other social groups diminished. The basic needs of the population had to be met by imported goods. This disequilibria contributed to an aggravated balance of payments deficit, inducing the importation of production goods and limiting the resources earmarked for social and economic development” (Plan National Agricole 1986:1508, quoted in Dorosh and Haggblade 1992).

In his study on the role of agricultural sector in responding to the development challenges of economic growth and poverty reduction in Tanzania, Amani (2005) also finds close ties between the performance of the overall Tanzanian economy and the performance of the agricultural sector in that country. He finds that the latter has been the main driver of the former. For instance, in 2004, in Tanzania, the agricultural sector contributed approximately 51 percent of foreign

exchange, 75 percent of total employment, and 47 percent of the Gross Domestic product (Amani 2005:2).

As the literature reviewed demonstrates, the potential for growth in the agricultural sector to cause general economic growth seems compelling especially in developing countries.

However, the opponents of the view of agriculture as an engine of growth have equally presented strong arguments to support their position. Their main argument is that “the causality might run in the opposite direction, i.e. from non-agriculture to agricultural growth” (Tiffin and Irz 2006:80). In other words, from this perspective, growth in non-agricultural sector is considered to be the main driver of the whole process of the economic growth including the agricultural growth. As Tiffin and Irz (2006) put it, those who advocate for this position build their case on the fact that an increase in the non-agricultural wage rate amounts into a reallocation of the surplus labour from agricultural sector to non-agricultural sector, and this, ultimately, increases labor productivity and value-added per worker in the agricultural sector. The proponents of this view produce supporting empirical evidences to strengthen their case.

A study on the US agricultural development by Gardner (2000) finds that income growth in the non-agricultural sector had played a crucial role in increasing the income in agricultural sector. In similar vein, in their study on the Philippines’ economy, Estudillo and Otsuka (1999) establish that the growth in the non-agricultural economy has been the main driving force of growth in agricultural wage rates in this country. Butzer and Larson (2002) are also of the same view. From their study on inter-sectoral migrations in Venezuela, these scholars conclude that “as labour migrates from agriculture to non agriculture, labour productivity in agriculture increases, reducing the inter-sectoral difference” (Butzer and Larson 2002, quoted in Tiffin and Irz 2006:80). Hwa (1988) put forward another reason which could justify that agricultural growth does depend on growth in non-agricultural economy and not other way around. In his opinion, given the fact that agricultural growth is spurred by the modern inputs and technological innovation from the industrial sector, it follows, therefore, that a rapid technological change in the manufacturing sector would cause growth in agricultural sector. The fair question to ask here, however, is the extent to which the economic growth generated by agriculture contributes to poverty reduction in developing countries.

2.4 The role of agriculture in poverty reduction

There is also debate in the scholastic milieu on the role of agriculture in poverty reduction. On the one hand, those who advocate for the crucial role that agriculture can play in poverty reduction have made a strong case that agriculturally-led growth has an essential role in poverty reduction, especially, at the early stages of structural transformation. The argument they put forward is that, given the fact that the majority of poor people in the developing world depend directly or indirectly on agriculture for their livelihood, agricultural growth potentially has a higher return in terms of poverty reduction than an equal amount of growth in a non-agricultural sector. As a result they contend that the poor stand to benefit much more from an increase in agricultural incomes than from an increase in non-agricultural incomes (Christiansen and Kuhl 2006; Thirtle et al. 2003; Gallup et al. 1997; Mellor 1999; Ravallion and Datt 1996; Fan et al. 2005; Bresciani and Valdes 2007; Bourguignon and Morrison 1998). The OECD (2006) report indicates, for instance, that a 10 percent increase in crop yields leads to a reduction of between 6 percent and 10 percent of people living on less than \$1 a day. Likewise, the report also indicates that the Green Revolution increased the average real income of small-scale farmers in South India by 90 percent and that of landless labourers by 125 percent between 1973 and 1994. Similarly, the report also finds that a 1 percent increase in labour productivity in agriculture reduced the number of people living on less than \$1 a day by between 0.6 percent and 1.2 percent, and 1 percent increase in agricultural gross domestic product per capita led to a 1.61 percent gain in the per capita incomes of the lowest fifth of the population in 35 countries (OECD 2006:19). This leads Wolz (2005:4) to conclude that “to a large degree, poverty is a product of unproductive agriculture”.

As with the debate over growth, there is also a school of thought which opposes the role of agriculture in poverty reduction. This school is very often referred to in the literature as “agro-pessimism”. Byerlee et al. (2005) provide a summary of five key points which constitute the agro-pessimist argument. First, they argue that agricultural development can be bypassed through rapid industrialization due to the availability of cheap and plentiful food imports that can allow developing countries to leapfrog agricultural development and proceed directly to industrialization. Second, agro-pessimists shift the focus away from agriculture as the “engine of

growth” in rural areas and, instead, put strong emphasis on migration and diversification into non-farm activities as the main drivers for growth in rural areas. Third, based on the ever declining share of agriculture in developing economies, the agro-pessimists argue that the agriculture’s contribution to pro-poor growth is increasingly becoming insignificant. Fourth, the agro-pessimists argue that the past agricultural successes such as the Green Revolution might not occur today due to current technological stagnation in agricultural sector. The final argument that the agro-pessimist theorists put forward in challenging the relevance of agriculture in ensuring growth and poverty reduction is the high costs of overcoming the sunk costs of urban bias.

This section will discuss the literature on these two opposing views on the role of agriculture in poverty reduction focusing first on the agro-pessimists.

2.4.1 Agro-pessimism school of thought

Dorosh and Diao (2007) identify three factors underpinning the pessimism about the role of agriculture in poverty reduction in developing countries. First, they contend that, given the neo-liberal ideology which dominates the world economy today and its emphasis on minimizing governments’ expenditure, the policy framework which supported the Green Revolution in Asian countries with regard to the price supports, fertilizer and credit subsidies and irrigation schemes are less acceptable models of public intervention today. Second, they argue that factors such as poorly developed rural infrastructure, low rural incomes, and high market transaction costs weaken the domestic demand to the extent that it is unlikely that increased production of food staples would translate into increases in rural economy. This weak domestic demand is further exacerbated by the long-term global decline in agricultural commodity prices which undermines the profitability of agriculture as a business. Third, they argue that the current globalised economic system has created a situation whereby the agriculture in developing countries is facing a sharp competition both from the poor countries themselves and from wealthy countries with agricultural subsidies.

The skeptics about the agriculture’s relevance to growth and poverty reduction further argue that the availability of cheap and plentiful food imports can allow developing countries to pass-by agricultural development and proceed directly to industrialization. In this regard, they suggest

that those countries which are rich in natural resources could export the abundant oil and minerals and import agricultural goods they need to meet their domestic demand (Ashley and Maxwell 2001). Additionally, the advocates of agro-pessimism suggest that the rural development thinking and practice should be revisited for various reasons. One of these is worth-mentioning here. They contend that the rural world is so diverse and heterogeneous in nature and this provides enough evidence that rural people obtain their incomes from various sources. Based on this, they argue that poverty reduction strategies should focus on promoting rural livelihood activities (Ashley and Maxwell 2001). Ellis and Harris (2004), quoted in Diao et al. (2006), go even as far as to argue that migration from rural areas to the urban areas which experience rapid economic growth might, actually, present the preferable route out of poverty as the benefits of growth would trickle down to rural households. Moreover, taking into account the urban bias which has characterized policy and investment processes in developing countries for so many years, the skeptics raises an important question of whether such biases can be reversed, given the “sunk cost” of past investments and the high investment and cost requirements, particularly in terms of rural infrastructural development (Timmer 1988).

The pessimist position vis-à-vis the small-scale agriculture is even stronger. The advocates of this position make a case that small-scale agriculture is unviable due to factors such as small and fragmented farms which are overused and this leads to the declining soil fertility and agricultural productivity; difficulty of most small-scale farmers to access credit for input; ever-declining prices of agricultural goods; and inability of small-scale farmers to keep up with the pace of international technological change in each crop (Timmer 1988). Additionally, there is a sense in some quarters that most of the rural population, especially young adults are increasingly more interested in non-agricultural activities, particularly petty trading (Chirwa et al. 2006). Likewise, Ashley and Maxwell (2001) question the expectation of equitable growth through the success of small-scale agriculture given the fact that the rise in supermarkets, the growing importance of quality standards, and poor access to markets jeopardize the ability of small-scale farmers to compete with their counterparts big and commercial farmers. Wolz (2005) argues that these new required standards of agricultural products may results in the withdrawal of small-scale farmers as they simply lack the capital and infrastructure necessary to meet these standards.

2.4.2 Agro-optimism school of thought

The literature on the direct and indirect positive effects of agriculture on poverty reduction has focused on rural development. While poor people are living in both rural and urban areas, there seems to be a consensus among scholars that the majority of the poor continue to live in rural areas and poverty is concentrated in rural areas. Empirical studies have shown that three quarters of the world's poor people live in rural areas of the developing countries (Bresciani and Valdes 2007; Wolz 2005). This leads scholars working in rural development field to argue that “fighting poverty today means first and foremost transforming rural lives and livelihoods” (Wolz 2005:2). In this vein, the OECD (2006) report also indicates that growth in agriculture tends to be pro-poor as it harnesses poor people's key assets such as the land and labour, and creates a viable economy in rural areas where the majority of poor people live. However, in their study on India, Bresciani and Valdes (2007) find that the contribution of agricultural growth to poverty reduction was not only limited to rural areas as it has significantly impacted on poverty reduction in urban areas and had even contributed to reducing income inequality in both urban and rural areas. For instance, it is argued that the Green Revolution gains offered a route out of poverty by increasing incomes and labor rates, lowering rural and urban food prices and generating new upstream and downstream livelihood opportunities (OECD 2006). The OECD (2006) report neatly sums up the role of agriculture in poverty reduction in the following words:

“Agriculture growth, particularly through increased agricultural sector productivity, also reduces poverty by lowering and stabilizing food prices; improving employment for poor rural people; increasing demand for consumer goods and services, and stimulating growth in the non-farm economy” (OECD 2006:10).

As it may be seen here, much focus in this literature is on the critical impact of both consumption and production linkages on rural economic growth and poverty reduction. According to Haggblade and Hazell (2007), these growth linkages in rural economy are dominated by the consumption linkages as they account for 80 percent of the agricultural demand linkages whereas the production linkages account for 20 percent. Available evidence seems to suggest that the importance of the consumption linkages decreases as countries' economy grows sustainably. Vogel's (1994) comparison study for both developed and developing countries, quoted in

Haggblade and Hazell (2007), shows that, for instance, consumption linkages fall from 80 percent of demand linkages in poor countries to about 60 percent in the developed world because of the rising input intensity of agriculture and the growing importance of backward linkages.

Despite these potential advantages, there are many challenges to the role that can be played by agriculture in the reduction of poverty. The OECD (2006) report has highlighted at least three of these challenges. First, in the majority of poor countries, particularly in Africa, rural areas are hard hit by the HIV/AIDS pandemic which is disrupting the transfer of farming knowledge, destroying traditional land allocation systems, and dramatically changing the demographic composition of several rural communities (See also Yamano and Jayne 2004). This has a strong negative impact on agricultural growth in rural areas as the pandemic is destroying the more energetic members of rural households, mostly, in working age who, under normal circumstances, would have been the driving force for a sustained and viable agricultural production growth in rural areas (Wolz 2005). Second, the report also takes note of the fact that the current global warming combined with rapid growing population density are increasingly putting pressure on already scarce and fragile natural resources which form the base of rural livelihoods. In this vein, Wolz (2005) notes that land and water resources have been increasingly declining to the extent that they are no longer enough to sustain a sustainable rural agricultural growth. He mentions that, for instance, per capita land area for agricultural production declined from 0.30 to 0.16 hectares between 1961 and 2001 in developing countries. Likewise, he also notes that water supplies for agriculture are declining as competition from non-agricultural uses increase. Finally, the report also highlights the fact that conflict conditions prevailing in many poor countries further undermine the livelihood systems in rural areas.

2.4.3 The heterogeneity of the rural world in developing countries

In part, these debates over the potential role played by agricultural in both growth and poverty reduction reflect the heterogeneity of the poor and the diverse rural and agricultural systems in which poor people live and operate. There is ample evidence to suggest that poor people do not form a homogenous group as they experience very diverse living conditions and have very diverse interests. They could be, for instance, grouped according to the regions or continents where they live; their locations, i.e., rural or urban areas; and their access to resources such as

land and other forms of capital (Wolz 2005). Accordingly, Wolz (2005:2) identify at least seven categories of rural poor: small-scale farmers, landless rural residents, nomadic pastoralists, ethnic indigenous groups, artisanal fishermen, displaced or refugee populations, and households headed by women. In similar vein, five “rural worlds” have been identified in the OECD (2006:11) report. These are: large-scale commercial agricultural households and enterprises, traditional agricultural households and enterprises, subsistence agricultural households and micro-enterprises, landless rural households and micro-enterprises, and chronically poor rural households. Lipton (2004), quoted in Byerlee et al. (2005), acknowledges the increasing diversification of rural incomes, especially, in some countries of Asia and Latin America but argues that while diversification in some countries of Asia and Latin America might reflect vibrant non-agricultural sectors, in other countries, particularly in most of African countries, diversification appears to reflect what he refers to as “diversification and migration of despair” and as such, it cannot be regarded, in his view, as long-term strategy for poverty reduction in those countries. Likewise, Diao et al. (2006) refute the agro-pessimist argument about the role that growth in the oil and mineral export sectors in poor countries could play in spurring economic growth and poverty reduction in those countries. These scholars contend that growth in oil and mineral export sectors is likely to lead to an appreciation of the real exchange rate that penalizes other traded goods sectors, including agriculture. They further argue that the income from such export is likely to be captured by a small group of elite people in the developing countries. They also point out that the export of natural resources necessitate capital intensive means of production with little demand for local labor and weak links to the domestic economy through the economic linkages discussed earlier. In similar vein, Diao et al. (2006) argue that the current globalization and trade liberalization waves in the global market economy raise other challenges which could make the agro-pessimist argument of by-passing agriculture and proceed directly to industrialization impractical, particularly in developing countries. Among others, they mention the following: First, growing the nascent industrialization in developing countries in the current open global economic order is very challenging as the poorly performing industries in developing countries need to compete with well-established and efficient industries from rich countries at both domestic and global markets. Second, the industrial sector absorbs a small quantity of labour force to such extent that it could take several decades to create enough jobs for

the entire labour force in poverty-stricken countries. Third, although this argument suggests that the free trade has made available of cheap food, it is still a reality that the prices of food remain high in developing countries due to the high transport costs caused by poor infrastructure in those countries and this seems to support the view that “growing food where it is needed is still the least expensive option” for countries in developing world (Diao et al. 2006:17).

Further, another important factor that this literature highlights is the “feminization” of agricultural work. As an illustration, the OECD (2006:17) report indicates that, for instance, in Cambodia, 65 percent of the agricultural labour and 75 percent of fisheries production are in the hands of women. In this country, 85 percent of rural women are responsible of food production, of which 78 percent are engaged in subsistence agriculture, compared with 29 percent for men. The report also indicates that the households headed by women are more likely than households headed by men to work in agriculture, and they are also more likely to be landless or have significantly smaller plots of land. The picture looks more balanced in Africa. Delgado et al. (1998:4) report that of the 20 countries for which data were available for 1980 to 1992, 13 had at least 50 percent of their economically active male population working in agriculture. Actually, four of those countries had over 75 percent of their male population working in agriculture. With regard to the female population, 14 of 20 countries had more than 50 percent of female population working in agriculture.

As the OECD (2006:11) report indicates, understanding all these dynamics within the rural economy is very crucial as they clearly show that “poverty is located unevenly across and within rural populations, that policy in and for agriculture affects different groups in different ways”. As a result, the differing views on the role of agriculture in developing countries perhaps should rather be seen as a continuum of potential outcome that will differ from country to country, and perhaps even within a country. Rather than contending which view should prevail, it is more informative to consider the reasons why agriculture might make a positive contribution to poverty reduction.

2.5 Agricultural-led pathways to growth and poverty reduction

2.5.1 Consumption linkages and their effects on poverty reduction

The importance of the direct benefits from agricultural growth in increasing rural incomes and employment is widely discussed in the literature. Simphiwe (2001) argues that non-agricultural employment opportunities in rural areas depend upon vibrant growth in local farm income. Hence, the rural consumption linkages, which consist of farm households' spending on locally produced consumer goods and services and the impact of these expenditures on generating employment in rural labour-intensive industries, are regarded as the main driving force for the rural economy and poverty reduction in rural areas (Dorosh and Haggblade 1992).

Agriculture contributes the biggest share in the rural households' income. Machethe et al. (2004) investigates the share of agriculture of the total rural household income in Limpopo province, South Africa. In this study, these scholars grouped the households into those who were thought to be poor and those who were thought to be rich and, then, they analyze the contribution of the various sources of income to total household income for these two categories. The results of this study which involved 138 small-scale irrigation farmers find that farming is the most important source of income for the "poor" rural households as it contributes about 28 percent to total household income. The study also reveals that the contribution of farming towards the total income of the "rich" households is even greater as it exceeds the total contribution of all non-farm income sources combined. These sources include among others, pension, wages, remittances, and family business. Accordingly, Machethe et al. (2004) conclude that the farming contribution towards the total household income seems to increase as households become richer. In similar vein, a study conducted in KwaZulu-Natal by May et al. (2000), quoted in Machethe et al. (2004:6), which involved 1031 households, concludes that "the level of farm income increases with total household income suggesting that agriculture remains an important source of income even for households deriving a significant proportion of their income from nonfarm sources". Likewise, Rangarajan (1982) argues that rural demand for industrial consumption goods will be unambiguously influenced by the output changes in agriculture and by the terms of trade. The terms of trade are critical here because if they improve in favor of agriculture, the

small-scale farmers who sell agricultural commodities will greatly benefit, thereby increasing their incomes.

However, the patterns of rural households' expenditures are highly disputed among scholars with some argue that the rural households' income is more spent on non-agricultural goods and services while others contend that food occupy the main place in the rural households' expenditures. On the one hand, in their study on the effects of Green Revolution in India, Haggblade et al. (2007) find that small-scale farmers spent about half of their income on non-agricultural goods and services and another third on perishable agricultural products such as milk, fruit, and vegetables, thereby generating strong demand for locally supplied consumer goods and services. Anderson and Leiserson (1980) also note that non-agricultural products occupy a rising share of the rural households' budget as income rises. Their study shows that the rural households as a group in developing countries spend between 30 percent and 40 percent of their incomes on non-agricultural products and about 10 percent to 15 percent of their incomes on foods which necessitate substantial processing.

Other studies show that much income of the poor households is spent on food. In their study in Zambia, Hazell and Hojjati (1995) find that only 7 percent of the budget is allocated to locally produced non-agricultural items. They find that, for instance in 1986, the average household consumed goods and services were estimated at 3 191 Kwacha of which 2 133 Kwacha were spent on home grown foods and only 1 058 Kwacha were spent on other products. This study further demonstrates that food, alcohol and tobacco accounted for 85 percent of the total value of consumption, and for 47 percent of total expenditure. Simphiwe's (2001) study in Eastern Cape, South Africa, also reaches the same conclusion. It shows that households in the area under the study spend more on basic food than on any other goods and services category. For instance, his study shows that a third of the total budget of the average household is spent on food. Dorosh and Diao (2007) go even to the extent to argue that the best prospects for agriculture-led growth remain in the food sector as it is in this sector that domestic demand for food products still represents a large and growing market. According to Hazell and Hojjati (1995:407), some factors could explain this scenario. These include among other things:

“lower levels of per capita incomes that restrain consumption expenditure on non-foods; more traditional agricultural practices that use fewer purchased inputs; poor infrastructure development that weakens links between villages and rural towns and low population densities that lead to seasonal labour bottlenecks and inadequate market concentration, both of which retard the emergence and growth of small, labour-intensive firms”.

Despite these diverging views with regard to the patterns of rural expenditure there seems to be a dominant view among scholars that a substantial share of the income of the rural households is spent on food.

Available evidence also seems to suggest that the part of the income of the rural households which is spent on non-agricultural items targets more the locally-made goods and services than the imported ones (Hazell and Hojjati 1995). In this vein, Wolz (2005) contends that the improvement of the productivity of agriculture results in a development of domestic mass-consumption market as the increased farm incomes and agricultural wage labour incomes are spent on the local employment intensive goods and services which, in turn, spurred the creation of many rural small scale enterprises to provide these goods with labour intensive techniques. Simphiwe (2001) echoes the same view when he says that the additional agricultural income from sales of agricultural surpluses has the great effect on total local income as it is re-spent on local non-agricultural goods and services. This leads him to conclude that without purchasing power generated within local areas themselves the local industries will die off. Likewise Delgado et al. (1998) argue that under appropriate conditions this new purchasing power stimulates additional production and employment. Available evidence on the employment gains generated by agricultural growth shows strong employment increases in a wide variety of rural industries, especially those supplying consumption goods and services to agricultural households (Haggblade and Hazell 2007). For instance, the results of a comparative study on agricultural households in Japan, Taiwan and South Korea by Haggblade et al. (2007) shows that, while agricultural households in Japan and Taiwan earned 80 percent and 65 percent of their income, respectively, from non-agricultural activities those in South Korea earned only 33 percent of their total income from non-agricultural activities. The study shows that Japan and Taiwan experienced rapid increases in rural non-agricultural employment and income, whereas the non-agricultural sector dwindled in South Korea. This disparity was caused, according to some

analysts, by differences in agricultural performance in these countries, as South Korea seemed to have neglected the agricultural sector whereas Japan and Taiwan invested massively in rural economy through infrastructural development and other institutional arrangements which supported manufacturing, commercial, and service activities in rural areas in those countries. In similar vein, a study by the International Labour Organization in the Philippines, quoted in Anderson and Leiserson (1980), demonstrates that the households residing in the regions which had had improved yields of rice within a period of five to six years have improved their houses, built new ones, and purchased household furnishings and other equipment. Additionally, this study also indicates that the households' expenditure on other goods and services such as education, health, personal services, food, farm tools and equipment and transport also increased.

According to Hazell and Roell (1983:12), these consumption linkages are more appealing because "the rounds of growth they induce are predominantly concentrated within rural areas and because the kinds of goods and services demanded are typically produced by small, labor-intensive enterprises". As Rangarajan (1982) notes, these consumption linkages played a critical role in spurring growth in labour-intensive rural industries in India and this, in turn, enhanced the rural nonfarm employment rates in that country, and subsequently broadened the participation of the poor in the benefits of the economic growth and generated a greater market for agricultural output in that country as well. As Bresciani and Valdes (2007) also note, this is certainly so if one takes into account the fact that one of the specific characteristic of agriculture with regard to the employment comparing with other sectors of the economy is its use of unskilled labor. Their study in four countries, namely, Chile, India, Mexico, and South Africa reveals that agricultural growth has a significant impact on the demand for unskilled labour and an economy-wide effect on their wage, thereby on poverty. This implies that agricultural growth raises the employment of unskilled labor comparing with the skilled labor. Accordingly, agriculture becomes a powerful tool in reducing poverty as the bulk of unskilled labour is still self-employed in the agricultural sector.

From a somewhat radical perspective, Hart (1988), however, vehemently rejects all the views discussed above. In his study in Muda region, Malaysia, he uses the same consumption data that Hazell and Roell (1983) use but reaches different conclusions. The results of his study contradict

all the studies discussed above at all levels. First, he finds that growth and poverty reduction in Muda region have come about through the expansion of commerce and government services. In his view, the main factor which increased the household income in this region was not agriculture or agricultural-led industrialization, but rather the flourishing of commercial activities which were made possible by the fact that Muda economy has always been open to trade with other regions for a long time. He notes that the 15 years of heavy investment in agriculture in Muda region did not bring about economic gains as it was expected. Second, he notes that imported goods were consumed in Muda region more than the locally-manufactured products. To illustrate this, he mentions that, for instance, the local consumption of the locally-manufactured cigarettes and soft drinks lost the ground to the brand-name products manufactured elsewhere outside Muda region. Finally, he also notes the massive outflows of capital from the region as local entrepreneurs preferred to take their investment to other regions in Malaysia where they could obtain more return to their investment. He mentions that the heavily subsidized agriculture created what he terms “an aggressive class of part-time farmers” who only take advantage of government favours in terms of jobs and contracts but willingly refuse to invest in industrial sector in the local towns. All these factors lead him to seriously question the effectiveness of the consumption linkages discussed above in reducing poverty and stimulating pro-poor growth, accusing those who advocate for those linkages of being manipulative and misleading. He even goes as far as to issue the following strong warning:

“...Manipulations of consumptions data – however sophisticated – are only part of the story, and efforts to deduce growth linkages from consumption patterns are likely to be quite seriously misleading” (Hart 1988:574).

Likewise, other doubters show cases whereby negative agricultural growth was experienced alongside high employment growth rates in rural non-agricultural sector. Additionally, they point to cases whereby agricultural income growth may stimulate demand for urban or imported rather than rural produced goods and services. The experience of farmers in Arcot region of India during Green Revolution shows, for instance, that farmers resorted to the use of sophisticated manufactured inputs such as tractors and petrochemical fertilizers all of which were imported from other urban regions in India, and farmers in this region also increased their consumption of imported goods such as cosmetics, ready-made clothes, plastics, and bottled cold drinks

(Haggblade and Hazell 2007). Available evidence also shows that in the Muda region of Malaysia, growing farm income amounted into increased consumption of television sets and other electronics mainly imported from urban areas within or outside Malaysia (Haggblade and Hazell 2007).

To conclude this section, a closer reading of the literature reviewed in this section does show that agriculture through its consumption linkages discussed above could be, indeed, qualified as a contributor in alleviating rural underemployment and reducing rural poverty and malnutrition. However, as some critics have pointed out, some conditions need to be fulfilled for agriculture to accomplish this role. Some key instruments needed for agriculture to achieve this end include, among other things, the increase of the assets of rural poor households, especially a more equitable land distribution; making small farmers more productive through providing them with farming skills and other inputs they need for farming, and creating opportunities in the rural non-agricultural economy through making available credits to supports non-agricultural livelihoods and effective and viable rural infrastructural development (OECD 2006; World Development Report 2008).

2.5.2 Production linkages and their effects on poverty reduction

Christiaensen and Kuhl (2006) contend that agriculture does have strong direct forward linkages to agricultural processing and backward linkages to input-supply industries. As Rangarajan (1982:13) put it, “agriculture and industry are linked to each other through the input-output relationship. The output of agriculture provides inputs for many industries, such as sugar, cotton textiles, jute textiles, and tobacco. Agriculture also absorbs the outputs of other sectors as inputs required in the production process. The major industrial outputs coming under this category are fertilizers and electricity”. To the Rangarajan’s (1982) list of major industrial outputs coming from other sectors Haggblade et al. (2007) add modern hybrid seeds necessary for increasing farm productivity. According to Tiffin and Irz (2006), these production rural growth linkages are very important for poverty reduction as the textile, food processing, and other agriculturally based industries require little technology and financial capital but are relatively labour intensive, thereby enhancing employment generation in rural areas. This segment of industrial structure occupies an important place in industrial sector of countries during the early stages of

development. In India, for instance, this segment of industries accounted for 66 percent of total industrial output in 1946 (Rangarajan 1982). In similar vein, a study in Taiwan by Amsden (1991), quoted in Haggblade et al. (2007), finds that forward linkages from agriculture to early export industries such as those producing canned fresh vegetables and other perishables played a critical role in the rapid rise of rural non-agricultural activities in the 1960s and 1990s in Taiwan. Similarly, the farmers' demand for locally produced mechanical equipment, for repair services, and farm inputs tremendously boosted demand for rurally produced goods and services in this country. Bresciani and Valdes (2007) note, however, that the relationship between these linkages and the rural labour market could only be enhanced by agricultural growth based on crops which require processing and transformation before consumption or export.

There exists, however, other views in the literature which raise serious doubts about the power of agricultural growth linkages discussed here-above. Factors other than agriculture are argued to strongly influence the growth of non-agricultural activities in rural economy. As an illustrative example, although the local silk industry expanded rapidly in a rural town in north India following the Green Revolution, this was apparently unrelated to developments in local agriculture as silk manufacturing in this region was based on imported rather than local inputs and on export rather than local markets (Haggblade and Hazell 2007).

From this review, it appears that although agriculture can also play a leading role in stimulating pro-poor growth and thereby reducing significantly poverty in poor countries as discussed above, it is not "any kind of agriculture" which can achieve that end. Only the "agricultural growth based on small-farm efficiency" could do this (Ellis and Biggs 2001:441; see also Lipton 2006). In similar vein, the World Development Report (2008:1) indicates that "using agriculture as the basis for economic growth in the agriculture-based countries requires a productivity revolution in smallholder farming".

2.6 The contribution of small-scale farmers to the agricultural – led pro-poor growth and poverty reduction

The idea that small-scale farming in developing countries could form the basis of agriculture-led process of economic development is widely discussed in the literature. As Simphiwe (2001) put it, both theories and empirics show that small-scale agriculture has been the principal driver of development in rural areas, and that small-scale agricultural units have attained higher returns to land and capital over time than big farms in various parts of the world. From an African perspective, Delgado (1998), quoted in Machethe (2004:2), argues, for instance, that “smallholder agriculture is simply too important to employment, human welfare, and political stability in Sub-Saharan Africa to be either ignored or treated as just another small adjusting sector of a market economy”.

The supporters of this view suggest at least four main arguments to justify their position. First, they argue that small-scale farmers’ rationality enables them to make appropriate and efficient decisions for their farming activities (Schultz 1964). The point which is being made here is that small-scale farmers are as capable as big farmers to decide on making use of inputs and agricultural strategies necessary to increase their agricultural output (Ellis 2001). The results of a study by Ngqungweni et al. (2006) conducted among small-scale farmers in the Eastern Cape, KwaZulu-Natal, and Northern Province, South Africa, indicate, for instance, that black small-scale farmers can produce both profitably and efficiently as their white commercial counterparts. Similarly, small-scale farmers in Kenya have increased their share of national agricultural production from 4 percent in 1965 to 49 percent in 1985 (Machethe 2004). Likewise, in what was termed “African Green Revolution”, small-scale farmers in Zimbabwe tripled maize production between 1980 and 1987 thereby increasing their share of the national marketable maize surplus from ten percent in 1980 to 40 percent in 1987 (Eicher 1994).

Second, the proponents of this view argue that there exist a positive relationship between farm size and economic efficiency in that small-scale farmers seem to be more efficient than big farmers. This is justified by the combination of factors such as the intensive use of abundant labour, small land holdings and low requirements for capital that small-scale farming entails (Berry and Cline 1979). Lipton (2005) argues that small-scale farmers have advantages in early

developing countries for the following good reason: On the one hand, small farms have lower labor-related transaction costs and more family workers per hectare and all are highly motivated to work and supervise the hired workers in their family land. On the other hand, big farms have lower capital and land-related transaction costs, allowing the big farmers to readily finance equipment necessary to farm their extensive land. In light of this, according to Lipton (2005), small farms become automatically preferable over the big farms in the context of the developing countries whose level of savings and capital accumulation that the big farms require is still very low or nonexistent at all. Lipton (2006) argues elsewhere that the kind of rapid growth in demand for productive labour and its command over staples that the poverty reduction requires in poor countries seem to indicate a small-scale farming orientation.

Third, they argue that the increase of agricultural output in the small-scale agriculture has positive effects on rural growth linkages which, in turn, can stimulate the growth of labour-intensive non-agricultural activities in rural areas (Johnstone and Kilby 1975; Mellor 1976). Byerlee et al. (2005) argue that the rural growth linkages discussed previously have proven to be strong when agricultural growth is driven by small-scale agriculture. However, Hazell and Roell (1983) find in a study conducted in Malaysia and Nigeria that big farmers in both regions have the most desired expenditure patterns for stimulating and sustaining growth linkages in rural economy. Finally, the advocates of this view make a strong case that “both growth and equity goals appear to be satisfied simultaneously via the emphasis on small-farm agriculture” (Ellis and Biggs 2001:441). In this vein, Bresciani and Valdes (2007) argue that, given the fact that poverty is highly prevalent in small-scale farming households, an increase in farm income of these households could be rightly regarded as key to rural poverty reduction. Similarly, Lipton (2006) contends that the reduction of rural poverty through agriculture favour small-scale farmers as more labour-intensive, as providing asset income to the poor, and as supplying locally available food staples.

One of the ways in which agriculture offers a route out of poverty already noted is the increase of employment rates in rural areas. According to Lipton (2006), this supports the argument for small-scale agriculture emphasis in poverty reduction not only because small-scale farmers have great potentiality to generate income per hectare for self-employed family farmers, but also

because growth in small-scale agriculture offers incentives for small-scale farming families to withdraw labour supply from hiring out, into the family farm, thereby creating enough opportunities of work in the hired-labour market available to the landless and this, in turn, raises their employment and wage rate.

2.7 Conclusion

To conclude this chapter, despite opposing voices with regard to the role of agriculture in the process of economic growth, it does seem that, in an appropriate context, agriculture can be the driving force in triggering, nurturing, sustaining, and influencing the long-term rate of economic growth, particularly in the context of the developing countries. It is precisely this which qualifies agriculture to be “an engine of growth”. As a result differing views on the role of agriculture should rather be seen as continuums of potential outcome that will differ from country to country, and perhaps even within a country depending on context. It is not “any kind of agriculture” which can achieve poverty reduction, and instead focusing on small-farm efficiency appears to offer the greatest potential. As the OECD (2006) report indicates, while agriculture remains the main driving force for growth and poverty reduction particularly in the early stages of development, it cannot, however, achieve these alone or function in isolation from the wider economy. It requires a viable and supportive environment. The creation of this environment necessitates that a certain number of conditions should be met certainly through what has been referred to in the World Development Report (2008:2) as the “visible hand of the state” consisting of massive investment in rural infrastructural development and services in rural economy. The crop, its mode of production and the context in which it is being produced will all play a role in determining the extent to which agricultural production can bring about a reduction in poverty. It is with this in mind that the remaining chapters examine avocado production in Burundi.

CHAPTER THREE

RESEARCH SETTING AND METHODOLOGY

3.1 Introduction

This chapter consists of three main sections. In the first section, the avocado industry in the world is discussed. In the second section, an attempt is made for describing the research site – Burundi and Giheta district. The methodology used for conducting this dissertation and the reason (s) for using the combined methods (qualitative and Quantitative methods) are discussed in great details in the third section. The theoretical frameworks used to collect and analyze the qualitative data, namely the value chain approach and Participatory Learning and Action (PLA) tools are also discussed in the third section.

3.2 Avocado Industry in the World

The average growth rate of avocado production globally between 1975 and 1984 was about 9 percent, and increased from 1183 tons in 1974 to 1578 tons in 1984 (Gaillard 1987). FAO's (2008) estimates show a significant increased production of avocados in the world which has attained an annual average of 3 million tons in the recent past and a value of over \$500 million in 2003. In New Zealand alone, increase in avocado production rate was 95-fold followed by Australia and Morocco (16-fold each) between 1981 and 2006. According to FAO's estimations, in the period between 1961 and 2006, on a worldwide level, there were 77, 550 million tons produced, of which 76 percent were produced in America; 12 percent in Asia; 10 percent in Africa; 2.9 percent in Europe; and 0.8 percent in Oceania (Carbajal and Hernandez 2008). Mexico is by far the largest producer, accounting for 33.2 percent of global production in 2004. This is shown in Table 3.1.

Table 3.1: World production of avocados (thousands of Tons)

	1961-64	1971-74	1981-84	1991-94	2001-04
Mexico	120.7	254.6	453.2	753.5	980.5
Indonesia	31.3	39.9	56.9	95.2	226.5
USA	47.0	67.1	209.3	180.4	195.2
Brazil	94.2	151.0	141.9	107.9	168.5
Colombia	12.2	13.2	19.9	73.5	149.6
Dominican Republic	109.8	125.8	134.7	141.7	137.1
Chile	9.4	13.1	28.5	46.8	127.5
Spain	0.4	1.6	17.4	47.8	113.1
Peru	21.7	102.4	80.9	81.9	94.4
Ethiopia	-	-	-	-	80.4
China, Mainland	-	-	-	17.0	78.6
Israel	1.3	11.7	40.6	56.1	75.5
South Africa	4.7	10.9	23.0	44.4	67.3
Democratic Republic of Congo	13.0	20.3	38.5	41.3	60.9
Cameroun	13.0	17.0	26.5	41.0	51.8
Venezuela	53.9	42.6	45.6	49.3	49.6
Haiti	40.8	51.0	61.8	48.0	45.0
El Salvador	17.7	25.6	33.1	40.0	40.0
Philippines	13.7	18.3	23.2	36.3	38.3
Australia	0.5	0.8	4.4	12.8	34.8
Others	136.1	154.4	171.2	184.5	207.3
Total	741.1	1121.2	1610.4	2099.2	3022.0

Source: FAOSTAT

Today, avocado is produced in more than 60 countries throughout all continents and production is expected to continue to increase since production is expanding in major emerging markets, particularly China and Brazil (Perez-Jimenez 2008). The farming of avocados is done differently from one country to another, ranging from big commercial avocado plantations in the western countries to avocado trees scattered in family farms, particularly in developing countries. The most produced varieties of avocados are Fuerte, Hass, and Bacon. The cost of production differs from one country to another and there are many factors which influence it. Avocado is either consumed as a vegetable or as fruit and the former consumption pattern seems to increasingly gaining grounds over the later. Avocados are also used to manufacture other consumable products, with avocado oil is the most common product resulting from this agro-processing (Gaillard 1987). This in turn is processed into cosmetics, food products such as salad dressings and more recently, into functional food products such as food supplements.

World avocado utilization has also increased by over 30 percent and the main drivers for this have been mainly human consumption of fresh and processed products, consumers' enhanced awareness of the fruit's nutritional properties, and the use of avocados in the cosmetic industry that has been spurred by the growing demand for natural based product components (FAO 2008).

Table 3.2: World consumption of avocados (thousands of Tons)

	1961-62	1971-72	1981-82	1991-92	2001-02
Mexico	99.4	212.0	425.6	662.3	745.7
USA	46.9	56.9	168.4	217.5	265.4
Brazil	70.5	137.8	110.6	88.6	130.7
Indonesia	27.0	28.8	55.6	83.1	131.7
Colombia	10.3	11.1	14.8	64.4	125.7
Dominican Republic	87.5	99.8	109.7	112.1	95.2
Ethiopia	-	-	-	-	79.4
China, Mainland	-	-	-	9.0	74.8
Peru	17.1	85.2	46.5	47.4	66.7
France	0.2	4.7	29.6	60.4	65.8
Democratic republic of Congo	11.2	15.4	30.0	32.6	48.6
Cameroun	11.3	16.9	22.8	35.1	45.9
El Salvador	16.0	22.8	32.6	40.5	45.1
Venezuela	45.7	35.3	38.6	43.4	41.1
Chile	7.6	10.8	23.8	22.7	37.9
Philippines	12.5	17.0	23.9	31.8	35.7
Haiti	30.3	37.1	45.0	38.3	32.2
Australia	0.4	0.9	2.9	14.0	28.0
Costa Rica	9.7	17.6	22.2	20.8	27.2
United Kingdom	0.0	3.4	8.2	14.7	24.3
Others	108.1	116.4	144.4	223.9	295.5
Total	611.4	929.8	1355.1	1862.4	2442.6

Source: FAOSTAT

Global exports of avocados reached 541, 000 tons in 2004 and were valued at US \$ 605.74 million. The four top avocado export countries include Mexico, Chile, Israel, and South Africa. The major producers and exports in Africa are South Africa, Ivory Coast, Kenya, and Swaziland (UEPB 2005). As table 3.3 shows, the avocado exports are mainly dominated by the first 10 exporters as these account for over 90 percent of the world market alone.

Table 3.3: World exports of avocados (thousands of Tons)

	1971-73	1981-83	1991-93	2001-03
Mexico	0.01	0.56	16.27	96.70
Chile	-	0.01	12.09	77.01
Israel	6.92	34.66	36.80	44.71
South Africa	1.17	10.00	28.09	38.68
Dominican Republic	2.14	1.14	6.29	12.44
USA	-	11.55	10.48	8.85
EC-15 (excl. intra-trade)	-	-	0.69	6.98
Ecuador	-	-	0.45	6.62
Peru	0.25	0.83	0.26	6.28
New Zealand	-	0.05	1.77	5.86
Guatemala	1.10	3.95	1.02	4.44
Venezuela	-	1.40	1.52	0.78
Argentina	-	-	0.21	0.71
Brazil	0.01	0.25	0.61	0.56
Dominica	0.07	0.03	0.39	0.46
Zimbabwe	-	-	-	0.40
Australia	-	-	0.16	0.39
Morocco	0.05	0.09	0.02	0.34
Others	1.00	1.67	3.20	3.54
Total	12.74	70.71	164.16	387.89

Source: FAOSTAT

The World imports of avocados increased from 284,000 tons in 1996 to 539,000 tons in 2004 and the United States is the largest importer of avocados, accounting for 29.7 percent of the total avocado imports in 2004 followed by France, the UK and the Netherlands. The ten first avocado importers account for 85 percent of imports alone (Evans and Nalampang 2006; FAO 2008).

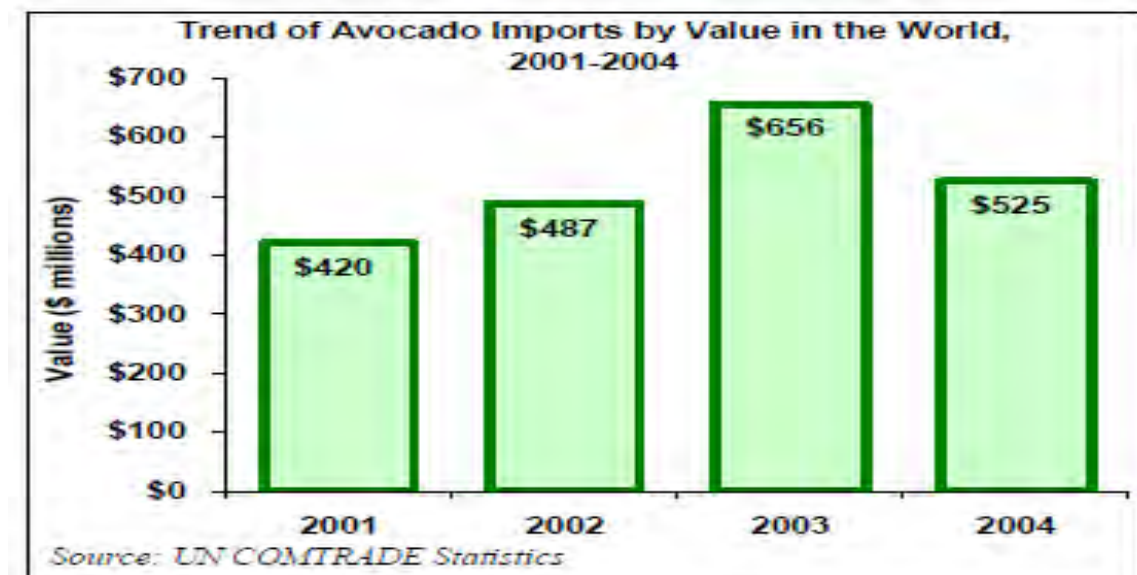
Table 3.4: World imports of avocados (thousands of Tons)

	1971-73	1981-83	1991-93	2001-03
USA	-	1.0	16.5	111.2
France	6.0	40.6	82.0	95.8
United Kingdom	4.2	9.4	15.2	26.2
Netherlands	-	1.7	8.0	24.7
Japan	-	1.2	3.6	16.1
Canada	-	0.0	6.8	14.6
German	0.6	2.8	9.1	14.6
El Salvador	0.6	3.2	3.9	10.6
Colombia	-	-	3.1	9.4
Belgium	-	-	-	7.7
Spain	-	0.2	0.4	7.3
Costa Rica	-	0.1	-	6.2
Honduras	-	0.2	0.3	5.5
Sweden	-	1.5	4.1	5.0
Australia	-	-	1.7	4.8
Guatemala	-	-	-	3.9
Denmark	0.1	0.8	2.6	3.9
Switzerland	-	-	2.6	3.6
Norway	-	-	0.5	1.7
China, Hong Kong SAR	-	0.3	0.3	1.4
Others	0.1	3.2	9.9	13.8
Total	11.6	66.3	170.6	388.1

Source: FAOSTAT

The total world import value of avocado was estimated at \$2.1 billion between 2001 and 2004, of which \$ 633 million was the import share of the USA. The top five avocado importers, namely, USA, France, United Kingdom, German, and Japan contributed alone 78 percent, that is, \$ 1.6 billion of the total imports between 2001 and 2004 (UEPB 2005). However, as figure 3.1 shows, the value of avocado imports registered a remarkable growth between 2001 and 2003 before it declines by about \$ 131 million in 2004

Figure 3.1: Trend of avocado imports by value in the world between 2001 and 2004



South Africa tops the list of the main suppliers of avocados to the European market, accounting for about 30 percent of imports in 2003, followed by Mexico, Israel, and Kenya. The remaining 15 percent of the avocado needs for the European market is supplied by Spain, which is the leading avocado producer in Europe, followed by Greece. The leading external avocado suppliers to the US market are Chile, accounting for 34 percent of imports in 2003, followed by Mexico and the Dominican Republic. It does seem, however, that the US market is mainly supplied by domestic production, mainly from the states of California and Florida, which altogether account for about 60 percent of domestic consumption. All imports to the European and US markets are subject to various kind of tariff such as the Most Favorite Nation (MFN) tariff for USA and to certification of compliance with sanitary standards (FAO 2008).

Hass avocados dominate the international trade and are highly demanded by the consumers than the “green” varieties which include Fuerte, Ettinger and Pinkerton. The latter are mostly consumed domestically in producing countries. Further, organic avocados are preferred on the market than the conventionally produced avocado and attract a price premium. The mark up varies from 34 percent at the farm gate level to 88 percent at the retail level at the European market, an average difference of about 56 percent. Factors influencing the prices in the USA market include, among other things, the variety, packaging, area of origin and the season. At

European market, however, prices of avocados are likely to be more influenced by factors such as the origin, specific European country destination market, and the variety of avocados. Surprisingly, available data indicate that the size of the fruit is not the main determinant of the price in both USA and European countries (FAO 2008).

The literature on avocado production in developing countries is still scarce to date. Against this background Van Wijk's (2006) study on avocado industry in Dak Lak province, Vietnam is important and worth mentioning here in some detail.

According to this study, there are at least three main sources from which the avocado was introduced in Vietnam. First avocado was introduced by the French in the 1940s and after other varieties were brought in Vietnam by the Americans and Philippines. The study finds that, in general, avocados are not popular among the farmers in Dak Lak province as they are not seen as profitable as other crops such as pepper. Accordingly, farmers do not grow avocados on big scale, and use the trees as windbreaks for their coffee or as fences around their fields and homes. They take no management of their avocado trees and do not apply fertilizer on them unless when avocado trees are intercropped. However, the increased consumer demand which has caused higher prices of avocados has led to some farmers to start developing small orchards of avocados in which they even use agro-chemicals and take proper management of their avocado trees. The study argues that the increased consumer demand for avocados is partly attributed to the rapid growing markets of avocados in the Vietnamese cities such as Hanoi and others. The improvement of infrastructure which facilitates the transport services is also believed to have played a crucial role in the development of these new markets.

Collectors are regarded as the key players in the avocado chain in Dak Lak province. They are involved in harvesting, collecting and selling the avocados either to the wholesalers in the province or in other parts of Vietnam. They seem to have developed sound professional relationship with their partners in different parts of Vietnam as, when they send their avocados to them, they just write the names of their partners, the place, and the city on the bamboo baskets and ensure that they put their goods in the right truck or bus. At the destination the goods are delivered to the right trader. To some degree, the Vietnamese government seems also to play a major role in the avocado chain as it has identified avocado as one of the seven priority fruits

which can offer enormous income generation opportunities to the farmers and has, accordingly, decided to support the avocado sector through investing in avocado research. However, generally speaking, the study finds no strong structural cooperation among different actors in the avocado chain in Dak Lak province in terms of exchanging information and knowledge. The key business services providers in the avocado chain are the transporters, suppliers of packaging materials and suppliers of the grafted avocado seedlings. Due to the weak demand of grafted avocado seedlings among farmers in this province, the study finds that there exist few institutions which are directly or indirectly involved in grafted avocado seedling production and distribution. Interestingly, the study also finds that farmers do not apply grafting knowledge that they have gained from the coffee sector in their avocado production. The study argues that one reason for this may be the fact that avocado is not considered by farmers in this province as such important product as other crops (Van Wijk 2006:24). For instance the study reports that farmers in Krong Pak district obtain between 75 and 80 percent of their income from coffee, between 10 and 15 percent from rice, pepper, peanut, taro or Yam and avocado contributes only between 5 and 15 percent towards their income. On average, a farmer own only five avocado trees without knowing their varieties as “almost every tree can be considered as a different variety” (Van Wijk 2006: 27).

The study further indicates that while the traditional avocado trees takes about 3 to 4 years to give yields after the planting, the grafted avocado trees take only 2 to 3 years. Both however start giving good harvest from the fifth harvesting round. The life span of an avocado tree is estimated to be between 25 and 40 years. The avocados develop flowers between November and February and five months separate the flowering and harvesting stages. The main avocado season lasts for four months, starting from May to August. One avocado tree can be harvested over a period of one month. Two main selling arrangements are used by farmers: Selling per an avocado tree or per harvested kg of avocados. The turnover that a farmer can obtain from a tree varies between VND 200,000 to VND¹ 1,500,000. About 80,000 farmers are involved in avocado production in this province and the harvested area of avocados is estimated to be around 2,650 hectares. The total revenue from the avocado sector in the province in the main season is estimated to be

¹ Exchange rate: 1\$ = 14,609.0 VND (As of 2/18/2011 21:34 PM)

around \$7 million. The prices of avocado have increased significantly over time from between VND 300 per kg and VND 1000 per kg at the farm gate in 1999 to about between VND 2000 per kg and VND 4000 per kg at the farm gate in 2006. The main disease which attacks the avocado production in Dak Lak province is the caterpillar and some of the key challenges identified in the study which hinders the avocado production in this province are the instability of the avocado prices on the market, lack of good avocado varieties, and farmers who are entirely dependent on the collectors for selling their avocados.

To sum up, the literature on avocado industry shows that the global market for this fruit has expanded dramatically over the last few decades. Output has increased significantly in major producing countries, particularly in the emerging economies and the consumption has also expanded drastically especially in major developed economies such as Europe and USA, and these trends are likely to continue in the future as the avocado production is also expanding rapidly in the most dynamic and viable emerging economies such as China and Brazil. Avocado production in poor countries is also rapidly growing. As the case of Dak Lak province in Vietnam shows, even without plantation style production, and with minimal cultivation, avocados can be an important source of income for small scale farmers. All these factors confirm the avocado crop's economic and market potential to stimulate rural development and reducing poverty in poor countries where potential exists for the commercial production of this crop.

3.3 Research Setting

3.3.1 Burundi

Burundi is a small central African landlocked country of about 27, 834 square kilometers. The country is divided into seventeen provinces with Bujumbura as the capital city. The ethnic configuration of the country is divided into three ethnic groups: 85 percent are Hutu, 14 percent Tutsi, and 1 percent Pygmy. It is estimated that about one-half of the total population is under the age of 15 and around 10 percent of Burundians live in urban areas. The rural population density is extremely high, at an estimated 779 people per square kilometer in 1998, and the country has the highest overall population density (265 people per square kilometer) in Sub-Saharan Africa. The country has a predominantly agricultural economy with about 94 percent of the population

participating in subsistence farming. The important agricultural export products are coffee and tea (Daley 2006:663; see also Nganou et al. 2008; and Taplin 2006).

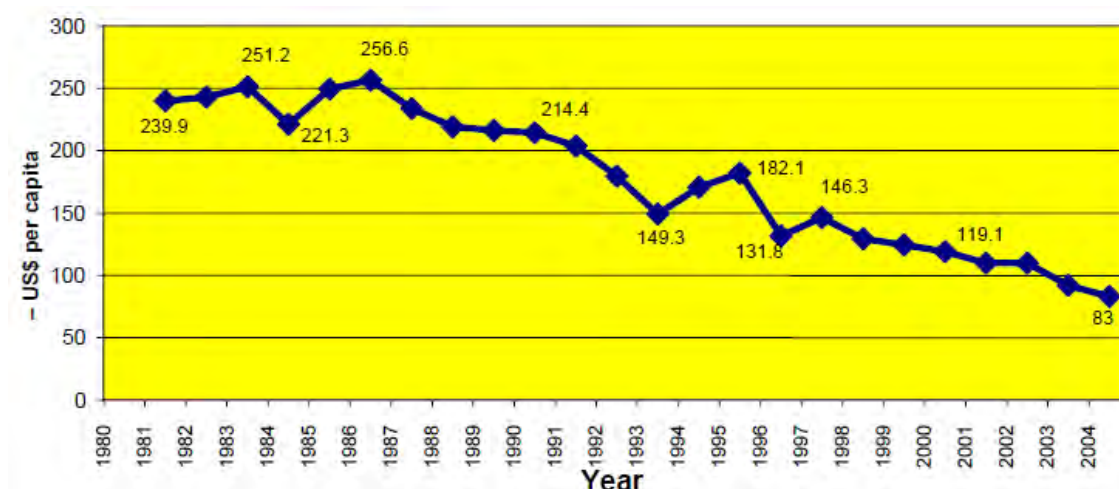
The major export partners for Burundi are the European countries such as Belgium, France, Switzerland, and the United Kingdom. These countries account for about 58 percent of the total Burundi's exports between 2000 and 2004 (Taplin 2006:3). Interestingly, while the USA and Canada have recently lost their place as key players in Burundi's exports, African countries seem to be emerging as major export partners for Burundi. Taplin (2006:3) reports that, for instance, the USA and Canada accounted for almost the half of Burundi's exports between 1960 and 1980 and African countries accounted only for 2 percent in the same period. But, the share of the African countries to Burundi's exports rose to about 15 percent between 2000 and 2004 partly due to the successful regional integration and that of USA and Canada dropped drastically to about 2 percent in the same period.

Since its independence in 1962, Burundi has been highly politically unstable, with six governments between 1962 and 1966, the abolition of the monarchy (1966), and five bloody coup d'états (1965, 1976, 1987, 1993 and 1996). Moreover, Burundi has witnessed violence of genocidal proportions: An estimated 200,000 people were killed in 1972 and a further 20,000 in August in 1988. Between 1993 and 2000, the civil war which was triggered by the assassination of the first democratically elected president in 1993 – Melchior Ndadaye - killed a further 200,000 people and forced over 350,000 into exile. The signing of the Arusha Peace and Reconciliation Agreement in August 2000, the establishment of a power-sharing national government in 2001 and the installment of another democratically elected government after elections in June and July 2005 have opened up a new era of peace and stability. The country is slowly emerging from 40 years of a socio-political instability that has greatly damaged its economy (Daley 2006).

Since the beginning of the crisis in early 1990s, the GDP has been falling an average of 3 percent annually and per capita GDP dropped to \$105 in 2005 (PRSP 2006:7; Nganou et al. 2008:21). In 1970s and 1980s the Burundi's annually GDP growth was estimated at 4.3 percent and 4.5 percent respectively, but it dropped to 1.4 percent in 1990s and slightly increased to 1.7 percent

from 2000 to 2005 (Nganou et al. 2008:2). Nganou et al. (2008:21) indicate that this GDP growth is far less what is needed to improve the living conditions of a population whose growth averaged an annual rate of 2.8 percent between 2000 and 2005. They even go as far as to argue that “if trends persist, Burundi will need 225 years to reduce its poverty by one-half” (Nganou et al. 2008:21). Figure 3.2 shows a somewhat steady decline of per capita incomes in Burundi, especially from the mid-1980s.

Figure 3.2: Changes in per capita incomes in Burundi



Source: PRSP (2006:6)

The levels of poverty in Burundi are alarming. Using the one dollar a day poverty line, Bundervoet (2006) indicates that, at the start of 1990s, the incidence of poverty in Burundi was almost similar to the average of poverty in Sub-Saharan Africa, that is, 45.6 percent for the former and 44.5 percent for the latter. In 2001, the incidence of poverty in Burundi reached 57 percent, an increase of about 12 percent, while that of the Sub-Saharan Africa increased by only 2 percent (46.4 percent) during the same period. With regard to the rural-urban distribution of poverty, Bundervoet’s (2006) study shows that 71.5 percent of the rural population in Burundi is considered to be poor, and that the poverty gap and poverty severity in rural Burundi stand at 32.5 percent and 19.2 percent respectively. These figures are slightly different from those provided by the Burundi’s PRSP (2006:14) which uses a poverty line of FBU² 182 725 and FBU

² Exchange rate: 1\$ = 741.741 Fbu (As of 2/18/2011 21:34 PM)

103 730 for urban and rural areas respectively. This document shows that poverty is more concentrated in rural areas than in urban areas as the incidence of poverty in the former is about 83.2 percent whereas for the latter it averages 41 percent. The document further shows that poverty also seems to be more severe in rural areas than in urban areas with a poverty gap standing at 45.9 percent in rural areas and 17.9 percent in urban areas. It also shows that poverty is geographically unevenly distributed in various provinces of the country as table 3.5 shows.

Table 3.5: Geographic distribution of poverty in Burundi

Province	Population distribution (%)	Poverty rate (%)
Bubanza	4.6	80.3
Bujumbura rural	7.5	79.0
Bururi	7.1	71.7
Cankuzo	2.8	82.4
Cibitoke	6.1	85.6
Gitega	10.9	89.7
Karuzi	5.7	83.2
Kayanza	7.8	89.0
Kirundo	8.1	91.2
Muramvya	7.9	74.2
Muyinga	7.8	82.9
Ngozi	9.7	83.9
Rutana	3.9	76.0
Ruyigi	4.9	89.4
Bujumbura Mairie	5.1	41.1
Burundi	100	81.1

Source: PRSP (2006:15)

Table 3.5 shows that the three most impoverished provinces in Burundi are Kirundo, Gitega and Ruyigi, respectively. The capital city (Bujumbura Mairie) is the least impoverished province. In both Bundervoet's (2006) study and Burundi's PRSP (2006), Gitega province has the second highest incidence of poverty (89.9 percent). Table 3.6 here below shows a positive correlation between poverty and the size of the household as households with more members are likely to be poor in both urban and rural areas. Female headed households seem also to be poor as compared to the male headed households in both rural and urban areas. Education also seems to be an important factor as households are likely to be well-off if their heads have a higher level of education. The absence of a partner in the household due to death or divorce also seems to have a significant impact on poverty as the risk of poverty seems to be very high among divorced and widows/widowers individuals in both rural and urban areas.

Table 3.6: Determinants of poverty in Burundi

	Incidence of poverty		
	Urban	Rural	Total
	Individual poverty rate	Individual poverty rate	Individual poverty rate
Population	41.0	83.2	81.1
Household size			
Less than 3	24.5	62.3	60.3
Between 4 and 6	37.5	83.9	81.7
More than 6	50.5	90.2	88.1
Sex of head of household			
Male	37.9	82.9	80.5
Female	54.4	84.3	82.9
Age of head of household			
Under 25	49.9	64.6	64.1
Between 26 and 35	32.5	78.6	76.1
Between 46 and 55	41.5	88.2	85.5
Over 56	64.8	79.0	78.5
Marital status			
Single	26.1	80.0	71.1
Married	39.0	82.2	80.0
Divorced/Separated	54.9	88.0	85.3
Widow/Widower	54.5	87.2	85.9
Head of the Household can read			
No	78.3	86.5	86.4
Yes	33.4	78.6	74.2
Head of Household's education			
None	78.1	85.8	85.7
Primary	64.2	80.7	79.9
Secondary	24.0	50.4	41.2
Higher	3.7	0.0	3.6
No	56.5	79.3	74.5
Yes	37.0	83.4	81.4

Source: PRSP (2006:16)

Nganou et al (2008:21) identify agriculture as the main contributor to growth and poverty reduction in Burundi because of its large share in terms of GDP and employment in the economy. As table 3.7 shows, although the service sector has been fairly growing at a reasonable pace especially between 2000 and 2005, agriculture remains the main driving force for the Burundi's economy. However, table 3.7 also shows that agricultural productivity has been steadily decreasing especially since the 1990s to the point that its contribution to GDP fell from 65.5 percent in 1970s to 39.2 percent between 2000 and 2005. Factors such as the political instability and rainfall dependency account mainly for this negative agricultural productivity growth. Adverse weather combined with declining soil productivity and a lack of inputs worsened the situation (Nganou et al 2008).

Table 3.7: Contribution of three sectors to the Burundi's economy, 1970-2005

Parameter	Agriculture	Industry	Services	Overall
Percent of GDP				
1970 – 1979	65.5	13.1	21.5	100
1980 – 1989	58.1	15.1	26.8	100
1990 – 1999	50.8	18.7	30.5	100
2000 – 2005	39.2	19.1	41.7	100
1970 – 2005	53.4	16.5	30.1	100
Growth rate (%)				
1970 – 1979	6.8	6.3	2.2	4.5
1980 – 1989	3.0	5.3	1.8	4.3
1990 – 1999	-0.4	-1.0	4.1	-1.4
2000 – 2005	-2.5	-6.2	2.8	1.7
1970 – 2005	1.7	1.1	2.7	2.3

Source: Nganou et al (2008:30)

Despite this sharp decline of the contribution of agriculture toward the GDP, the Burundian government has identified agriculture as the principal source of growth for the economy. This sector is widely discussed in Burundi's PRSP (2006) where it has been referred to as "the foundation of Burundian economy" because "it occupies 94 percent of the working population, provides 95 percent of the food supply, and accounts for more than 90 percent of foreign exchange earnings" PRSP (2006:48). Thus the government considers this sector as "the principal source of growth of the economy and the foundation on which efforts to strengthen and improve the Burundian economy must be based" (PRSP 2006:48). Accordingly, the Burundian government has established an institution called "Agence Burundaise de Promotion des Investissements (API)" whose one of its main mandates is to identify and implement "an effective strategy for the diversification of agricultural products" through the identification of nontraditional cash crops which can be used for development (PRSP 2006:53).

Coffee constitutes the principal traditional cash crop in Burundi and the country's primary source of income (PRSP 2006:50). Between 2000 and 2004, coffee accounted for the half of the total of Burundi's exports which stood at about \$50 million a year (Taplin 2006:3). However, the Burundi's share in the world coffee production is very small, accounting only for less than one percent compared to that of Brazil and Vietnam the two countries which dominate the world coffee production and export (Taplin 2006:4). The production of coffee in Burundi currently stands at 30,000 metric tons (PRSP 2006:50). Taplin (2006:4) reports that the coffee sector in Burundi employs between 750,000 and 800,000 rural households but he also notes that "coffee is but one of a number of cash crops for these farmers, and it has lost ground in recent years". The API has undertaken a study which intends to explore and determine the export potential of some

horticultural and fruit products and essential oils (PRSP 2006:53). However, the government also intends to invest in the production of crops which can contribute to the improvement of food security and those for which the country possesses a comparative advantage and which could be exported at the regional market within the Eastern African Community. Some identified crops to this end are, among others, paddy rice, wheat, maize, sorghum, beans, cassava, and bananas (PRSP 2006:49). The government is putting into practice its commitment to improving and developing agricultural sector as it has allocated 11 percent of its budget to agricultural sector in 2011 compared to 3 percent of the budget allocated to this sector in 2010 (Burundi Senate, 2010).

Although, avocado and its derived products are not mentioned in the Burundi's PRSP (2006), the minister in charge of Water, Environment, Physical Planning and Urbanization told the senate during its plenary session of April 21, 2009 that the crop produces oil of good quality which can contribute towards income generation and also plays a critical role in reforestation of the country after a decade of civil war. It is noteworthy that members of senate were concerned about the incompatibility of traditional avocado trees with food crops in the context of scarce farming land and that this could have negative impact on food security. The minister reassured them that the government is exploring the possibility of introducing the production of avocado varieties such "Hass" and "Fuertes" which can cohabit with other food crops and which do not take much space in the farm (Burundi Senate, 2009).

In summing up, the following Taplin's (2006) argument about the agricultural sector in Burundi strengthens the case that Burundi provides a useful case study with which to investigate opportunities for agriculturally led poverty reduction in a densely settled poor country. He wrote:

"The strengths of the agricultural sector include an abundant labor force; the presence of experienced and properly trained technicians; the receptiveness of farmers to intensive agriculture techniques and modern technologies; potential reclaimable land (including swamps) in certain regions; adequate soil fertility in many regions; favorable rainfall (despite the drought that has hit the country in the recent past) which allows for two rotations of crops in certain areas; and an abundant network of rivers that can be tapped for irrigation" (Taplin 2006:3).

3.3.2 The Giheta district

This dissertation focuses on one of the districts of Gitega³ province – Giheta. Two factors are of particular interest for this region. First, Giheta is considered to be the worst affected region in the province by the civil war (PCDC 2008:15). This implies that the levels of poverty are expected to be high in this district. Second, the construction of an avocado oil firm in Giheta in 2006 by a foreign businessman has potential to increase the avocado demand in this region. All these two factors make this region particularly relevant and interesting for this dissertation.

Giheta is bordered by Bugendana district in the north, Gitega district (the main city of Gitega province and the second city in the country) in the south, Shombo district of Karuzi province in the east, Nyabihanga district of Mwaro province and Rutegama district of Muramvya province in the west. Giheta is subdivided into three zones – Giheta, Kabanga, and Kiriba, and these are in turn subdivided into small geographic and administrative entities called “*collines*”. Zone Giheta comprises 8 *collines*, Kabanga 14 *collines*, and Kiriba 9 *collines* (PCDC 2008).

Giheta is one of the most densely populated districts of Gitega province. Its population was estimated at 78 560 (488 people per 1 square kilometer) in 2008 (PCDC 2008:12) and this puts enormous pressure on the available land for farming as agriculture is the main source of income for the majority of the population of Giheta. Of these, 26 273 (13 455 males and 12 818 females) are literate, and 52 287 (28 748 females and 23 539 males) are illiterate. The overall schooling average rate of the population in Giheta is 33 percent and the figures show that the rate of schooling for males is higher than that of females. The population of Giheta is generally young as 72 percent of the entire population of this district is under 40 years of age; of which at least 40 percent are under 14 years of age. Like other parts of the country, Giheta district was also hard hit by the socio-political crises that the country experienced since 1993 and its internal displaced population was estimated at 1605 in 2008 and many of its socio-economic infrastructures were destroyed. The housing situation in Giheta seems fairly improved in general. The roofing of: 3105 houses is made of the iron sheets, and although 2757 houses are constructed from of grass,

³ See a map showing the location of Gitega on the front page of the dissertation.

9394 houses are made of the brick tiles (PCDC 2008:16). The district has five clinics – Giheta, Gasuru, Bukinga, Mutoyi, and Kibimba and the main causes for morbidity and mortality in this area are malaria, respiratory infections, diarrhea, malnutrition, and HIV/AIDS (PCDC 2008:28). Giheta possesses many roads of which only the National Road (RN2) is tarred. This road joins two largest cities of Burundi – Gitega and Bujumbura. Many small informal shops are built alongside those roads especially alongside RN2. Further, the district possesses four rural markets which operate once or twice a week – Giheta (Wednesday and Sunday), Bukinga (Tuesday and Friday), Gasunu (Wednesday), and Bubu (Wednesday and Sunday). There are no banking services or insurance companies in this district and the absence of these important institutions makes difficult for the population in this district to access credit and other forms of capital which they might need to improve their livelihoods (PCDC 2008).

Giheta is fairly well watered as many rivers run through this district. The most important are: Ruvyironza, Ruvubu, Mutwenzi, Nyambeho, Rufunzo and their tributaries. This facilitates the agricultural activities in this district which has three agricultural seasons. The first season runs from September to February and the main crops which are produced in this season are the maize, beans and peas. The second season runs from February to July and the main crops produced are the beans, sweet potatoes, and cassava. The last season coincide with the dry season in Burundi and runs from July to December and the agricultural activities take place alongside the rivers and other points of water. The main crops produced during this season are the maize, beans, sweet potatoes, and potatoes. As mentioned above the most produced food crops in this district are: bananas, sweet potatoes, cassava, beans, and maize. The vegetables produced include: tomatoes, herbs, cabbages, onions, calottes, brinjals, and green papers. The main fruits produced in this district are: avocados, papaya, oranges, pineapples, and granadillas. Coffee is the only main cash crop which is produced in this district (PCDC 2008).

3.4 Methodology

3.4.1 Research Design

3.4.1.1 Combination of Quantitative and Qualitative Methods

Once a research topic and questions were determined, methods for conducting the research were decided upon. After closely examined the research questions, it was decided that a combination of qualitative and quantitative methods is best suited for this dissertation as this combination could enable the researcher for capturing different features of the topic under investigation.

Johnson (2008) argues that the quantitative method is grounded in the positivist worldview in which there is an assumption that there is only one truth or reality and that truth is independent from the researcher's perception. Accordingly, "researchers should eliminate their biases, remain emotionally detached and uninvolved with the objects of study and test or empirically justify their stated hypothesis" (Johnson & Onwuegbuzie 2004, quoted in Johnson 2008:2). Data in quantitative methods is collected through the use of predetermined questions (Johnson 2008) in numerical form, collected from a representative sample and statistical methods are used to analyze the data (Lazaro and Marcos 2006). In the quantitative analysis of the data, dependent and independent variables are identified and inadequate or unnecessary variables are eliminated in order to reduce as much as possible the complexity of the problem at stake (Lazaro and Marcos 2006).

Qualitative methods approach the research from a constructivist perspective which firmly holds a belief that there are many possible truths or realities relative to time and situation (Johnson 2008). According to this worldview, these multiple realities and multiple truths are based on the construction of a social reality that is constantly changing. Hence, "the investigator and the object of study are interactively intertwined in such a way that discoveries are created mutually within the context of the situation that molds the investigation" (Lazaro and Marcos 2006:758). Accordingly, qualitative method is especially effective in obtaining specific information about the values, opinions, behaviors, and social contexts of particular populations. Widely used qualitative methods in research are participant observation, in-depth interviews, and focus

groups. Each of these is particularly suited for collecting a specific kind of data. Participant observation is suited for obtaining the information about naturally occurring behaviors in their usual settings. In-depth interviews are appropriate for obtaining the data on individuals' personal histories, perspectives, and experiences. Focus group are most appropriate for collecting data on cultural norms of a group and on illuminating some broad issues of concerns to cultural groups or subgroups represented. Field notes, audio or video recordings and transcripts are the types of data which are generated through the qualitative methods (Family Health International 2008).

At least two key differences between quantitative and qualitative methods stand out. The first one consists of their degree of flexibility. Quantitative methods are fairly inflexible as for example researchers ask all participants identical questions and in the same order in the surveys and questionnaires. In addition, the response categories from which participants may choose are close-ended or fixed. The qualitative methods are more flexible in that they allow great interaction between the researcher and the participant. While the relationship between the researcher and the participant in qualitative research is, to some extent, less formal, it is strictly formal in quantitative research (Family Health International 2008). The second difference is what Reichardt and Cook (1979), quoted in Shih (1998:632), refer to as "the dimension of discovery versus verification". By this they mean that "while the qualitative researchers aim for rich, deep, real and valid data, the quantitative researchers attempt to attain hard, replicable and reliable data" (Shih 1998:632).

It is precisely these differences which make a combination of these two methods in the same study more desirable as it makes a study to be better balanced, strengthened, reliable, and valid. According to Kaplan and Duchon (1988), combining these methods in the same study bring about both testability and context in the research. These scholars contend that "collecting different kinds of data by different methods from different sources provides a wider range of coverage that may result in a fuller picture of the unit under study than would have been achieved otherwise" (Kaplan and Duchon 1988:575). Similarly, White (2002) goes as far as to argue that there is a synergy between them: "That is, using the approaches together yields more than the sum of the two approaches used independently" (White 2002:573). As Bryman (2006)

put it, however, the key questions to ask here is “when”, “how”, and “why” these methods are combined.

To the question of “when”, many researchers argue that the qualitative and quantitative methods could be combined at any stage of the research. Particular attention in the literature is put on the question of “why” qualitative and quantitative methods are combined. Five justifications are put forward as constituting the rationale for combining quantitative and qualitative methods in a single study (Bryman 2006). The first reason that these scholars propose is “triangulation”. This refers to the convergence, corroboration, correspondence of results from different methods. The second reason is “complementarity” and this refers to using the results from one method to elaborate, enhance, illustrate, or clarify the results from another. The third justification is “development”. This refers to the use of the results from one method to shape and guide the design of another method at different stages of the research. The fourth reason is the “initiation”. This “seeks the discovery of paradox and contradiction, new perspectives of frameworks, the recasting of questions of the results from one method with questions of the results from the other method” (Bryman 2006:105). The last suggested reason is “expansion” and this refers to the extension of the breadth and range of the study through the use of different methods for different inquiry components. Bryman (2006) argues that, of these five reasons mentioned above, complementarity and expansion are the most frequently used rationales for justifying the combination of qualitative and quantitative methods in one research project.

With regard to the analysis of the combined methods, Sandelowski (2000) suggests two main ways in which the analysis could be done. Either qualitative and quantitative data sets can be analyzed separately using the appropriate techniques for each and then are linked after but preserving at the same time the numbers and words in each data set or these data could be converted into one data set, with qualitative data being transformed into quantitative data or vice versa. In Sandelowski’s (2000) view, linking the results of qualitative and quantitative analysis is best accomplished by treating each data set separately with the techniques appropriate to each method and then the results of qualitative analysis and that of quantitative analysis are then combined at the interpretive level but each data set remains analytically separate from the other. The present dissertation has used the latter.

Foss and Ellefsen (2002) warn, however, that the combination of different methods within the same study presents, to some degree, its own problems. The most obvious difficulty of this combination is a high degree of complexity as these methods belong to different worldviews with fundamentally different epistemological positions. Foss and Ellefsen (2002) contend that the combination of these methods is only possible if one method takes precedence over the other because, in their view, both methods cannot be given equal weight in the same study. Barbarour (1999), quoted in Foss and Ellefsen (2002), also echoes a similar concern that it is highly unlikely that equal emphasis could be put on qualitative and quantitative methods when these methods are used in the same study. Such concern becomes even more significant in circumstances whereby combined methods lead to contradictory outcomes in the same study. These scholars then raise the question of which result should be considered valid in such circumstances. For Kaplan and Duchon (1988) such divergence is not a problem at all because the same divergence, in their view, could actually increase robustness of the results when an explanation is developed to account for it. Another problem that could be posed by the use of multiple strategies in a single study that Shih (1998) identifies is the time and money constraints as the use of different methodologies in one single research project can result in an increase in the amount of time, human and financial resources needed to collect the different types of data and an increase in the data preparation time caused by the enormous volume of data during the analysis stage of the study. These concerns have been kept in mind in the analysis of this dissertation, although it must be admitted that the last concern has been a constraint and has contributed towards the length of the dissertation.

3.4.1.2 Methodological Frameworks

The main methodological frameworks used for this dissertation are the value chain approach and the Participatory Learning and Action (PLA) and these two frameworks are used in this dissertation within the qualitative exploratory research paradigm.

The analytical framework of this dissertation is in part informed by the value chain approach discussed by Kaplinsky and Morris whose three key elements are the following: rent, governance, and systemic efficiency. But, these areas are not considered for this dissertation. In a simplified way, the value chain approach describes the activities required in making a product

from its conception to the final consumer (Morris 2001). As Sturgeon (2001) put it, the usefulness of the value chain approach resides in the fact that it clearly identifies all key actors at different stages of the production and their role in the entire process of getting a particular product from the conception stage to market. In similar vein, McCormick (2001) contends that the value chain approach generates important and adequate information by analyzing the full range of industry actors and the linkages between and among them. This clearly shows that the value chain approach plays a critical role in supplying detailed information about the actors, linkages, and value-added at each stage of production and distribution, all of which are of great importance in understanding the operations of any industry.

McCormick (2001) notes, however, that this framework cannot help us to understand why things are the way they are in the value chain and what can be done to bring about change and improvements in the value chain. Hence, another analytical tool is needed to answer the questions of “why” and “what”. Accordingly, the use of the PLA approaches was taken into consideration for this dissertation for the contribution that these techniques can bring for helping “to analyze what is happening in and around the avocado chain” (Van Wijk 2006:8). As Van Wijk (2006:8) continues to argue, the PLA “is a process and method that can be used to learn the situation, conditions and perceptions of various actors in a value chain”. This approach promotes interactive learning, shared knowledge and helps to identify shared priorities (Wetmore and Theron 1998; Schunter and Busza 2001; Chambers 2002).

The following PLA tools were used for this study: First, *participatory mapping*⁴ was used to collect information on places where avocados trees are planted, informal market where avocados are sold, roads used to transport avocado, institution(s) that provide inputs for avocado production, cooperative banks, and avocado oil firm. The information from this exercise contributed greatly to the development of the avocado value chain in Giheta. Second, *transect walks*⁵ were used to collect information on housing conditions, distance from the house to the

⁴ *Participatory mapping* activities are descriptive in nature and allow the local people to conceptualize the area they live in and the resources available in that area (Thomas 2004).

⁵ *Transect walks* involve actual walking through the area with a community member or group in order to observe and explore various aspects of interest of the area (Thomas 2004).

avocado plantation, the nature of the avocado plantation (whether a piece of the land is allocated to growing avocado or avocado trees are just planted anyhow and scattered throughout the farm), varieties of avocados grown, condition of the avocado trees (young, old, length, pests and diseases, whether there are fruits on the tree, whether the avocado trees are pruned, irrigated or fertilized, and so forth), interaction between men and women, Children's labour, existence of transport infrastructure and their condition, informal street commerce of avocados, availability of public transport and/or means of transportation and types of grocery stores in the community. Third, *time lines and sequencing*⁶ were used to gather the information about the history behind the farming of avocado crop in this area and how it has changed over time. The responses from the exercise two and three helped, to great extent, answering research question one. Fourth, *seasonality diagrams*⁷ were used to get general information about the full cycle of the avocado plantation from the seed to the first harvest and the following harvests and challenges and opportunities associated with this. Further, these tools also enabled the researcher to get a sense of the periods for income flow in the households and the share of the avocado production in that inflow. Fifth, *diagramming*⁸ was used to explore the sources of income of poor small-scale farming households and how that income is distributed among members of the households. Information which was collected from exercise four and five helped to answer research question two. Finally, *daily schedules*⁹ were used to collect information on gender dynamics in avocado production within the households by getting general information about men's and women's workloads. This tool also helped to detect the new farming activities in this area and their implications on the existing farming activities. Here, I was particularly interested in finding out

⁶ *Time lines and sequencing* are time-related tools which help to gain a wider historical understanding of the subject under investigation through gathering and examining the data about a sequence of events over many years (Thomas 2004; McCracken et al. 1988).

⁷ *Seasonality diagrams* are PLA tools which help to understand how seasons determine rural activities such as farming, rural employment, migration and so forth (Chander 2006).

⁸ *Diagrams* are PLA tools which help to gather data about proportions. These tools consist of a circle which is divided into different sized components and the size of each component reflects the importance of the element it represents (Schubert et al. 1994b).

⁹ *Daily schedules* are PLA tools which help to explore the daily work patterns of a particular person and thereby enabling the researcher to compare the daily work patterns of two or many individuals (Guijt 1992).

how much time is spent on avocado farming and how this has changed over time. This helped to answer research question three.

3.4.2 Data Collection

3.4.2.1 Collection of Qualitative Data

Access to the study area was facilitated by the Secretary General for the ruling party in Gitega who introduced the research team to the local leaders in Giheta district. After an exploratory tour of the study area, the research team visited the Avocado oil firm of Murayi in Giheta and met the Roman Catholic missionaries operating at that centre which is one of the oldest Roman Catholic missions in Gitega Province. The Roman Catholic Church is playing an important role in the avocado industry in that area through Gitega Archdiocese Development Organization (ODAG), a Roman Catholic institution which is involved in food security in the central part of Burundi (encompassing three provinces).

Ten households of small-scale farmers were selected for the PLA exercises discussed above. These households were selected purposefully in all three zones which constitute Giheta district. Two main criteria which were used for selecting these households were the distance separating them from the avocado oil firm of Murayi (that is, closer, far, and very far to the firm) and whether the household is involved in the farming of the avocados (that is, whether there are avocado trees in the household's farm). After obtaining informed consent and the introductory part, the first PLA exercise that I normally started with was the mapping of the household's farm. The purpose of this exercise was to identify all the avocado trees planted in the household's farm and their precise location in the farm. Members of the household used the ground and a stick to draw the farm and identify where avocado trees are planted in the farm. All members of the household participated in this exercise as they reminded each other all avocado trees which are planted in the household's farm and where exactly they are planted.

Figure 3.3: PLA Exercises with one Household's members in Giheta



I was then accompanied by the head of the household for the transect walk through the household's farm to explore various aspects and nature of the household's avocado farming. The following PLA exercise to be conducted was the "time lines and sequencing". Although all members of the household were involved in this activity, the very old people were very useful as they shared their stories about when and where they first saw the avocados and how they started planting the avocados in their farms and how the farming of this crop has been increasing overtime and why. The following exercise was the "seasonality diagrams". In this activity, the question of how many years does the avocado tree normally takes to give its first fruits was first asked. Then all twelve months of the year were drawn on ground using the stick and members of the household got the opportunity to indicate in which month of the year the avocados are harvested. This exercise gives an opportunity to enquire what other harvest the household obtain in that particular month in order to get a sense of the exact contribution of the avocado on the income flowing into the household comparing to other crops in that particular month. The "Diagramming" exercise was done next to explore the sources of income of small-scale farmers' households and how that income is distributed among members of the households. In this exercise, the big cycle was drawn on the ground and members of the household were asked to divide that cycle into unequally parts and allocate each part to the source of income for this household. An activity which brings more income to the household was given a big part of the pie and that which brings home little income was given a small part of the pie. The last PLA exercise to be conducted was the "daily schedules" and these were used to collect information on gender dynamics in avocado production within the households by getting general information about men's and women's workloads. In this exercise, different hours of the day were drawn on the ground from 5h00 AM to 21h00 PM in the evening when many people sleep in rural areas.

Both male and female members of the household were asked to mention the activities that they are doing in each slots of the day. In some instances, further probing questions were asked to both males and females in order to find out how much time is spent on avocado farming and how this has changed over time.

In addition to PLA exercises, two focus group studies were also conducted; one with members of a local small women farmers' association which is involved in avocado seedling production and distribution in Giheta, and another one with the collectors of avocados in Giheta. Further, a number of the interviews were also conducted with various actors in avocado chain within and outside Giheta district. Table 3.8 gives the details of those interviews.

Table 3.8: All interviews for the qualitative data

Interviewee	Place of the interview	Purpose of the interview
Administrator of Giheta district	Giheta	Gaining general information about the nature and structure of the avocado production in Giheta district and the perceived role of the crop in the economy of this district.
Agricultural technician of Giheta district	Giheta	Exploring general technical aspects of avocado farming in Giheta and enquiring possible challenges and opportunities related to the farming of the crop in this district.
Leader of the women association which sells avocados on RN2	Giheta	Exploring various aspects of selling avocados on RN2; Enquiring about opportunities and challenges associated with selling the avocados in that place.
Owner of the avocado oil firm of Murayi – Giheta.	Giheta	Exploring various aspects related to the functioning and operation of the avocado oil refinery in this district; Enquiring some opportunities and challenges that the firm might be experiencing at the time the interview was

		conducted.
Medical doctor in charge of the geographical health sector which includes Giheta district.	Giheta	Investigating the contribution of avocado to the diet of the population in Giheta and the benefit of this to their health (This information enabled the researcher to answer the research question 4).
Executive Secretary of ODAG	Gitega	Exploring the operations of ODAG and its role in avocado industry in Giheta district.
Agricultural technician of ODAG	Gitega	Exploring various technical aspects of ODAG's avocado seedling production and distribution; Enquiring challenges associated with its operations.
Governor of Gitega province	Gitega	Collecting general information about avocado industry in the province; government policy with regard to the promotion of avocado production in the province; the perceived role of avocado industry in the economy of Gitega province; and available supporting mechanisms for avocado industry in this province.
Director of DPAE (Direction Provinciale de l' Agriculture et de l' Elevage)	Gitega	Investigating the nature and structure of avocado production in Gitega province and Giheta district in General; Enquiring challenges and opportunities associated with avocado farming in this province especially in Giheta district.
Researcher and lecturer at ISA (Institut Supérieur d' Agronomie)	Gitega	Enquiring about research activities in this institution of high learning intending to promote the avocado production in this region through developing modern techniques and technology with regard to the

		farming and processing of the avocados.
Advisor of the minister of Agriculture.	Bujumbura	Seeking general information about the role that the government has played or ought to play in supporting the avocado industry in Burundi.
Agricultural technician of Projet Maraichee (a government institution which is involved in producing and distributing the “modern” seedlings of fruits and vegetables)	Bujumbura	As one of its areas of expertise is the avocado, I needed some information about its role in avocado production in Burundi and some challenges associated with this and possible solutions to those challenges.
Avocado sellers at the Central Market of Bujumbura.	Bujumbura	Getting information about their suppliers and the prices of the avocados in the capital city.

All the interviews were in-depth and semi-structured in order to allow the interviewees to express themselves freely as to what they see as the main opportunities and challenges of avocado industry, drawing on their own experiences. Caution was taken so that the interviews are conducted in a conducive environment in which the interviewees could feel safe to disclose the information. As mentioned earlier, sampling was conducted purposefully, in order to represent as many voices as possible across demographics and at every stage of the value chain within Burundi. All interviews but one (with the Italian owner of the avocado oil firm) and focus group discussions were conducted in “*Kirundi*” language and were translated in English during the transcribing process.

3.4.2.2 Collection for Quantitative Data

A questionnaire was developed for the small-scale farmers in Giheta. It was composed of two main parts. The first section consisted of a set of questions which intend to collect the information on the households interviewed. A definition for a household used by the Statistics South Africa in Living Conditions Survey 2008/2009 was adopted for this dissertation. Statistics South Africa has defined a household as “all persons who live together and provide themselves jointly with food or other essentials for living, or a single person living alone”. In this section, questions were designed to obtain different kinds of information. Firstly, a set of questions were designed to obtain the information about household composition and particulars of each person in the household. The persons considered were those who reside in the household at least four nights a week on average and have so done over a period of four weeks prior to the date of the interview. Babies and elderly people were included. Secondly, a number of questions were also asked about the education for each member of the household. The third bunch of the question in this section related to the employment and these cover all economic activities in which persons aged 15 years and above in the household are involved in. The fourth category of information in this section consists of the information about dwellings and different services that members of the household have access to such as food market, public transport, and so forth. The fifth category of question in this section was set to investigate the household’s assets. The category number six of the questions looks at the subsistence of the household in terms of agricultural production and other means of acquiring food for the household. The last category of questions in this section was on the living circumstances of the household. Here questions about whether the household has enough food and the living standards of the household were asked.

The second section of the questionnaire consists of the avocado production in the household. The first category of question in this section investigated different use of the avocados in the household. The second category of questions was set to obtain the information about the production and the production costs of avocados in the household. This section was concluded with two open-ended questions that assessed the key problems and constrains associated with avocado farming in the household and the possible solutions to address those challenges.

All questionnaire items were written in English but were translated to the potential respondents. The short answers to the open-ended questions were then translated during the analysis process of the quantitative data. The questionnaire was administered to a hundred households which were selected randomly in Giheta. The selection of the households involved in the quantitative data was done in the geographical part of Giheta which is delimited on the one side by RN2 and on the other side by the river which separate Giheta and Bugendana district on the northern part of the district. The questionnaire was administered to each tenth household with a randomly selected starting and the counting started from the place where the river crossed with RN2 and it progressed in the direction towards the capital city of Gitega province. The respondents were the heads of the households and the interviews took two hours per one household. As is typical of African societies, many of the respondents were men. In some instances, the research assistant did not find people for the tenth household and the following household was substituted. The collection of the quantitative data was carried out in parallel with that of qualitative data.

CHAPTER FOUR

ANALYSIS OF THE QUANTITATIVE DATA¹⁰

4.1 Introduction

The discussion presented in chapter three provided a brief description of the methodologies which have been used for the collection of the data for this dissertation. The analysis of the quantitative data is the subject of this chapter. This will be undertaken in four main sections. In the first section, the characteristics of the sample are presented. The nature and structure of avocado production are discussed in the second section, followed by the analysis of the contribution of the avocados to the sampled households' diet in section three. In the last section, an attempt is made to analyze the impact of avocados on the sampled households' wellbeing.

4.2 The Characteristics of the sampled households

As mentioned above, the sample for the quantitative data consists of a total of 100 randomly selected households. The size of the households ranges from one member to 11 members with a Mean of 3.88 and Std. Deviation of 2.25. Figure 4.1 shows that the number of males is slightly higher than that of females¹¹ (51.7 percent and 48.3 percent respectively). The age of the majority of the sampled households' members seems to be between 10 and 24 years as figure 4.1 shows. This is consistent with other statistics which show that the bulk of the Burundian population is generally young with almost half of the population being under 18 years¹².

¹⁰ All questions were not analyzed. Only those which answer the research questions were analyzed. A further analysis for other questions is anticipated for publication.

¹¹ Although the small size of the sample may account for this unusual gender picture the sex ratio of Burundi also shows that the number of males is higher than that of females in the age category of between 0 and 15 years. See http://www.theodora.com/wfbcurrent/burundi/burundi_people.html

¹² See http://www.unicef.org/infobycountry/burundi_statistics.html

Figure 4.1: Sex and age of households' members in the sample

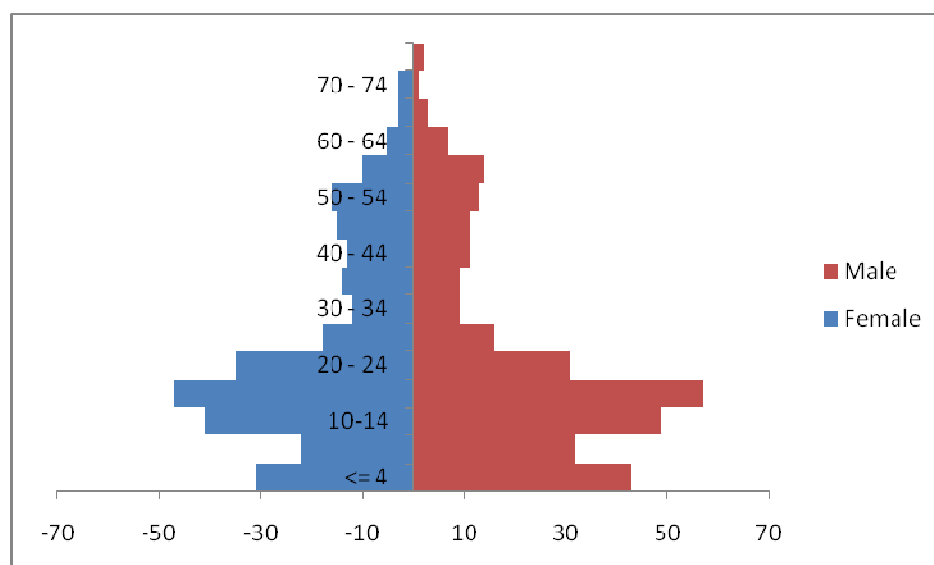


Table 4.1 provides the marital status of the households' members in the sample. It shows that 28 percent of the sampled households' members are married. Almost all the spouses of the married members live in the households (25.6 percent) and this may suggest that a very small number of spouses (only 3 percent) had left their households in searching for better opportunities especially in the city. The percentage of widows/widowers in the sample is almost insignificant (1.5 percent). The remaining (about 71.4 percent) has never been married and this is justified by the information provided above in Figure 4.1.

Table 4.1: Marital status for the sampled households' members

	Households' members (percentage)
Married with certificate	25.1
Married traditional	1.2
Consensual union	1.7
Widow/widower	1.5
Never married	70.5
Spouse/partner live in the household	25.6

n=601

With regard to the literacy in the sample, table 4.2 below, reports that 60.7 percent of the sampled households' members can read and write. This is in line with other statistics which provide the literacy rate of 59.3 percent.¹³ This table also shows that the schooling rate of the

¹³ See http://www.theodora.com/wfbcurrent/burundi/burundi_people.html and http://www.unicef.org/infobycountry/burundi_statistics.html

sampled households' members is relatively high as 56.2 percent of the households' members are doing or have at least completed primary schooling; 9.2 percent are doing or have completed secondary schooling; and 0.3 percent have completed tertiary education. Although this is consistent with the UNCEF statistics¹⁴ it seems to diverge from the finding that was reported earlier in chapter three (section 3.3.2)¹⁵.

Table 4.2: Education of the Households' members in the sample

	Households' members (percentage)
Literacy	60.7
Currently doing or have completed primary schooling	56.2
Currently doing or have completed secondary schooling	9.2
Currently doing or have completed tertiary schooling	0.3
Currently attending school or any other education institution	35.8
Having no schooling at all	34.1

n=601

This table further indicates that 35.8 percent of the sampled households' members were attending school or any other education institution by the time the data was collected. In addition, it shows that 34.1 percent of the sampled households' members have no schooling at all. The results provided in this table seem to suggest an abundance of unskilled labour in the sample as almost 90 percent of the households' members have only some levels of primary education or have no education at all. These results lend support to other findings that argue that the main characteristic of the labour force in rural areas is that the latter is generally unskilled (Bresciani and Valdes 2007).

Turning to the employment situation in the sample, table 4.3 shows that 18.3 percent of the sampled households' members aged 15 years and above have worked for payment at least 7 days in total in the past 12 months and 12.6 percent of the households' members aged 15 years and above have run a business for at least seven days in total in the past 12 months. This table also reports that 16.8 percent of the households' members aged 15 years and above have worked for any payment in the calendar week prior to the one during which the data was collected and about

¹⁴ See http://www.unicef.org/infobycountry/burundi_statistics.html

¹⁵ The definitional difference may account for this divergence of the statistics.

11.5 percent of the households' members aged 15 years and above have run any kind of business (selling avocados excluded) in the same period. All the respondents indicate, however, that members of their households aged 15 years and above participate in the households' farming activities. This may suggest that although small-scale farmers may engage in diversified livelihoods albeit to a small degree, farming is still the main economic activity that people do in the sample. This analysis is consistent with that by Lipton (2006) and many others researching on rural development.

Table 4.3: Employment situation in the sampled households

	Households' members (percentage)
Worked for at least 7 days in total in the past 12 months	18.3
Run any kind of business for at least 7 days in total in the past 12 months	12.6
Worked for any payment in the last calendar week	16.8
Run any kind of business in the last calendar week	11.5

n=356

The housing situation of the sampled households seems to be, to some extent, relatively favorable as table 4.4 shows. About 98 percent of the respondents' households live in permanent formal structure and 68 percent of the households live in sound main buildings. The percentage of the households who live in main buildings which need major repair is fairly modest (27 percent). Almost all the households' main buildings (99 percent) have the walls built in bricks and the type of flooring is dirt (94 percent). About 67 percent live in the main buildings which have tile roofing, 31 percent live in the main buildings which have iron sheets roofing, and only 2 respondents report that their households live in the main buildings which have grass roofing. This is in line with the housing situation of Giheta discussed in chapter three (section 3.3.2). One possible explanation for this favorable housing may have much to do with the fact that local people are able to make brick tiles and bricks by themselves using inputs such as the clay from their own farms. Families also often help each other when it comes to building houses especially when a young man is planning to get married. This is deeply grounded in the Burundian culture and it is regarded as one of the strengths of Burundian society. However, additional research may be needed to understand this favorable housing condition in the face of other forms of poverty.

Table 4.4: Households' dwellings and access to the main facilities

	Number of the households
Observation of the main buildings	
Living in Permanent formal structure	98
Type of roofing material	
Iron sheets roofing	31
Brick tiles roofing	67
Grass	2
Type of walls	
Mud walls	1
Bricks wall	99
Type of flooring	
Dirt	94
Cement	5
Cement with additional covering	1
Observed structural condition	
Main building seriously dilapidated	5
Main building need for major repairs	27
Sound main building	68
Distance to the nearest market	
Less than 500 m	12
– less than 1 km	16
1 – less than 2 km	41
2 – less than 10 km	31
Distance to RN2	
Less than 500 m	30
0.5 – less than 1 km	22
1 – less than 2 km	37
2 – less than 10 km	11
Distance to the avocado oil firm	
Less than 500 m	3
0.5 – less than 1 km	12
1 – less than 2 km	13
2 – less than 10 km	71
Distance to nearest primary school	
Less than 500 m	12
0.5 – less than 1 km	25
1 – less than 2 km	34
2 – less than 10 km	29
Distance to nearest secondary school	
Less than 500 m	7
0.5 – less than 1 km	15
1 – less than 2 km	23
2 – less than 10 km	55
Distance to nearest clinic/community health centre	
Less than 500 m	
0.5 – less than 1 km	7
1 – less than 2 km	15
2 – less than 10 km	23
	51
Distance the nearest hospital	
Less than 500 m	
0.5 – less than 1 km	5
1 – less than 2 km	6
2 – less than 10 km	19
	70

n=100

Noteworthy is the fact that a significant number of the sampled households seem to live at a fairly short distance to the nearest main facilities such as the public transport (RN2), market, and primary school as table 4.4 also shows. About 89 percent of the total sample lives at less than 2 km to the nearest public transport (RN2), 69 percent and 71 percent of the sampled households live at the same distance to the nearest market and primary school respectively. More than half of the sampled households live between 2 and 10 km to the nearest secondary school and community health centre (55 percent and 51 percent respectively)¹⁶. The majority of the sampled households seem to live at a considerable distance to the nearest hospital and the avocado oil firm. About 71 percent of the sampled households live at between 2 and 10 km to the Avocado Oil Firm and 70 percent of the households live at the same distance to the Avocado Oil Firm.

Further, the sampled households' ownership of assets, current economic status and living conditions are all provided in table 4.5. This table shows that the levels of poverty among the sampled households are reasonably high with more than half (54 percent¹⁷) of the households in the sample considering themselves to be poor and the majority of the respondents reporting that they cannot afford to buy meat, new clothes or make savings for the emergencies (97 percent, 77 percent, and 81 percent, respectively). Likewise, although the Burundian government provides free health care services to children aged 5 years and below and to the pregnant women more than half of the households (58 percent) still cannot afford to purchase medicine prescribed by the doctor when a household member is ill. Nonetheless, almost the same percentage of the respondents (68 percent and 67 percent) indicate that adults (18 years and above) and children (17 years or under) respectively never go hungry in the past 12 months because there was not enough food in their households. These results are not surprising since Burundi is classified among the poorest countries in the world as discussed in chapter three (section 3.3.1). This also confirms the findings from other many international studies that have shown that the majority of the poor live in rural areas as discussed in chapter two (section 2.2).

¹⁶ The clinic and the secondary school are built at the same centre.

¹⁷ This is in line with the statistics for rural poverty nationally. See <http://www.ruralpovertyportal.org/web/guest/country/home/tags/burundi>

Table 4.5: Sampled households' ownership of assets, current economic status and living conditions

	Number of the households
Ownership of assets	
Owns television	0
Owns Motor vehicle	0
Owns Sewing machine	0
Owns computer	0
Owns a radio	52
Owns at least two beds	54
Owns bicycle	15
Owns cell phone	1
Owns landline telephone	1
Owns land	73
Size of the household's land	
Less than 5000 m square	9
– 9 999 m square	1
but less than 5 hectares	27
5 but less than 10 hectares	4
Don't know	59
Current economic status	
Reasonably comfortable	5
Just getting along	41
Poor	29
Very poor	25
Going hungry (Adult)	
Never	31
Seldom	37
Often	13
Always	19
Going hungry (children)	
Never	31
Seldom	36
Often	15
Always	18
Living conditions	
Has meat	2
Has some new clothes	22
Has School uniforms for children	27
Has regular savings for emergencies	15
Has medicine prescribed by a doctor when a household member is ill	40

n=100

Noteworthy, however, is that the households' ownership for some valuable assets in the sample seems to be fairly encouraging. At least about 73 percent of the respondents report that they have access to the land that can be used for growing food or raising livestock even though the size of the land seems to be, on average, quite small (less than five hectares). Further, more than half of the respondents indicate that they own a radio and at least two beds (52 percent and 54 percent

respectively). Only 15 percent of the households own a bicycle which constitutes the main means for transport in rural areas in Burundi. This table also shows that the means of communication seems to be lacking for the households in the sample as only 4 percent of the respondents report that their households have a member who owns a cell phone or simcard, one household has a land line telephone and has access to internet services¹⁸.

Turning to the sampled households' subsistence activities; table 4.6 shows that 90 percent of the households use their entire land for growing food or raising livestock.

Table 4.6: Farming activities taking place on the households' land

Land used for growing food or raising livestock	Number of households
All	90
Half or more	9
Farming activities	
Field crops	99
Horticulture	45
Livestock	53
Coffee	22
Avocado	67
The household owns medium size animals	50
The household owns poultry	18

n=100

This table also reports various farming activities taking place on the households' farms. Surprisingly, it shows that more households are involved in farming avocados than coffee (67 percent and 22 percent respectively). This is, indeed, interesting given the fact that coffee is traditionally regarded as the main cash crop and source of income for small-scale farmers in Burundi (cf. PRSP 2006) and accordingly one would expect to see more households involved in farming this crop.

¹⁸ This is in line with the UNCEF statistics. See http://www.unicef.org/infobycountry/burundi_statistics.html

4.3 The avocado production in the sampled households

The production¹⁹ of avocados in the sampled households is presented in table 4.7. This table reports that avocados are intercropped with other food crops in about 96 percent of the sampled households' land. This may suggest that farming of avocados among the sampled households is rarely undertaken as a commercial orchard and part of the reason for that may be the scarce of the farming land as it was shown in table 4.5. Almost all the households (96 percent) are involved in farming of traditional avocados and the number of the households who are engaged in farming the grafted avocados is still negligible (7 percent). The reasons for this may be the fact that the grafting business is not yet well developed in the area of the study as it may be still at its early stage of development or small-scale farmers may find it difficult to afford the costs of the grafted avocado seedlings because of the situation of poverty the majority of them are living in as discussed above.

Table 4.7: Nature and structure of avocado production in the sampled households

	Number of the households
How land is used for growing avocados	
Inter-cropping	96
Varieties of avocados grown	
Traditional varieties	96
Grafted varieties	7
Means for transporting avocados from the farm to the house and from the house to the market	
Head carrier	81
Bicycle	9
Source of the baskets used for transporting avocados	
Local market	94
Directly from the maker	1
Is the total amount of avocados the household sold on the market higher, lower, or more or less the same if compared with that consumed	
Much higher	39
Higher	9
More or less the same	3
Lower	33
Whether the household consumes its own avocados now compared to five years ago	69
The main causes of the avocado post-harvest losses	
Bad harvest method	88
Bad transportation means	1

¹⁹ The information was gathered concerning the production costs of avocados in the sampled households but the inter-cropping nature of the avocado production in the area of study makes it difficult for the small-scale farmers interviewed to provide accurate answers to the questions. For instance when small-scale farmers were asked to provide the cost of the fertilizer applied for the avocados they simply gave the total cost of the fertilizer that they used on their farms because avocados are intercropped with other food crops in their farms. The same happened for other similar questions such as the cost of labour and so forth. Consequently, it becomes more difficulty for the researcher to calculate the estimated costs of avocado production in the sample and as a result these questions were left out for the present analysis. It is anticipated, however, that the analysis of qualitative data will provide more insights on this issue.

Inappropriate and inadequate method of storage at home	2
Role of adult males in household's avocado production	
Planting	70
Harvesting	15
Selling	23
Transporting	26
Role of adult females in household's avocado production	
Planting	45
Harvesting	6
Selling	33
Transporting	53
Role of children in household's avocado production	
Planting	31
Harvesting	6
Selling	22
Transporting	36
Main buyers of households' avocados	
Households selling avocados	48
Neighbors	38
Shoppers at the local market	25
Travelers (RN2)	46
Collectors	10
Avocado oil firm	6
Main recent changes in the household's avocado production	
Varieties	12
Fertilizer	14
Production volume	33
No changes	24
Whether the selling price of avocado increased for the past three years	76
Whether the selling price of avocado is likely to increase for the next three years	80
Important buyer requirements	
Product quality	79
Product size	78
Product maturity	72
Selling arrangements in order of priority: Important	
Cash	65
Delayed payment	7
Barter basis	0
Contracts	0

n=100

The bicycle is reported as the means of the transport for avocados in only 9 percent of the sampled households and the head-carrier seems to be the most used mode of transporting²⁰ avocados from the farms to the houses and from the houses to the various local markets for the majority of the sampled households (81 percent). None of the respondents interviewed make the baskets that they use for this mode of transport and 94 percent of the respondents mention that they outsource the basket from the local markets. The cost of a basket depends on the size. Big

²⁰ See the picture of different modes of transporting avocados in appendix 2

baskets cost more money than small baskets. The minimum price for a basket is 300 Fbu²¹ and the maximum price is 3000 Fbu with a mean of 835.48.

Figure 4.2: Sellers and buyers of bamboo baskets at the local market in Giheta



This seems to present a quite substantial downstream multiplier in the avocado value chain. The total amount of avocados sold is reported to be higher than that consumed in about 48 percent of the households, and lower in about 33 percent of the households. This may suggest that, in addition to the households' consumption, avocados are also regarded as a potential source of income among the sampled households. Noteworthy though is the fact that about 69 percent of the respondents report that their households consume their own avocados now compared to five years ago which implies that the avocado production and consumption is rapidly and significantly expanding among the sampled households. This is further supported by the fact that the upward production volume is identified by 33 percent of the respondents as the main change which recently takes place in the avocado production in their households and the majority of the respondents indicate that the selling price of avocado has increased for the past three years and is likely to increase for the next three years (76 percent and 80 percent respectively). This is in line with the global avocado outlook discussed in chapter three (section 3.2).

Additionally, table 4.7 also shows that the burden for producing avocados seems to be equally shared among members of the households although various categories of the households' members are more involved in some aspects of the avocado production than others. The planting of avocados seems to be more dominated by adult males (70 percent of the households), followed by adult females and children (45 percent and 31 percent of the households

respectively). Selling and transporting avocados are more dominated by adult females as 53 percent of the respondents report that women in their households transport avocados from the farm to the houses during the harvest as compared to 26 percent and 36 percent for adult males and children respectively; and 33 percent of the respondents indicate that the selling of avocados is done by adult females as compared to 23 percent and 22 percent for adult males and children respectively. Adult males are more involved in harvesting (in 15 percent of the households) than other members of the households (in 6 percent of the households for both adult females and children). Much of the avocado post-harvest losses are attributed to bad harvest methods in about 88 percent of the sampled households.

This table also shows that neighbors and travelers on RN2 constitute the main buyers of avocados produced in the sampled households as 38 percent of the respondents report that they sell their avocados to their neighbors and 46 percent indicate that they sell the avocados to the travelers on RN2. Only about 25 percent of the respondents report that they sell their avocados at the local market and 10 percent report that they sell their avocados to the collectors. A small number of respondents (6 percent) report that they sell their avocados to the avocado oil firm. The price premium may play a crucial role for the households' preferences of the buyers as they are likely to prioritize the category of buyers from whom they may obtain higher income for their avocados. The important buyer requirements are product quality, product size, and product maturity (reported in 79 percent, 78 percent, and 72 percent of the sampled households respectively). These seem to differ from the consumers' requirements at both European and USA markets discussed earlier in chapter 3 (section 3.2). Finally, table 4.7 reports that "Cash" seems to be the most selling arrangement preferred by small-scale farmers in the sample as 64 percent of the respondents rank it on top of all other selling arrangements such as delayed payment, barter basis and contracts.

4.4 Use of avocados in the sampled households' diet

As is shown in table 4.8 here below, the consumption of avocados among all categories of the sampled households' members is substantial. About 95 percent of the respondents indicate that children in their households eat avocados and 96 percent of the respondents report that adult females in their households eat avocados. The percentage for adult males (in 85 percent of the

households) is slightly lower than that for adult females and children reported above. Interestingly, the information provided in this table seems to suggest that the sampled households' members do not just eat avocado because it is the only fruit or food available. It clearly shows that the driving force behind this wide consumption of avocados is the fact that all categories of the sampled households' members have preference for the fruit (adult males in 78 percent of the households, adult females and children in 92 percent of the households respectively).

Table 4.8: Consumption of avocados in the sampled households

	Number of the households
Eating avocados	
Adult males	84
Adult females	96
Children (under 18 years of age)	95
Reasons for eating avocados (adult males)	
Nutritious	45
Like the taste	78
Only food available	13
Reasons for eating avocados (adult females)	
Nutritious	51
Like the taste	92
Only food available	13
Reasons for eating avocados (children)	
Nutritious	47
Like the taste	92
Only food available	12
Days in a week avocados are eaten (Mean)	
Adult males	3.45
Adult females	3.21
Children	3.81
Total amount of avocados consumed by all people in the household per a day	6.51
Source of avocados	
Produced by the household	83
Bought from the local market	79
Given	7

n=100

This is further evidenced even by the number of days avocados are consumed per a week (adult men - Mean = 3.45; children - Mean = 3.81; and adult women - Mean = 3.21) and the number of avocados consumed per day in these households (Mean = 6.51)²². This table also reports that the most preferred mode of avocado consumption among the sampled households (87 percent) is the

²² All these information reflect the use of avocados in the sampled households' diet during the avocado season period. Information was not gathered concerning the avocado use in the sampled households' diet in off-season period.

combination of avocados with other food and this may have more to do with the contribution of avocados to the taste of the basic food due to the quantity of oil the avocado fruit contains. This table also gives the information about the sources where most of the avocados consumed in the sampled households are sourced from. It indicates that 83 percent of the households consume the avocados that they have produced and 79 percent consume the avocados bought in the market. Noteworthy is the fact that these results seem to suggest that even the households which produce the avocados may still buy avocados from the local markets in order to meet the need of the households' avocado consumption, presumably because of the ripening that prevents storage in times of glut. These results seem to diverge from Van Wijk's (2006) study which found that avocados are not well known among the Vietnamese people who are still in the process of discovering this fruit for local consumption.

To sum up, the wide consumption of avocados among the sampled households seem to suggest that the contribution of avocados to their diet is quite significant and important and based on the findings from other studies discussed in the introductory chapter (section 1.1) which show the high nutritional value of avocado, one can safely say that this wide consumption of avocados can play a vital role for the improvement of health of the sampled households' members. However, in order to make a strong conclusion on the contribution of avocados to the health of people, additional research is needed as information was not gathered concerning the health of those who produce and consume avocados and those who do not and as a results the finding of this study may not allow for making a conclusion on the matter subject.

4.5 Impact of avocado production on the wellbeing of the sampled households' members

Table 4.9 shows that the income that the sampled households obtain from their avocados is limited (Mean of 8362.91). However, this self-reported income is, to great extent, underestimated given the fact that small-scale farmers sell their avocados systematically as a need of money rises in their households and do not keep the records of their avocado selling. Added to this is the fact that small-scale farmers own, on average, few trees of avocados on their farms from which they obtain avocados that they use for both households' consumption and

selling. Accordingly, they may not be able to have enough avocados for selling in order to get more income.

Table 4.9: Value of households' avocados sold (Fbu)

	Minimum	Maximum	Mean	Std error of the mean
Value of the avocado sold in the past 12 months	500.00	45000.00	8362.91	1486.18

n=48

The findings reported in Table 4.10 here below gives mixed results on the impact of avocado production on the living conditions in the sampled households. On the one hand, there is a statistically significant association between selling avocados and having enough food as the majority of households which sold avocados was found to have less adults and children members who went hungry because there was not enough food than the households which did not sell avocados; selling avocados and having new clothes; and selling avocados and owning a radio. A very weak association was also found between selling avocados and saving for the emergencies. But on the other, no association was found between selling avocados and having meat or fish; selling avocados and having medicine prescribed by a doctor when a household member is sick; and selling avocados and owning a bicycle.

Table 4.10: Avocado production and poverty indicators for the sampled households

	Percentage of 48 households who Sold avocados	Pearson chi- square	Statistical test results
Assets ownership			
Bicycle	16.67	0.201	0.432
Radio	62.5	4.077	0.034*
Having meat	2	0.003	0.732
Having new clothes	31.25# ²³	4.603	0.028*
Saving for emergency	20.83#	2.464	0.098*
Affording medicine prescribed by a doctor	43.75	0.541	0.298
Self-reported economic status		2.478	0.085*
Not poor	54.16		
Poor	45.83		
Hunger (Adult)		7.015	0.007*
Never	43.75#		
Often	56.25		
Hunger (Children)		7.015	0.007*
Never	43.75#		
Often	56.25		

n=100, *statistically significant

The households' expenditure priority may account for this. Given the lower levels of per capita incomes from avocados which may not enable the small-scale farming households to cover everything they need, they may prioritize things that they deem important in the households and on which they can spend the little income they obtain from the avocados. Subsequently, they may prioritize to spend their little income from the avocados on food and this is in line with other findings discussed in chapter two (section 2.4.1). Additionally, prioritizing a radio may also come as no surprise for a country which has endured four decades of political instability and violent ethnic conflict. The radio serves to provide Burundian people, especially those living in rural areas, with information about the new developments in terms of security so that they can be able to plan accordingly. This table also shows that there seems to be a statistically significant association, albeit a weaker one (0.085), between selling avocados and self-reported economic

²³ In the cases where percentages seem to be lower than expected, the explanation may be the big gap between the households who did not sell avocados and do not own an asset at the stake or their children went hungry and the households who sold avocados and own asset at the stake or their children never went hungry. Take for instance the latter as an example to illustrate this. In the sample (n=100), 42 households who did not sell avocados their children went hungry as compared to 21 households who sold the avocados and their children never went hungry.

status and one could argue that, to some degree, this weaker significance may be due to the small sample size. One could also argue that, as mentioned above, the lower levels of per capita incomes from avocados may not be sufficient to turn around the poverty situation of the sampled households in a context of high levels of poverty as Burundi is one of the poorest countries in the world and Giheta is located in the second poorest province (Gitega) of Burundi as discussed in chapter three (section 3.3.1). All in all, the results reported in table 4.9 seem to suggest that households that sell avocados are less likely to be poor in terms of some assets, self-reported status and hunger.

The lack of correlation between selling avocados and the distance for the households to the different facilities is rather surprising. Two possible explanations for this may be the work of collectors who move around the areas looking for avocados and the fact that the majority of the sampled households live at a reasonably short distance to the facilities (see table 4.3) taken into account in table 4.11.

Table 4.11: Selling avocados and the distance to the main facilities

	Percentage of 48 households who Sold avocados	Pearson chi- square	Statistical test results
Distance to the nearest market		3.665	0.300
Less than 500 m	8.33		
0.5 – less than 1 km	12.50		
1 – less than 2 km	50		
2 – less than 10 km	29.16		
Distance to the nearest public transport (RN2)		0.091	0.993
Less than 500 m	29.16		
0.5 – less than 1 km	22.91		
1 – less than 2 km	37.50		
2 – less than 10 km	10.41		
Distance to the nearest avocado oil firm		7.563	0.109
Less than 500 m	4.16		
0.5 – less than 1 km	24.16		
1 – less than 2 km	10.41		
2 – less than 10 km	79.16		

n=100, *statistically significant

Surprisingly, table 4.11 shows for instance that the percentage of the sampled households who sold avocados seem to increase as the distance from those households to the avocado oil firm increases and also to the nearest market (8.33 percent to 50 percent of the households living at

less than 500 m and between 1 and 2 km respectively). There seems also to be a very small difference between the percentage of the households which sell the avocados and those which did not at all levels of the distance to RN2. Actually, this table shows that there are more households living at between 1 km and less than 2 km who sell avocados than those who live at, say, less than 500 m (37.50 percent and 29.16 percent respectively) to RN2. Further, the link is also weaker for selling avocados and the distance to the avocado oil firm (0.109). However, there is a statistically significant difference between the sampled households who are involved in farming avocados and those who do not in terms of the amount of land that they have as is shown in table 4.12.

Table 4.12: Farming of avocados and the use of the land

	Percentage of 67 households growing avocados	Pearson chi- square	Statistical test results
Size of the land		19.145	0.014*
Less than 5000 m square	1.49		
– 9 999 m square	0		
Less than 5 hectares*	29.85		
5 but less than 10 hectares	5.97		
Don't know	62.68		
Livestock	58.20		0.000*
Coffee	28.35		0.000*

n=100, *statistically significant

This table reports that the majority of the households who are involved in avocado farming have between 1 and 5 hectares of the land and as was shown in table 4.5 the size of the land owned by the majority of the sampled households falls in this range.

Finally, the logistic regression model was used to test the relationship between whether the household had a child (17 years or younger) going hungry in the past 12 months because there was not enough food and whether the household sold avocados in the same period, controlling for confounders that influence the likelihood of sales. The model controlled for the sampled households' assets, the size of the households, the sex of the households' heads, the proportion of the number of children in the households per the size of the households, and the distance for

these households to the nearest market.²⁴ Peng et al. (2002) argue that logistic regression is best suited for testing relationships between a categorical or dichotomous dependent variable and one or many categorical or continuous independent variables as it offsets some of the weaknesses of the traditional models such as the Ordinary Least Square (OLS) regression and the linear discriminant function analysis. In the late 1960s and early 1970s, these two techniques were found to be inappropriate for analyzing the dichotomous outcomes because of their “strict statistical assumptions, i.e., linearity, normality, and continuity for OLS regression and multivariate normality with equal variances and covariances for discriminant analysis” (Peng et al. 2002:1). The sample size required to perform reliable estimations with the binary logistic regression method is greater than that needed for OLS regression, and the number of the cases required depends on the number of independent variables used in the model. The more independent variables used in the model, the more cases are needed. Spicer (2004) suggests 50 cases per each independent variable used and Garson suggests only 10 cases. This may explain in part the small value of R square obtained for the model used in this dissertation given the small sample which was used for the logistic regression analysis.

The logistic regression model predicts the logit of a dependent variable Y and one or more independent variables X_1 to X_n . The logit refers to the natural logarithm (\ln) of odds of the dependent variable Y . Odds refer to the ratios of probabilities (π) of the dependent variable Y happening (i.e., the household never had a child - 17 years or younger - going hungry in the past 12 months because there was not enough food) to probabilities ($1-\pi$) of the dependent variable Y not happening (i.e., the household had a child - 17 years or younger - going hungry in the past 12 months because there was not enough food) (Peng et al. 2002).

The data were entered in the analysis as 0 or 1 coding for the dependent variable Y (the household having a child - 17 years or younger - going hungry in the past 12 months because there was not enough food was coded as 1=never and 0=often) and the independent variable

²⁴ / While land size is obviously an important influence on the quantity of avocado produced, this variable could not be included due to a high non-response. More than half of the respondents were unable to estimate the size of the land in meters. Actual measurement of the land would have been a better strategy for data collection but was not possible given time and financial constraints.

(whether the household sold avocados in the past 12 months) was coded as 1=yes and 0=no. The logistic regression analysis was carried out by the logistic procedure in SPSS version 16.0 in the windows 2007 environment. The results are shown in table 4.13 here below.

Table 4.13: Relationship between hunger and selling avocados

	B	S.E	Wald	df	Sig.	Exp (B) (Odds Ratio)
Assets	1.201	.363	10.947	1	.001	3.32
Hhold_sex_head	2.153	1.104	3.804	1	.051	8.610
q6.10_avocadosold	.974	.576	2.858	1	.091	2.648
q4.2a_distmarket	1.522	.623	5.969	1	.015	4.583
Hhold_size	-.336	.150	5.021	1	.025	.715
childper	-.516	1.450	.127	1	.722	.597
Constant	-4.754	1.548	9.427	1	.002	.009

Variable(s) entered on step 1: Hhold_sex_head, q4.2a_distmarket, q6.10_avocadosold, asset, Hhold_size, childper.

N	100
Chi-square	42.145
Sign.	.001
-2 Loglikelihood	81.676
Nagelkerke R. square	.484
Cox&Snell R. square	.173

The results reported in table 4.13 show a positive relationship between whether the household had the child going hungry in the past 12 months and whether the household sold avocado in the same period. The Wald test results presented at the bottom of table 4.13 indicate that the variables in the model of avocado sales contribute significantly as a group to explain the absence of child hunger. The Nagelkerke pseudo $R^2 = 0.484$ statistic shows that the model fitted the data moderately well ($p\text{-value} = 0.001$). In fact, this table shows that the odds of a household who sold avocados in the past 12 months to have a child who never goes hungry in the same period are more than 2.5 times greater than the odds for a household who did not sell avocados in the same period. Simply put, the results from the logistic regression analysis show that the household who sold avocados in the past 12 months is less likely to have a child who went hungry in the same period than the household who did not sell avocado.

Some of the key problems and constraints associated with avocado farming in the sample are outlined in table 4.14 and proposed solutions to those problems are also given in the same table.

Table 4.14: Some of the problems and constrains associated with avocado production in Giheta

	Number of the households
Key problems and constrains	
Insufficient land	44
Lack of grafted seedlings	29
Lack of funds or credits	8
Lack of fertilizer	47
Lack of skills with regard to avocado farming	27
Pests and diseases	19
Bad infrastructure	3
Proposed solutions	
Provision of the land	41
Provision of grafted avocado seedlings	39
Provision of fertilizer	42
Provision of funds and credits	16
Provision of skills	23
Treatment for avocado diseases	10

n=100

4.6 Conclusion

The results of the quantitative analysis clearly show that avocados are not produced at the commercial scale as the avocado trees are mainly intercropped with other food crops. The traditional varieties dominate the avocado farming in the sample. Various categories of households' members are involved in various aspects of avocados production albeit at varying levels. Access to the RN2 seems to play a vital role in the trade of avocado in the sample. The results also suggest that avocados are widely consumed in the sample, who enjoy the taste, and this has a positive impact on the health of the sampled households' members. The results further show that the living conditions are more favorable for the producers of avocados in the sample than those that do not produce. Interestingly, the quantitative results show that more households are involved in avocado farming than coffee which is the main cash crop in Burundi. To gain more insights on this and on other aspects of avocado production in this area, a qualitative analysis is necessary and this constitutes the subject of the next chapter.

CHAPTER FIVE

ANALYSIS OF THE QUALITATIVE DATA

5.1 Introduction

The analysis of qualitative data undertaken in this chapter consists of three main sections. The discussion in the first section focuses on the nature of avocado production and processing with special focus on at least five aspects - production process, planting, harvesting, marketing, institutions, and challenges experienced by various actors in avocado chain. In the second section, however, the focus shifts towards an investigation of avocados' income generation potentiality in the sample. Finally, the third section analyses the contribution of the avocados to the sampled households' diet.

5.2 Nature of avocado production and processing in Giheta: A brief overview

It emerged in my interviews with the small-scale farmers that the production of avocados in Giheta started in the early 1940s. The avocados were brought by the European missionaries who arrived in Burundi in early 1920s. At this time, avocados could only be found at the missionaries' centres or in the traditional chiefs' backyards. Production of this crop expanded in Giheta from these two sources. The farming of this new crop was then embraced by local people and expanded to such an extent that there were a significant number of avocado trees in the area by the 1960s. By the 1970s and 1980s, avocados were already sold at the local markets. To date, avocados are found in almost every household's farm and the fruits are plentiful at the local markets. In our interviews with small-scale farmers in Giheta, three main factors were singled out as the main driving force for the rapid expansion of the avocado production in Giheta. First, local people have rapidly embraced the production of avocado as they like its taste and thus have easily incorporated it into their diet. The fruit is consumed in many different ways by local people; either with other food such as beans and red potatoes (two basic staple foods of the area), or it can be consumed alone. Local people prefer to use the avocados with other food because they add taste to these basic foods as a result of the quantity of oil contained in the avocado. In

many instances, avocados are even used to substitute cooking oil which a significant number of the local people cannot afford. Moreover, due to food insecurity issues in the area, families cannot afford to have two types of food to complete their meal and therefore use avocados to substitute the type of food that they do not have. This feature gives avocados more preference over the other types of fruits produced in Giheta. Second, they mentioned that avocados sold very well at the market. As such, avocados are seen as the potential source of income for many households in this area. Third and finally, the RN2 has also played a crucial role in the expansion of avocados as local people have managed to get easy access to the market of the fruit at Bujumbura. Surprisingly, the construction of the avocado oil industry at Murayi – Giheta has not visibly influenced the overall avocado market in Giheta for reasons that will be mentioned further on.

5.2.1 Production process

Since its advent in Giheta, avocados have predominantly been grown as backyard crops (not as commercial orchards), scattered in farms where they are intercropped with other crops or are planted at the frontiers of farms as indicators of the limits of farms and to free the space for other crops. However the planting of avocados at the peripheries of households' farms can create conflict among small-scale farmers due to the space an avocado tree occupies when it matures and the associated negative effects this has on other crops such as maize and banana which cannot cohabit with avocado trees. There seems to be a general ignorance among small-scale farmers on the many varieties of avocados planted on their farms. The only distinguishing criteria they used were the taste of the fruit and the quantity of the fruits the avocado tree can produce. Some avocado trees yield fruits that are considered to be tastier than others and some trees produce a larger amount of avocados compared to others. They also use the same criteria when planting new avocado trees. Surprisingly however, the small-scale farmers (or respondents) interviewed for this study were able to competently distinguish the grafted avocados that they referred to as “modern” avocados from the “other” types of avocados. The farming of the grafted avocados in Giheta is not yet well developed as all the grafted avocados I came across during the transect walks in the farms were still very young. Although still at its early stage, there seems to be a beginning in the increased production of grafted avocados in

Giheta as I discovered during my field work. A few organizations, together with local farmers' associations (especially women associations) seem to be investing massively in the expansion of the grafted avocado farming within and outside Giheta district. The small-scale farmers which I interviewed highlighted three main reasons which motivate the embarkement of grafted avocado farming. Firstly, they mentioned that grafted avocados produce fruits at a very early age (2 to 3 years). Secondly, they produce the fruits which contain a larger quantity of oil than the traditional avocados and this increases their demand and prices on the market. Lastly, grafted avocado varieties do not grow as tall as the traditional varieties and this makes harvesting easier and reduces the quantity of damaged avocados, a byproduct of the harvesting process. Interestingly, the agricultural specialists interviewed could not confirm that grafted avocado varieties occupy less space when they mature as compared to space occupied by traditional ones. I was told that all varieties grow wider as they grow older.

5.2.2 Planting

Avocados are normally planted in October, the month which marks the beginning of the rainy season in Burundi. Traditional avocado trees take five to six years of growth before they start to yield fruit, compared to grafted avocado trees which take a maximum of two to three years. In planting the young avocado plant; small-scale farmers dig a hole of 50 cm by 50 cm, put in traditional fertilizer, then place the young plant in this and cover the roots with soil. Small-scale farmers then leave a small place where water would be stagnated around the newly planted young avocado plant. After this, they hardly use any inputs and undertake almost no management of the plant. Only avocados which are intercropped receive some fertilization as they benefit the fertilizers applied to other crops. The daily schedules exercise that I conducted with small-scale farmers in Giheta showed no slot of time dedicated to the management of avocado trees.

Among the traditional varieties of avocado, the *bakari* (the avocados of this type have a red skin and are well-known for their excellent taste), and *indundi* (the avocados of this type have a green and very smooth skin) are preferred by consumers.

Figure 5.1: Various avocado “varieties” – *Bakari*, *Indundi*, and grafted avocados



During the transect walks on the farms, I learnt that some pests and diseases had attacked the avocado trees. Small-scale farmers were able to describe these but they remained uncertain of the specific names or causes of these pests and diseases. The first disease observed was one very similar to the one which very often attacks a coffee plantation in that area. This disease known locally as “*rukarakara*” affects the leaves of the tree and make them to dry up and if there are some fruits on it they also dry up. This may be a form of anthracnose, a common disease encountered in avocado producing regions²⁵. In addition, small-scale farmers mentioned another disease which makes the flowers of the avocado tree fall before the fruits can develop. This is probably due to a mineral deficiency. The general observation was that small-scale farmers do not know how to treat their avocados when they are attacked by these diseases. Very often they cut down the infected avocado tree in the hopes that the disease will disappear and the tree will rejuvenate itself. In other instances, they resorted to traditional practices which include placing a nail in the tree. Local small-scale farmers furthermore hold specific traditional beliefs about avocado production. For instance one farmer stated that parts of her avocado tree did not produce fruit because a woman might have breast-fed her child under the tree. Another farmer believed that avocado trees should not be pruned as this caused them to lose their flavour.

²⁵ Source: <http://www.avocadosource.com/books/AvocadoHandbook/Diseases.htm>

Although not much can be done to treat the already infected fruits, the agricultural technician of Giheta noted that there are treatments available for these problems. Small-scale farmers, however, claimed that they never sought assistance from the agricultural technician of Giheta and added that they rarely saw him in their localities. They added that he only looked after selected crops such as coffee, vegetables, and some “modern” grafted fruit trees.

Although avocado trees may flower throughout the year, I was told that many are flowering between February and March. The trees are harvested after six months, normally between August and November. Very often, avocados of the same tree do not mature at the same time, as I found during the transect walks, particularly in respect to one avocado tree which produces avocados throughout the year. This would explain why avocados can always be found at the market even during the off-season period. The avocado trees, however, do not yield the same amount of fruit every year and remain unpredictable in regard to assessing yields. Although avocados are available all year round, quantities are substantially smaller during the February to June period.

5.2.3 Harvesting

When harvesting the avocados, small-scale farmers use a long stick to hit in the area where the fruit is joined to the branch. They also use a traditional instrument locally known as “*urukero*” to harvest the fruits. To minimize damage of the falling avocados, dried banana leaves are placed on and around the cultivated soil under and around the avocado trees.

Figure 5.2: A young woman harvesting avocados with “*urukero*”



Three main factors influence the quantity of avocados a tree can yield: the quality of the soil it is planted in, the variety of the avocado tree, and the size of the tree. Although, the age of the tree is not seen as a crucial factor in its actual yield, mature trees (from, say, their fourth harvest) tend to produce more avocados than the younger ones (at their first and second harvests). According to the small-scale farmers, the lifespan of the traditional avocado tree can go as far as, or even beyond, fifty years. During the transect walks in the farms I came across avocado trees which had been planted in the 1950s and 1960s and which still produce good yields. The fruits from more productive trees are set apart for selling whilst the avocados produced from the least productive trees are used for home consumption. Both men and women plant and sell the avocados. However, the actual harvesting process is left only to men, specifically young male children who can easily climb the trees. Females thereafter transport the harvested avocados to the house.

5.2.4 Marketing

The avocados are sold in three ways: Small-scale farmers sell avocados either; directly to consumers at the local markets, to the retailers who resell along the RN2 or, to collectors who resell them at Bujumbura. To start with, small-scale farmers indicated their preference to sell either ripe or hard avocados at the local markets and other places. Some important factors which influence the small-scale farmers' choice in the places they sell the ripe avocados are the price and the days on which avocados get ripe. Given the fact that local markets only operate a few days a week, farmers find it difficult to sell their avocado at the local markets as their avocados can ripen on the days the markets are not operating. However, even when the avocados ripen on days that the local markets operate, small-scale farmers prefer to sell their avocados at various places in Gitega such as the military camps, factories, schools, and market because they obtain a better price. The distance from the farmers' home to Gitega is reasonably long. On average, it is a two-hour walk. The distance from their home to many local markets is about 45-minutes walk on average. They carry the avocados in big baskets on their heads. The avocados are ripened at home using big pots or baskets. They first lay banana leaves in the pot or basket, then place the avocados in and cover it up. The ripening process can usually take between three and five days depending on the variety of the avocados. Some avocados rot in the process but this is mainly a result of bad harvesting methods where avocados get bruised while being harvested.

In most instances, it is the women who sell the avocados and buy other products that may be needed in the household such as food. They give the money left over to their husbands. Small-scale farmers who prefer to sell their avocados in this way normally harvest their avocados systematically when they need money or/and when there is a need for avocados to be consumed in the household. Furthermore, some small-scale farmers prefer not to sell their avocados to collectors as they believe that such sale arrangements only benefits the collectors. One informant said: *"No! We never sold our avocados to the collectors. These people give us very little money. We rather take our avocados to the market"*.

Next, small-scale farmers who do sell their avocados to collectors do so in relation to three kinds of collectors: primary collectors have capital to buy avocados and resell them at Bujumbura. The second type or category of collectors buy the avocado trees from the small-scale farmers and

then sell these trees to the primary collectors. The second category of collectors also provide services for harvesting and transporting the avocados from the farms where they were bought, to the RN2 from where they are transported to Bujumbura. Both groups may employ agents who lack capital but have the knowledge and skills to identify a source of avocado, and these form the third category of collectors.

The primary collectors are almost all from the Giheta district. They buy avocados in two ways; either they buy the avocado trees or they can buy avocados in the big bags (which can contain between 200 kg or 300 kg). For the former, the collectors can buy the avocado trees which have mature avocados ready for harvesting or they can buy the avocado trees which have avocados that are still very young and waiting to be harvested. While the second strategy is cheaper it is also more risky as the avocados can fall down before maturing. For this buying strategy, collectors normally buy trees that they know as they fear other people may buy them first.

Collectors also buy mature avocados in bags. The way this operates is that they bargain with the small-scale farmer who owns an avocado tree on the price of the full bag. If they reach an agreement, then the small-scale farmer harvests the avocados according to the quantity the collector needs. The collectors are well-known in this district and very often the small-scale farmers look for them if they have avocado trees to sell. When the avocados finish in the Giheta district, they cross over to other districts bordering Giheta to look for more avocados. The main challenge they face in this case is that they do not know and are not familiar with these other areas. Consequently, they do not know small-scale farmers in these districts who may have good trees to sell. This is how the collectors of the second and the third category become important.

Most of the collectors of the second and third categories were from Bugendana district which is bordering Giheta district in the north. These collectors have a place at Bugendana where they wait for the primary collectors from Giheta every day from six AM to eight AM. After eight, those who did not manage to be hired by the collectors go back home to do other activities, specifically working on farms. Given the fact that the primary collectors are desperate to obtain avocados, collectors of the second and third category seem to exploit this by only showing the avocado trees to the primary collectors that they know will give them more money and buy them beer. The primary collectors that do not offer beer are generally ignored or shown the bad

avocado trees in the hopes that they do not come back. It is important to note then that the collectors of the second and third categories play a key role in this business.

What follows is a description of how these three categories of collectors mutually interact in the value chain. When the primary collectors from Giheta come to the neighboring districts looking for the avocados they find the collectors of the second and third categories waiting for them in a particular place. They find the collectors of the second category already have the avocado trees available for sale. They buy these trees in advance, some months before when these avocado trees still had very young avocados on them. So when, the primary collectors come to them, they show them those trees and if the primary collectors are happy they buy the trees. Additionally, the primary collectors pay them for harvesting those trees and transporting the avocados to the RN2 at Giheta. The primary and second categories of the collectors are so experienced that they can tell how many bags they can get by only looking at an avocado tree. This enables them to calculate the amount that they will pay for any particular avocado tree. They use different methods to find out the quality of the fruits. Some break the fruit and check if the fruit is yellow inside and other take a sample home to check whether the fruit gets ripe on time. The primary collectors are of the same view that buying avocados in this way is expensive but they also acknowledge that the collectors of the second category work very hard to get the avocado trees as they normally use them towards the end of the avocado season. The collectors of the third category are only working when they are hired by the primary collectors. The former are hired for harvesting and transporting the avocados to the main road where they are transported to Bujumbura. They use the bicycles and traditional wheel barrows for transporting the avocados to the main road. The costs of the transport depend on the distance.

Figure 5.3: Different ways of transporting avocados



When the avocados are transported to the main road, the primary collectors start looking for cars which can transport their avocados to Bujumbura. Sometimes they don't get one for three consecutive days. This, then, puts their business at a serious risk. First, they do not have any place to store their avocados. Their avocados are left on the road under an open sky and there is a risk that the avocados get ripe before they reach its final destination. If this happens they throw them away as they can neither transport ripe avocados to Bujumbura nor sell them at the local markets. The cost of transporting one big bag of avocados to Bujumbura depends on how the collectors have bargained with the drivers. On top of the transporting costs of the avocados from the farms where avocados are bought to Bujumbura where they are sold, the primary collectors also pay various taxes to government officials. The primary collectors send between two and six big bags to Bujumbura two or three times each week.

The primary collectors normally have their own business partners at Bujumbura who buy their avocados. The latter sell the ripe avocados to the various retailers of avocados at various municipal markets of Bujumbura. The main collectors of Giheta appear to have a strong relationship with their business partners and may simply send the bags to their business partners who later send them the money after the avocados are sold. The collectors from Giheta only get the money for their avocados after their partners have seen that the avocados sent to them are of good quality, ripening on time. It is only after they have sold those avocados that they can send money to the primary collectors from Giheta. If it happens that the avocados do not get ripe when they reach the capital city (they called this phenomenon "*ibipine*" to refer to the situation

whereby the avocados become like rubber instead of getting ripe), the partners do not send money to the primary collectors from Giheta. In such circumstances, the latter bear the losses.

Small-scale farmers also sell their avocados to retailers. These are a group of women who sell the avocados on the side of RN2 at the centre of Kibimba in Giheta. These women have formed an association called “*Dushirukubute* (let us avoid laziness) Association”. The centre of Kibimba is situated just at the periphery of the RN2. The centre also hosts the local market which operates twice a week - Wednesday and Sunday. However, there is a place which is located alongside the national road where items are sold throughout the week, mostly to travelers moving between Bujumbura and Gitega. The best month for business is December as there are more travelers.

Figure 5.4: *Dushirukubute* Association Selling Place in Giheta



When this association started in early 1990s, it had a membership of 10 women. It has since grown to 60 members which form three groups of 20 women. Each group has its own day of selling staff in that place. No person is allowed to sell in that place unless she is a member of this association. Things which are sold include avocados, sweet potatoes, fresh peas, maize and so forth. A tax of 20000 Fbu is paid annually by the association to the administration of Giheta district. All members contribute a certain amount toward that annual tax. Additionally, each member needs to pay a tax of 100 Fbu on the day the market is operating if she is doing business on that day. They have hired a sweeper who cleans the place every morning before they open the business and are not harassed by the local authorities or police. To become a member, three steps are followed: First, a request is sent to the other members of the association. A person who is seeking the membership can send her request using any member of the association. The second

step is to call the person who is seeking the membership in the meeting with all members to explain her request. The third step is for the members of the association to endorse or reject the request. Moreover, I was told that the association has decided to put on hold the recruitment of new members because the site cannot accommodate more members. They also take into consideration the moral qualities of the person who seeks the membership in this association. Among other things such member should not be a robber, drunkard, or prostitute. As mentioned earlier, the members of *Shirukubute* association are divided into three smaller groups of twenty each. Members of these also operate a rotating savings club whereby they pool money which they use to give loan to a member who needs money for doing small business, which is then repaid with interest. The travelers are the main clients of these women.

Avocados are sourced from four main sources: First, they buy avocados on the days the local market is functioning – Wednesday and Sunday. Second, they buy avocados from producers or collectors who bring the avocados to the centre during the days on which the market is not functioning. Each retailer (or member of the association) at this centre has built strong mutual business relationship with local suppliers of the avocados. Both individuals benefit from this business relationship. On the one hand, the retailer benefits from this relationship in two main ways. First, she gets an assured and reliable source for supplying the avocados. Second, even if her business partner might find her not having enough money to buy the avocados the former can trust her with her avocados and come later to collect the money. On the other hand, the supplier benefit from this relationship in a sense that she gets an assured and reliable market even when there is an over-supply of avocado.

Thirdly, members of *Shirukubute* association do sometimes buy trees which have mature avocados that they harvest themselves. In this way, they act both as collectors and retailers. Before they pay the money, they take home a sample to check whether the avocados ripen within the normal period (between three and five days) and whether the fruit is of good quality. When the retailers buy the whole tree, the harvest is being done systematically as they harvest just the quantity they can sell in a day. Sometimes they use their children for harvesting or they can hire the children from the households in which the avocado trees were bought. Retailers reported that they consider buying of the avocado trees as the best method of getting the avocados at the best

price more than other buying arrangements. However, this is becoming more difficult as there is competition due to many people entering the avocado business, especially from the collectors who supply the avocados to the retailers at Bujumbura. Additionally, as mentioned earlier, local farmers also now prefer to sell their avocados directly at the local market where they obtain higher prices. And finally, members of Shirukubute association do, sometimes, sell the avocados that they harvested from their own households' trees.

Surprisingly, small-scale farmers do not sell the avocados at the Avocado Oil firm of Murayi as one would expect. Three main reasons were identified by farmers. First, farmers mentioned that small quantities of avocados from the small farms in this area were not bought by the firm when it started. At this time, the firm sought suppliers who were able to provide large supplies like one ton and above, of avocados. However, the firm recently started buying smaller quantities of the avocados as a supplier who meets the firm's requirements could not be found in this area. Second, the firm prefers "modern" varieties over the "traditional" ones, buying the former at 80 Fbu per one kg compared to between 40 Fbu and 60 Fbu for one kg of the "traditional" avocado varieties. This difference in price is because the varieties do not contain the same quantity of oil. During our interview with the owner of the firm, he pointed out that he would need 50 kg of traditional avocados to produce one litre of oil whereas he only needs between 20 and 23 kg of the Hass and Fuertes varieties in order to produce the same quantity. Third, the firm does not pay cash for the avocados it purchases. Farmers wait some weeks before they can get their money. All these factors have contributed to local small-scale farmers' decision to sell their avocados at the local market or to the collectors rather than selling them to Murayi.

5.1.5 Institutions

First, "*Tujijuke Dukorere Hamwe*" (Let us Avoid Ignorance and rather Work Together) association is a local association which is involved in the multiplication of grafted avocado seedlings at a place called "*Isaso*" which is located at the border between the district of Giheta and the district of Gitega. It has a membership of twenty people; sixteen women and four males. It is led by a female president and two vice-presidents; a woman and a male. This association is

supported by a Swedish NGO called “Caritas Swedish²⁶” which committed itself to supply all the materials needed such as the hoes, wheel barrows, sachets, and so forth for the grafting work and pay stipends to the members of the local association for encouragement. It also sponsored the training of some members of the association who, after they have obtained hard skills and knowledge in grafting, come back and train other members (this training takes place at one of the governmental agricultural research institutions called ISABU Bugarama where small-scale farmers acquire some hard skills in various farming activities through an intensive training for four days). The local administration provided a piece of land that the association can use for this project. The traditional avocados which are used for grafting are brought by members of the association from home and the root stocks are outsourced from ISABU Murongwe and are taken from two main avocado varieties - Fuertes and Hass. The association does not pay for these components as the ISABU Murongwe has an agreement with Swedish Caritas for supplying the avocado components for grafting to the association. Four stages are followed to produce the grafted avocado seedlings which can then be planted in the farms. The first stage consists of the preparation of the ground. The second stage consists of filling the small sachet bags with the soil. The third stage consists of putting avocado seedlings in those small sachet bags filled with the soil. And the fourth stage consists of grafting. Fuertes and Hass are the two avocado varieties which are most often used for grafting. The whole process takes up to 6 months to be completed. The process normally starts in August so that the grafted avocado seedlings could be ready for selling from January as avocados are basically planted during the rainy season. At the time of the field work in December 2009, the association had 10,800 grafted avocado seedlings of which half (5,000) would go to Swedish Caritas and another half (5,000) will be sold by the association as per agreement between these two business partners. The grafted avocados are sold within or/and outside Giheta district.

The second organization involved in the grafted avocado production in this area is a Roman Catholic Church Organization called “ODAG” – Organization de Developement pour l’Arch-Diocese de Gitega. ODAG operates in three provinces which comprise the Arch-Diocese of

²⁶ Website for Caritas Swedish:

<http://www.missioncouncil.se/sidorpaandrasprak/inenglish/memberorganisations/thecatholicchurchinsweden.4.40f9f922109b64589f08000969.html>

Gitega, namely, Gitega, Mwaro, and Karusi. It operates in both social and economic sectors. For the former, this organization is involved in health, education, housing and relief activities. For the latter, the organization is involved in agricultural sector mostly food security, infrastructural development, and micro-finance projects. The organization is managed by three structures: The general assembly, executive committee which is headed by the Arch-Bishop of the Arch-Diocese of Gitega himself, and the executive secretary. One of the main projects that the food Security department is currently working on is the multiplication of grafted avocado seedlings in the whole Arch-Diocese of Gitega. This project is sponsored by the Italian Council of Roman Catholic Bishops and will be run over a period of three years. The rationale for initiating this project consists of three main factors. First, from a food security perspective, it was thought that the project will boost the avocado production in this area, thereby contributing a great deal to the diet of the poor small farmers. Second, given the emerging market of avocados in this area because of the construction of the Avocado Oil firm of Murayi, it was believed that avocados can contribute greatly to increasing the income of the poor local small-scale farmers in this area. Third, it was realized that the traditional avocados existing in this area are very old to the extent that they need to be replaced. When I visited the organization, the project was in its first operational year. The budget of one year is estimated at 21 Million Fbu. The project consists of two sites of which one is located at Gitega and another at Murayi - Giheta. Each site produced 25,000 grafted avocado seedlings. This means that 50,000 grafted avocado seedlings were produced in this project. ODAG does not intend to sell its grafted avocado seedlings to local farmers but rather it will distribute its grafted avocado seedlings to local “vulnerable” small-scale farmers for free. However, the strategy which will be used to carry out successfully such distribution is not yet finalized as the project is still at its early stage.

Thirdly, the Avocado oil plant of Murayi – Giheta has also invested in the expansion of grafted avocado farming in Giheta. The Avocado Oil Firm of Murayi started its operation in 2007. The firm has the capacity of using ten tons of avocados per a day and it has employed 64 workers including supervisors. All workers are trained at the firm and there is no particular level of education required to work at the firm. When I visited the firm during my field work, however, I found that the firm was not functioning. The main cause of that was the lack of the avocados. For instance, the stock had less than 50 kg of the avocados while the minimum quantity of avocados

needed per a day for the firm to function is one ton. As a result all workers had been sent home. To mitigate the problem of insufficient quantity of the avocados, the owner of the firm has started a program of producing and distributing the grafted avocado varieties that he distributed to the local small-scale farmers. At the beginning of the last agricultural season in 2009, he distributed between 10 000 and 12 000 grafted avocado plants to the local farmers for free. He only gives the avocado seedlings to the local small-scale farmers who are in the associations and he hopes that the farmers will sell the avocados to the firm when the distributed avocado trees will start producing fruits. To the question of what would happen if the beneficiaries of these avocado plants decide otherwise and sell the fruits elsewhere; the owner of the firm responded that that is not a problem as the market operates in that way. Additionally, the local leaders have given him five hectares of the land in which he has established an orchard of grafted avocados. Furthermore, the program of the president of Burundi in expanding the production of fruit trees throughout the country created a situation where more than 5,150 grafted avocado seedlings were planted in Giheta. All of these show that there might, quite possibly, be an overproduction of avocados in Giheta in the near future.

5.1.6. Government support

Government support for agriculture has a long history in Burundi. In my interview with an official who is in charge of agriculture in Giheta district, I was informed that prior to the civil war in Burundi in 1993, the agricultural administration in Burundi was built up according to the Burundian territorial structures which consist of four main parts at the provincial level. At a more grass-roots level, there is the smallest administrative geographic entity called “*colline*”. This encompasses a small number of households of which the number differs from one *colline* to another. The following administrative entity is called the “zone”. This encompasses a certain number of *collines*. Then, the following administrative entity is the “communal district”. This also encompasses a certain number of the zones. As mentioned earlier, the communal district of Giheta is formed by three zones: Kabanga, Giheta, and Kiliba. And finally, the province is composed by a certain number of communal districts. Giheta is one of the eleven communal districts which constitute the province of Gitega.

With regard to the agricultural administration; at the colline level, there were the agricultural technicians called “*Moniteur Agri*” (Agricultural Monitors). Each *colline* was allocated one agricultural monitor. Besides some training in agriculture given to these people, they did not have any formal education in agricultural sciences. At the zone level, there were the agricultural technicians called “*Assistants des zones*” (Assistants of the Zones). These had received the formal education in agricultural science but at a very low level (three years after the completion of primary schooling). Their role was to coordinate the activities of the agricultural monitors in the whole zone. Each zone was allocated one assistant zone. Then, there was one agricultural technician at the communal level called “*Agronome*”. The persons who were appointed as the agricultural technicians at the communal level were normally those who have completed the agricultural technicon colleges (four years after grade ten). They coordinated and managed all the agricultural activities taking place in the entire communal district. At the provincial level, there was what is called “*Direction Provinciale de l’Agriculture et de l’élevage*” DPAE (Agricultural provincial directory). This department controlled all farming activities taking place at the provincial level. All agricultural technicians working at the communal district level reported to this department in each province.

From this interview, it appears to me that the way this system operates is quite appealing. Each agricultural monitor subdivided his *colline* into small sectors, say, four or five sectors. This means that each day of the week was allocated a sector. This helped the agricultural monitor to visit all the farmers from his *colline*. When the agricultural monitor visited a particular sector, he usually started with a small meeting with all farmers living in that small sector. He listened to their views, opinions, and problems. After that meeting, he started patrolling the farms in that sector, looking if the farmers were doing the farming in the “correct” way and provide help and assistance for the farmers who might be in need for that. He was doing this each week and for each sector. The agricultural technician at the communal municipal level held a meeting with all the agricultural monitors every week. In this meeting, each agricultural monitor reported on what he has been doing in the previous week and some of the key challenges or suggestions that farmers in his colline might have raised. The agricultural technician at the communal level then worked on those reports and acted accordingly. He used also these reports to produce the final report that he submitted to DPAE.

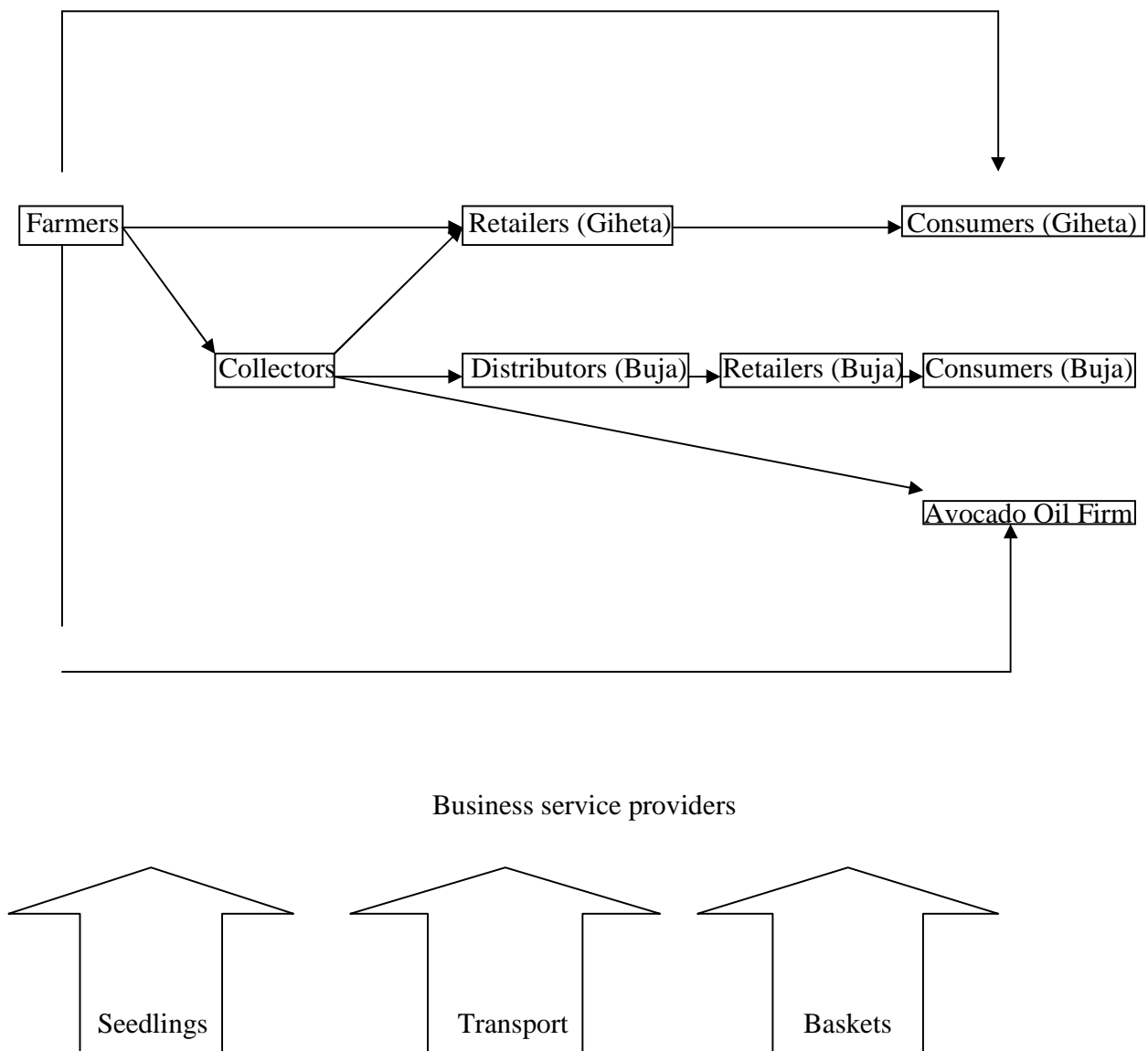
In this interview, I was informed that this whole system was functioning very well and efficiently when the agricultural sector was still technically and financially supported by the World Bank and the African Bank for Development. All different categories of agricultural technicians at all levels were paid very well and were motivated to do their job properly. But when the civil war started in Burundi in 1993 and the World Bank and the African Bank for Development pulled out from funding the agricultural sector in Burundi, the whole system described above almost collapsed. The Burundian government was forced to revise the whole agricultural sector and implemented many changes. Among these was the retrenchment of all the agricultural monitors in the whole countries due to the lack of funds. The salary of the agricultural technicians at the communal district level was also sensibly reduced.

After the civil war, the Burundian government tried to re-establish the former system in 2007 through the reestablishment of all categories of agricultural technicians at all levels, especially the agricultural monitors at the *colline* level. However, the role of the agricultural monitors was entirely revised in that they are no longer operating as monitors who act as bridges between the small-scale farmers and the officials at all levels in the agricultural sector but rather they are now acting as “role models” to the local small-scale farmers. Using their own farms, the agricultural monitors set up the standards at which other local farmers should strive to meet in their farming activities. Quite frankly, although the agricultural technician of Giheta seems to be optimistic that this system can also work better in the long term as the agricultural monitors can influence a big number of the local farmers if they do their job properly, the findings from this study seem to indicate that the change of role of the agricultural technicians operating at the *colline* level from being monitors to being role models is really not assisting much in promoting agricultural sector in Burundi. It does seem to me that the new system has actually broken the communication chain among various actors in the agricultural sector and consequently it has greatly contributed to the widening of the gap between the small-scale farmers and other officials operating in agricultural sector. As mentioned earlier, small-scale farmers do not even know that they can seek assistance from the agricultural technician of Giheta for their avocados when these are affected by the diseases. In my interview with the small-scale farmers, I asked them a question of whether they seek assistance from the *agronome* and one informant responded: “*we do not see him in our area and we do not even know that he could assist us in treating the avocados. We thought that he*

only deals with coffee". It also emerged in my interview with the agricultural technician of Giheta that he did not even know that farmers were experiencing those problems until I informed him what I saw in the farms. He seemed a bit surprised and said, "*no one has reported to me about those problems*". Worse still, at the far end of the spectrum, my interviews with various political leaders in the ministry of agriculture revealed that they seem to be completely detached from the reality on the grounds. They are completely ignorant about emerging new developments in agriculture at a grass-roots level. It does seem to me that this political leaders' ignorance can fairly be traced back in the workings of this new system which, to some degree, according to my understanding, seems to failing the agricultural sector in Burundi.

To sum up, the value chain of avocado production in Giheta can be depicted as follows:

Figure 5.5: Giheta avocado Value Chain Map



5.2.6 Challenges

Some of the challenges that small-scale farmers have identified with regard to the production of the avocado are: First, the small size of the land as small-scale farmers own small farms averaging 0.8 ha (Gahiro 2000) and this is exacerbated by the fact that some other important

crops such as maize and banana do not cohabit with the avocado trees. Second, the lack of grafted avocado varieties, fertilizer, and funds were also highlighted. Third, small-scale farmers also mentioned that the traditional avocados varieties are slow to yield fruits and as a result, people would prefer to farm other crops that take less time to be harvested. The fourth challenge identified consists of the diseases which attack the avocados and the invisibility of the agricultural technician to assist small-scale farmers combating these diseases. Fifth, the lack of skills, especially, those for farming grafted avocado varieties was also mentioned. Finally, some small-scale farmers also lament the fact that some of their avocado trees produce small and tasteless avocados that they cannot sell at the market nor consume them at home. The key challenge that the retailers of avocados face is when their avocados get ripe before they are sold out. If this happens, the retailers are forced to give them away to people at the centre before they rot. Another challenge related to finding avocado trees to buy due to the increasing competition existing in this industry.

The avocado collectors outlined the following challenges that they face in their business. First, the primary collectors do not, sometimes, get the means for transporting their avocados to Bujumbura. This can lead to their avocados ripening before they reach the final destination. Second, some varieties of the avocados get rotten or do not ripen. The third challenge is that the collectors do not get any support for their business and should they lose their capital due to the reasons mentioned above; they are, then, out of business. Fourth, the retailers at Bujumbura, sometimes, prefer the avocados from other provinces in the north west of the country over those from the central provinces of the country where the district of Giheta is located. Finally, for those that buy avocado trees which have young fruit, the fruits can fall down due to the wind or the branches of the avocado trees can get broken due the heavy rain or strong wind.

Associations and organizations involved in avocado grafting also face challenges. The first consists of the fear that the grafting process might be unsuccessful due to the lack of skills and the climate change. Second, a lack of market for grafted avocados was identified as the serious challenge especially for those who are selling the products. The market is further distorted as some organizations involved in avocado grafting sell their products whereas others distribute them for free to the local population. The third challenge identified related to the funds as many

of these organizations and associations depend on external funding. Their sustainability is not ensured beyond the period of funding. The last challenge identified here relates to the inputs used for grafting, particularly the imported ones. The plastic bags used for grafting are imported, and there are sometimes delays in delivering and/or the service provider supplies the bag of poor quality. The costs of the importation of the plastic bags are also rapidly increasing. The main challenges that the avocado oil firm is facing are the lack of inputs, particularly, the avocados and lack of financial support from the government.

Small-scale farmers have formulated the following suggestions: First, they request the government's intervention in providing them with grafted avocado seedlings and credits in order to increase the avocado production in their households. Second, they also suggest that the government should support small-scale farmers by providing them with the fertilizer. Third, they suggest that the government should provide them with the sufficient land so they can farm the avocados and other plants without sacrificing ones over the others. Fourth, farmers further requested government assistance in dealing with the various diseases and pests which attack the avocados. All farmers that I interviewed shared the same view that if the production of avocados can be developed and professionalized in such way that it can significantly increase the income of the farmers' households they can plant many avocado trees in the farm as they can use money they obtain from the avocados to buy food that they do not produce.

Other key actors in the avocado chain have also formulated some suggestions. To start with, the retailers suggest that the government should create a sustainable market of the avocados. Second, they wanted the government to support them by providing them with the cheapest means for transporting the avocados to the market as they spend a lot of money for transport alone. Finally, they also hoped that a study like this one would help to improve the business of avocados in this area. Collectors have suggested that the government should support their business by providing them with the means for transporting their avocados to Bujumbura and credits, particularly during the time of business crisis. Second, they also suggest that the government should help them to obtain the foreign market for their avocados as this crop create jobs locally. Local associations and other organizations which are involved in the grafted avocado multiplication and distribution have also expressed their wishes. First, they wished that donors should continue

supporting the avocado grafting projects they are involved in. Second, they wished that different actors in the avocado production value chain should build strong synergistic working relationship and cooperation which could facilitate the sharing of information and experience in order to ensure the rapid expansion of the avocado production in this area. Third, local associations of small-scale farmers wished to obtain more training in grafting in order to sensibly reduce losses during the grafting process. Fourth, they wish to have access to sustainable market where they can sell their products at a desired price. Finally, there was also a suggestion that law makers in Burundi should allocate a significant budget to agricultural sector as farming represents the main economic activity that many rural people are involved in. Further, they suggested that people who are working in agricultural sector especially the technicians should be given the opportunities to further their studies in other countries where the agricultural sector is more developed so that they can accumulate enough knowledge that they can use for promoting and developing agricultural sector in Burundi.

There seems to be a general consensus among various actors in avocado value chain that avocado production offers many opportunities for those who are involved in this sector. First, like any other fruit, the avocados can play an important role in improving the health of the population. Second, the avocados can also increase the income of the farmers as the fruit is on high demand at the local market. Third, it can also be used for creating jobs as it is the case for various people who have now started the business of producing the grafted avocado varieties and those who are selling the avocados at different levels.

5.3 Avocados and income generation

Avocados play a vital role in the generation of the income of small-scale farmers in the sample. Of the eleven households that I interviewed, avocados were reported as the main source of income for eight households as the following table shows.

Table 5.1: Main sources of income for ten households interviewed in Giheta

Household Number	Sources of income per degree of importance (from very important to least important)	Income obtained from avocados in the previous season
1	Coffee, banana, beans, sweet potatoes, cassava, and avocados.	6,000 Fbu
2	Avocados, banana, sweet potatoes, cassava, and beans	75,000 Fbu
3	Avocados, cassava, banana, beans, madumbi, coffee, and peas	56,000 Fbu
4	Avocados, remittances, potatoes, beans, cassava, small domestic animals, and firewood	17,000 Fbu
5	Avocados, banana, sweet potatoes, domestic animals, Beans, maize, and non-farming activities	14,500 Fbu
6	Avocados, sweet potatoes, banana, beans and small domestic animals	26,000 Fbu
7	Avocados, sweet potatoes, banana, beans and small domestic animals	8,000 Fbu
8	Banana, goats, cassava, peanuts, and coffee	Does not know
9	Avocados, bananas and honey	74 000 Fbu
10	Avocados only	60 000 Fbu

The figures reported in table 5.1 here above only reflect the money that farmers obtained from selling the avocado trees because they can remember these amounts. The money that farmers obtained from selling the avocados at the local markets are not captured in these figures as this selling strategy is hard to monitor as it is done as the need of money rises in the households and records are not kept. It is interesting to realize in the above table that coffee which is the main cash crop in Burundi was reported as the main source of income in only one household. Indeed I discovered during the course of my field work that farmers are increasingly abandoning the

farming of coffee. The following table shows the incomes, costs and profits of farmers, retailers and collectors in the avocado value chain.

Table 5.2: Profitability of avocados²⁷

Incomes from avocados			Costs			Profits		
Small farmers	Retailers	Collectors	Small farmers	Retailers	Collectors	Small Farmers	Retailers	Collectors
Turnover for one big bag (300 kg) of avocados: between 5,000 Fbu and 6,000 Fbu	Turnover for one avocado tree: between 48,000 Fbu and 72,000 Fbu.	Turnover for one big bag of avocados at Bujumbura for the Primary collectors from Giheta: between 12,000 Fbu and 17,000 Fbu		Price of a small bag (50kg) of avocados: between 2,000 Fbu and 3,000 Fbu.	Price of one big bag of avocados: between 5,000 Fbu and 6,000 Fbu	One big bag (300 kg) of avocados: between 5,000 Fbu and 6,000 Fbu		Profits from one avocado tree: Between 500 Fbu and 5000 Fbu (Collectors of the second category)
Turnover for a small bag (50kg) of avocados: between 2,000 Fbu and 3,000 Fbu.		Turnover for one big bag of avocado at Bujumbura for the primary collectors' partners: 25,000 Fbu		Price of an avocado tree: between 5,000 Fbu and 15,000 Fbu.	Price of an avocado tree: between 2000 Fbu and 30000 Fbu	One small bag (50kg) of avocados: between 2,000 Fbu and 3,000 Fbu.		
Turnover for an avocado tree:				Costs for harvesting: between 500 Fbu and	Costs for the transport: between	One avocado tree: between		

²⁷ All the information provided in table 5.2 is directly taken from the interviews with small-scale farmers and I am aware of its imperfection as the figures reported by small-scale farmers are only those that they can remember. They do not keep the written records of their avocado selling for verification. I have tried in the appendix to make my own estimation about the profitability of the avocado industry in avocado value chain in Giheta based on the information I collected from the farmers but such estimation is still also lacking in many aspects. It would have been helpful to collect the prices of avocados by myself at various selling levels and arrangements but due to time and financial constraints this was not possible.

between 2000 Fbu and 30000 Fbu				1,000 Fbu	500 Fbu and 4,000 Fbu	2000 Fbu and 30000 Fbu		
				Costs for transport from the farm to RN2: between 300 Fbu and 2,000 Fbu				
				Costs for transport from Giheta to Bujumbura: between 2000 Fbu and 4000 Fbu				
				Tax: between 700 Fbu and 1,000 Fbu				

It is not yet clear the extent to which the avocado grafting activities that I came across during the field work are and/or can generate income. Part of the explanation of this is because these activities are still at their very early stage. Another possible justification for this could be the fact that many organization involved in these activities are not seeking profits as they distribute their products for free to the local small farmers. Even “*Tujijuke Dukorere Hamwe*” association does not seem it is making big profit as it registered a deficit during the first year of operation due to the failure of the grafting process. Of the 5,000 avocado seedlings which were grafted, only about 1,600 were successful of which half went to Swedish Caritas and the association only sold another half (800 grafted avocados). They did not get people to buy these as local farmers complained about the high price they were sold at (1500 Fbu per one grafted avocado seedling). As members of this association mentioned, the sustainability of this business seems to be in jeopardy as other organizations are giving the grafted avocados seedlings for free in this area.

Members of the association mentioned that they will only rely on some organizations (UN related organization such as FAO) and the president's programme for multiplying the fruit trees throughout the countries to buy their products.

Finally, the Avocado Oil Plant of Murayi seems to be a potential source of income if it can function efficiently and at its full capacity. The firm employs 64 workers including the supervisors. The ordinary workers are paid 1400 Fbu per a day and the supervisors are paid 2000 Fbu per a day. As mentioned earlier, all workers are trained at the firm and there is no particular level of education is required. The supervision posts only might require a certain level of education and knowledge of French. If the input problems can be resolved, this firm may be a potential source of rural job creation in Giheta.

5.4 Contribution of avocado production to the diet of small-scale farmers in the sample

As mentioned earlier, avocados are widely consumed by people of all categories in Giheta. During the interviews with small-scale farmers' households I found all members of these households eat avocados. The number of avocados consumed in the household per day depends on the quantity of avocados produced in that household, the size of the households, and the period and it was reported that between 4 and 31 avocados are consumed per day as the following table shows.

Table 5.2: Most preferred fruits consumed in ten households interviewed in Giheta

Household Number	Fruits consumed ranked per degree of importance (from very important to less important)	Number of avocados consumed in the household per a day
1	Avocados	Don't know
2	Avocados	5
3	Avocados, guava, granadillas, and mangos	31
4	Avocados, mango, paw paw, and guavas	10
5	Avocados, pineapples, granadillas, oranges, and guavas	Don't know
6	Avocados, mangos, and guavas	Don't know
7	Avocados, papaya, and mangos	Don't know
8	Avocados, papaya, oranges, banana (as fruit), and lemon	4
9	Avocados and mangoes	24
10	Avocados	30

This widespread consumption of avocados among small-scale farmers in Giheta is very important given the high levels of malnutrition prevailing in this area. As it was mentioned in Chapter one (section 1.1), avocado is considered to be an important nutritional food source as it contains important nutrient elements such as proteins, lipids, vitamins, minerals, salt, sugar as carbohydrates and water. As such, the avocado can play a crucial role in improving the health of the population and this was also confirmed by the medical doctor in charge of the health region in the province of Gitega.

5.5 Conclusion

The qualitative results provide a detailed picture of avocado production in Giheta. The results show that although avocado farming still consists of a few avocado trees scattered in the small-scale farmers' farms, the profitability of the sector is quite significant and the demand of avocados seems to be on the rise in this area. Findings also show that avocados are widely

consumed among all the small-scale farming households that participated in the study. Although the experiences of the 11 households interviewed for the qualitative component, has provided a good understanding of household use of avocado, this information is not generalizable. For this reason, the quantitative data provided in Chapter four was required.

CHAPTER SIX

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

6.1 Introduction

This dissertation set out to investigate the contribution of avocados to the income generation and wellbeing of small-scale farmers in Giheta-Burundi. Its main objectives were: First, to determine the nature of avocado production and processing in Giheta; second, to determine how the burden of avocado production in terms of labor and other direct and indirect costs is shared among the small-scale households; third, to determine the profitability of the avocado industry in terms of income generation and its contribution to the wellbeing of small-scale farming households in Giheta, and finally to determine the extent to which the production of avocado contribute to the diet of small-scale farming households and the implication of this on their health. The key findings of this dissertation are summarized in this last chapter and the policy implications in terms of supporting the avocado industry so that it may benefit the small-scale farming households in Giheta are also discussed.

6.2 Summary of findings

6.2.1 Nature and structure of avocado production in Giheta

The results from both qualitative and quantitative data suggest that the nature of avocado production in Giheta looks very much similar to that of the avocado production in the Dak Lak province of Vietnam. The results show that farming of avocados in Giheta is rarely undertaken as a commercial orchard as avocados are predominantly produced as backyard crops and avocado trees are scattered in the farms where they are intercropped with other crops. Small-scale farmers do not seem to know the varieties of their avocados and undertake hardly any management of their avocado trees. The traditional avocado varieties seem to dominate the avocado farming in this area. The situation may change in the near future as the avocado grafting activities which are rapidly expanding in Giheta have started making available modern avocado seedlings to the local small-scale farmers. The burden for producing avocados seems to be fairly shared among

members of the small-scale farming households as various categories of the households' members are more engaged in some aspects of the avocado production than others. For instance adult males are more involved in avocado planting whereas adult females are more involved in avocado selling processes. The collectors seem to be the most important actors in the avocado chain in this area as they supply avocados to both local and external markets. Both quantitative and qualitative results show that there has been a spectacular growth of avocado production in Giheta for the past 30 years and this trend is likely to be maintained in the future. The underpinning factor for this rapid expansion of avocado production seems to be increased consumer demand for avocados both locally and in the cities of Burundi, but not in the export market. The results show that, indeed, the internal market for avocados in Giheta is well developed and rapidly expanding. The local demand of avocados is potentially further boosted by the avocado oil firm established in this area which requires several tons of avocados per day to function to its full capacity. However this is undermined by the preference of this firm for hybrid varieties and the inability of local producers to supply these in sufficient bulk and their preference to sale to the local market.

The results also suggest that the external national market of avocados from Giheta is increasingly becoming significant. This is caused by an ever increasing high demand of avocados from Giheta by consumers from both Gitega and Bujumbura; the two main cities of Burundi. The RN2 and regular transport services between Gitega and Bujumbura also play a crucial role in developing and sustaining this external market of avocados from Giheta. All these factors clearly indicate that the demand of avocados in Giheta is very high, even exceeding to great extent the supply capacity of the small-scale farmers in the area. This is evidenced by the fact that the avocado oil firm has closed down because of the short supply of inputs such as avocados.

6.2.2 The contribution of avocados towards the income generation and wellbeing of small-scale farmers

The results from both quantitative and qualitative analysis suggest that the avocado sector in Giheta seems to be a profitable business for all actors in the avocado value chain. From small-scale farmers to collectors, all seem to earn income in avocados albeit at different levels. For instance the qualitative results show that avocados constitute the main source of income for the

majority of smallholder farmers interviewed than coffee which has been traditionally thought to play this role. In fact, the quantitative finding reveals that more small-scale farmers are involved in avocado farming than coffee. Additionally, avocados seem also to contribute to the government's revenue through various taxes collected from different actors in the avocado value chain. The transport sector and people who are making baskets also seem to benefit, to some extent, from the avocados in Giheta. Further, the quantitative results suggest that some assets ownership and self reported status in terms of economic conditions seem to be favorable among the sellers of avocados. However, the quantitative results also show that per capita income from avocados is still, to some extent, limited and this may be caused by a small number of avocado trees owned by the small-scale farmers on their farms.

The qualitative results show that small-scale farmers spend much of their income from avocados on food. The quantitative analysis also finds positive association between selling avocados and having food, new clothes and radio. The households' expenditure pattern on these items may have significant impact on the growth of the local food market and could contribute greatly to the flourishing of commercial activities in this area. All these have significant positive impact on rural economy and poverty reduction in Giheta.

This contribution together with an apparent shift of small farmers' economic interest from coffee to avocados seems, however, to be not well understood by various political leaders in Burundi involved in agricultural sector that I have interviewed. They tend to only focus on the role of avocados for the households' consumption and seem to be ignorant of the crucial role avocados are playing in increasing the income of small-scale farmers. Although this study is not a comparative study of coffee and avocados with regard to the contribution of these two crops to the income of small-scale farmers in particular and to the overall Burundian economy in general (therefore I cannot make any generalized conclusion in this regard), I strongly believe, nevertheless, that the failure of political leaders to detect as early as possible the small-scale farmers' shift in their economic interests which is increasingly been reflected in their farming activities and respond to this shift accordingly and appropriately can potentially cause disastrous consequences for the Burundian economy in the near future given the fact that it depends almost entirely on agricultural sector.

6.2.3 The contribution of avocados to the small-scale farmers' diet

The results from both qualitative and quantitative analysis show that avocados are very well-known and widely consumed in Giheta. The driving force for this widely small-scale farming households' consumption of avocados in this area seems to be the taste of the fruit. The finding of both quantitative and qualitative analysis also shows that adults and children in small-scale farming households from Giheta like and eat avocados, in substantial volumes, and that those that sell avocados are less likely to experience hunger or to be poor than those that do not. The implication of this is that the contribution of avocados to their diet and the documented associated positive effects to their health are quite significant and important.

6.3 Policy implications

The finding of this dissertation, namely, the crucial role that avocados are playing for the income generation, wellbeing and diet of the small-scale farmers in Giheta, has significance for policy for poverty reduction and rural development in this area. Although the majority of the small-scale farmers interviewed are getting a significant share of their income from avocados, the avocado value chain remains largely one in which subsistence farmers are selling surplus crops in a limited national market. Costs are relatively high, and there are substantial inefficiencies along the chain with wastage, poor institution support and virtually no quality improvement or beneficiation. As a result, small-scale farmers have not yet been able to reap substantial benefits from avocados as the levels of per capita income from avocados remain low. In order to increase the capacity of avocado production in this area and subsequently enabling small-scale farmers to gain a greater income from this sector, the avocado sector needs to be substantially supported by both the private and public sectors. Although some private organizations have already started investing in the sector especially in the area of avocado grafting, these efforts may not be able to attain desirable outcomes by their own. Small-scale farmers need other forms of support in order to engage sustainably and effectively in a viable avocado farming. Among other things they need access to farming land, fertilizers, extension services, avocado farming skills, financial credit, packaging, refrigerated transportation and processing.

In the long run, the government can support the avocado sector at least in the following two main ways. First, one of the major challenges that consistently emerge in both qualitative and quantitative analysis is the scarcity of the land. In as much as the small-scale farmers are willing to plant more avocados this is hindered by the fact that they do not have enough land to do so and opt rather to farming other food crops. This is exacerbated by the fact that avocados are not cohabiting with other crops such the maize and banana while also taking much space in the farm. One way of resolving this issue is for the government to invest in research in order to seek avocado varieties which take less space in the farm and cohabit with other main food crops. This view was also echoed by the Minister of Environment when he addressed the Burundian senate on April 21, 2009. Another way of addressing this problem is for the government to provide the land²⁸ to those farmers who are motivated and committed for avocado farming. Given the fact that the available land may not be enough the ideal may be to allocate the land to the associations of small-scale farmers. Although this may not pose any problem as the associational culture already exists in this area, it requires, nevertheless, an efficient regulatory legal framework. In addition, monocropping in terms of developing small avocado orchards may be the most preferable avocado farming strategy for this. However, the provision of the land should be accompanied with other supportive mechanisms to make this project work. If the development of small avocado orchards seems to be sustainable and viable in this area, then an efficient monitoring system will be needed to consistently monitor the levels of avocado supply and demand in this area in order to keep these in a balance and avoid the overproduction that can drive the prices of avocados down, a phenomenon which can encourage small-scale farmers to abandon the sector as it seems to be a case for coffee. At this stage, the avocado sector in the whole country (not only in Giheta) will have attained satisfactory levels which could make even exports possible. The government may, then, start investigating the external international avocado market, starting with the Eastern African Community right through to its overseas traditional economic partners such as France, German, Belgium and USA. China also could be another option to explore as it is currently emerging as the most important economic partner for

²⁸ The researcher was informed by some senior officials in the ministry of agriculture at Bujumbura interviewed that the government does have available land in some parts of the country that it can allocate to the associations of small farmers for small scale agricultural projects. However, they were not sure whether there is available land in the central part of the country where Giheta is located as this is the most densely populated area in Burundi.

Burundi. This process may be facilitated by the already existing links for coffee. The development of the export oriented market for avocados, however, would require the government to invest massively not only in research but also in both hard infrastructure (especially rural roads) and soft infrastructure (communication, energy, and various forms of financial services).

In the short run, it seems urgent that the government provides necessary technical and financial support, leadership and direction in order to avoid the poorly organized value chain. This implies that efforts should be made to make sure that all activities along the chain are well-coordinated and ways should be examined as to how all actors in the chain are brought together in order to ensure an efficient communication and sharing of information in the chain. The government should also provide necessary support to the small-scale farmers who want to increase the avocado production on their farms. Such support may be in the forms of small credits, fertilizer, grafted seedlings and other technical assistance that small-scale farmers may need especially for treating various diseases which may affect their avocado trees. All these require a significant intervention of the government and strong commitment of political leaders involved in agricultural sector to promote avocado farming not only in Giheta but also in other parts of the country where this crop can grow. Such commitment will only be possible if political leaders appreciate the enormous economic opportunities that this crop presents to the income generation for the small-scale farmers and its potential to diversify the farming of cash crops in Burundi which is currently dominated by coffee, tea and cotton.

In closure, the finding of this dissertation seems to confirm the agro-optimist view about the crucial role that agriculture can play as an engine of growth and a driving force for poverty reduction, especially in rural areas in developing countries.

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1 Appendix One: Profitability of avocado in the value chain

1.1 Retailers

The retailers buy avocados either from their suppliers or from the avocado trees. For the latter, prices for an avocado tree ranges between 5000 Fbu and 15000 Fbu depending on the size of the tree. A small avocado tree that retailers buy at 5000 Fbu can give a harvest of two or three small bags of avocados of 50 kg each. The big avocado tree that they buy at 15000 Fbu can give a harvest of about 2 big bags of avocados of 300 kg each. They sell the avocados in small baskets which can contain between 3 and six avocados depending on the size of the fruits. A small bag of 50 kg can contain between four and six small retailing baskets and the big bag of 300 kg contains between 24 and 36 retailing small baskets. Each retailing small basket of avocados is sold at 1000 Fbu. This means that the estimated turnover of a small avocado tree is between 10 000 Fbu and 15 000 (if we use five small baskets of avocados in one small bag on average) and the turnover for the big tree can be estimated at between 48 000 Fbu and 72 000 Fbu. The costs entail those for harvesting and those for transport. For the former, the retailers normally pay the children who harvest the avocados between 500 Fbu and 1000 Fbu depending on the quantity harvested. Let us assume that they pay 500 Fbu for the small bag and 1000 Fbu for the big bag. Based on this figures, the harvesting of a small tree would cost between 1000 Fbu and 1500 Fbu and the harvesting of the big tree would cost 2000 Fbu. For the latter, the money that retailers pay for the transport depends on the distance between the place where the avocado tree is bought and the centre where avocados are sold. For instance they can pay between 1500 Fbu and 2000 Fbu for one big bag. The transport of two small bags can cost between 300 Fbu and 1000 Fbu. This implies that the costs of transport for the big tree could be estimated at between 3000 Fbu and 4000 Fbu and 1000 Fbu for the small tree. They also need to pay a tax of 300 Fbu per one big bag. Taken together, all the costs (buying, harvesting, transport, and tax) for the small tree could be estimated at between 6300 Fbu and 7800 Fbu and that for the big tree between 20300 Fbu and 21300 Fbu. The net profit of a small tree could be estimated at between 3700 Fbu and 7200 Fbu. That of the big tree could be estimated at between 27700 and 50700 Fbu.

1.2 Collectors

Collectors also make considerable profits from the avocado business. These buy avocados in Giheta and surrounding districts and resell them at Bujumbura. They buy avocados in two ways: They buy the avocado trees and harvest themselves or they can buy avocados in the big bags of 300 Kg. The price of one big bag of avocados is ranging from 5000 Fbu to 6000 Fbu. The cost of harvesting the big bag is estimated at 1000 Fbu. The primary collectors normally spend between 500 Fbu (less than 5 km) and 4000 Fbu (from 30km and above) for transporting the avocados from the farms to RN2. The cost for transporting one big bag of avocados to Bujumbura is estimated at between 2000 Fbu and 4000 Fbu, depending on how the collectors have bargained with the drivers. Additionally, from the farms where avocados are bought to Bujumbura where they are sold, the main collectors also pay various taxes. For instance, if the main collector buys the avocados from the neighboring districts of Giheta, he needs to pay the tax of 300 Fbu per a big bag in that district where he buys the avocados and another tax of 300 Fbu per a big bag is paid in Giheta district. The collector pays again another tax of 400 Fbu per a big bag at the northern entry of the capital city of Bujumbura. In short, a total amount of 1000 Fbu for tax per one big bag is paid from the farms where the avocados are bought to Bujumbura, the final destination. Taking all of these into consideration, the cost of one big bag (buying price, harvesting, transport and tax) could be estimated at between 9500 Fbu and 16000 Fbu. At Bujumbura, one big bag of avocados is sold at between 12 000 Fbu and 17 000 Fbu. This implies that the net profit per one bag varies between 1000 Fbu and 2500 Fbu. Very often the primary collectors send to Bujumbura about six big bags at once and three times a week, this implies that they could get a net profit of between 18000 Fbu and 45000 Fbu per week.

No interviews were conducted with the distributors of avocados at Bujumbura in order to determine the estimated profit that they may be getting from the avocados. But the primary collectors mentioned that the distributors of avocados at Bujumbura sell one big bag of ripe avocados to the retailers at about 25000 Fbu. At Bujumbura, retailers sell one avocado at between 150 Fbu and 250 Fbu depending on the period. This shows that that both distributors and retailers in the capital city-Bujumbura make quite a lot of money from the avocados.

1.3 Smallholder farmers

Given the fact that the small-scale farmers do not use any kind of input for their avocados whatever money they obtain from selling their avocados constitute the net profit. Different prices were reported for the avocado trees but they range between 5000 Fbu to 45000 Fbu depending on their size and the amount of fruits on it. If a farmer owns, for example, three big trees which seemed to be the case for many of the small-scale farmers interviewed, it means that they obtain quite a significant income from the avocados.