ECONOMIC ANALYSIS OF SPECIALTY COFFEE PRODUCTION IN RUNGWE DISTRICT, TANZANIA

BY

GODWIN MUSHUMBUSI KAKIKO

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ABSTRACT

The objective of the study was to undertake an economic analysis of specialty coffee and non-specialty coffee production in Rungwe District Council (RDC). Specific objectives were to analyze (i) cost involved in specialty coffee and non-specialty coffee production (ii) benefits resulting from specialty coffee and non-specialty coffee production. Purposive and random sampling was carried out. In the first stage, purposive area sampling was used to obtain divisions and wards were specialty coffee and non- specialty coffee are cultivated. From each sampled wards 60 specialty coffee growers and 60 non specialty coffee growers were selected randomly. Descriptive analysis included statistical means, percentages, ranges, frequencies were used. Gross margin and Return on Investment were employed. Total revenue per ha obtained from specialty coffee production was Tshs 553 559.32 higher than 226 906.78 with a Net gross margin of Tshs 318 936.92 while the Total variable cost per ha observed was Tshs 215 114.41. Non-specialty coffee production have a Total revenue of Tshs 226 906.78 ha and a Net gross margin of Tshs 103 177.97 while the Total variable cost per ha observed was Tshs 123 728.81. The production cost of specialty coffee was higher due to high variable cost involved to attain a good quality coffee when compared to non-specialty coffee; this is true in the production function curve due to the reason that at region I there is high initial cost and low returns obtained when compared to the preceding region II where there is an optimum production. Return on Investment was employed on both categories of coffee, the results shown that specialty coffee has a higher ROI of 1.48 when compared with non specialty coffee which was 0.83. Therefore specialty coffee is an economically worthwhile enterprise to be undertaken by smallholder farmers.

DECLARATION

I, Godwin Mushumbusi Kakiko, do hereby declare to the Senate of Sokoine University of Agriculture, that this dissertation is my original work and that it has neither been submitted nor being concurrently submitted for degree award in any other institution.

Godwin Mushumbusi Kakiko
(MSc. Candidate)

8/9/2010
Date

The above declaration confirmed

Dr. E. Lazaro
(Supervisor)

8/9/2010
Date

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LIST OF ABBREVIATIONS AND ACRONYMS

AKSCG	–	Association of Kilimanjaro Specialty Coffee Growers
AMCOS	–	Agriculture Marketing Cooperative Societies
BACAS	–	Bureau for Agriculture Consultant and Advisory Services
BoT	–	Bank of Tanzania
CBD	–	Coffee Berry Disease
CLR	–	Coffee Leaf Rust
CPU	–	Central Pulperly Units
DADPs	–	District Agricultural Development Plans
DALDO	–	District Agricultural and Livestock Development Officer
FAO	–	Food and Agriculture Organisation
FFS	–	Farmer Field Schools
GDP	–	Gross Domestic Product
GM	–	Gross margin
IFAD	–	International Food and Agriculture Development
IRR	–	Internal Rate of Return
LDC	–	Least Developed Countries
MAFS	–	Ministry of Agriculture and Food Security
MKUKUTA	–	Mkakati wa Kukuza na Kuendeleza Uchumi Tanzania
MT	–	Metric Tonnes
MUCCOBS	–	Moshi University College of Cooperation and Business Studies
NCVIS	–	National Coffee Voucher Input Scheme
NDV	–	National Development Vision
NSGRP	–	National Strategy for the Reduction of Poverty
RDC	–	Rungwe District Council

ROI	–	Return on Investment
RPOs	–	Rural Producer Organisations
SCAA	–	Society of Coffee Association of America
SNAL	–	Sokoine National Agriculture Library
SPSS	–	Statistics Package for Social Sciences
TaCRI	–	Tanzania Coffee Research Institute
TC	–	Total cost
TCA	–	Tanzania Coffee Association
TCB	–	Tanzania Coffee Board
TCGA	–	Tanzania Coffee Growers Association
TR	–	Total revenue
UNFAO	–	United Nations – Food and Agriculture Organisation
URT	–	United Republic of Tanzania

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Agriculture sector is central to poverty reduction in Tanzania. Average growth in 2000 to 2006 was only 4.7% which is not sufficient to meet MKUKUTA's ambitious goals for reducing poverty (URT, 2003). According to the various Poverty reduction strategy review reports, there has been little progress achieved in poverty reduction, though the prospects for substantial decline in poverty are still considered feasible.

Currently, the government has reviewed its poverty reduction strategy to emphasize the growth and employment aspects. However, Tanzania will have to sustain the economic growth rates which it has attained in recent years or surpass it if it is to achieve the poverty reduction target stipulated in the National Strategy for the Reduction of Poverty (NSGRP) of halving poverty by 2015 (ESRF, 2006). The sector is almost entirely driven by smallholder primary producers, characterized by the use of hand tools, reliance upon traditional rain-fed cropping methods and animal husbandry. According to BoT (2005) coffee is one of Tanzania's most significant agricultural export crops. Contribution of coffee to the GDP in Tanzania for five consecutive years 2004/5 to 2007/8 was declining due to some reasons such as low production which is attributed by low price of the commodity and low usage of agrochemicals (Table 1).

In 2004, the agricultural sector contributed 46% of GDP and provided about 51% of foreign exchange and 75% of the total employment (URT, 2004). Its growth rate has decreased from 6.5% in 2001 to 6.1% in 2002 due to various factors including lack of adequate rainfall, fall in world market prices, decline in production, loss in soil fertility, the

growth rate was increased from 6.3% in 2003 to 6.4% in 2004 (URT, 2003). The following year 2005 the GDP was 6.8 % thereafter dropped to 6.2% (URT, 2006). Output of traditional export crops including coffee, tea, sisal, cotton decreased from 54.0 MT in the year 2004/05 to 34.3 MT in 2006/07 respectively due to low usage of agricultural inputs fall in price at the world market poor extension services and heavy taxes on export crops (BoT, 2008). Low exports earnings may also be attributed to decline in quality; poor quality offers lower prices (Bamanyisa *et al.*, 2005).

1.2 Coffee Production in Tanzania

Coffee contributes about 32.8 percent of total trading export for Tanzania (BOT, 2007) hence more than 2 000 000 people are directly or indirectly employed in the industry. More than 400 000 farm families (95%) and 110 estates (5%) derive their livelihoods from growing coffee with an estimated 2 000 000 additional people employed being directly or indirectly in the industry (BACAS, 2005). Coffee was introduced as a commercial crop in 1900s on the slopes of Mount Kilimanjaro. Production is concentrated in five main geographic areas of Tanzania: in the north (Kilimanjaro, Arusha &Tarime), in the west (Kigoma & Kagera) and in the south (Mbeya- specifically Rungwe, Mbozi and a small amount in Ileje district, Iringa and Ruvuma) (Kumbulu, 2006).

Since the mid-1990s, the country's coffee industry has been in a state of stagnation or decline until the year 2003 there was a rise. The reasons for this are diverse. Falling world coffee prices have eroded profit margins and income of coffee growers and therefore threatening livelihoods. Productivity is low because of lack of motivation to invest in inputs and improved crop husbandry, which in turn has affected quality and yields. Costs of production are high, thus further reducing competitiveness in the world market. Coffee

trees as well as coffee growers are aging, and research, so essential for supporting a vibrant coffee industry, had been declining for many years (BACAS, 2005).

However, despite this situation, Tanzania is very well suited to coffee production (and in particular the production of less price-sensitive Arabica coffee) because of its expansive volcanic highland areas and the Great Lakes basin which provide ideal conditions for growing coffee (BACAS, 2005).

1.2.1 Coffee production in Tanzania

According to TCB (2007) current production is around 52 000 tons in the year 2006. Approximately seventy percent of coffee produced in Tanzania is arabica, with most of this grown in high altitude. Robusta trees are most commonly grown near Lake Victoria at a lower altitude. In Tanzania, most coffee is produced by small farmers, with 95 percent of the country's coffee farmers cultivating smaller than five acres. The average yield of 170 kg/ha is very low as compared to Kenya, Burundi and Rwanda, which are 700 kg/ha, 600 kg/ha and 650 kg/ha respectively (URT, 2001). Other reasons such as coffee diseases, high costs of agricultural inputs and old trees contribute to make coffee a difficult business for Tanzanian farmers (Technoserve, 2003).

A baseline survey by BACAS (2005) Tanzania's production of coffee is about 48 000 tons, or about 0.7% of the world's output of 7.02 million tons per year. For the past 15 years or so coffee production in Tanzania showed varying trends in terms of quality and quantity. Coffee production moderately declined from the early 1990s to 1998 after which it gradually increased until 2003 (Table 1).

Table 1: Coffee production trend in Tanzania

Year	Quantity of coffee (in Metric Tons)
1989/90 - 1993/94	49 877
1994/95 - 1998/99	44 526
1999/00 - 2002/03	48 085
2003/04 - 2005/06	52 000

Source: Tanzanian Revenue Authority & FAO (2007)

Coffee area expanded extensively during the 1970s and 1980s when prices were more encouraging but declined subsequently. From 1980/81 to 1998/99 coffee sales (equivalent to total output) declined from 61 514 tons to 47 050 tons (GoT/EU/World Bank, 2004). Tanzanian coffee yields relative to the rest of the world have gradually declined in the 1990s and early 2000s. With this trend, expanding the country's market share will require improvements both in productivity and quality. Tanzanian coffee yields relative to the rest of the world have slowly declined in the 1990s and early 2000s from 798 kg/ha up to 281 kg/ha (GoT/EU/World Bank, 2004). With this trend, expanding the country's market share will require improvements both in productivity and quality. Verification from several studies such as Coffee Baseline Report for TaCRI - BACAS found that coffee growing areas in Tanzania associate low production/ productivity with several reasons such as; farms having few and old trees, growers practice poor husbandry, high intensity of intercropping particularly with banana (in the North and West) which increases the risks for diseases and lack of inputs or insufficiently use of inputs such as fertilizers and chemicals and weather related problems.

1.2.2 Coffee Prices in the World Market

The price of mild Arabica coffee in the world market has tended to decrease since the 1980s, and it reached its lowest level in 1992 (ICO, 2004). Factors leading to the decrease

of coffee price included competition from the high production of Robusta coffee. improvements in processing technologies, and the overproduction of 43 countries such as Brazil and Vietnam changed coffee market after economic liberalization of coffee in general, because of the introduction of new varieties and production areas and improvements in cultivation technologies worldwide. For example, production area of organic robusta coffee, has increased its share of arabica coffee market in the last 10 years (Baffes, 2003).

1.2.3 Coffee quality

Quality is a key aspect for access to the world coffee market and for the price obtained for its coffee. The price paid for different coffee qualities depends on the type of coffee (Arabica/Robusta), bean size (screen), processing (dry/wet), colour, taste (cup), and the status of the country of origin (Belling, 2002). Currently in Tanzania few conventional coffee producers already produce high quality coffee that allows them to get a license for the direct export of coffee at a premium price in the world market (Lazaro and Makindara, 2008).

Table 2: Tanzania coffee export (volume in metric tonnes and value)

	2004/05	2005/06	2006/07	2007/08	2008/09
Value (Mill of USD)	16.1	34.7	23.2	41.0	34.1
Volume (MT)	12.9	21.0	11.3	18.6	13.9
Unit Price (USD/MT)	1 247.3	1 651.5	2 048.6	2 200.7	2 464.4

Source: Bank of Tanzania and Tanzania Revenue Authority (2007)

According to BoT (2008), coffee production in Tanzania in the year 2004/05 was 54.0MT but dropped to 34.3 MT in the year 2005/06. Procurement of the traditional export crops during the quarter ending March 2008 declined by 2.1% to 159 039.9 tons compared to

162 371.5 tons procured in corresponding period in 2007 on account of decline in production of coffee. There were some reasons which contributed to the decline in production such as poor quality of coffee fruit of which occurs due to the low usage of agricultural inputs, improper pruning of coffee branches and leaf suckers and some farmers received poor extension services (BoT. 2008).

1.2.4 Coffee marketing

Traditional crop exports in Tanzania including coffee has been dropping for about twenty years in the world market. The price of coffee, for example, reached the lowest level ever recorded in real terms between 2001 and 2002 (Lazaro and Makindara, 2008). This took place partly due to structural changes in the global coffee market, as well as production innovation in Brazil and booming supply from Vietnam, and partly due to changes in corporate strategies among the leading roasters, counting the way in which coffee is blended (Lazaro and Makindara 2008). Facing uncertainty regarding future prices and lacking safety nets many growers abandoned plantations and sought other opportunities. On the other side, employment in the coffee sector dropped by more than 50% in some countries where as coffee export revenues also declined in producing countries, with negative consequences for fiscal accounts and balance of payment (Varangis *et. al.*, 2003). With the coffee price crisis acting as a catalyst, the governments and international community had to come up with strategies for restoring the balance and bringing the coffee industry on a sustainable path. The strategies proposed in response to the crisis relied on increasing the value-added of green coffee through improvements to quality and the use of differentiated markets such as specialty coffee growing.

1.2.5 Specialty coffee

Specialty coffee refers to the highest-quality green coffee beans roasted to their greatest flavour potential by true craftspeople and then properly brewed to well-established standard (Mike. 2003). Specialty coffee is not defined by a brewing method, such as the use of an espresso machine. It begins at the origin of coffee, the planting of particular varieties into a particular growing region of the world. The concept of specialty includes the care given to the plant through harvest and preparation for export. Specialty coffee in the green bean phase can be defined as a coffee that has no defects and has a distinctive character in the cup (Mike, 2003). For the smallholder farmers to perform better in specialty coffee production good price offered is one of the factors which could contribute to good quality coffee.

1.3 Problem Statement and Justification

1.3.1 Problem statement

Traditional major crops in Rungwe district are coffee and tea. Banana and maize are principle food crops. However, food crops are sometimes sold for cash due to the sharp drop of coffee price. Among 2200 farm families of coffee growers in the district only 5% of the coffee producers are specialty coffee growers (DALDO, 2006). In economic sense price increase is one of incentives for farmers to increase production of a certain crop. Regarding the proportion of speciality coffee growers in Rungwe district it is not well known why smallholder farmers continue to grow non specialty coffee which has a low quality and low price as well. That is why this study was proposed to make economic analysis of both non specialty and specialty coffee.

1.3.2 Justification of the study

According to URT (2006) the capita income level in Rungwe district was Tshs 372 844. this is low compared to the national income per capita which is Tshs 400 000. As such the need for cash crop with higher price at international market is urgently required so as to alleviate the prevailing income poverty. Specialty coffee is one of promising crops with such high price The poor performance of agricultural sector in Tanzania is evidenced by low standard of living in rural areas (Msangi, 2001). It is clear that the rural sector consisting of farm families offer great potential for employment generation for the teeming population. However this potential will not be achieved if efficiency is not increased within the rural sector.

The success of agricultural development in Tanzania largely depends on development of small- scale agriculture, which in turn depends upon availability and proper use of factors of production such as labour, land and capital (Msangi, 2001). Unfortunately there has been significant decrease in coffee quality for some crops in Tanzania. For instance in recent years, coffee quantity and quality has dropped quite substantially mainly due to the crop diseases and other poor management. Evidence from several studies in coffee growing areas in Tanzania (GoT/EU/World Bank, 2003, 2004; Bafes, 2004) associate low quality production of coffee.

Hence the study aims to identify obstacles which limit smallholder farmers to produce specialty coffee. This will help policy makers and other stake holders to design coffee programs which address these obstacles.

1.3 Objectives

1.3.1 General objective

The overall objective of the study is to examine the economic benefit of specialty coffee in Rungwe district.

1.3.2 Specific objectives

(i) To analyse production cost of specialty coffee and non- specialty coffee production in the study area.

(ii) To determine benefit from specialty coffee and non-specialty coffee production in the study area.

1.3.3 Research questions

(i) What are the costs associated with specialty coffee and non-specialty coffee production.

(ii) What are the benefits associated with specialty coffee and non-specialty coffee production.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The Specialty Coffee Quality Rating

Specialty coffees distinguish themselves by the quality of the coffee beans from what it is made. According to the Tanzania Coffee Board, only 1.7 per cent of coffee in Tanzania is considered high quality (Grade AA, Class 5 or better) while class 1-6 is designated as speciality coffee. In practice, class 4 is the best quality achieved in Tanzania. The Specialty coffee quality rating is defined over 17 classes. High quality includes classes 1–5; medium quality includes classes 6–10; low quality includes classes 11–13; and poor quality includes classes 14–17. Quality is complicated and misunderstood issue, it may be simply a reflection of demand and supply, therefore it is difficult to measure quality, but the best approximation may be the price premier or discount that the particular commodity commands against some benchmark or fixed standards (Ponte, 2000).

For the farmers to have higher prices for their produce they must abide on the principles and agronomic practices to make sure that quality coffee are produced (Lingle, 2001).

2.2 Primary Processing and Quality Assurance

Coffee undergoes both primary and secondary processing before it is exported. Primary processing takes place at the grower's level. It involves handpicking of red cherries, pulping on same day of picking, washing, fermenting, drying and packaging. Prior to sale, farmers grade their coffee according to established grades. This should be done on the farm after pulping. Analysis of Auction data revealed that on average, coffee quality based on class, has not changed significantly since the early 1990s. Coffee farmers are encouraged to use central pulping units (CPU), instead of pulping coffee at home. At CPU, the pulping

process can be monitored and uniform quality achieved (Ms Tanzania, 2008). To make sure that both quality and high income is achieved among specialty coffee growers in Rungwe District two AMCOS (Agricultural Marketing Cooperative Society) was established by the farmer themselves in the coffee growing area namely: MPUKILI AMCOS and UKUKWE/IPENJA AMCOS, also Rungwe District Council (RDC) through DADPs (District Agricultural Development Programmes) supported specialty coffee growers by constructing two CPUs in the district (DALDO, 2006).

2.3 The Roles of Standards in Specialty Coffee

According to Jensen (2000) standards communicate information about the quality of a product. These characteristics can be classified depending on the ease with which they can be measured. Look for quality are those that can be verified at the time of the transaction (the colour of a coffee bean). Experience attributes can be assessed only after the transaction has taken place (the taste of brewed coffee). Credence attributes can not be objectively verified through the analysis of the physical characteristics of the product and are based on trust whether coffee has been grown organically (Jensen, 2000). These attributes can pertain to the product itself (coffee appearance, taste, cleanliness, absence of taints) or to production and process methods, which include aspects related to the authenticity of origin (geographic appellation), safety (pesticide residues, levels of toxins) and environmental and socio-economic conditions (organic, fair trade, shade grown coffees). Standards systems can be classified in three broad categories: mandatory, voluntary and private. Standards are mandatory when they are set by governments in the form of regulation. Here, standards are understood as rules of measurement that can be established by regulation or authority (mandatory standards), through formal coordinated processes in which key participants in a market or sector seek consensus (voluntary standards) or by individual enterprises (private standards). These may affect trade flows

by placing technical requirements, testing, certification and labelling procedures on imported goods (Wilson, 2001).

2.4 Economic Benefit of Coffee Growers

According to Agricultural Economics (2007), low prices in the conventional coffee markets have caused financial and social hardship among farmers. In the face of this crisis, specialty markets have attracted the attention of the international donor community. These markets segments have shown consistent growth over the last decade and exhibit prices premiums in international markets. Therefore higher prices are passed on farmers access to specialty markets could help to alleviate the crisis brought on by low prices in the conventional sector.

A study by Donnet (2007) revealed that variable from specialty coffee prices in 2004 and 2006 do not present differences with respect to 2003, however, prices in 2005 were 24% significantly lower on average. By considering year to be a macro variable that captures broader supply and demand factors influencing coffee prices. Similarly, the commodity price estimate indicates that the specialty coffee premium is influenced by the commodity price level during the auction month. For every one percent increase in the commodity price there is a 0.58% increase in the specialty price. For specialty coffee producers, this means that they are subject to the price fluctuations of the supply and demand factors in the broader coffee market. The coefficient of 0.58 specifically indicates that while producers can expect higher prices when the commodity price goes up, they can also expect that the premiums, i.e. the difference between the two markets, is proportionally smaller when the commodity price is higher (Donnet, 2007).

Some farmers in Africa have been benefited from specialty coffee selling compared to non specialty coffee growers, for example coffee farmers in Ethiopia exported 146 478 tons in 2003/04 and earned $ 207 million due to the quality of Arabica coffee produced. Like wise in Uganda specialty coffee has been the largest single foreign exchange earner since the 1970's, based entirely on small scale production. With some coffee farmers, about a quarter of Uganda's population depends on coffee for cash income. In Tanzania since March 2004 benefits from specialty coffee was observed when the Association of Kilimanjaro Specialty Coffee Growers (AKSCG) with the assistance of Technoserve has begun selling high quality to Peet's coffee & Tea company and received prices up to 150% higher than neighbouring farmers who are not (KSCG) members (Kumbulu, 2006).

Technoserve through KILICAFE has been providing support and training to farmers, enabled them to increase quality, access credit and improve marketing. As a result of the quality coffee produced and excellent international image of KILICAFE, the groups' coffee is being marketed to the most prestigious coffee buyers in the world. In the first year of the project, five central pulperies collected a total of 83.7 metric tons of parchment coffee (*Arabica*), which was sold to specialty coffee buyers in USA, Europe and Japan. These were: Peet's Coffee & Tea (US), Starbucks Coffee Company (US), Dallis Coffee (US), List & Beisler (Germany) and Volcafé Ltd (Japan). The participating groups received an average net sales price of US$1.65/kg parchment ($1.47/kg net, after processing & financing costs). This was 61 per cent higher than the price received by other groups (at $.85/kg) who did not have access to the technology. This price was after capital loan repayments, demonstrating significant premiums for participating smallholder coffee farmers.

The specialty coffee growers in Mexico stipulate that traders pay a price that covers the costs of sustainable production and livelihoods, provide a premium for social development, sign contracts that encourage long-term planning and stability, and help provide pre harvest credit (FLO, 2003).

Another study done by Gombe coffee promotion project revealed that Specialty coffee represents a clear solution to poor farmers in Kigoma region, as it is one of the few cash crops that can grow in harmony under a canopy of trees. The Gombe Coffee Promotion Project was economically benefited approximately 900 farmers during the first importing year of 2006, and benefited 900 additional growers each of the following years, directly impacting 2700 people. In a country where the average income is $150/year, the coffee growers involved in the project was earned an average of $330 per year, or 220% above the national average income. This will inject an additional $2.1 million into the community over the next four years (Kumbulu, 2003).

2.5 Economic Cost of Coffee Growers

There are so many costs involved in specialty coffee when compared to non-specialty coffee growers. Agricultural inputs and transaction costs result to high cost in specialty coffee production.

2.5.1 Transaction costs

A transaction occurs whenever "a good or services" is transferred across a technologically separatable interface Morton (1995) and Hobbs (1997) as cited by Makhura (2001). Transaction costs of gathering and processing the information needed to carry out a transaction, costs of reaching decisions costs of negotiating contracts, and costs of policing and enforcing those contracts. Moreover, Morton (1995) and Hobbs (1997) as cited by

Makhura (2001) describe transaction costs as the cost involved to partners with whom to exchange, the costs of bargaining, monitoring, enforcement and eventually, transferring the product to its destination, all these costs are carried by farmer hence reducing his/her income. According to Dorward *et al.* (1998) competition among new, private traders seems to have reduced the cost of exchanging many export crops, but the presence of multiple marketers can make completion of other exchanges in the marketing chains more costly.

2.5.2 Agricultural inputs

Reduced inputs usage could reflect a number of developments. First, it may be a response to change in relative prices of agricultural inputs and outputs. Through the 1990s, devaluation of the Tanzania shilling (Tsh) followed by currency market liberalization brought substantial increase in local price of agricultural inputs as cited by (Dorward *et al.*, 2001).

During the 1970s and 1980s, chemical inputs were subsidized and supplied to growers through the cooperative system. The first reduction in input use became visible in 1992, when chemicals were supplied at market prices. After 1994, only a quarter of growers purchased inputs, primarily due to lack of credit. With the abolition of the monophony power of the cooperative unions, credit became available only to few creditworthy, usually large farmers. Lack of affordability of inputs at market price has remained the inhibiting factor hindering input use by growers. In order to increase farmers' input use, representatives of Ministry of Agriculture and Food Security (MAFS), Tanzania Coffee Board (TCB), Tanzania Coffee Association (TCA), Tanzania Coffee Growers Association (TCGA) established the National Coffee Voucher Input Scheme (NCVIS) in 1997. However, vouchers in the form of forced saving scheme for the next season have not been universally preformed by all farmers. Allegations of side dealing of vouchers, complaints

about unavailability of adequate inputs at stockiest shops or sale of expired or inefficient inputs (BACAS, 2005).

According to the Farm Management Survey carried out by the Economic Research Bureau of the University of Dar es Salaam, only a quarter of coffee growers used purchased inputs after 1994. The survey attributed the low input use to the absence of credit (GoT, 2000).

In many cases, lack of access to information and liquidity are among the factors that prevent their participation in the specialty segment. Cooperatives can play an important role in providing farmers with these services and in helping them to adjust to the new requirements of the market.

2.6 Coffee Markets

According to Gonza´lez (2007) coffee marketing consists of several important stages such as collection of coffee at farm gate or village level, transport, processing, storage, whole transaction and exporting. While each marketing activity is necessary for production of the final good, this is green coffee for export and therefore generates significant value added. Wollin and Zeller (2007) in their analysis of marketing agricultural inputs found that small-scale farmers are easily excluded from new market developments.

The final price that farmers get for their coffee is subject to their marketing performance. A farmer's marketing performance is primarily a function of their choice of a marketing channel, because the timing of the transaction is not subject to farmers' decision making. The price a farmer receives should depend on product quality and, given imperfect markets, access to price and market information as well as the market environment (Hazell, 2000).

Subsequent to reform, production and marketing were integrated into a single marketing channel within the cooperative system and the crop boards. Producers delivered coffee to primary societies, where they received an initial payment based on announced price of un-graded coffee. Coffee was then sent to central pulperies for primary processing, where parchment coffee was then graded. The cooperative unions collected coffee from primary societies, cured it at their own curing factories, and brought coffee to auction in Moshi, held by the Tanzania Coffee Marketing Board (TCMB). Growers received their final payment after all deductions had been done by the board, unions and the primary societies to recover incurred costs, often a year later (TCB, 2007).

With liberalization in the early 1990s, the system changed rapidly. In August 1993, the government passed a bill opening coffee marketing and production to the private sector, and further reducing government controls on pricing. The Coffee Board became responsible for coffee grading, issuing licenses and permits and operating coffee auctions. In 1994/95, private coffee buyers were invited to purchase coffee directly from growers. Based on these changes, growers now have a choice of selling their produce through four marketing channels: Private Coffee Buyers (PCBs), Cooperative System, Farmer Groups, and Independent Primary Societies, that had split from the union system (TCB, 2007). The prospect of receiving a second payment and price are strong factors in the choice of marketing channels. The analysis of coffee marketing during 2002-03 shows that decisions that coffee producers made relating to which channel they sell to, the time of sale and location had significant influence on prices received. The analysis revealed that direct coffee sales to the auction by members of farmer groups yielded higher returns than any other marketing channel. As expected, the choices that producers make in marketing their outputs significantly affect their returns. Marketing of coffee is without doubt one of the biggest and most complicated challenges for coffee farmers. They find the marketing

system impenetrable due to lack of information and knowledge about what happens in the value chain after they deliver their coffee to the milling company's (Ms Tanzania. 2008).Since coffee prices are set by external market coffee farmers have to minimize costs in order to have profits. Farmers must produce efficiently to ultimately remain in the industry (Gregory and Fetherstone, 2008).

2.7 Review of Analytical Tool

2.7.1 Gross margin analysis

Gross Margin (GM) may be defined as the difference between total revenue and total variable costs. Gross margin analysis aims at estimating the cost of production and returns to factors of production/or resource use. Msangi (2001) used gross margin analysis to compare resource use efficiency between SURUDE, HPI and non-project supported smallholder dairy farmers in Turiani, Morogoro rural district. Rweyemamu (2001) in his study of economic analysis of cash crop production and marketing in Tanzania under a liberalization market economy, gross margin analysis was conducted for the two competing crop enterprises in the area, tobacco and maize so as to establish the relative economic profitability of the crops. Mutayoba (2005) by means of gross margin analysis he examined the relative competition of vanilla with the most important traditional cash crop (coffee) enterprise in Bukoba district. Ngairo (1993) used gross margin of the main crops maize, potatoes and pyrethrum in order to establish the relative economic profitability of various smallholders' production. Mwikila (1992) also used the gross margin per hectare for the two crops i.e. tobacco and maize to obtain the most profitable enterprise. Senkondo (1988) used gross margin per hectare for the sugar cane and paddy to obtain the most profitable enterprise. Gross margin analysis also was employed by Mathania (2007) to compare relative profitability of paprika and tobacco. It is used to make comparison of

returns to resources for different economic activities and suggest relative efficiency in performance of different markets (Msangi, 2001).

Regardless of its usefulness, according to Ferris *et al.* (2000) cited by Mutayoba (2005) gross margin has the following limitations:

- Gross margin is not a profit figure. Fixed costs have to be covered by the gross margin before arriving at a profit figure.
- Gross margin can vary widely from one year to the next year. This is due to the difference in market prices, weather conditions and efficiency.
- Gross margin can also differ considerably from farm to farm. This can result from differences in performance levels or differences in the overall systems of production or methods or recording.
- Comparison to average gross margins can be useful but it should be done over a number of years. However, it is gives the starting point in the assessment of the enterprise.

2.8 Conceptual Framework of the Study

Conceptual framework (Fig. 1) shows factors affecting production and marketing of specialty coffee which include primary and secondary factors. Primary factors which consists of capital, technology in production, distribution channels and prices forms the basic set of instrument used in production and marketing of product. Secondary factors such as storage of product and packaging technology, and transportation facilities involves cost which at the end will determine if the specialty coffee production is worthwhile on not, on the other hand will determines the economies of scale.. Both primary and secondary factors can lead to poor production and marketing of specialty coffee. However

through interventions such as appropriate policy, legal institution, good infrastructure, well established information system and improved environment could improve production and marketing of specialty coffee.

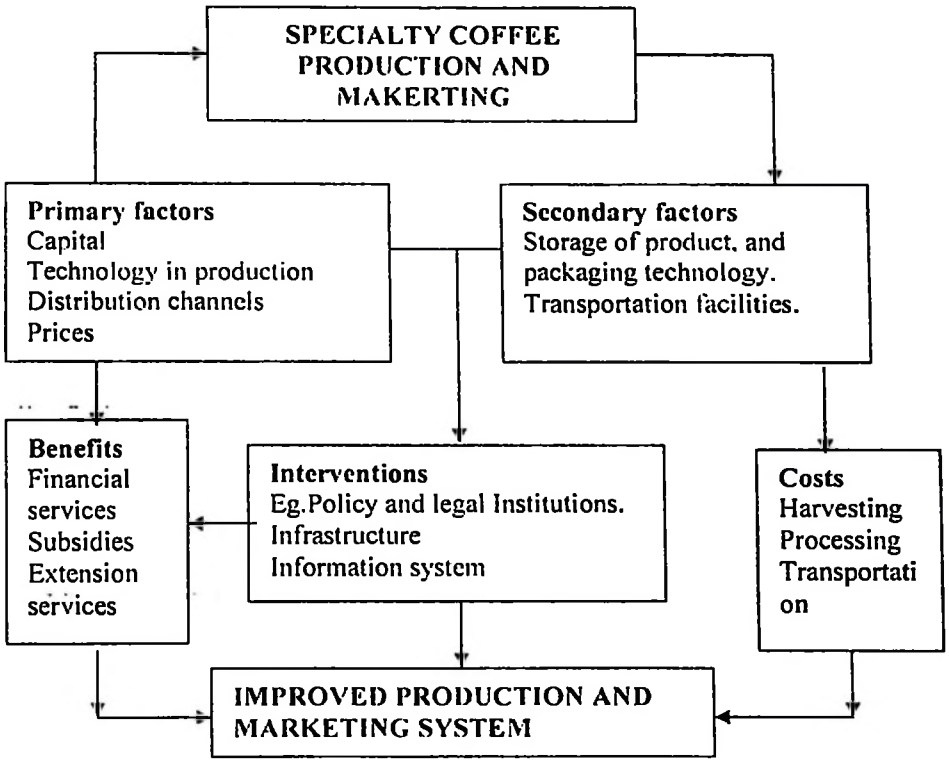

Figure 1: Conceptual framework: Economic analysis of specialty coffee production

Source: Modified from Food and Agriculture Organization (2001)

CHAPTER THREE

3.0 METHODOLOGY

3.1 The Study Area

3.1.1 Location

Rungwe is one of the Districts in Mbeya Region. It lies between latitude $8^0 30^l$ and $9^0 30^l$ South of Equator and longitudes 33^0 and 34^0 East of Greenwich Meridian. The District shares borders with Kyela District in the South, Ileje District in the West, Makete District (Iringa Region) in the East and Mbeya District in the North (RDC Profile, 2008).

3.1.2 Climate and topography

The District is mountainous with Rungwe Mountain and the Livingstone Ranges rising from an altitude of 770 meters to 2265 meters above sea level. These mountains have great influence on the climatic condition of the District, which make it experience cold and rainy seasons with 900 mm in the lowland areas to 2700 mm on the highlands with temperature ranging 18^0-25^0c all the year round, therefore this kind of weather contribute to good quality coffee found in the district.

3.1.3 Farming systems

Agriculture is the main economic activity of the District, employing about 90% of the District workforce (RDC Profile, 2008.) According to the 2003 national agriculture census estimates the district have 165 825 hectares of arable land of which 36 048 hectares have perennial crops, of which 11 110 hectares or 6.69 % is under coffee. The District comprises of 3 agro-ecological zones and in each zone has a specific farming system.

First the highland zone with altitude of 2265 meters above sea level and high rainfall ranging between 1500 and 2700 mm per annum. The main crops grown in this zone include potatoes, pyrethrum, maize, beans, and vegetables (RDC Profile, 2008).

Second the midland zone with altitude of 1000 to 1500 meters above sea level; receive average annual rainfall ranging between 800 mm and 2200 mm. The main crops grown include coffee, tea, maize, beans, bananas and groundnuts (RDC Profile, 2008).

Third the lowland zone with the altitude of 772 meters above sea level and rainfall ranging between 900 and 1200 mm per annum. The main crops grown include paddy, maize, beans, cocoa, and banana (RDC Profile, 2008).

3.2 Research Design

The study was a cross sectional design, which constituted a collection of data from a population at a single point in time.

3.3 Sampling Techniques

The study was conducted in four villages namely; Mpuguso and Nsongola in Pakati division, and Kikota and Ibililo in Ukukwe division. The selection of the villages was based on area being coffee producer and currently is involved in producing specialty coffee.

Both purposive and random samplings were employed. In the first stage, purposive sampling was used to obtain divisions and wards which cultivate specialty coffee and non-specialty coffee. From each ward random sampling was carried out to obtain one village comprising specialty coffee and non-specialty coffee growers. A total of four villages were

sampled. The sampling frame or target population of this study were all household heads producing specialty coffee and/or non-specialty coffee in the study area.

A representative sample of 60 specialty coffee growers were selected from the register of two Agricultural Marketing Cooperative Societies (AMCOS) namely; Mpuguso AMCOS in Pakati division and Ukukwe/Ipenja AMCOS in Ukukwe division by using systematic random sampling. The two AMCOSs collect specialty coffee beans and sell them by auction in Moshi. Forty six non specialty coffee growers were randomly selected from the rest of the farmers who sell their coffee to private buyers in respective villages.

3.4 Data Collection

Both secondary and primary data was used in this study. Coffee production data for the year 2008 were used during this study. Primary data were collected by administering a structured questionnaire. Questionnaires (for both specialty coffee growers and non-specialty coffee growers) was designed to collect both qualitative and quantitative data. Variables in the questionnaire included household identification variables, farm activities, labour use and other purchased inputs, output and marketing of specialty coffee and non-specialty coffee. Personal observation and informal discussion with farmers were used to explore more information.

The questionnaire was pre-tested using 10 respondents randomly selected to involve both specialty and non-specialty coffee growers. After pre-testing the questionnaire was corrected accordingly to ensure its validity and reliability. Beri (2000) argues that pre-testing of the research instruments helps the researcher to decide any changes in the question content or wording of questions, that are called for specific changes and are

desirable, can be ascertained and incorporated in the instruments in order to improve their quality.

Secondary data was extracted from reports and other documentary materials from the relevant institutions and organizations including agricultural district offices in the study area, Sokoine National Agriculture Library (SNAL) and internets.

3.5 Data Analysis

Data collected were coded on Statistical Package for Social Sciences (SPSS version 12.0) computer software. Descriptive analyses such as means, frequency distribution and percentages were used for analysing sampled households characteristics. Two sample independent T-test was used to test the income of two different means generated from two coffee production categories.

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\frac{S_1^{\,2}}{n_1} + \frac{S_2^{\,2}}{n_2}}$$

Where:

$\overline{X}_1$ and $\overline{X}_2$ are sample means

S_1^2 and S_2^2 are sample variances

n_1 and n_2 are sample sizes

Therefore in this context the tool was useful in comparing the gross margin of specialty coffee and non specialty coffee in the study area so as to identify which enterprise is more profitable than the other.

3.5.1 Gross Margin Analysis

Gross margin analysis is used as an indicator of enterprise profitability/viability. It easy, simple to use, also it does not require advanced mathematical computation than addition, subtraction and multiplication which are within capacity of an intelligent farmer. An advantage of this method of analysis is simple, but efficiently powerful tool for economic analysis of introduced technologies.

GM=TR-TVC

Where:

GM= Gross Margin (Tshs/ha)

TR= Average Total Revenue (Tshs/ha)

TVC= Average Variable Total Costs (Tshs/ha)

Then after calculating Gross Margin from both specialty coffee and non specialty coffee the ROI (Return on Investment) was employed to see which is more profitable than the other one.

$$\text{Return on investment (ROI)} = \frac{\text{Sales value}}{\text{Cost of Production}}$$

3.6 Limitation of the Data

The data collected had several problems. The data collected from specialty and non-specialty coffee growers, depend mainly on their memory recall and willingness to cooperate. Error resulting from respondents is one of the limiting factors relying on the respondent to recall the exact quantity of coffee harvested, sold due to poor record keeping especially for non specialty coffee producers.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

This chapter presents empirical results and discussion. The chapter presents descriptive statistics showing family and general characteristics of sampled specialty coffee and non specialty coffee growers. It also presents problems associated with specialty coffee production and cost-benefit analysis.

4.2 Socio –Economic Characteristics Sampled Households

4.2.1 Education level

Table 3 shows cross tabulation results of respondents' level of education and coffee production categories. The proportion of respondents with primary level of education for specialty coffee growers was 50% as compared to non specialty coffee grower which was 15.2%. Proportion of respondents who had no any education was less in specialty coffee growers than non specialty coffee growers. Proportions were 26.6% and 39.1% respectively. As shown in Table 3, proportion of respondents with secondary education was higher with specialty coffee growers than non specialty coffee growers. Proportion of respondents with adult education was higher in non specialty coffee growers (41.3%) than in specialty coffee producers (11.7%).

The results imply that specialty coffee producers are more educated than non specialty coffee producers. The level of education is an important factor in coping with poverty, particularly coping with risks and uncertainties related to agricultural production specifically to specialty coffee growing. A farmer with formal education is likely to be more efficient than a farmer with no formal education when other factors remain constant.

The majority of farmers in specialty coffee growing which are more than 50% are primary school leavers because primary education is compulsory and also since in Rungwe district the only alternative to standard seven failures is to engage in farming. These findings support the observation by the assessment of agricultural marketing information needs study (URT, 2004), which found that there is a large number of farmers with primary education and below.

Table 3 : Level of education and coffee production

Level of education	Coffee production category				
	Specialty		Non specialty		
	Number of Respondents	%	Number of Respondents	%	Total
None	16	26.6	18	39.1	34
Adult education	7	11.7	19	41.3	26
Primary education	30	50.0	7	15.2	37
Secondary education	7	11.7	2	4.4	9
Total	**60**	**100.0**	**46**	**100.0**	**106**

4.2.2 Age

Age of a person can influence positively or negatively the new technology introduced depending on the stage one is in the life cycle. Group statistics results show the average age of specialty coffee smallholders was 50.1 years as compared to non specialty coffee smallholders with a mean age of 56.6 years. The mean difference was statistically significant at $p < 0.01$ (Appendix 3). This implies that specialty coffee smallholders are younger than non specialty coffee smallholders. This is the fact that younger people are the ones who adopt technologies early compared to older ones. The young group are risk takers. Specialty coffee production is labour intensive and laborious as compared to non

specialty coffee production. This could be the reason for young to shift to specialty coffee production. These results suggest that many respondents under specialty coffee growers were at the active and energetic age group which is important for economic activities performance.

4.2.3 Farm size

Coffee farm size in the study area ranged from 0.2 ha to 2.4 ha with an average of 0.81 for specialty coffee growers. Most farmers in both categories which are specialty and non specialty coffee growers intercrop coffee and banana together in their fields. Non specialty coffee growers' farm size ranged from 0.1ha to 2.0ha with the average of 0.75ha. Table 4 shows there is no significant difference in farm size between the two coffee production categories due to land scarcity facing Rungwe district. Farmers in the district owned small plots.

Table 4: Descriptive statistics for farm size of coffee owned in hectare

Category	n	Minimum	Maximum	Mean	Standard deviation
Specialty	60	0.2	2.4	0.81	1.53
Non specialty	46	0.1	2.0	0.75	0.37

4.2.4 Land ownership and mode of acquisition

It was observed that all respondents in specialty and non specialty coffee production owned land; this land is specifically for area under coffee. Mode of acquisition of land differed. Table 5 shows percentage distribution of mode of land acquisition. Forty two percent of respondents acquired land by inheriting from their parents, whereas 28.3% acquired land through buying on cash. The proportion of respondents who acquired land through offer by village government was 19.7%. Only 9.5% of respondents accessed land freely long time ago.

Table 5: Mode acquisition of land under coffee

Means	Number of respondents	Percentage
Inherited	45	42.5
Bought	30	28.3
Given by the village	21	19.7
Accessed as open (free) land	10	9.5
Total	**106**	**100.0**

4.2.5 Source of labour

The results in Table 6 shows that 65% of interviewed specialty coffee growers use both family and hired labour, whereas 30% use family labour, and only 5% hire as the only source of labour. The proportion of non specialty coffee growers using family as source of labour is 76.1% whereas 16.6% of respondents use both family and hired labour. The proportion depending on hiring as the only source of labour is 4.3%. This implies that specialty coffee production demands more labour than non specialty coffee production which demand to have extra labour outside the family. Secondly it implies that smallholders under non specialty coffee production have a low income as compared to specialty coffee growers therefore they have less cash for labour hire.

Table 6: Source of labour in coffee production by category

Source of labour	Coffee production category				Total %
	Specialty		Non specialty		
	Number of respondents	%	Number of respondents	%	
Family	18	30	35	76.1	53
Hired	3	5	2	4.3	5
Both	39	65	9	16.6	48
Total	**60**	**100**	**46**	**100.0**	**106**

4.3 Reasons for Adopting Specialty Coffee Production

Table 7 shows the reasons for adopting specialty coffee. The Main reason for adopting specialty coffee production as indicated by 76.7% of specialty coffee was due to high price offered, this an incentives makes specialty coffee production a profitable enterprise to deal with, an average net benefit from specialty coffee was Tshs 318 936.92 per ha higher compared to non specialty coffee which was Tshs 103 177.97 per ha (Table 12). However in Tanzania, most farms are far from achieving the required standards and majorities of farms, which are currently in production, are characterized by low yields and high production costs (TCB. 2007). Average coffee yield in Tanzania is 170 kg per hectare (Mpangile, 2001). If you compare the average price of 2 000.00 which offered during the 2007/08 the farmer with 170 kg per ha could get the average income of Tshs of 340 000.00. The farmer could get much profit if they could produce at the recommended rate. Another reason was higher productivity due to higher intensive care of the field; the high usage of agricultural inputs such as fertilizers and pesticides results to high productivity and 23.3% said that the reasons for adopting specialty coffee was the tree coffee they have in field have a high productivity because most of them they have a new coffee variety from TaCRI Mbimba substation of which is a disease resistance when compared to other local varieties used in the past.

Table 7: Reasons for adopting specialty coffee production

Reasons	Number of respondents	Percentage
It is marketable	46	76.7
High productivity	14	23.3
Total	**60**	**100.0**

4.4 Experience in Coffee Production

About 97.8% of total non specialty coffee growers respondents had more than 6 years in coffee production (Table 8). For specialty coffee respondents of 56.6% have an experience of more than 6 years in specialty coffee production. 20% of the interviewed have an experience ranging between 4-6 years and about 16.7% have an experience between 2-3 years, while 6.7% of the interviewed respondents have an experience of one year and below. These are growers who have just shifted from non specialty coffee to specialty coffee production. A small number of coffee producers is shifting from non specialty to specialty because specialty coffee production involves high cost in terms of agricultural inputs and high skilled labour for the process involved. However majority of non specialty coffee respondents seems to have more than six years of experience, yet they are not ready to shift to specialty coffee production.

Table 8: Experience in coffee production by coffee production category

Experience in years	Coffee production category				Total	
	Specialty		Non specialty			
	Number of respondents	%	Number of respondents	%	Number of respondents	%
1	4	6.7	0	0	4	3.8
2 – 3	10	16.7	0	0	10	9.4
4 – 6	12	20.0	1	2.2	13	12.3
More than 6	34	56.6	45	97.8	79	74.5
Total	**60**	**100.0**	**46**	**100.0**	**106**	**100.0**

4.5 Constrains Associated With Specialty Coffee Production

Coffee production like other cash crops is costly and labour intensive. In coffee specialty production more attention has to be paid so as to get good quality coffee. About 57% of the interviewed specialty coffee smallholders said that the big problem was coffee diseases

such as Coffee Leaf Rust (CLR), Coffee Berry Disease (CBD) and leaf minors, whereas about 33 % faced a problem of unavailability of agricultural input, the rest of the sampled smallholder farmers represented by a small proportion (10%) claimed that the price offered was very low (Table 9). These problems of coffee diseases are unique to both coffee production category, the only difference faced by non specialty coffee were the income obtained from coffee are relative low to purchase agriculture inputs when compared to specialty coffee growers.

Table 9: Problems associated with specialty coffee production

Problems	Number of respondents	Percentage
Coffee diseases	34	56.7
Low coffee price	6	10.0
Unavailability of agricultural input	20	33.3
Total	**60**	**100.0**

4.6 Access to Coffee Market Information

Indicative coffee price is announced annually by a joint meeting between District Commissioner (as a chairman), District Agricultural and Livestock Development Officer (DALDO as secretary), AMCOS and private buyers in the district. The price paid to coffee producers depends on grade and the world market price. This indicative coffee price is communicated to farmers through AMCOS groups and private buyers representatives and convey the information for both category of coffee production. About 35.0% of the smallholder farmers under specialty coffee get market information from their farmer groups, those hearing from extension officers was 18.3%, and those getting information from private buyers are 11.7%. Specialty coffee producer accessing market price from direct visit to the market was 8.5% and only 2.7% hear from friends. To be a member in marketing group makes access of marketing price information very easy. For the non

specialty coffee 41.3 % access information through friends followed by 24% who access information from direct visit to market places, while 21.7% of the sampled smallholders farmers access information from private buyers. Respondents who accessed information from extension officers were only 13%. No body accessed information from farmers association. The only difference observed each season was that; for private buyers they are aiming at maximizing profit through lowering coffee prices while the AMCOS groups price offered are stable and always higher than indicative price.

Table 10: Access information on market price of coffee by production category

Source of information	Coffee production category				Total
	Specialty		Non specialty		
	Number of respondents	%	Number of respondents	%	
Direct visit to the market	5	8.5	11	24.0	16
From their farmers association	21	35.0	0	0	21
Hear from friends	16	2.7	19	41.3	35
From extension officers	11	18.3	6	13.0	17
Private buyers	7	11.7	10	21.7	17
Total	**60**	**100**	**46**	**100**	**106**

4.7 Smallholder Farmers Plan For Specialty Coffee Production

Table 11 shows that 51.7 % of the interviewed smallholder's farmers intend to increase size of their farms, followed by those who are expecting to remain with the same area 38.3 % and 10 % of the interviewed smallholder farmers the are expecting to reduce their coffee cultivated area. An intention to increase the size of farm by high proportion of respondents is due to the fact that specialty coffee pays more than non specialty coffee. The reasons for reducing the size of the farm probably were due to the fact that the operational cost

involved in specialty coffee were relatively very high in terms of agricultural inputs, and this could be the reason for those who remained with the same farm size. Although specialty coffee pays more but farmers need to put more capital in the first two to three years in the initial stage of specialty coffee growing.

Table 11: Specialty coffee producer's future plan

Plan	Number of respondents	Percentage
Increase farm size	31	51.7
Reduce farm size	6	10.0
Remain with the same farm size	23	38.3
Total	**60**	**100.0**

4.8 Gross Margin Analysis

Table 12, shows that specialty coffee growers have relatively higher total revenue amounting to Tshs 533 559.32. Non-specialty coffee producers had total revenue of Tshs 226 906.78. At the same time, gross margin observed from specialty coffee growers was Tshs 318 444.92 while non specialty coffee growers earned gross margin of Tshs 103 177.79. Average variable cost used for specialty coffee was Tshs 215 114.41 as compared to 123 728.81 of non specialty coffee. Higher costs observed in specialty coffee production is due to high input costs including higher labour used in that type of coffee production as compared to non specialty .if large capital are invested more returns on investment is expected to be large and this addresses the concept of economies of scale to have an impact . The specialty coffee growers in this study shown that have higher ROI of 1.48, the implication of this is to every Tshs 1 invested there is an increase in profit of 1.48 when compared to non specialty coffee of return on investment which is 0.83, the implication of this being that to every Tshs 1 invested for non specialty coffee there is an increase in profit of 0.83 (Appendix 2).

Therefore, it is more profitable to deal with specialty coffee than non specialty. Based on its profitability, specialty coffee contributes more to household's income than non-specialty coffee enterprise. Farmers are rational and therefore they will choose the enterprise which pays more than the other.

Table 12: Rungwe District: Gross margin comparison between specialty and non-specialty coffee

Particulars	Specialty coffee	Non specialty coffee
Quantity sold (kg/ ha)	226.78	151.27
P rice per kg(Tshs)	2 000.00	1500.00
Total revenue (Tshs/ ha)	533 559.32	226 906.78
Total variable cost(Tshs/ha)	215 114.41	123 728.81
Gross margin (Tshs/ ha)	318 936.92	103 177.97

1. The price used for Gross margins calculations under specialty coffee and non specialty coffee was during cropping season of 2008/09.

$$\text{Return on Investment (ROI)} = \frac{GM}{TVC}$$

Where: GM= Gross margin

TVC= Total variable cost

Therefore:

- ROI for specialty coffee $= \frac{318936.92}{215114.41} = 1.48$

$$\text{ROI for non specialty coffee} = \frac{103117.97}{123728.81} = 0.83$$

4.9 Income Generated from two Categories of Coffee

By using two sample independent T-test to test the income of two different means. the total income from specialty coffee was twice as much of non specialty coffee. The mean difference of specialty coffee in income was Tshs 201 068.64 higher compared to non specialty coffee and statistically significant at $p < 0.00$ (Appendix 4).

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The main objective of this study was to examine the economic benefit of specialty coffee production and non-specialty coffee production. The specific objectives of this study were to determine the production cost between specialty coffee and non-specialty coffee production, to determine benefit obtained between specialty coffee and non-specialty coffee production,

The specialty coffee had high ROI of 1.48 as compared to non-specialty coffee enterprise which had a ROI of 0.83. Average production cost of specialty coffee of Tshs 215 114.41 was used to produce a Gross margin of Tshs 318 444.92, which means to every Tshs invested has the profit increase by 1.48. This is higher than non-specialty coffee which has the average cost of Tshs 123 728.81 but produced a Gross margin of 103 177.97, the implications of this is to every Tshs invested produces the profit of Tshs 0.83. Returns per Tshs invested is higher for specialty coffee production than non specialty coffee production. This leads to conclusion that specialty coffee is more profitable than non specialty coffee.

The outcome of this study shows that, there is significant difference between income realized from specialty coffee and non-specialty coffee enterprises. By using independent sample t test the income mean difference was very significant at $p < 0.00$ (Appendix 4).

5.2 Recommendations

The study was conducted with reference to the 2008/09 cropping season from Rungwe district. Based on the study result, the following recommendations aimed at improving the specialty coffee production enterprise are made.

(i) Farmers should organise themselves to strengthen the present AMCOS and primary societies by opening agricultural input shops so as to increase quantity and quality of coffee in the future.

(ii) There is a need of DALDOs office to design training programmes under DADPS and train coffee farmers, private buyers, and cooperative and agricultural extension staff on how specialty coffee is prepared. Most farmers seem to have inadequate knowledge on agronomy of the crop followed a limited number of extension officers which are not adequate and cannot be recruited to cover all coffee producing villages, Therefore it is important to promote and strengthen FFS (Farmer Field School) to give coffee farmers an opportunity to have strong groups that will be able to be trained the whole season hence become coffee experts and become trainers to their fellow farmers. Also government should train and employ extension staffs specialized in coffee production.

(iii) An improved incentives package for agricultural extension workers should be put into consideration. This should include good working environments so that quality coffee can be increased through the increase the number of specialty coffee growers in the district and other coffee growing areas in the country.

(iv) Where necessary, farmers should have their own banks which deal with agriculture only, this will enable smallholder farmers to secure loan easily, this will remove the notion that it is very risky to invest in agriculture. The Government of Tanzania under the Ministry of Agriculture, Food Security (MAFS) should also reconsider providing subsidy for coffee agricultural inputs rather than food crops only like maize and rice.

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APPENDICES

Appendix 1: Questionnaire for farmers

The questionnaire was used to collect data from both specialty and non specialty coffee growers

Questionnaire No.....Date of interview.....

Division.....Ward.....Village.....

Interviewer's Name.....

Name of respondent.....

A. Household Identification Variables

Name of household head.....

1. Age.....(years)
2. Gender.....1=Male, 2=Female
3. Marital Status of household head.....

   1=Married, 2=Single, 3=Divorced, 4=Widowed
4. Level of education.....

   1= None

   2=Adult education

   3=Primary education

   4=Secondary

   5=others (specify)

B. Farm Resources and Input Availability and Use

I Land Availability use

6. What is the total area owned by farmer?..... (Hectares..... (Acres)

7. How did you acquire this land?

1=Inherited

2=Bought

3=Hired

4=Given by the village government

5=Accessed a free land

6=Others (Specify)

8. What is the total area owned by coffee farmers?..... (acres).

II. Labour Availability and Use

9. What is your source of labour? 1 = Family labour ... 2= hired labour.....3= both.....

10. Indicate labour used for coffee enterprise in 2007/2008 season

Activity	Family labour (Mondays)	Exchange Labour (Mondays)	Hired Labour (Mondays)	Total payments (T.shs)	
				Cash	In kind
Land preparation					
Holes preparation					
Fertilizer/Manure/ Compost					
Planting					
Pruning					
Pesticides spraying					
Weeding					
Mulching					
Harvesting					
Processing and drying					
Marketing					
Other(Specifying)					

Note: One day=8 hours

11. Estimate the yield obtained from coffee in last season of 2007 /.....kgs/ha.

12. What was the average price of coffee you received in the last season of 2007/2008?

.....

13. Give the information about the implements used in the farm

Implements	1= yes , 2= no	1=hired, 2= owned	Hired rate	Purchase prize.
Central pulperies				
Pulping Machine				
Sprayer pump				
Pruning knives				
Bags				
Hoe				

C. Coffee production information on specialty coffee

14. (a) Do you know anything about the specialty coffee technologies

1= Yes 2= No

(b)If yes which technologies do you know?

(i) Processing .....

(ii).....

15. What was the reasons for adopting specialty coffee production?

1= Good price offered

2= highly marketable

3= Other reasons (medium)

16. How do you compare the processing involved in specialty coffee production

1= Excellent

2=Very good

3=Satisfactory

4=Bad

5=Very bad

17. Why do you think so?.....

18. For how long you have been in coffee production

1= less than a year 2= 1-3 years 3= 3-5 years 4= more than 5 years.

19. For how many years have you practicing specialty coffee production?

20. Did you stop producing any crop in favour of specialty coffee production.....

1=Yes 2= No

21. If yes which crop (s) did you switch from? (Mention).....

22. Did you reduce a plot size of coffee to put more time in specialty coffee production?

1= Yes 2=No

23. If yes how much land was increased /decreased? ..... (Acres).

24. (a) What is the most critical problems in specialty coffee production.

(i).....

(ii).....

(b) Do you think these problems can be solved to obtain quality coffee?

D. Investment and Equipment costs

25. Indicate the number, acquisition and expected lifespan of the following items:

Item	Number	Lifespan	Acquisitions	
			Original price	Year
Pulping machine				
Fork jembe				
Hoe				
Panga				
Sprayer				
Other(specify)				

E. Farm input Information for coffee production

26. Indicate input, source, prices and cost

Establishment Costs		
Operation	Costs/unit	Total
Cost of land(Tshs/unit		
Land preparation(labour)		
Holes preparation(labour)		
Manure application(labour)		
Planting(labour)		
Weeding(labour)		
Fertilizer application haulage		
Weeding		
Prunning		
Fertilizer Application		
Harvesting		
Processing and drying		
Transport cost		

27. Indicate costs of materials used in coffee production

Materials	Source	Quantity used	Unit price	Total cost
Seedlings/ha				
Fertilizer(manure)				
Herbicides in liters				
Insectides in liters				
Fungicides in liters				
Spray rental				
Mulch				
Terrace construction				
Any other specify				

F. Quality and price

28. (a) .(i). Has quality of coffee increased since 2003/2004? 1= Yes 2= No

(ii). If yes, what was the most important reason for the increase?

(b). (i). Has quality of coffee decreased since 2003/2004? 1= Yes 2= No

(ii). If yes, what was the most important reason for the decrease?

.....

29. How do you access information on market prices of coffee?

1=Direct visit to the market

2=Cross checks with fellow farmers

3=Hear from friend

4=From extension officers

5=From NGOs

6=others (specify)

30. What has been the price trend of coffee produce for the past 5 years?

1=Increasing 2=Decreasing

31. From above, if is increasing/decreasing, why?

1=Few/many buyers in market

2=Low supply/high production

3=High/low demand

G. Inflow and Outflow of Income

32. Give marketing information as indicated for 2006/2007 season

Amount produced	Amount sold	Unit price(Tshs/kg)		Revenue	Transport cost
		Auction mart –Moshi	Private buyers		

33. Which buyer did you sell the coffee for 2007/2008 season.....

H. Extension Services

34. Have you received any extension advice coffee in thc last cropping season?

1=Yes 2=No

35. If Yes, how many times?

1=Once per season

2=2-3 times per person

3=4-5 times per season

4=More than 5 times per season

36. Where do you receive extension services?

1=Extension officer

2=Training centre

3= On my farm plot

4= On demonstration plots

5= During meeting

6=Through farmers' group

7=Other (specify)

37. What type of advices do you get from a village extension officer?

1=Crop quality control

2=Crop management

3=Marketing issues

4=Others (specify).....

38. Plans for coffee production

1=Expand production

2=Reduce production

3=Continue producing the same

4=Others (specify)

I THANK YOU FOR YOUR COOPERATION

Appendix 2: Comparison of Return on Investment between specialty and non-specialty coffee (Average).

$$\text{Return on Investment (ROI)} = \frac{GM}{TVC}$$

Where: GM= Gross margin

TVC= Total variable cost

Therefore;

$$\text{ROI for specialty coffee} = \frac{318936.92}{215114.41} = 1.48$$

$$\text{ROI for non specialty coffee} = \frac{103117.97}{123728.81} = 0.83$$

Appendix 3: Independent Samples Test for age of respondents

Group Statistics

	Coffee production category	N	Mean	Std. Deviation	Std. Error Mean
Age of the farmer	Specialty	60	50.0667	13.21384	1.70590
	Non specialty	46	56.5652	11.12885	1.64086

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig.(2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Age of the farmer	Equal variances assumed	2.703	.103	-2.684	104	.008	-6.4986	2.42125	-11.29997	-1.69713
	Equal variances not assumed			-2.746	103.038	.007	-6.4986	2.36696	-11.19284	-1.80426

Appendix 4: Independent Samples Test for income realized from coffee production

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Income from speciality and non speci	Equal variances assumed	31.858	.000	5.561	116	.000	201068.64407	36156.20820	129456.71795	272680.57019
	Equai variances not assumed			5.561	71.054	.000	201068.64407	36156.20820	128976.16912	273161.11901