DISTRIBUTIONAL ISSUES IN CEREAL VALUE CHAINS; A CASE STUDY OF WHEAT MARKET IN *ARIS*, ETHIOPIA

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"Distributional Issues in Value Chains: the case of wheat market in Arsi, Ethiopia ."

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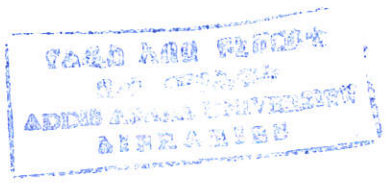

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Abstract

In Ethiopian where 85% of the population feeds on agriculture raising the farmers share out of the retail value of their product contribute positively to the nations well being. But in order to design policies that are deemed to boost farmers' share, one need to know what factors affect the share of farmers out of the retail value of their product. However there are few works on this area. This paper is an attempt to address this issue. The main objective of the paper is first to map the distributional outcome and then to investigate and examine factors that affects farmers share out of the retail value of their product. The paper uses 120 farmers form two districts Hitosa and Tiyo in Aris zone. The papers take up a value chain concept which has proven particularly useful to provide a key to understanding the appropriation of the returns to agents in the chain. The results indicate that farmers sell more than 50 % of their product without adding any value to it. In addition to this value addition was found to be one of the main determinant factors that affect farmer's share in the chain. Moreover financial access and infrastructural facility contribute significantly to farmer share. From the results the policy implications are straight. First government should facilitate the establishment of farmer's cooperation with capabilities to process the raw wheat in view of raising small farmers' benefit. In addition to this there is a need to invest on the construction of feed roads that may facilitate framers' buying and selling activities in local and regional market.

1. Introduction

In a country where almost 85% of the population fed on agriculture, which consists almost entirely of semi-subsistence farmers, improving the living standard of farmers should be given primary importance. The reason is that boosting rural incomes reduce poverty in the poorest countries, it can be used to loosen a constraint (which in this setting could well be a credit constraint) in farming, in addition to this, it allows farm households to invest and become more efficient in farming.

There is also a linkage effect, that means increased farm incomes stimulate the growth of non-farm activities and, hence, employment opportunities. Put differently, while growth in farmer's income reduces rural poverty and food insecurity directly, the indirect effects on the rural non-farm economy through demand and supply linkages can be even more important sources of food security and rural poverty reduction in the long run.

The main point is that increasing farmers' income can be considered as an important means to increase overall rural economic activity and employment.

But what policy should government adopt to increase farmer's income? One option would be to increase the farmers share out of the retail value of their product. But before saying anything about increasing farmers share, one should understand what factor affects the share of farmers out of the retail value of their product.

To this effect this paper attempt to identifying and examining factors that affects farmers share our of the retail value of their product.

Statement of the problem

Since our economy is basically agrarian understanding the mechanism of this sector greatly help to design appropriate policy that bring more gain to farmers and the whole society at large. But designing policy having in mind a single sector, industry or economic agent is not the best strategy since changes in one of these industries or sectors often have an effect on the network of buyers and suppliers in that industry and ultimately affect the entire chain. But little work has been done to analyze the implications of these trends on the entire value chain and Ethiopia is no exception.

In Ethiopia few works have been done to find a way to increase framers share and most of them was on coffee. For example (Dempsey and Campbell, 2005) by adopting a value chain approach, identifies three key elements that should be addressed to achieve global competitiveness these are; efficiency, product differentiation and response to specialized market demand. They argue that by concentrating on these three issues one can bring a significant positive impact on small-scale coffee producers and the coffee value chain as a whole. (Dereje, 2007) also uses value chain analysis. The main objective of the paper was to improve the competitiveness of Ethiopian forest coffee so as to offer a better future for the national economy and for those who depend on forest coffee for their livelihood. This paper indicates that integration of coffee producers to international market is a viable strategy to improve their livelihood.

To the best of my knowledge there are few works on the value chain analysis of cereal production and marketing in Ethiopia. Even in the existing few studies, distributional issue is not ether fully addressed or not dealt with at all.

So to fill this gap this study attempts to investigate the distributional issues in the wheat value chain by taking *Arise* zone as a case study. The approach we will follow will be a value chain analysis. The reason is that this approach has some advantage over the traditional market analysis. According to (Kaplinsky and Morris, 2000), the traditional analysis has tended to focus on the size and growth of individual sector in terms of employees and gross output (rather than net value added). But value chain analysis throws

more light on the determinants of income distribution, both within and between countries, and especially over time than this traditional industry analysis. In addition to this it makes possible to trace through a particular thread of rent-rich activities which are not easily captured by branch and industry analysis. And lastly value chains analysis allows us to chart the spread of income in a number of different dimensions (Kaplinsky and Morris, 2000).

So because of these features we make use of value chain analysis to investigating the distributional issue in the wheat value chain.

Our basic questions are:

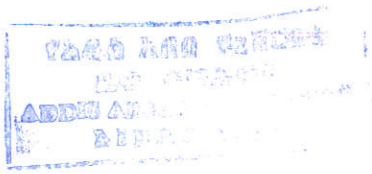
- What is the share of income by small wheat farmers in the wheat value chain?
- Why agents in the chain gets what they got or in other word what determine the distribution of income in the value chain?
- And finally what can be done to improve the share of wheat?

Objective of the study

The general purpose of this paper is to examine the distributional issue in wheat value chain with special focus on the distributional issue pertains to small holder:

The specific objectives are

1) To map the distributional outcomes in the wheat value chain.
2) To examine the share appropriated to each link[1](agents) in the chain
3) To identify and explain factor that determine the distribution of income in the wheat value chain with particular reference to smallholders.
4) To draw policy implication as to how to improve the working of the chain in general and raise farmers share in the value chain in particular.



[1] Link in the chain includes (a)producers;(b) traders/collectors;(c)processors;(d) wholesalers;(e) retailers

Research hypothesis

- Share of the retail prices of wheat is not evenly distributed to agents in the chain and in particular farmers share in the value chain is not as much as intermediaries like traders, wholesalers or retailers even though they are the main actors in the process of producing and marketing wheat.

Organization of the study

The organization of the paper will be as follow. The paper has seven parts. In part one discusses why we need to concentrate on the development rural sector in general and raising framers income in particular. This part will have two sections. We present the statement of the problem in section one, after that objective of the paper takes section two. Part two is review of theoretical literature and sub divided in to three sections. In section one is about basic concepts, definition and importance of value chain. Section two discuss issues in the value chain research and in the final section of part two we lay down the conceptual frame work to investigate the determinants of income distribution in the value chain. Part three briefly reviews empirical literatures. Part four is about the methodology of the paper. The paper makes use of both qualitative and quantitative methodology. To this effect this part has two sections. Section one is about qualitative methodology and in section two covers the quantitative methodology part. Part five examine the general background of cereal market in Ethiopian in general and wheat market in particular. Part six is all about the data analysis and discussion of results. Since the paper makes use of both qualitative and quantitative methodology, this part is divided in to two sections. Descriptive statistics is presented in section one and the model results is discussed in section two. And finally section seven concludes and put forward major policy implications of the paper.

2. Theoretical Perspectives and Conceptual Frame Work

The organization of this section will be as follows. In section one, we will discus the basic concept of value chain, after that we will see the main issues in the value chain in details and then distributional issue in the value chain will be discussed in details in section 2.2 and finally we review relevant empirical literature

2.1 Concept and Importance of value chain

Before discussing the importance of value chain analysis, let us first define what value chain means.

Generally value chain refers to all the activities and services that bring a product (or a service) from its conception to its end use in a particular industry.

Following (Roduner D., 2005) the main approaches and concepts relevant for value chain analysis are:

1. The French **"filière"** concept: this describes the linear flow of physical inputs and services in the production of a final product. But the "filière" concept is static model with non changing actors and national boundaries it is less functional to analyze the globized world.
2. **Porter's value chain analysis:** Porter developed modern value chain analysis as an instrument for identifying the value created at each step of the production; the main aim was to offer the customer the level of value that exceed the cost of activity, thereby the resulting in profit margin. According to porter a firm value chain is part of a large system that includes the value chains of upstream suppliers and downstream channel and customers.
3. **Global Commodity Chains:** Global Commodity Chains was first introduced by (Gereffi G., 1999b). The concept mainly focuses on the power relations in the coordination of dispersed, but linked, production systems. He has shown that generally commodity chains are characterized by leading parties that are determining the overall character of the chain.

4. **World Economic Triangle:** a concept pointing out that the combination of strong local linkages within global commodity chains might bring upgrading prospects for regions in developing countries; and thus is an approach for showing the importance of linking vertical (chains) and horizontal (clusters) integration. But this concept become more useful when one considers the global rather than the local chains. (Roduner, 2005)

Each the above concept emphasizes a specific part of the value chain. But in this paper we will adopt a more comprehensive definition given by (Kaplinsky and Morris, 2000). These authors define value chain as;

> "The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumer, and final disposal after use." (Kaplinsky and Morris, 2000:4)

After defining value chain the next step would be to discuss why we need to undertake a value chain analysis. There are at least three main reasons why value chain analysis is important. The first one is to build up systemic competitiveness[2]. Discussion on improving competitiveness often concentrates on how to achieve individual excellence. But one has to bear in mind that the competitiveness of the individual firm depends upon the competitiveness of the value chain to which it belongs. The implication is that the ability to make an impact on competitiveness by improving the efficiency of individual links in the chain has become increasingly limited. So there is a need for systemic competitiveness and value chain analysis greatly helps to create this competitiveness. To sum up, with the growing specialization and division of labor, systemic competitiveness has become increasingly important and value chain analysis plays a key role in identifying core competences in the whole system by redirecting the focus of attention from point to systemic (that is, value chain) efficiency.

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[2] "Competitiveness" is the ability of a firm or industry to develop and maintain an edge over market rivals. This can be achieved through a combination of three strategies: producing and delivering goods and services more efficiently, differentiating products or services through quality standards and branding, and/or exploiting new market demand.

The second reason as to why we undertake value chain analysis is the inadequacy of efficiency in production to successfully penetrate the market. Value chain analysis help to evaluate the merit and demerits of specializing in a specific economic activity for example production rather than service and enable one to understand how the way producers are connected to final market influence or affect their gain from participating in the market.

Finally and importantly value chain analysis by giving focus on governance, and highlighting power relations in the chain, assists policy maker to formulate appropriate polices and making necessary choices and allow for an understanding of the dynamic determinants of income distribution in the chain.

2.2 Issues in the value chain research

There are three key features in the value chain analysis (Kaplinsky and Morries, 2000). To begin with, value chains are repositories for rent, second successfully functioning value chains involve some degree of governance and finally there are different types of value chains.

Rent

The value chain is an important construct for understanding the distribution of returns arising from design, production, marketing, coordination and recycling. Essentially, the primary returns accrue to those parties who are able to protect themselves from competition. This ability to insulate activities which arises from the possession of scarce attributes can be put in a nutshell by the concept of rent. The classical economists argued that economic rent accrues on the basis of unequal ownership/access or control over an existing scarce resource (e.g. land). In general economic rent arises from different things (Kaplinsky and Morries, 2000). To start with it arises in the case of differential productivity of factors (including entrepreneurship) and barriers to entry (that is, scarcity). It may also arise from purposeful activities taking place between groups of firms or it could be inter-firm cooperation and coordination – these are referred as relational rents. In addition to this it takes various forms within the firm, including technological capabilities, organizational capabilities, skills and marketing capabilities. Not only this but another important feature of

economic rent is that it have become increasingly important since the rise of technological intensity and eroded by the forces of competition after which it is then transferred into consumer surplus in the form of lower prices and/or higher quality.

Governance

The second key element in the value chain is governance. To start with governance in the context of value chain refers to the inter-firm relationships and institutional mechanisms through which non-market coordination of activities in the chain is achieved. (Humphrey. and Schmitz, 2001)

When we say value chain governance what we actually mean is that parameters requiring product process and logistic qualification that are set which have a consequence up or down the value chain.

Value chain governance involves the ability of one firm in the chain to influence or determine the activities of other firm in the chain. This influence can extend to defining the product to be produced by suppliers and therefore the suppliers' supplier and specifying processes and standards to be used. This power is exercised through decisions about what requirements suppliers should fulfill monitoring suppliers and what should be done if this standards are not met.

After discussing the concept of governance in the value chain in what follow we will see why we need to study governance in the value chain. (Schmitz, 2005) suggests possible reasons. The first one is the existence of product definition and the risk of supplier failure. The intuition is that as producers practice product differentiation strategy, there arises a need to have precise product specification and governance in the chain ensures that these specifications are met.

The second reason that was suggested is that in the face of free market and competition, non-price competition plays a major role for a firm to win or to lose. Since non-price competitions such as quality, responses time, reliability of delivery and safety are very delicate matters and are more vulnerable to the performance of suppliers. Moreover those firms that are in this tight non-price competition can not afford to lose. So again there arises

a need to formulate standards and actively monitor if those standards are met. This means governance in the value chain is not superficially imposed by external agent but it is a phenomenon that came out as firm in today's economic environment tries to stay alive and if possible to successes and trounce their rivalries.

In any case setting standards or requirements and monitoring suppliers whether they observe this requirement becomes an indispensable practice in today's market. Due to this fact any market study should give due attention on how setting rules and monitoring them evolves over time and how this affect the working of the market. In other words the governance structure should not be overlooked in any market studies..

But most importantly we need to study the governance of wheat value chain because it shades light on our main objective, distribution. Since value chain analysis take into consideration the power relations in the chain which is the main driving force that affect the distribution outcome in the chain, understanding the governance of a chain helps to understand the distribution of gains along the chain.

The next logical question will be how we analysis governance in the value chain. (Kaplinsky and Morries, 2000) raise an important analogy that greatly help us to understand what governance in the value chain look like. They argued that understanding how the civic[3] society works help us to be clear with how value chain governance works. As is the case in the governance of civic society we can identify three distinctive forms of value chain governance.

First the basic rule which defines the condition for participation in the chain needs to be set. These rules may include meeting basic cost parameter, guaranteeing supply conformance to international standards etc. The establishment of various sets of rules as a participation criterion in value chain can be termed as legislative governance. The other features of governance suggest itself. Since there is a rule, there should be a body that audit performance and check the compliance with these stated rules which is termed as judicial

[3] There are three relevant elements civic society governance. -Separation of power with in it includes legislature executive and judiciary- The existence of sanction that could be negative or positive and Legitimacy of those in power

governance. This part of the governance monitor the product compare it against the standards and if there is any disparity or divergence form the declared rules they report to the concerned body which is in our case termed as exècutive governance. Executive governance punishes those who fail to observe and follow the rules lay down by legislative governance in the chain. The role of executive body in the chain is not only punitive; they could also provide assistance to value chain participants in meeting these stated rules. For instance the executive forms of governance could be manufactures helping a supplier to achieve quality standards or delivery requirements.

To wrap up, the analysis the governance structure in the chain is done by answering the following questions. These are:

- Who make the rules or set the standards in the chain
- Who monitor
- Who enforcing the rules

Different types of value chains

The third key element in the value chain analysis is the existence of different types of chain. McCormick and Schmitz (2001) distinguish between four basic type of relation or value chain governance; (a) Arms length market relationship; (b) Balanced network; (d) Captive network and finally (e) Hierarchy;

In an Arms length market relationship as the name itself suggest, there is no close relationship between buyers and sellers as the production is standardize and range of firms can met the buyers' requirement. In second type there is information intensive and reciprocity dependent relation between firms and among themselves and also buyers get what they want. The third kind is where buyers take the leading position. Buyers exercise a high degree of control over other firms in the chain. The last one is polar opposite of the third one. In this type of relationship the lead firms take direct ownership of some operations in the chain. This topology is not the only one that could be used to understand value chain governance. In fact (Griffin 1999) on the bases of who play critical governing role has made useful distinction between two types of value chain; (i) Buyers driven ;(ii) Producers driven; In buyer driven value chain buyers play a critical governing role to quote (Gereffi, 1994) "Buyer driven commodity chains refer to those industries in which large

retailers, marketers, and branded manufacturers play the pivotal roles in setting up decentralized production networks in a variety of exporting countries, typically located in the third world. This pattern of trade-led industrialization has become common in labor-intensive, consumer goods industries such as garments, footwear, toys, house-wares, consumer electronics, and a variety of handicrafts. Production is generally carried out by tiered networks of third world contractors that make finished goods for foreign buyers. The specifications are supplied by the large retailers or marketers that order the goods."

While in producer driven value chain producers take responsibility for assisting the efficiency of both their suppliers and their customers.

When we see the applicability of this distinction to our specific case it is not as black and white as the literature suggest. Since wheat suppliers are basically dispersed small framers they do not have the influence to decides and set standards. But on the other hand buyer's even though they are in a more secured position relative to framers they still lack the capacity to dominate the market and to make the chain completely buyers driven.
The implication is that in the actual market the distinction is not only of black and white type but there is a gray area. Why we bother to identify the chain as buyer driven or producers driven? The reason is that different types of value chains have different policy.

2.3 Distributional issue in the value Chain

It is a common phenomenon to see the lack of correspondence between the spreading of gains and the associated economic activity needed to turn the raw material into something that could be consumed. One(farmers) that contributes a lot on the processes of making the product ready for consumption get less than from the one(intermediaries) who contribute very little or nothing at all. More often than not this lack of correspondence between economic activities and the distribution of benefits creates incentives or disincentives for performance. Due to this fact distributional issue become an imperative issue that should be addressed.

We saw that distributional issue is an important topic. But how one could go around and tackle this subject? Here value chain analysis helps greatly to clearly understand the

distribution of benefits. First by considering the power dynamics in the chain value chain analysis indicates a point of interventions that improve the benefits to the agents most disfavored in competitive value chains. Why power is important, because any link in a value chain that have more power typically receive the greatest benefits from business transactions (Kaplinsky and Morries, 2000). Second value chain analysis not only helps to understand power relation but with in a dynamic perspective it also helps to explain the growing disjuncture between the spread of activities and incomes.

First, by mapping the range of activities in the chain it provides the capacity to decompose total value chain earnings into the rewards, which are achieved by different parties in the chain. Second by focusing on the way particular firm, region or country linked it self in to the market value chain analysis will tell us to what extent their mode of insertion determine the distribution of outcome which in turn help agents to launch themselves onto a path of sustainable income growth. Third its focus on institution helps to formulate policies that alter the exiting lop-sided distribution pattern (Kaplinsky and Morries, 2000).

After discussing the importance distribution in the chain and deciding which method to take up to investigate it our next task would be to see what the determinant factors are.

2.3.1 Determinant of income distribution in the value chains

We have said that value chain analysis helps one to unravel the processes which determine the spread of incomes in value chains.

To start with where level of competition is high the share of income appropriated to that sector or link or activity is low. The only way in which income growth can be sustained is through an enduring barrier to entry or - where barriers to entry are momentary - by the firm, the region or the country developing the dynamic capability to systematically move to activities in which high barriers to entry prevail. Therefore to understand the determinant of income distribution focus should be on rent and barriers to entry. By focusing on the nature of economic rent in each of the links value chain is able to explain a significant part of the distributional outcomes arising from participation in national production systems. Because in the first place a comprehensive focus on the different components of rent identifies which activities in the chain are able to sustain high incomes. Second the focus on

economic rent in the value chain analysis helps us to identify activities which are subject to growing competition and those where there are likely to be sustained.

When we come to our case based on literature review I identify the following as determinant factor of farmers' share in the wheat value chain; (i) Rents; (ii) Value added in each stage;(iii) Rate of profit;

The first one is rent. Generally speaking rent is having access to capabilities which arises from the possession of scarce attributes which other do not possess and involves barriers to entry. Rent could be of different kind (Kaplinsky and Morris, 2000). These include:

i. *Marketing rents* – possessing better marketing capabilities and/or valuable brand names
ii. *Resource rents* – access to scarce natural resources
iii. *Infrastructural rents* – access to high quality infrastructural inputs such as telecommunications
iv. *Financial rents* – access to finance on better terms than competitors
v. *Marketing rents* are most visibly reflected in brand-name presence, which in turn is largely fuelled by advertising.
vi. *Resource rents* arise from high-yielding mineral deposits and land.
vii. *Infrastructural rents* reflect the relative effectiveness of communications.

Our next factor that affects the distribution of benefit in the chain is value addition. Value added is defined as the value of output at market price (factory gate price minus the value of all intermediate inputs purchased from other firms. Value added thus represents the contribution of and payments to, the primary factors of production. (Kaplinsky and Morries 2000) defined value added as the difference of gross output costs–including material costs, depreciation costs of equipment, labor costs, utilities and profit and total input costs (bought-in materials, components and services). The more value a firm can add to a product for a given primary and intermediate cost configuration, the greater its share.

Our final variable as a determinant of framers' share out of retail price of their product is profitability. Profit is often thought of as being a key to understand the distributional out come of the value chain. But how should we measure it. (Kaplinsky and Morris, 2000)

provide some insight about different measure of profit. In using return on equity problem may arise since different firm will have different polices towards funding their investment requirement in some cases these are largely financed by equity, in other cases most resources come in the forms of loans. So even if these firms get the same profit using "equity" in the denominator of the profitability calculation leads us to a different figure. The other option is return on net assets. Net assets take account of all the gross assets of a firm, which include equity, reinvested profits and outstanding payments due from debtors. It subtracts from this all the liabilities which the firm has, which includes short and long-term loans and money owed to creditors. This also has demerits of its own. It does not take in to account the return on intangible assets. But, relatively speaking, it is a better indicator of profit because it takes account of equity and loans and payment schedules to debtors and creditors.

The other alternative of measuring profit is the mark up on sale. But we should be aware that the value of mark up depends upon the volume of sale. This means the size of the mark up by it self tell us little about the rate of profit.

It may also be possible to compute the total profit generated throughout the chain, and then apportion this to the different links in the chain. This provides a reflection of the share of profit accruing to different links in the chain rather than to their rates of profit. (The difference arises because of the different sums of investment required to generate profits in each link in the chain).

When we come to wheat farmer in Ethiopian the relevant[4] types of rent we are going to analyze as a determinant of farmers shares are financial rent, infrastructural rent and resources rent.

So to capture the direction and the magnitude of these determinants of share of income on farmers share, we will use a model with share as explained variable and these (rent value addition and profitability) determinants as explanatory variables. It is a good starting point

[4] Relevancy is an empirical question. I identify two types out of the different types of rent discussed in the literature based on relevancy as per framers' responses.

to chart how different factors that affect the share of income of agents in the value chain are incorporated into our equation.

In this section we identified three general variables as a determinant factor that affect the distributional outcome in the value chain. We have also seen how to measure these variables.

4.2.1 Conceptual frame work

In analyzing the distribution we have identified three general variables as a determinant of share in the chain in our literature review part these are; Rents; Value added in each stage and Rate of profit.

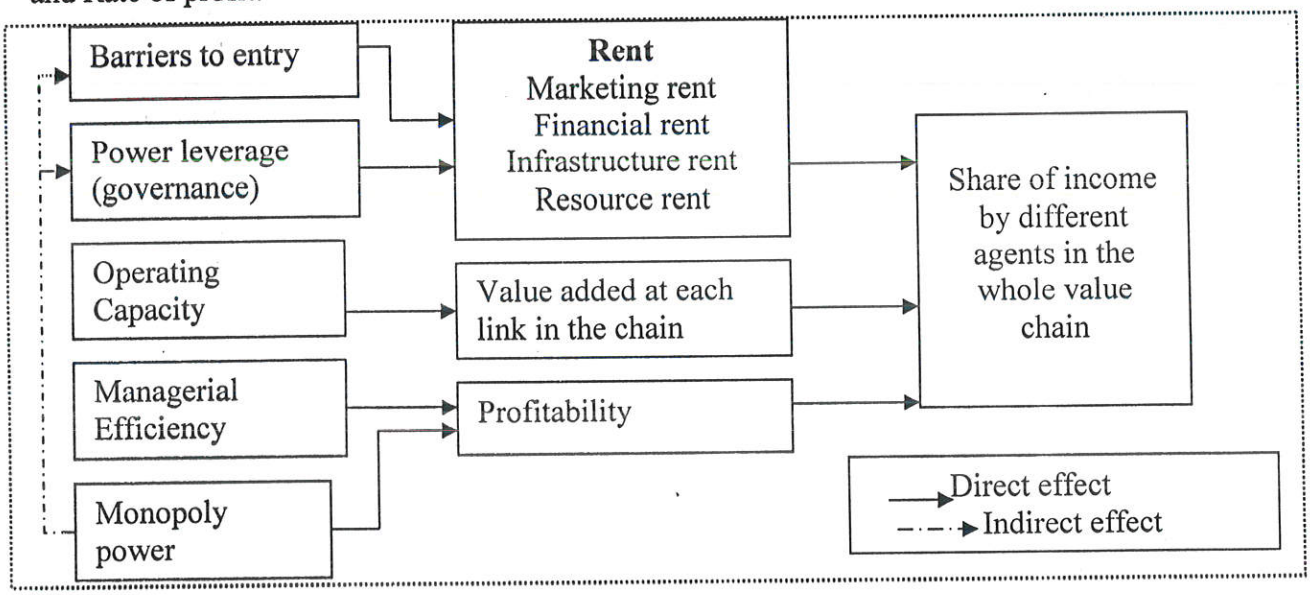

Figure 1: *Flow chart of factors that affect framer's share*
Sources: (Kaplinsky and Morris, 2000)

What we tried to show in the above chart is that different factors that affect the share of each agents income are incorporated in our equation through there effects on the three variables. These are different kinds of rents, value addition and profitability. The reason is that, most of the factors that affect the distribution of income can not be measured directly. So in order to capture there effect on the share of individual agent in the value chain we use those variables that are measurable and at the same time can transmits the effect of those factors that affect the share of each agents and could not be measured.

3. Review of the Empirical literature

In the literature review section we outlined the theoretical frame work of value chain approach and argue that this approach is very helpful to investigate the distribution issue in the chain. In this section will see how value chain analysis helps policy maker to design a policy that have a positive significant effect on the chain participant.

We have seen that the share of income in directly affected by the existence and sustainability of rent. This means that static positioning of producers, either within particular activities in particular links of the chain where there is no rent, are likely to be associated with a worsening of relative and/or real income. This contention has some empirical support. (Kaplinsky, 2000) in his analyses of Canned Deciduous Fruit (CDF) showed that the ability to create rent or the existence of rent in a particular link in the chain determines the share that link can sustain.

In the paper (Kaplinsky, 2000) argue that in the past, before the EU provided support for European producers, the major sources of rent were to be found in the growing and canning links of the value chain for this reason, the primary value chain returns accrued to producers in South Africa and Australia, both of which had efficiently organized agro-processing industries. But during the 1980s the European Union began to provide increasing support to the domestic industry, both on the output side (through tariff protection), and via subsidies to fruit inputs. The paper indicates that using these trade policy rents growers and canners in the high income countries become the primary recipients of economic rent and able to sustain the loin share out of the total value of these products.

This paper also discusses the governance structure of CDF value chain which is one of the major issues that value chain research addresses. 'Legislative' role is performed by the final product retailers who determine the standards that need to be met. The auditing of these standards – 'judicial role' – is performed by a combination of supermarket representatives who visit producers, and the import agents who manage the provision of products to the supermarkets and who, together with the supermarkets search for new sources of supply.

And finally the 'Executive' role of governance – assisting suppliers to meet the required standards – is provided to the canners by the supermarkets and to fruit, tin and sugar suppliers by the canners themselves (Kaplinsky, 2000).

A recent study by (Centre for Policy Dialogue (CPD), 2007) for Bangladesh also revealed the importance of value chain in identifying potential leverage points where policy makers can manipulate the outcome so as to improve the disfavored agent in the chain.

The study was done by identifying first the detailed value chain for each of the products then performing information need assessment at each nodal point and finally elicitation of required information deploying upstream tracking of price formation behavior. CPD researchers made use of a checklist as the survey instrument, which was field-tested prior to the initiation of the main survey. Focus Group Discussions (FGD) and individual Case Studies were also conducted to generate the required data and corroborate the information.

In the course of the field survey existence of at least eight different marketing chains were identified. The study clearly brings out the shares of the various agents in the supply chain. In case of domestic production, the difference between farm gate price (which included a 20% margin for farmer) and consumer's price at retail level was about 40% of the retail value. Considering that millers processing cost was only about 2.3% of the retail value, the margin accrued to the miller (23% of the retail value) appears to be rather high. As is revealed from the study, the miller whose margin was 23% of the retail value with the production cost of 2.3% of the retail value are the most powerful players in the entire supply chain wielding a significant control over the market price.

As for domestically produced wheat four different marketing chains and eight nodal points were identified

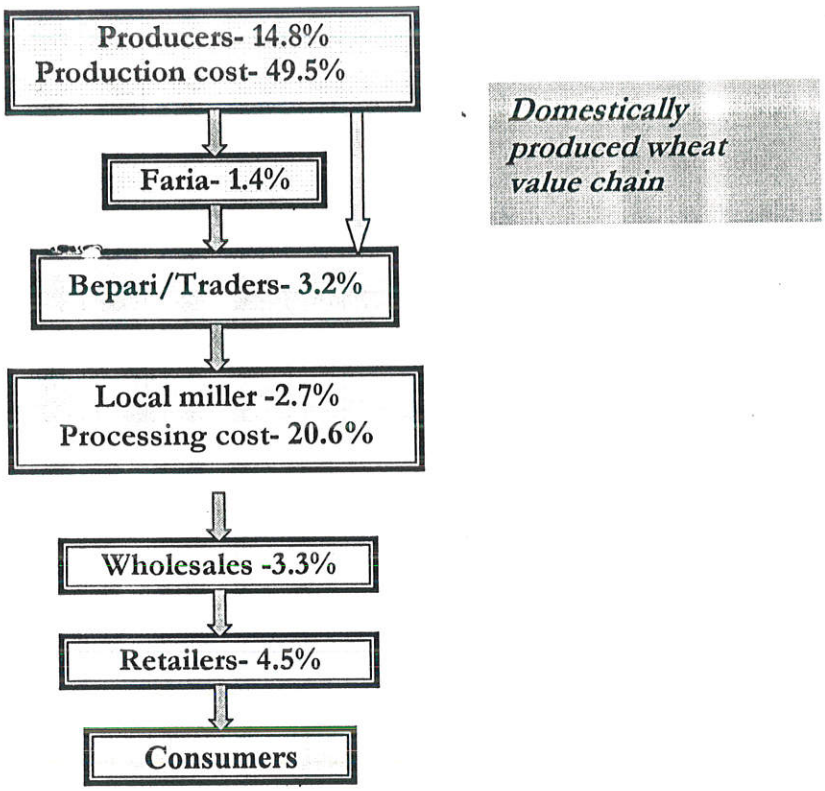

Figure 2: *Value chain of Wheat with distribution of consumer's expenditure(in %) Adapted from* **CPD, 2007**

The flow chart indicates the share of different agent's share out of the retail value.

As is evidenced from the chart and distinct from rice, processing cost of miller in this case was relatively high – about 21% of retail value. So the paper concludes that policy initiatives to reduce processing cost at the milling stage are likely to have positive impact on prices.

A more recent study was conducted by (Dereje, 2007). The main objective was to identify what can be done to improve the competitiveness of Ethiopian forest coffee so as to offer a better future for the national economy and for those who depend on forest coffee for their lively-hood.. As a start point the paper recognize the following as major constraints. First farmers face competition from other certified coffee producing countries is increasingly become fierce, have low level of education, large family size and small farm lands ranging between 0.5 and 3.52 hectares and finally they get only 3 % of the retail price in the German market. After stating the problem farmers face it attempt to forwarded policy recommendation as to relax these constraints. The paper suggest as a viable policy option the followings better integration of the poor section of the population, more specifically

coffee producers in to the dynamics of world coffee markets is assumed to lead to economic growth and to help overcome under development and poverty, strong linkages between coffee producers and actors involved at the grass root level of coffee production and international traders and roasters are strongly advocated. Another important issues need to be considered is improving efficiency, by all possible means (financing, market information services, improve linkage between institutions working on coffee, relax licensing restriction). And finally strong linkages between institutions and organizations working on coffee sector are vital to enhance coffee sector development.

As a summary what all these studies shows us is that first infrastructural developments significantly improve the working of the value chains. Second ability to create rent or the existence of rent in a particular link in the chain determines the share that link can sustain and finally creating financial institutions that are close to farmers greatly help to ease financial constrains farmers faces.

4. Methodology

Up till now we have seen the in the theoretical literature the key features of value chain analysis and identifies factors that affect the share of the retail price by different agents in the chain. In this section we will sketch out how we carry out the study. First we will address key issue in the value chain and then we will set out a frame-work or model to estimate the direction and the magnitude of factors that we identified in the literature part as the determinant factor. Here we mainly use qualitative and quantitative method. In section one we will present how we perform the qualitative analysis and section two will describe the quantitative part.

4.1 Qualitative analysis

We analyzing the value added process of wheat in Ethiopia by making our major objective focus on the distributional issue in the value chain. That is we try to see the share of especially small-farmer out of the total value of there product when it reaches is final consumer.

The whole endeavor of analyzing the wheat value chain Ethiopia could be accomplished by looking into the four key parts of the value chain. Theses are mapping the chain, examining characteristics of final market, look at the structure of governance and finally understanding the distributional pattern in the chain which is our main objective

Mapping

Mapping[5] in its simplest form it is merely a flow diagram. More sophisticated versions show that some actors (enterprises) differ in size and that some connections are more important than others; and they help to identify bottlenecks and leverage points. Chain maps help to get a quick grasp of complicated realities. Since it will be difficult to decide which bits of reality are important (and need to be mapped) and which bits can be left out we have to do it in stages.

[5] Mapping a chain means giving a visual representation of the connections between actors involved in the chain

In wheat chain the main categories are

Table 1: *Different link in the value chain*

Link in the chain	What they do
Input suppliers	supply generically modified crops Fertilizers Providing other Extension service
Producers/small farmer	producing wheat
Wholesalers/brokers	collecting wheat form small farmers Selling to final consumers or processing industries
Processors	inspecting and testing the quality of the wheat Milling the wheat Selling to the final consumers
Final consumers	milling the wheat Consumes the floor

Final market

The second issue would be analyzing the characteristics of final market. This becomes an important issue because today's production system is that they tend to be 'market pulled'. This will requires us to investigate the market size, market growth, market segmentation, critical success factor (CSF) and order winning and order qualifying characteristics which need to be analyses in order to understand the value chain dynamics.

A useful tool for conducting CSF characteristics is a scored response of 1-10 or 1-7 scales (Kaplinsky and Morris, 2000)

This will be accomplished by two stages

Pilot interview to get a feel for CSF in particular market

Then ask key respondent how important are CS in each market

After getting the data we will use a radar chart as this clarify which factor are very important to be successful in that market. In addition to this the graph will also help as to see whether what is perceived by the suppliers (seller) as a success factors are really what their buyers are looking for.

Structure of governance in the chain

One of the distinctive features of value chain analysis is its focus on governance. In our literature review part we identified three elements in the value chain governance. In this section we will we how to examine this element in wheat value chain. In legislative governance we will try to see action of standards set for supplier, in our case, farmers in

relation on-time delivery, frequency of deliveries and quality. In judicial governance we will see how the performance of supplier monitored in meeting these standards and finally in executive governance we will try to see if there is a mechanism that punish like delisting, fines or compulsory closure for those that did not observe the rule or if there is a system that assists suppliers to meet these standards. In value chain making rule does not grantee its implementation. There is a need for effective sanction. This sanction could be positive or negative and could be from with in the chain of outside the chain.

So what we are after is for a given requirement or rule by legislative governance a positive or a negative sanction if there is any in the value chain.

4.1.1 Method of qualitative data analysis

Data analysis is the process of bringing order, structure and meaning to the mass of information collected. The first thing we do is to draw the follow of resource starting from the input supplier to the farmers until the final product reaches its final consumers. That is mapping. Mapping is a central element of value chain analysis, using diagrams to show the flow of transformations and transactions from sourcing raw material and inputs, to production, to further processing, to marketing and final sale. We also make use of different graphs like pie-chat to we who gets how much and a radar chart to see the ordering of critical factors. In assessing the marketing channel through which wheat passes margin[6] analysis become handy (Dereje, 2007). Here we will try looking at the marketing margin of the different market participants. In other words we will employ margin analysis to examine marketing costs and margins of the different market participants.

Marketing margin measures the share of the final selling price that is captured by a particular agent in the marketing chain. It includes costs and typically, though not necessarily, some additional net income (Mendoza, 1995).

In a situation where there are several participants in the chain the margin is calculated by finding the price variations at different segments and then comparing them with the final

[6] This part is largely draws on from (Dereje, 2007)

price to the consumer. The consumer price then is the base or common denominator for all marketing margins.

One of the figures we employ in margin analysis is Total Gross Marketing Margin (TGMM). This is the difference between producers or frames prices and price paid by final or end consumer.

TGMM is given as:

TGMM= Consumer price- Farmer's price

Marketing margin at each stage computed as the difference between purchasing prices and selling prices in that particular link. The formula is:

$$GMM_i = \frac{SPi - PPi}{TGMM} * 100$$

i = 1,2,3,4 1=farmers, 2=traders, 3=processors, 4=retailer

PP_i=purchasing prices at i^{th} link

SP_i=selling price at i^{th} link

TGMM= total gross marketing margin

The other similar concept is profit margin that deducts operating expense from marketing margin. The formula is:

$$TGPM = TGMM - TOE$$

TGPM= total gross profit margin

TGMM= total gross marketing margin

TOE= total operating expense

$$GPM_i = \frac{GMMi - OEi}{TGPM} * 100$$

GPM_i= gross profit margin at i^{th} link

GMM_i= Gross marketing margin at i^{th} link

OE_i=operating expense at i^{th} link

TGPM=total gross profit margin

4.1.2 Data sources for qualitative analysis

Generally we our data source is form the survey conducted on 120 farmers in Arise Zone. Bu to fill the gap we make use of Annual report/balance sheet; interview with CEO or finance officer. To identify CSF we undertook CSF analysis as it is outlined in the previous section and for clear elucidation we will plot these responses on a radar chart.
The data is obtained again form our survey and to triangulate or cross check results interviews is made with key respondents, both amongst buyers and suppliers. And finally the data to investigate the governance in the value chain is obtained form our survey.

4.2. Quantitative analysis

Our quantitative analysis which is the core of this paper mainly focuses on the distributional aspect of the value chain. Here first we will set out the conceptual frame work and then we will proceed to specification and estimation of the model and finally we will discuss how to test for miss-specification.

Specifying functional form

In the theoretical literature part we have identified three variable as a determinants of farmers' share in the value chain here we will specify the functional These are; Rents; Value added in each stage and Rate of profit.

$Farmshare_{ij}=F(R_{ij}, \Pi_{ij}, V_{ij})$ where

$Farmshare_i$- farmer share of income out of the retailer value

for i = 1, ..5 R_{ij}- Rent sustained by the j^{th} agent in i^{th} link in the chain

Π_{ij}-Profitability of the j^{th} agent in i^{th} link in the value chain(***protocapital)***

V_{ij}- Value added of the j^{th} agent in i^{th} link in the chain ***(valuetocost)***

Dependent variable is farmer share out of the retailer value of wheat ***(Farmshare)***

To compute ***(Farmshare)*** we will use the following formula

Retail price of processed wheat= i^{th} price of wheat + gross margin in the chain

$$P_r = P_i + \theta$$

With in this structure, the i^{th} value share is P_i / Pr

$$Farmshare_{ij} = P_i / Pr$$

Independent variables are

- rate of profit is computed using total profit divided by total value of capital ***(protocapital)***
- Value added is computed by dividing total value added[7] by total material input cost ***(valuetocost)***

Infrastructural and financial rent entered into our model through dummy variables

- Infrastructural rents means better access to high quality infrastructural inputs such as telecommunications transportation
- Financial rent in our context means access to credit both in cash and in kind.

We will have three levels for each variable. These are poor, medium and good. In other words we have three variables that will enter in to our model for financial rent as good, medium and poor financial access and another three for infrastructural rent -good, medium and poor access to infrastructural facilities.

We have two variables that will have positive effect on farmers share and are incorporated as dummy variables. Including both these variables will create high multi-collinearty to our model. In addition to this simply using these variables makes it difficult to interpret the constant term in our equation. So we use interaction dummy. We now have nine instead of six variables for these two variables; infrastructural and financial rent. These are:

(INFPFINP) for poor financial access and infrastructural facility
(INFPFINM) for poor financial access and medium infrastructural facility
(INFPFING) for poor financial access and good infrastructural facility
(INFMFINP) for medium financial access and poor infrastructural facility
(INFMFINM) for medium financial access and medium infrastructural facility
(INFMFING) for medium financial access and good infrastructural facility
(INFGFINP) for good financial access and poor infrastructural facility

[7] We have defined value add in this paper (pp 12 L9) as the value of output at market price (factory gate price minus the value of all intermediate inputs purchased from other firms.

(INFGFINM) for good financial access and medium infrastructural facility

(INFGFING) for good financial access and good infrastructural facility

To avoid dummy variable trap we make INFPFINP as a base variables. That is it will not be included it in our model.

We have defined our variables and see how to measure them. The next task would be to specify our model. To my knowledge there is no work done using these variables as a determinant factors of farmers' share in the value chain. . Moreover in the literature review both theoretical and empirical part I see no obvious functional form. To this effect I will adopt a functional form that best represent the data.

So to begin with I have used a linear functional form for simplicity.

The general form take is $Farmshare_{ij}=F(R_{ij}, \Pi_{ij}, V_{ij})$ and the specific functional form has a the form of

$$Farmshare_i = \alpha_0 + \beta_1 INFPFINM + \beta_2 INFPFING + \beta_3 INFMFINP + \beta_4 INFMFINM + \beta_5 INFMFING + \beta_6 INFGFINP + \beta_7 INFGFINM + \beta_8 INFGFING + \beta_9 PROTOCAPITA + \beta_{10} VALUETOCOST + B_{11} SHOCK + \varepsilon_i$$

That is we assume that share of farmers ***Farmshare*** is linearly dependent on economic rent R_{ij} profitability Π_{ij} and value added at farm level. , V_{ij}

Table 2: *Variable description and expected signs*

Variables	Coeffic ient	Description	Expected Effect
INFPFINP	not included	takes 1 if both infrastructure facility and financial access is poor otherwise it takes 0	-
INFPFINM	B_1	takes 1 if infrastructure facility is poor and financial access is medium otherwise it takes 0	?
INFPFING	B_2	takes 1 if both infrastructure facility is poor and financial access is good otherwise it takes 0	?
INFMFINP	B_3	takes 1 if both infrastructure facility is medium and financial access is poor otherwise it takes 0	?
INFMFINM	B_4	takes 1 if both infrastructure facility and financial access is medium otherwise it takes 0	+
INFMFING	B_5	takes 1 if infrastructure facility is medium and financial access is good otherwise it takes 0	+
INFGFINP	B_6	takes 1 if infrastructure facility is good and financial access is poor otherwise it takes0	+
INFGFINM	B_7	takes 1 if infrastructure facility is good and financial access is medium otherwise it takes0	+
INFGFING	B_8	takes 1 if both infrastructure facility and financial access is good otherwise it takes 0	+
PROTOCAPITA	B_9	rate of profit is computed using total profit divided by total value of capital	+
VALUETOCOST	B_{10}	Value added is computed by dividing total value added by total material input cost	+
SHOKE	B_{11}	Shock term	-
	α_0	Constant term	
	ε_i	Normally distributed Error term	

Good financial rents reflect a combination of low levels of bureaucracy, low interest rates, access to venture capital and regulations on security. A link with a good access to financial resource takes greater share that those that have no or poor access. That is there is a direct positive relationship between financial access and share of income in the value chain. Infrastructural rents reflect the relative effectiveness of communications. So good infrastructural facility are expected to raise farmers share out since they would have access to different local and regional market

Since we don't know a priori the functional form there is a possibility of miss-specifying the model. So to detect if there is any functional miss-specification we have to test our tentative model. There are some tests that have been proposed to detect general functional form misspecification. (Ramsey's, 1969) regression specification error test (RESET) is the one. The idea behind RESET is fairly simple. If the original model satisfies the classical Gauss- Markov assumption, then no nonlinear functions of the independent variables should be significant when added to equation. RESET adds polynomials in the OLS fitted values to equation to detect general kinds of functional form miss-specification.

But certain kinds of neglected nonlinearities will not be picked up by adding quadratic terms. Obtaining tests for other kinds of functional form misspecification—for example, trying to decide whether an independent variable should appear in level or logarithmic form—takes us outside the realm of classical hypothesis testing. To test this first thing is to construct a comprehensive model that contains each model as a special case and then to test the restrictions that led to each of the models.

In this section we have set the conceptual frame work and the econometrics model to estimate the direction and the magnitude of different factors that affect the distributional outcome in the value chain. After this what we need is the data. The next section will discuss how I collect the primary data.

4.3. Sampling and Methods of data collection

To investigate the distributional issue we will need data on profits which could be obtained from the financial reports of the enterprises, government publication
Generally primary sources (such as in-depth interviews, questionnaire surveys) and secondary sources (such as official statistics, previous research papers, and press clippings) are our main data sources.

Since our investigation manly deals with wheat our sampling area will be concentrated on wheat growing area. As per the information of most key respondent in major food processing industry indicated and as statistical records shows major wheat growing region are Arise and Bale Zone. Since Aris is located near to Addis we took it as our sampling zone **Arsi** (or **Arusi** or Arssi) is one of the 12 zones of the Oromia Region in Ethiopia. In Aris zone there are 20 districts (woredas) among which Hitosa and Tiyo are know to be wheat producing regions. **Hitosa** is one of the 180 woredas in the Oromia Region of Ethiopia. Part of the Arsi Zone, Hitosa is bordered on the south by Digeluna Tijo, on the southwest by Tiyo, on the west by Ziway Dugda, on the northwest by the Misraq Shewa Zone, on the northeast by Dodotana Sire, and on the east by Tena. The administrative center of the woreda is Iteya. Since these two woredas are know as wheat growing district in the region our sampling area further narrow to this two (districts) woredas. I did not consider all farm households in Hitosa and Tiyo districts (woredas) since my resources would not allow that. What I did was among these districts I took one kebele. Odagilla from Hitosa woredas and Gonde form Tiyo wordas because these two kebeles can easily be reached both transportation wise and these kebeles are major wheat growing kebeles in their respective woreda. In side these two kebeles there are 460 households in Odagilla kebele and 600 house holds in Gonde kebele. As a result I decide the sample size to be 60 from Odagilla kebele and 60 from Gonde kebele. With regards to the sample size there was a project that investigates the impact of SG 2000. For their impact assessment they took 60 households form Odagilla kebele and 60 from Conde kebele by random sampling

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As for the questionnaire it was revised now and then as I get new information form the farmers. Interview is administered in 3 stages. First the questionnaire is divided into three parts. In the first stages all the 120 farmers were asked the first part of the questionnaire in the second stage all farms were asked the second part of the questioner and finally in stage three all the framers were asked the last part of the questionnaire. The reason for adopting this kind of strategy is simply to get the data right. In other words it is widely believed that the quality of a research analysis is as good as its data. And I believe asking the entire question in one go will compromise the quality of our data.

There were few problems I encountered during data collection. The first one was the timing. Data was collected in June and July. At this time farmers become very busy preparing the land as a result they could not spare any time to answer my questionnaires. In addition to this there were some problem between farmer especially in Odagilla kebele and input provider. The thing is that, in the past farmers used to take fertilizer by credit but this year they were asked to pay the full amount of fertilizer. Due to this fact, farmers decide to saw their seed without using any fertilizer and they become hostile to any one that approaches them. These two were the major set back to our plan as a result we are forced to push our time frame of data collection.

5. Wheat market in Ethiopia

Before embarking into our data analysis task we have to have background information of grain market and especially wheat market in Ethiopia. In what follow we will see the characteristics of grain market in. Especially we will see the market feature before the reform and also how the reform affects the working of the market. In section 4.1 we will present grain market and in section 4.2 we will narrow our focus to wheat market in Ethiopia.

5.1 Grain market

In the five year development plan the government of Ethiopian view rural and agricultural as a focal point of development. Because first since 85% of the country's population is located in rural areas and engaged in agriculture, mobilizing the country's resources for fast development requires working with the rural population to improve agricultural productivity.

Second, a broad-based development strategy which shares the benefits of development among many is necessary to maintain peace and ongoing support for the development process. Third, a focus on increasing rural and agricultural productivity is the key to finding a lasting solution to Ethiopia's chronic famine problem.

The plan also recognizes the important role that agricultural markets play in motivating farmers to increase their agricultural production. Farmers will have little incentive to increase production if there is no marketing system through which they can sell their products, and buy agricultural inputs and consumption items at fair prices. In other words Sustained improvements in productivity growth and household access to food in Ethiopia require the development of more reliable and efficient food markets that (a) create incentives to minimize real costs at various stages in the food system; and (b) offer incentives for rural households to shift from a subsistence-oriented pattern of production and consumption to more productive systems based on specialization and gains from exchange. An important feature of grain markets in Ethiopia is the presence, at the national

level, of a large number of wholesalers, retailers, farmer-traders, truckers and commission agents with variable purchasing, storage, transporting capacities and market shares. Not all these participants are equally active in all markets, however. In smaller markets the number of traders may be quite limited, with negative implications for competitiveness. There is also no clear cut specialization in grain trading among the participants in the market (Kuawab, 1994).

Since our focus is on grain market in Ethiopia in general and wheat market in particular we will discuss how it evolves through time and in the face of different policy adopted by different regime

Background information of grain market in Ethiopia

In the last regime (1976-1990) grain trade was highly controlled by the government. There was this enterprise Agricultural Marketing Corporation (AMC) which was a night mare for small framers as it forces them to sell their hard earned agricultural produce at official price that were set below market price and even in some case below producers in 199 cost)Eleni 1999). As economic theory suggests this practice distorts market. In addition, it severely restricts inter-regional movement of grain by the private sector (Lirenso 1993).

So in 1990 in the face of grain market distortion and pressure from external institution, a market reform was enacted (Fisseha 1994). This reform even forces this monster corporation (AMC) to enter the free market and compete with private organization. Generally the market reform experienced in Ethiopia in the period since 1990 is considered a relatively consistent and internally driven process, generally approved by the international donor community (Jayne, Negassa, and Myers 1998). After the reform one would expect all the fruits of free market like reduce cost, risk marketing, reduced institutional barriers, increase efficiency and production. A study by Jayne, Negassa, and Myers (1998) evaluates the impact of reform on inflation-adjusted grain prices and price spreads among major markets using monthly price data on eight markets over nine years (1987 to 1996). There results suggest that that market reform has led to a reduction in price spreads (the difference in prices between surplus and deficit areas). The decline in spreads was particularly large for *teff*, on which the former AMC exercised the greatest restrictions. Econometric analysis conducted holding rainfall, seasonality, and other exogenous factors constant reveals that the decline in price spreads was associated with liberalization in 16 out 19 cases and was

statistically significant in 10 cases (Negassa and Jayne 1997). One possible explanation for the decline in market spreading lower transaction costs resulting from the elimination of smuggling and bribery (Franzel, Colburn, and Degu ,1989) which was prevalent before the reform as the policy which was implemented then lent itself to create rent seeking behavior by appointed officials.

Another impact of the reform was an increase in market integration i.e. the extent to which price changes in one market are associated with price changes in other markets (Eleni, 1999) (Negassa and Jayne, 1997) using simple correlation coefficients between wholesale prices across markets, found that changes in wholesale prices were transmitted more rapidly and more fully after liberalization for 17 out of 24 market pairs observed. Co-integration analysis was undertaken by (Dercon, 1995) using six years of deflated monthly teff prices for 11 markets to test for the effect of liberalization on short-term and long-term integration. Using the price in Addis Ababa as the reference price, the test results show that an increased number of markets became linked in the short run to the Addis Ababa market after liberalization After discussing how the grain market evolves i.e. its characteristics before the reform, the reform itself and how it affects the grain market let us spend a few ink on the present situation of grain market in Ethiopia.

The market for grain is the largest of all markets in Ethiopia in terms of the volume of output handled the number of producers, consumers and other market participants involved, and the vastness of the geographical area of operation.

Grain production in Ethiopia is almost entirely based on rain-fed agriculture and is characterized by a dominant harvest *(meher)* in November and December and a secondary harvest *(belg)* in April and May. Production is carried out by small-scale farmers with limited agricultural technology and low yields and by a small percentage of state farms.

To get the feeling of what proportion marketed out of total production lest see what the figure says. According to the Central Statistical Authority's *meher* and *belg* production estimates, in 1995/96, which was a relatively good crop year Of the total produced quantity, the proportion of output marketed by farmers and state farms was 27 percent and 80 percent, respectively (Gebremeskel, Jayne, and Shaffer 1998). The difference of marketed surplus is not limited to state and small farmers but there are considerable differences

among crops. A lower proportion of total production of cereals that is marketed (26 percent), compared to pulses (37 percent) and oilseeds (71 percent). At the same time, because cereals production is the bulk of total grain production, the total marketed quantity of cereals represents 81 percent of the total marketed quantity of grains. Among the cereals, maize has the highest share of total marketed surplus (25 percent), followed by teff (21 percent), and wheat (14 percent) (Eleni, 1999).

The second feature of grain market is its seasonality in the period of November through December which is a high harvest season the volume of transaction is at its pick and prices are at their lowest given the large supply that floods the market as farmers seek to sell in order to meet their financial obligation. Analogously, the main grain-purchasing period for traders is between January and March, during which traders purchase 51 percent of their annual volume. To depict the seasonality patter we adopt the following figure from Eline (Eline, 1999)

In normal production year prices exhibit a typical seasonal pattern in which, as the new harvest starts to come to the market, prices decline from September, reaching a trough in the period from January to April, when the market is flooded. Although negatively affected by the supplies from the second harvest in April, prices rise in May through August with the approach of the rainy season.

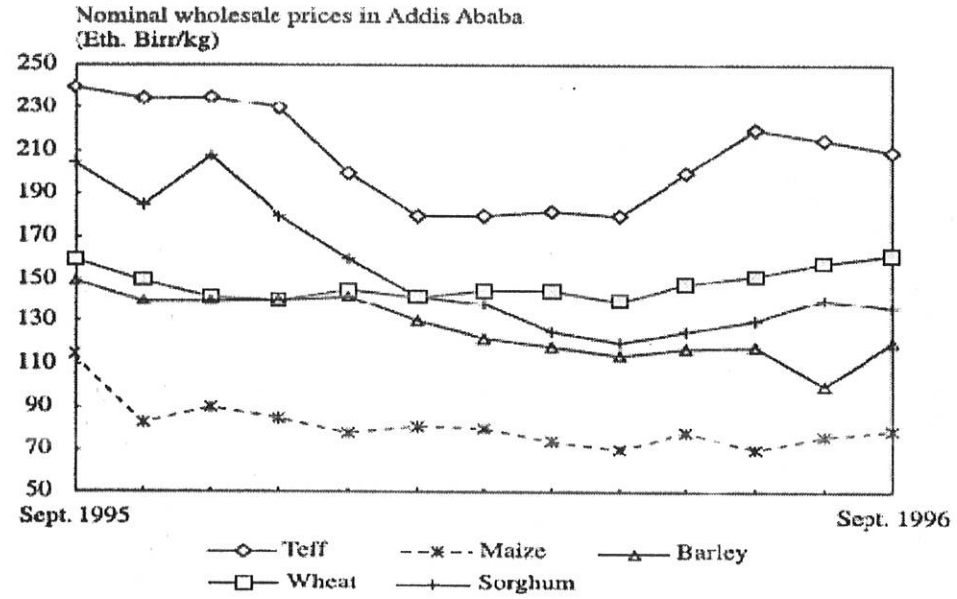


Figure 3: *Seasonality of grain price in Ethiopia*

The third features of grain market is that farmers bear the full price risk in marketing their output as there is no forward and interlinked contract (Gebremeskel, Jayne, and Shaffer 1998) which theoretically are used to spread the risk of price variability among economic agents.

A market concentration study of grain market in Ethiopian is done using four firm concentration Raton CR4 following (Kohls and Uhl, 1985) (Gebremeskel, Jayne, and Shaffer, 1998). This was computed sing annual volume of purchase both at national and local market levels. The result reveals that about 90% of the merchants account for 57% of the volume of grain purchased nationally by wholesalers. The largest 10% of wholesalers account for about 43% of the grain marketed nationally at the wholesale level. The bottom 40% has an insignificant share of less than 10%. The computed Gini coefficient is about 0.56, indicating a high degree of inequality in terms of volume annually handled. This suggests that few traders I national market control a sufficiently large share of marketed volume. This study found that Market concentration in Addis Ababa, the dominant market in the country, was found to be very low for all cereals which will not be a surprise when we take the number of grain traders in the market.

The other characteristic of grain market is there are barriers to entry. As we have said earlier following market reform in 1990 institutional barriers to grain trade, such as the enforcement of the quota system, price control, preferential treatment given to state enterprises and cooperatives in the allocation of bank credit, limitations imposed on capital ceilings for wholesale and retail trade, restrictions on the number of merchants in a particular market are reduced and some are even abolished. But there remain other barriers like large amount of start-up capital for most potential entrants. A study by (Gebremeskel, Jayne, and Shaffer, 1998) roughly calculates capital needed to fiancé minimum scale of operation. Taking the average annual volume of purchase by the lowest quartile, i.e., 1,014 quintals as the minimum scale of operation, an average procurement price of Birr 150 per quintal, and based on the assumption that this volume is in 2 discrete purchase/sale cycles per year, the minimum financial outlay needed for purchasing, storing and transporting grain would be about Birr 75,000 (roughly US$11,538).

Another feature of Ethiopian grain market is its spatial distribution and the resulting implication on food security. The most important grains in terms of consumption are *teff*, wheat, and maize, which together constitute roughly two-thirds of caloric intake in Ethiopia (Lirenso 1993). Monthly grain requirement of major urban center inculcate that Addis Ababa central market takes the lion share. Generally the claim that total production of grain is inadequate to meet the demand is taken for granted by the public and by some domestic scholars. According to national research institution (NRI) national production met only 65% of the per capita requirement and there is a grain deficit o up to one million ton. Some studies, however, does not agree with this rather common belief. According to (Clay, Molla, and Habtewold, 1998), sufficient food is available, before food aid imports, to meet the nutritional needs of the entire population. The study indicates that the geographical dispersion of production and the unevenness of trade result in food-secure households' consuming nearly four times more food on average than food-deficit households (with a Gini ratio of food availability of 0.44) and a large segment of the population, the food-deficit population, lacking access to minimum levels of nutrition. This means that even though there is enough production to feed some 75 million people due to the structure and spatial distribution of grain market in the country some part of the population does not have access to minimum calorie requirement. In other word the country is food insecure not only because there is no enough food but also the grain markets are not in a position to distribute the already produced product efficiently. This inefficiency is further aggravated by the inadequacy of transportation facility (Lirenso 1993), weak storage infrastructure (Dadi, Negassa, and Franzel 1992), incomplete or no information about price prevail even in nearby markets (Amha, 1994); (Dadi, Negassa, and Franzel 1992).

5.2 Wheat market

Wheat has been and continues to be one of the most important cereal crops in Ethiopia in terms of both area under cultivation and production. The demand for wheat as a staple food grain is increasing, especially in the urban areas. At present, consumer demand for wheat far exceeds domestic production and wheat imports are costing the country million of dollars in foreign exchange. Wheat contributes significantly to the calorie and protein intake. It is consumed in several different forms such as leavened bread, pancakes,

macaroni and spaghetti, biscuits and pastries. The most common of the Ethiopian recipes are *dabo* (Ethiopian home-made bread), *hambasha* (home make bread from northern Ethiopia), *kitta* (unleavened bread), *injera* (thin bread part of the nation dish and prepared mainly from teff), *nifro* (boiled whole grain), *kollo* (rostred whole grain), *dabo-kollo* (ground and seasoned dough, shaped and deep fried), and *kiniche*(crushed kernel, cooked with milk or water and mixed with spiced butter)

The important production area are Arsi., *Bale, Shewa, Gojam, Gonder, Tigray, Wole*, and highlands of *Harerge* and *Sidamo* region. Durum wheat *(triticum durum)* is by far the most predominant species and occupies 60-70 % of the total area under cultivation (Tesemma and Mohammed, 1982). In this connection, even though a large part of the wheat produced in Ethiopia is durum wheat or macaroni wheat most of the spaghetti and macaroni factories have been depending on imported durum wheat for no other reason than misinformation and misconception regarding the quality of local durum wheat. As long as farmers are made aware of the market demand for durum wheat, they are capable of producing the required quantities of durum wheat. After all, Ethiopia is considered as a major center of genetic diversity of durum wheat (Tessema, 2001)

We have said above that among the marketed cereals wheat takes 14 percent only preceded by two other cereals maize (25 percent), and teff (21 percent), as a result we can safely extrapolate the characteristics of grain market into wheat market. Since what we have discussed about the grain market is nothing but the characteristics of major marketed grain among which wheat is the third on in terms of percentage share of the marketed grain.

Ordinarily, factory products are supplied to the market following the regular marketing chain starting from the factory gates and ending at consumer's homes. Within this supply chain, wholesalers and retailers serve as intermediaries between the factory and the shop and between the shop and the customer's home, respectively. Nearly every food processing industry in Ethiopia follows this supply chain. However, there are occasions when some factories circumvent the chain by directly supplying their products from their own retail shops or directly to consumer.

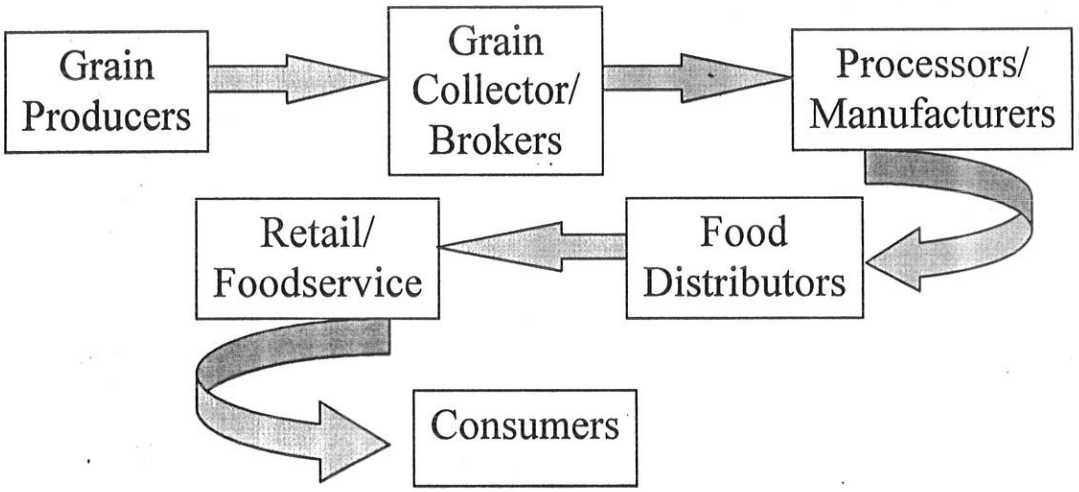


Figure 4: *Marketing channel of wheat in Ethiopia*
Source: (Johnson, 2005)

Farmers normally bring their marketable grain to markets that are 5 to 20 km away from their villages by carrying it or using pack animals. Because of their large number compared to the wholesalers, lack of direct access to other markets or alternative channels and absence of any market extension service, farmers' bargaining power is generally weak.

Even though the wholesale merchants collect grain from different places they do not provide advance payment, credit, or any incentive other than a price to farmers as a means of encouraging them to bring the grain to their stores. Traders indicated that the price at which they buy grain at the local markets is determined by deducting miscellaneous costs and a net profit margin from the prevailing wholesale price in Addis Ababa which they get from the brokers that could be changed by the time they manage to bring the grain at Addis. As a results of these risks, wholesalers may incorporate an added "risk premium" into their marketing margins

On the sales side, the wholesale merchants' strategy is mainly focused on the terminal markets and deficit areas of the country rather than on the smaller local markets. The brokers generally do not compete aggressively for regional wholesalers' business and most of the regional traders are loyal to their respective "client" broker. This situation indicates generally long-term relationships between brokers and regional traders based on trust.

Most wholesalers (about 66%) carry out their local grain sales by directly selling to clients, but grain sales in the terminal markets and other deficit areas are mostly carried out using the services of commission agents and sometimes by directly selling to buyers. In the Addis Ababa terminal market in particular, regional wholesalers have difficulty selling grain without the assistance of the big brokers.

6. Result and Discussion

6.1 Descriptive statistics

The objective of the paper was to analysis the value chain of wheat by giving special emphasis on the distributional issue. That is the paper will investigate what determines the share of farmer in the wheat value chain. To this end questionnaire were designed to capture both the value chain process of wheat and what determines the share of farmers in the value chain.

6.1.2 Wheat value chain map

While analyzing our data we make use of different kinds of chain map that show the flow of physical good and value addition process. Mapping a chain means giving a visual representation of the connections between actors. In its simplest form it is a flow diagram. So we start with the following value chain map. The study identifies that the wheat value chains in *Aris* zone have five links; input providers, producers; local assembles that includes traders and cooperatives, processors, wholesalers and finally retailers.

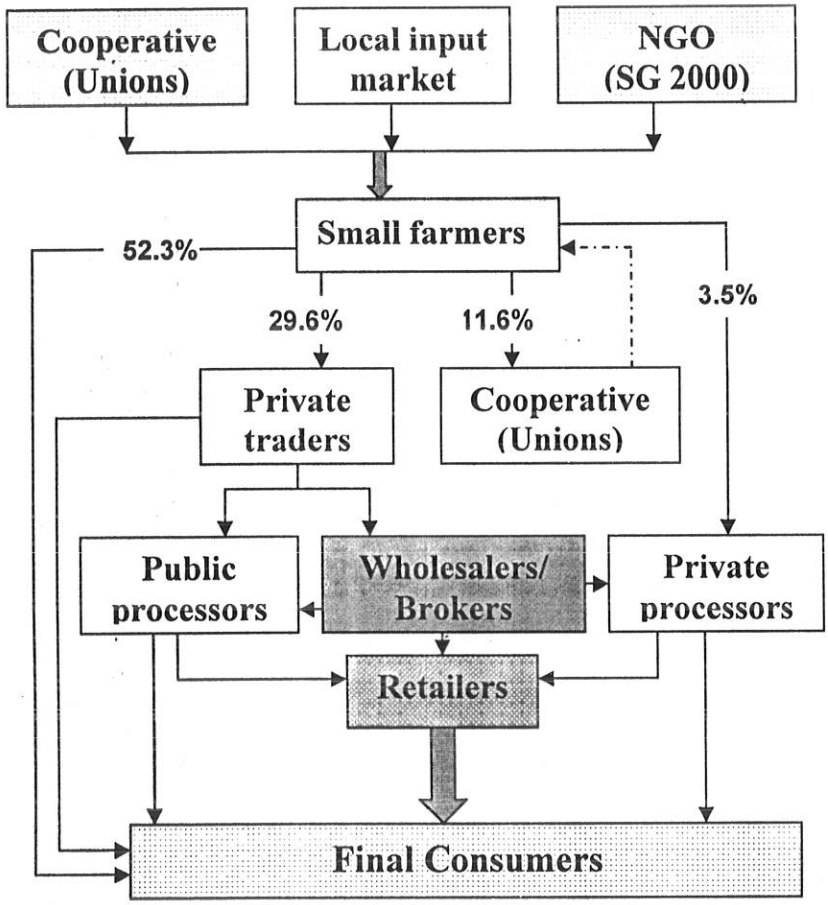


Figure 5: *Wheat value chain*
Note: The above figure add up to 97% the total marketable surplus the remain 3% are paid to fulfill other social obligations like 'iddir' and 'iqub'

As the above map shows farmers that grow wheat especially small farmers get their input supply mainly form cooperatives (Union), local input market and from non-government organization (NGOs). These input providers provide farmers with improved seeds, different kinds of pesticides, herbicides, fertilizers and some farm equipment. By making use of these farm input farmers produces wheat on their plot of land. When the wheat is ready for sell the farmers appropriate in the following manner.

Generally grain market in Ethiopia is structured so that grain moves from producers to rural assemblers then through central market brokers to processors and then to retailers and finally to consumers.

Farmers transport grains to the nearest regional market and they sell directly to wholesalers (Lirenso, 1993). Farmer also sells small quantities of grain to rural assemblers who assemble grain from a large number of farmers and transport it to the processors. Farmers also sell grain directly to retailers and final consumers.

Assemblers, mainly farmer-traders, buy grain from farmer in rural market for the purpose of reselling it to consumers wholesalers or processor. Regional wholesalers collect from farmers and assemblers and supply to public processors, to retailers and to final consumers.

Grain brokers are typically located in Addis Ababa. This broker acknowledges receipt of the grain from the regional wholesalers, inspect its quality, determine its market clearing prices and proceed to sell it on behalf of their clients for a commission.

Retailers purchase directly from farmers, from processors or from wholesalers and sell it to final consumers

Finally consumers purchase the raw wheat directly from farmers, assemblers, regional trade. They also buy the wheat flour or wheat product directly from processors or retailers.

To see what percentage of total production in 1999/2000 P.Y goes to different buyers or in other words the appropriations of wheat product by farmers we make use of the following pie-chart constructed from the survey.

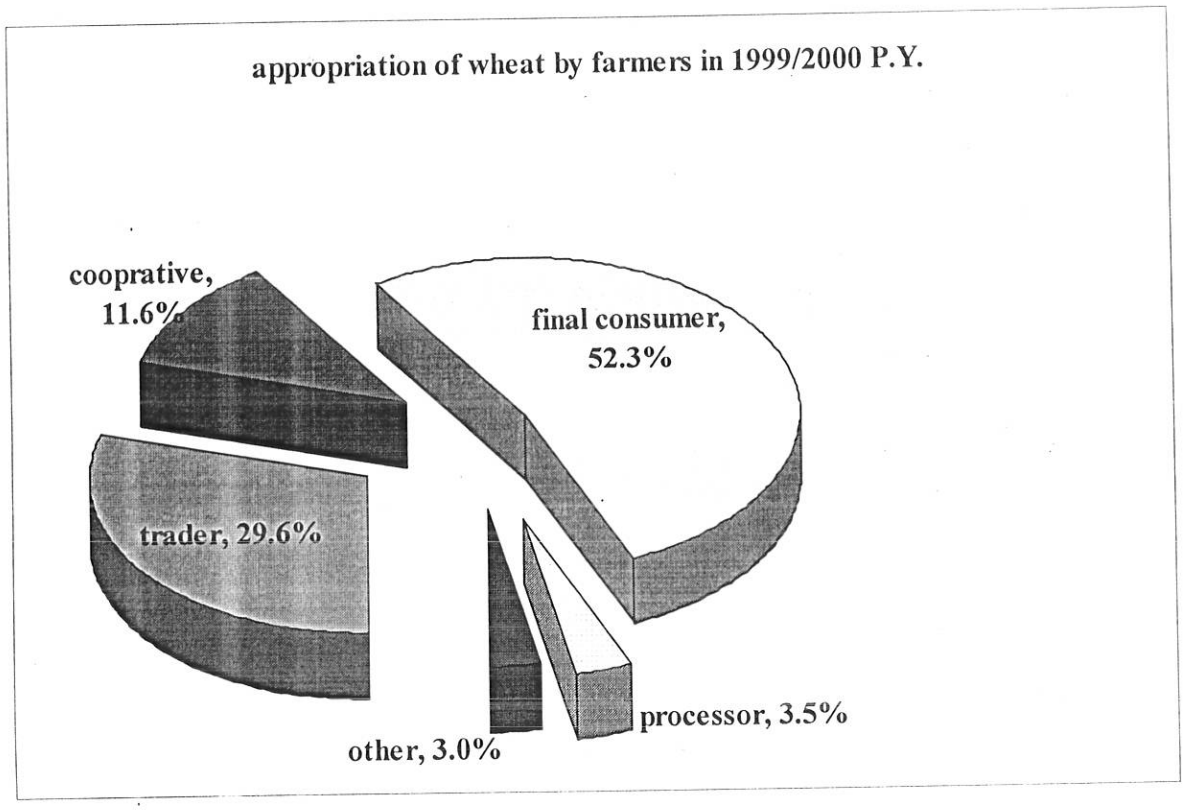


Figure 6: *Appropriation of wheat*

As the above pie-diagram show almost half of what is produced is sold for final consumption with out passing through any value adding process. The next large proportion goes to local trader or collector which they will again sell to processors. In the diagram above a proportion that goes to final consumer includes also what the farmers retain out of their product for their own consumption because selling to other final consumer or consumption by the farmers themselves has no difference it just mean that almost more that half of what the framer produced is consumed directly with out any value added to the wheat by the framers themselves or other third party. In fact while consuming the wheat the household is not going to consumer the raw wheat they convert the raw wheat into a more edible form.

The next large proportion will go to local traders those that assemble small quantities of wheat and resell it to processors or to final consumers. Here the title local traders include some capable farmers that are farmers and also collectors at the same time. The framers distributed the rest 20% (1-.523-.296) to cooperatives, directly to processors and other.

In our specific wheat value chain cooperatives or unions play two roles. In one side they are input provides. They provide improved seed to the farmers and in the other side the farmers sell their product to them.. This cooperative provide the improved seed to the farmers and make a contract with the farmers that when the wheat is ready they will buy this improved wheat at a premium price usually ETB 50 more that its current market value. The whole aim of these cooperatives is to distribute the improved seed varieties to the maximum number of farmers possible.

As it can be seen clearly here farmers sell 10% of their product to this institution with out adding any value to the raw wheat. What farmers get is the ETB 50 premium and the difference between quantity of input and quantity of output. Here again there is a leverage point that is the farmers can gain more from his/her product.

Critical success factors

We have seen that farmers provide for two major markets for cooperatives and traders. So we need to see the critical success factor for these two markets.

Table 3 *Critical Success Factors (CSF) where farmers sell their product.*

Success factors	No of farmers who said Primary important				No of farmers who said Secondary important				No of farmers who said Not important			
	Traders		Cooperatives		Traders		Cooperatives		Traders		Cooperatives	
price	*7*	*5.8%*	-		*16*	*13.3%*	-		*97*	*80.8%*	-	
time	*24*	*20%*	*33*	*27.5%*	*87*	*72.5%*	*83*	*69.2%*	*9*	*7.5%*	*4*	*3.3%*
quality	*89*	*74.2%*	*98*	*81.7%*	*25*	*20.8%*	*19*	*15.8%*	*6*	*5%*	*3*	*2.5%*

Source: Compiled from the field survey result

The table shows that almost three forth of our respondents regard quality as primary important requirement they should fulfill to sell for traders and cooperatives. Next to quality time take the second more important factor in these two markets. We can see especially for cooperatives that price does not matter because there is a pre agreed prices that the cooperatives will buy from the farmers that succeed in achieving the quality requirements. At the time when this survey was conducted the agreed price was ETB 50 above the market price.

As the survey shows the first and the most important thing the farmers should full fill or what these two markets ask is quality next to quality is time of delivery. Surprisingly price

takes only insignificant place as there is untapped demand. Especially the traders given that the farmers meet the quality requirement will take the wheat with out giving much attention to its price.

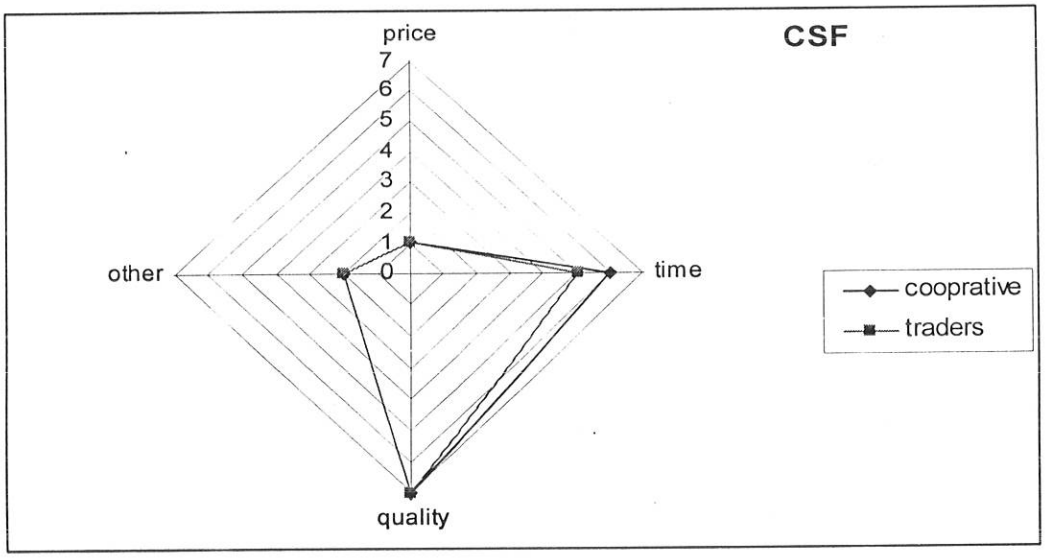


Figure 7: *Critical success factor CSF*

When we compare what these market demand of their suppliers to full fill and what the farmers consider as the critical success factor we see there is conformity. That is with regards there seem to be no information gap. The farmers know what their suppliers demand of them.

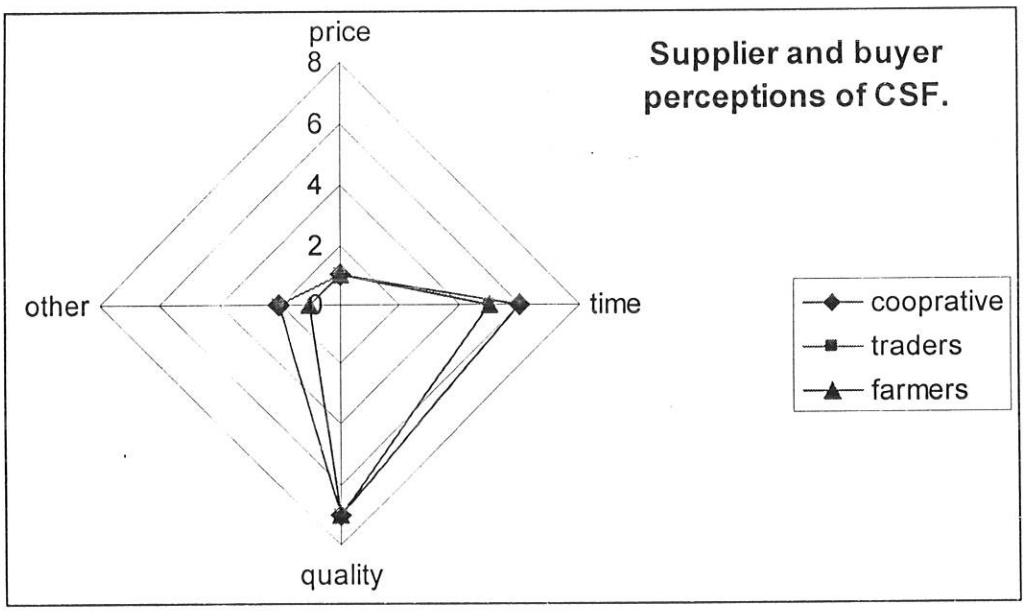


Figure 8: *Perception of CSF by different participant in the wheat value chain*

Until now first we defined point of entry and from that we map backward to input provides and forward to buyers. We have also identified key buyers that are traders and cooperative and saw the critical success factor of these markets.

Relationship of buyers and sellers

What will follow will be to analysis the relationship of buyers and sellers. What relationship is there between farmers and cooperative and farmers and traders? Our survey shows that the relationship between farmers and cooperative is more formal than farms with traders.

The relationship between framers and cooperative is not only in selling of wheat. The thing is that first this cooperative provides the farmers with improved seed varieties and train farmers new and relatively efficient agricultural technique so that farmers will sell them the product they produce using these input regularly especially at time of harvest at a premium price. Since there is information intensive and reciprocity dependent relation between firms and among themselves and also buyers get what they want this type of relationship is what (McCormick and Schmitz, 2001) call balanced network

The relationship of farmers with traders is mostly informal. In fact more than 50% of the respondents said that they do not stick to a single trader or assembler rather they can easily find another. Unlike to the cooperatives farmers do not sell their product to traders regularly. More that 80% of the respondent said that they sell to trader when they need cash and is not always at the harvest time.

After saying this much about the nature of relationship between buyers and seller let us turn our attention to the structure of governance in the value chain.

Governance in wheat value chain

As we stated in the methodology part we try to analysis the structure of governance in light of who make the rule of the game who monitor those rules and who will inflict punishments on those who fail to follow them. In our survey the role of legislative governance is played by cooperative and traders in other words by buyers.

Table 4: *Different parts of governance*

Parts of Governance	*Number of farmers who answered*			
	Producers	*Buyers*	*Gov't*	*No one*
Legislative role (Who set rules)	6	97	-	17
Judicial role (Who monitors)	8	91	-	21
Executive role (Who punish)	18	83	-	19

They set the standard the wheat should have. These standards could include both pre-harvest and post-harvest activities like the framers should use improved seed, harvesting should be done on time and trashing should be performed appropriately. In value chain making rule does not grantee its implementation. So there is a need for effective sanction. This sanction could be positive or negative and could be from with in the chain of outside the chain. So what we are after is for a given requirement or rule by legislative governance a positive or a negative sanction if there is any in the value chain.

In our case study unlike other manufactured products there is no independent body that monitor whether this standards are met. So the buyers themselves monitor and if they found any one violating or not full filling the established standard they will significantly decrease the price of his/her wheat and even take a more drastic action and make the one out of the market. The sanction is not limited to this of course. Since there strong informal relationship between traders and farmers there is also a social sanction like stigmatizing from social gathering etc which in some case is more severing than economic sanction. Since these social sanctions also involve producers they took same role as executive branch of the chain governance.

So we see that all the function of governance that we try to analyze i.e. different functions associated with the legislative governance, executive governance and judicial governance are performed by major buyers. Since framers do not export their product there is no international standard or requirements they should full fill.

We saw that most function of governing the chain in done by buyer. This should not come as a surprise since buyers are in a better financial position compared to small farmers. The reason is that buyers having more buying power at the same time have more opportunities to enforce compliance with their wishes. This result is in line with John Humphrey when he side governance is associated with buyer power. (Humphrey, 2005),

According to (Kaplinsky and Morris, 2000) one of the most important issues to be addressed in the research on value chains and governance is the extent to which producers in the chain are helped to achieve these rules. We have asked the farmers if they get any support from their buyers that may help them to attain the standards. Their response is presented in the table below

Table 5: *Relationship of farmer with their buyers*

	Improved Seed	Farming Technique	Facilitating Marketing	Renting Farm Machinery
From traders	*36*	*56*	*73*	*53*
cooperatives	*39*	*41*	*27*	-
NGOs	*71*	*69*		-

The result indicates that most farmers get support like improved seeds and better agricultural technology that help them to reach the requirements their buyers ask of them. In fact concerning improved seed and farming technique NGOs are doing better in than the main chain participant traders and cooperatives.

The selling activity

When we see how often farmers sell their product we will come to the realization that they are making their decision based on the expected prices of grain.

Table 6: *When farmers sell their product*

Time of sell	**Number of farmers**	**% to total sample**
At the time of harvest	38	31.7%
When spending is needed	10	8.3%
regularly	-	-
When prices are good	69	57.5%
other	3	2.5%
		100%

Our data indicates that more than 30% farmers sell their product right after harvest 8.3% sell when there is a need for cash to fulfill their financial obligation and to cover their day to day activity but the rest 57.5% wait until they get favorable prices for their product. These is because the fact that price varies because of short term supply rigidities, i.e. in a period of less than 12 months, and producers cannot respond to high prices by increasing supply especially for agricultural commodities like grains, which is cropped mainly once in a year. This short term rigidity implies that price of grain fall after harvest and rise late after harvest until the next crop is supplied. Since farmers in our survey are market oriented participant they take advantage of rising prices by storing the commodities and by thinly supplying the market until the next season.

It is important to see why one farmer sell right after harvest and the other one wait till he/she get favorable prices. The possible reason that suggests itself from the data is financial access that is access to credit. Those farmers that sell their product right after harvest have poor financial access both to cash and in kind to full fill their financial obligations. The negative effect of selling agricultural product emanate from two thing one at the time of harvest the supply that goes in to the market depress the market prices and those that sell at this time get a decreased prices. The other one is that when these farmers needs for to buy wheat for their own consumption it will be usually after harvest time passed. At this point the seasonal pattern dictate price to rise as there is a shortage of supply. As a result farmers face an increased price. In short they sell their product when price is low and buy when price is high.

Here we see a policy intervention point where government should create a favorable environment on which the rural credit market works more efficiently.

Farmers' flexibility

The other point we will raise will be how farmers react to a sudden and unexpected change on the demand of their product

Table 7 : *Farmer's reaction to unexpected chain*

Flexibility	React		Do not react	
	No	%	No	%
Increase in demand	33	27.5%	87	72.5%
Sudden order	11	9.2%	109	90.8%

The data indicate that more than 70% of framers in our sample do not react to an increased demand of their product. This is contrary to what standard theory suggest. Theory suggests that if there is demand in excess of supply price will go up and producers will be encouraged to increase their production. But in our case only price move upward and nothing happens on supply side. The possible reasons for this are the followings

Table 8: *Reason for not reacting*

	No enough capital	Not enough in storage	Not willing
Increasing demand	59	60	2

The two major reasons framers mention as to why they do not react to an increase in the demand of their product is shortage of capital especially land and not enough surplus production. That is more than what they need to cover their annual consumption expenditure on both agricultural and non-agricultural product. Framers like any rational economic agent want to reap the benefit of increase in the demand of their product and the resulting increase in the price of their product, the only thing that holds them up is that they are not in the position to hire more oxen and rent more land. The production capacity of most framers in our sample only covers their annual consumption of agricultural and non-agricultural product. So to full fill they need to hire additional oxen and rent more land which in the face of no easy access to credit market this is an impossible task for farmers

Margin analysis

We start our margin analysis from farmers or supplier, next come traders together with cooperative then processors and finally retailers

Suppliers' margin

A supplier margin is the portion of the price paid by the end consumer that belongs to the farmer as a producer.

Table 9: *Producer's margin*

Cost description	*Small Farmer/k.g.*	
Seed	**2.70**	
Direct labor cost	**0.30**	
Material Input cost	**0.29**	
Over head	**0.07**	
Transportation	**0.06**	
Marketing cost	**0.08**	
Total expense		**3.5**
Selling price		**3.6**
Marketing Margin	**0.9**	
% share of marking margin	**15.46%**	
Profit margin for small farmers	**0.1**	
% share of profit margin	**14.08%**	

Farmers are the initial link in the chain. They buy seed in cash or credit from input suppliers fertilizers from government body mostly in credit and other agrochemicals and combine all theses inputs to grow wheat which is feed in the value chain as a basic ingredient for the final product that is pasta, macaroni, biscuits, breads … When we see the cost structure for farmers labor cost constitutes almost more than 50% of operating expenses[8]. Next to that is material input cost. With in material input cost fertilizers expenses is the major one. It accounts about 75% of the total material input cost. Total expense on seed contributes a significant amount to the total expenditure that the farmers use for the production of wheat. The other point form this margin analysis is that transportation and marketing cost takes a little less than 20% of total operating expense. It implies that out of this cost some part of it can be transformed into income component just by improving the infrastructural facility and creating enabling marketing environment. Since then farmers will not spend as much as they do now. The other point where government and other concerned body should concentrate is on material input because

[8] Total expense minus purchasing price or in farmers case expenditure on seed

expenditure on labor and material input constitute almost three fourth of farmer's operating expense. So if there is a way that farmers could get these inputs especially fertilizers at a favorable (reduced) price what was their cost previously would be their income and they would be in a better position.

Traders and cooperative margin

Table 10 *Traders margin*

Cost description	*Traders per kg*		*Cooperatives per kg*	
Purchasing price	3.36		3.85	
Overhead cost	0.07		0.08	
Transportation	0.14		0.05	
Marketing cost	0.08			
Total expense		3.65		3.98
Selling price		3.73		3.98
Marketing margin	0.37		0.13	
% of marketing margin	6.36%			
Profit margin for traders/cooperatives		0.08		-
% of profit margin	11.27%			

Traders buy wheat directly form farmers and resell to processing industries or to big wholesalers. Basically this link of the chain does not add value to the raw wheat before they sell it. What goes in will go out and the difference between purchasing price and selling is mostly traders margin and administration cost. Compared to farmers traders operating expense is a little more than one third but their profit margin way more than three fourth of that of farmers. That means by simply buying from the framers and reselling to wholesalers or processors they took more than10% of the total profit margin while farmer doing all the work that is needed[9] to produce wheat and bearing all the risk associated with crop harvest took only 14% of the total profit margin. When we compare profit margin per unit cost[10] we can easily see that traders (0.0275) gets more than what framers (0.125) take.

[9] Prepare the area selected to grow wheat, Smoothing the soil, Plowing the field and dig long narrow furrows, applying moderate quantity of a manmade or natural manure to fertilize the soil and ensure proper growth of the wheat stalks, Watering the field or irrigating the cultivated land, apply a light insecticide/pesticide spray to the harvested field, cut the wheat kernels by using a scythe or sickle or rent combiner if the geography of the land permit, thrashing and finally bring the wheat to the market

[10] Profit margin per k.g. divided by operating cost per k.g

Processors and wholesalers margin

Table 11: *Processors and wholesalers margin*

Cost description	*Processors per kg*		*Wholesalers per kg*	
Purchasing price	3.75		3.7	
Direct labor	0.9		0.02	
Maintenance and repair	0.08			
Energy cost	1.3		-	
Other input other than wheat	0.5		-	
Administrative cost	0.17		0.07	
Depreciation	0.1		-	
Milling	0.03		-	
Inventory cost	0.05		0.2	
Transportation	0.1		0.1	
Sales commission	0.06		-	
Marketing cost	0.63		0.03	
Total expense		7.67		4.12
Selling price		8.00		4.52
Marketing Margin	4.25		1.22	
% of marketing margin	73.02%		61%	
Total margin for Processors/wholesalers		0.33		0.4
% of total profit margin	46.48%			71%

Processors perform all the activity that is needed to produce pasta, macaroni and biscuits form the raw wheat. Since the amount of wheat that goes into the production of biscuits and breads are insignificant compared to how much goes to pasta and macaroni production we will concentrate on pasta and macaroni direction.

The above table shows that processors capture 73% of the total marketing margin in the chain. The reason of having this much marketing margin is to cover all the cost that is needed to produce pasta form the raw wheat. Among the cost components for processing industry three items make up more than 70% of total operating expenses these are energy expense that takes almost more than one third of all operating expense, direct labor which is more than 20% and marketing including advertising expenses which is more than 15%.

Retailer's margin

Table 12: *Retailer's margin*

Cost description	*Retailers*			
	Processed wheat per kg		*Raw wheat per kg*	
Purchasing price	**8.00**		**4.52**	
Direct labor				
Transportation	**0.01**		**0.023**	
Distribution cost			**0.01**	
Overhead cost	**0.08**		**0.05**	
Marketing cost	**0.01**		**0.017**	
Total expense		**8.10**		**4.62**
Selling price		**8.30**		**4.7**
Marketing margin	**0.3**		**0.18**	
% of total marketing margin	**5.15%**		**9%**	
profit margin for Retailers		**0.20**		**0.08**
% of total profit margin	**28.17%**		**14%**	

Retailers directly sell to final consumer of both raw wheat and processed wheat that is pasta and macaroni sell. The main role of this link in the chain is for distribution purpose. That means almost all the value adding activity has already been done before it reaches to this particular link. They (retailers) just passed the processed wheat as it is only adding their administrative cost and profit margin. By making available the processed wheat or raw wheat to where the final consumers desire they capture more than one forth of the chain profit margin.

Summary of margin analysis

Table 13: *Summary of margin analysis*

Link in the chain	Margins	*Per k.g.*	*Per k.g*	*%*	*%*
Supplier Small farmers	Marketing Margin		**1**		**15%**
	Profit margin	**0.27**		**14%**	
Traders	Marketing Margin		**0.37**		**6%**
	Profit margin	**0.08**		**11%**	
cooperatives	Marketing Margin		**0.13**		**2%**
	Profit margin	-		-	
processors	Marketing Margin		**4.25**		**63%**
	Profit margin	**0.33**		**5%**	
Wholesalers	Marketing Margin		**1.22**		**18%**
	Profit margin	**0.4**		**47%**	
retailers	Marketing Margin		**0.3**		**4%**
	Profit margin	**0.20**		**28%**	
Total marketing margin					

In the above table indicates that only looking at the marketing margin could some times be misleading for example marketing margin for framers is 15% which is greater than both for traders and wholesalers but the profit margin is less than both of them. So in this case farmers has high marketing margin because they incur much cost to produce wheat and make it ready for market than what wholesaler and retailer incur to make ready the wheat they purchase for marketing.

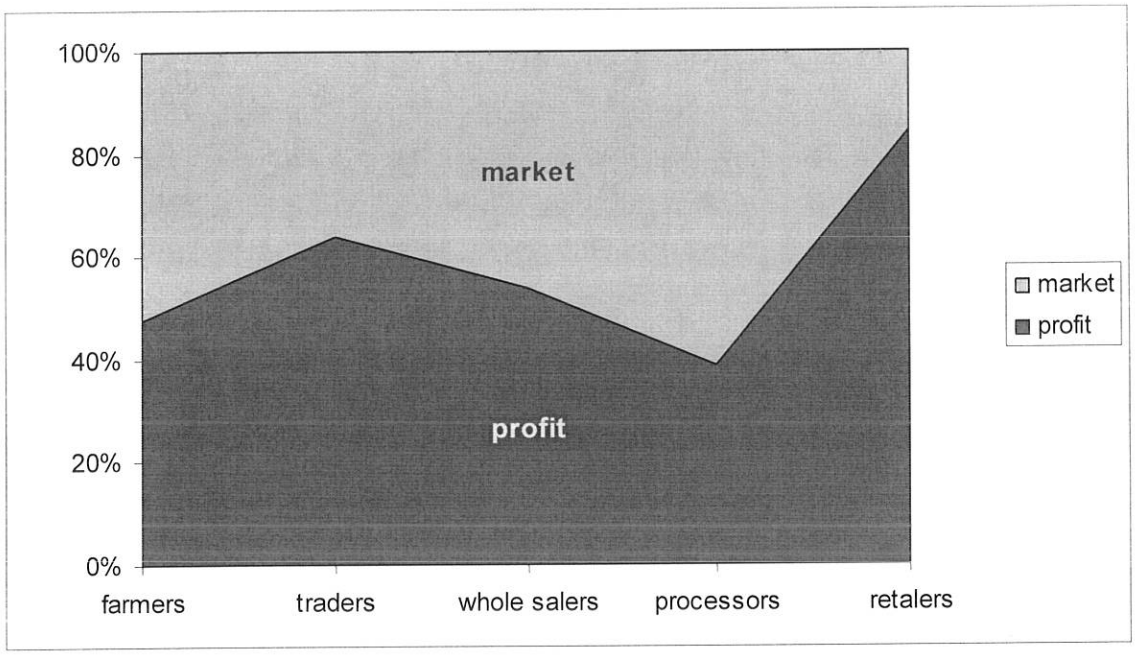


Figure 9: *Marketing and profit margin*

This figure shows the patterns clearly. For trader and retailer where there is little or no value addition takes place the profit margin is way beyond the marketing margin. On the other hand for farmers and processors, where most if not the whole value addition activity takes places, the marketing margin is greater than the profit margin.

6.2 The Distributional Aspect of Wheat Value Chain

In our attempt to understand the wheat value chain especially the distributional issue we will consider three variables

Rents

Value added in each stage

Rate of profit

For small farmers the relevant rent includes financial rent that is access to credit in cash or in kind infrastructure rent that is easy access to transportation resource rent that is access to irrigational water, very fertile land and technological (agricultural) rent that may include better farming practice improved seed. The data on these variables are obtained using a structured questionnaire.

Value added at farm level is computed by taking the total value of material input and total production and taking the difference. To compute the value we make use of price index for both input prices and output price at their relevant period.

To understand the determinant of income distribution in addition to value addition and profitability focus should be on rent

This ability to insulate activities can be put in a nutshell by the concept of rent, which arises from the possession of scarce attributes and involves barriers to entry. The classical economists argued that economic rent accrues on the basis of unequal ownership/access or control over an existing scarce resource (e.g. land). In general economic rent takes various forms

6.2.1 Model Result and discussion

In the methodology part we define variables and see how to measure them. We have also specified a model. In this section we will present the result.

Results on regressing ***Farmshare on INFGFINM, INFPFINM, INFPFING, INFGFINP, IFMFINM, INFMFING, INFGFING, INFMFINP, PROTOCAPITAL, VALUETOCOST, and a constant***

Table 14: *Result of the model*[11]

Variables	*Coef.*	*estimates*	*Std. Err.*	*P>|t|*	*t-value*
INFPFINM[12]	β_1	*0.04913*[13]	*0.026312*	*0.0650*	*1.87*
INFPFING	β_2	*0.09517***	*0.046338*	*0.0420*	*2.05*
INFMFINP	β_3	*0.09566**	*0.030196*	*0.0920*	*3.17*
INFMFINM	β_4	*0.00361*	*0.286130*	*0.1652*	*1.13*
INFMFING	β_5	*0.12741**	*0.035767*	*0.0810*	*3.45*
INFGFINP	β_6	*0.12556**	*0.046517*	*0.0780*	*2.70*
INFGFNM	β_5	*0.05871*	*0.397420*	*0.2841*	*0.98*
INFGFING	β_8	*0.19623 ****	*0.039794*	*0.0080*	*4.93*
PROTOCAPITAL	β_9	*0.22388***	*0.039889*	*0.0283*	*5.61*
VALUETOCOST	β_{10}	*0.27677 ****	*0.094480*	*0.0040*	*2.93*
SHOCK	β_{11}	*0.15213*	*0.217730*	*0.1109*	*1.02*
CONSTANT	α_0	*0.03552 **	*0.018215*	*0.0540*	*1.95*
Farmshare =dependent variable			**R-squared = 0.7167**		
F(9, 110) = 134.57			**Adj R-squared = 0.7099**		
Prob > F = 0.0000			**Number of obs = 120**		

[11] In the final equation two dummy variables **INFGFNM INFMFINM** and the shock term **(SHOCK)** are not statistically significant at generally acceptable level that is1%, 5% and 10%.

[12] the descriptions of the variables are presented on next page

[13] *** significant at 1%,** significant at 5%, * significant at 10%

Key

Table 15: *Variables in the models*

variables	Good access		Medium access		Poor access	
	infrastructure	financial	infrastructure	financial	infrastructure	financial
INFGFINM	X			X		
INFPFINM				X	X	
INFMFINP			X			X
INFPFING		X			X	
INFGFINP	X					X
IFMFINM			X	X		
INFMFING			X			X
INFGFING	X	X				
PROTOCAPITAL	gross profit/ total value of capital					
VALUETOCOST	value added/total material input cost					

Diagnostic tests

Before drawing any inference from the model first we have to diagnosis our model for general misspecification, Multicollinearity and *heteroskedasticity*

Test for *heteroskedasticity*

Since if there is *heteroskedasticity* the standard errors of the estimates will be biased and if the standard errors are biased, we can not use the usual t statistics or F statistics for drawing inferences from our model so we need to test our model for *heteroskedasticity*. In *stata* we have a single command to perform *heteroskedasticity* test

estat hettest

Breusch-Pagan / Cook-Weisberg test for *heteroskedasticity*

Ho: Constant variance

Variables: fitted values of ***farmshare***

chi^2 (1) = 1.84

Prob > chi^2 = 0.1746

The statistic indicates that we fail to reject the null hypothesis at both 5% and 10% significance level. That is there is no significant *heteroskedasticity* in our model and our estimates

The second test is misspecification test

In reality, all our models are miss-specified to some extent. Our theories are always a simplification of reality, and all our measures are imperfect. Our task is to seek models that are reasonably well specified that means a model that keeps our errors relatively small.

There are some tests that have been proposed to detect general functional form misspecification.

Ramsey's (1969) regression specification error test (RESET) is one of them. While this test often detects functional form problems, it has the drawback of using up many degrees of freedom if there are many explanatory variables in the original model. Further, certain kinds of neglected nonlinearities will not be picked up by adding quadratic terms

The bottom line is has proven to be useful in detecting general functional form misspecification (Wooldridge, 2004)

estat ovtest

Ramsey RESET test using powers of the fitted values of ***farmshare***

Ho: model has no omitted variables

F(3, 110) = 3.87

Prob > F = 0.0112

The test result shows that at 5 and 10% of significant level we fail to reject H_0. That is RESET test does not able to detect functional form misspecification in our model

The other test we are going to make is test for *multicollinearity.*

In fact *Multicollinearity* is a question of degree and not of kind. Therefore, we do not test for *multicollinearity* but can, if we wish, measure its degree. (Gujarati, 2004)

It is true that *multicollinearity* violates no regression assumptions. Even in the presence of *multicollinearity* we will get unbiased, consistent estimates, and their standard errors will be correctly estimated. The problem of *multicollinearity* is although BLUE, the OLS estimators have large variances and co-variances, making precise estimation difficult.

Variance-Inflating Factor (VIF) shows how the variance of an estimator is inflated by the presence of *multicollinearity*. As a rule of thumb, if the mean VIF of a variable exceeds 10, it indicates high degree of *multicollinearity*.

estat vifn

Variable	VIF	1/VIF
infgfig	16.69	0.059917
valuetocost	14.56	0.068672
infmfig	2.96	0.337543
protocapital	2.41	0.414870
infmfip	2.11	0.473595
infpfim	1.82	0.550641
infgfim	1.78	0.562206
infpfig	1.50	0.667243
infgfip	1.48	0.674046
Mean VIF	5.03	

Since our mean VIF is less than 10 there is no significant level of *multicollearity* in our model.

Generally by looking the adjusted $\mathbf{R^2}$ (adjusted for degree of freedom) we can say that the fitness our model to our data is 70 percent But we have to be cautious that although adjusted $\mathbf{R^2}$ are overall measures of how the chosen model fits a given set of data, their importance should not be overplayed. What is critical is the underlying theoretical expectations about the model in terms of a priori signs of the coefficients of the variables entering the model and, their statistical significance.

After making the necessary diagnostic check on our model that is test for general misspecification, *Multicollinearity* and heteroskedasticity and observing that the signs of the coefficient are in agreement with what theories suggest we are now ready to interpret and draw some inference.

Value added at the farm level and profitability are the two most important factors that positively affect the share of wheat farmer in our survey. Next to these two variables good financial access and infrastructural facility contribute positively to the farmer share. We can see from the model that infrastructural and financial rent significantly affect the share of farmers out of the retail value of their product. That is two farmers with same plot of land, capital etc but one with poor infrastructural and financial access the other with good infrastructural and financial access have different share out of the retail value of their product. Farmers with good financial access and infrastructural facility get almost 0.20 more out of the retail value of their product than farmers with poor financial access and infrastructural facility.

One fact that is clear form the result table is that infrastructural facilities play more roles or contribute more to the farmers share than access to finance. Both ***INFMFINP*** (0.0956) and ***INFGFINP*** (0.125) is statistically greater than ***INFPFINM*** (0 .049) and ***INFPFING*** (0.0955).

Mean (diff) = mean (***INFMFIP - INFPFIM***)

Ho: mean (diff) = 0 Ha: mean (diff) > 0

Pr (T > t) = 0.0479

Mean (diff) = mean (***INFGFIP - INFPFIG***)

Ho: mean (diff) = 0 Ha: mean (diff) > 0

Pr (T > t) = 0.03850

This means if means if the government wishes to increase the share of farmers and do not have enough budget to upgrade both the infrastructural faculty and setup rural credit giving institution priority should be given to upgrade infrastructure faculty like constructing roads that connect the rural population to the nearby town or market place.

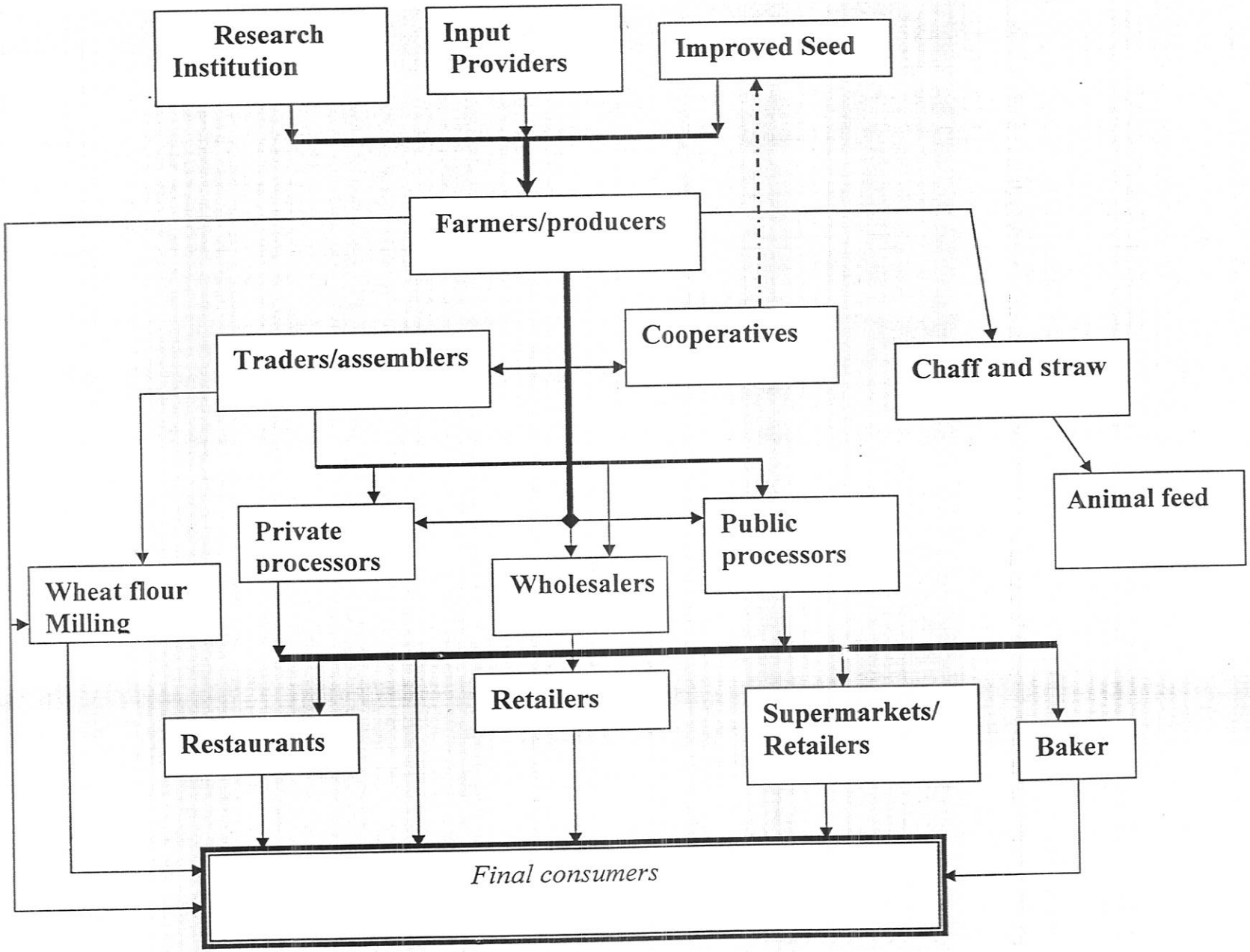
Summary of data analysis

We started our data analysis by drawing the wheat value chain. In the whole wheat value chain we tried to study there are five major links: Suppliers of wheat/farmers; traders/collectors and cooperative; processors; retailers and finally end users or consumers. So our final self explanatory map will look like this

Map

Figure 10: *The wheat value chain map*

Sources: form field survey and form interview with key informant



The next thing we saw was how farmers appropriate their product. We saw that farmers sell almost more than 50% of their product to final consumers. Had this product passed the value addition process, it would have been sold to final consumer at a higher price relative to the raw meat and farmer's will improved.

After this we try to examine the final market wheat farmers sell their product. We found out that quality and time of delivery are the two most important success factors in those markets and price only play minor role. We also try to inspect the governance structure in the wheat market. It turned out that all the function of governance is done mainly by the buyers as they are in a more secured financial position relative to farmers. But generally the chain we are dealing with reveal very little governance or it has at best very thin forms.

This is not surprising since it is possible for a value chain to exhibit little form of governance (Kaplinsky and Morris, 2000). The last point we discus in the first part of the analysis is that farmers are not in a position to respond to a sudden order form their buyer due to lack of working capital and financial access .

What comes next was margin analysis. We attempt to see the profit and marketing margin of the major link in the chain

For easy exposition we will make use of the following pie-chart which is drawn form the data from table 15.

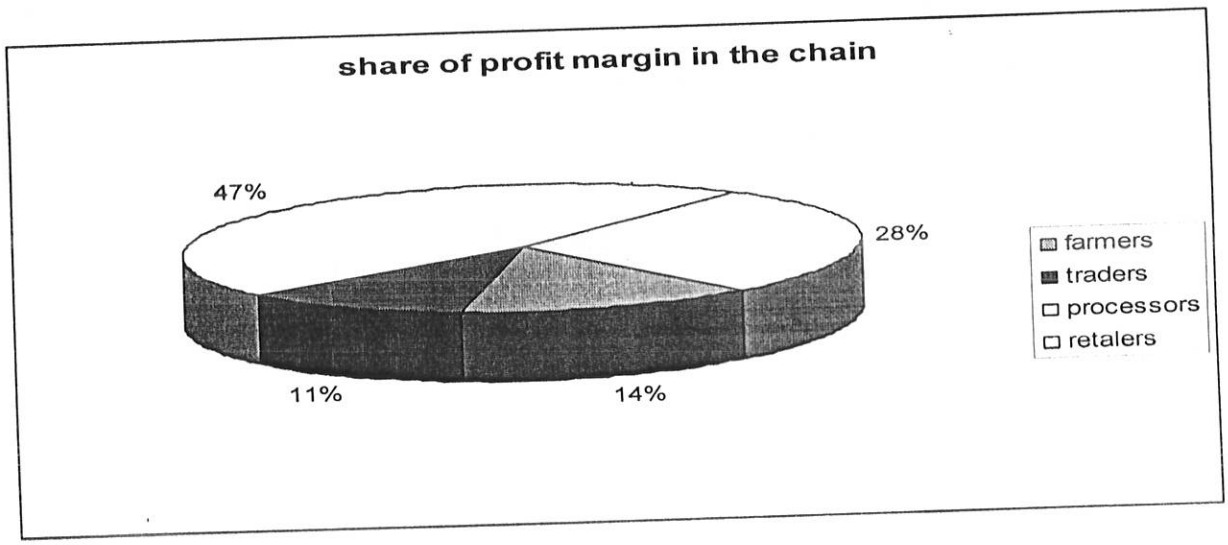


Figure 11: *Share of profit margin*
Sources: interview with key informant and field survey

As a summary we can see that processors take the lion share of chain profit margin as they are the main value adding agent in the whole value chain. What come next should be farmers as they are the second value adding agent in the chain but my survey indicates that retailers catch the second position and only after wholesalers that took 14% of the chain profit margin that farmers position stand that is 11% of the chain profit margin. This is not surprising if one consider the fact that these farmers are small dispersed economic agents that have no power in the market

The paper also makes an effort to better understand what factor affect farmer's share. Model is formulated that explain the framers share as a function of rent, profitability and value addition. The result point out that financial access and infrastructural facility positively affect farmers share so there is a need to improve the infrastructural facility and establish financial institutions that are more close to farmers than the formal financial institutions that are unable to reach small farmers. This result is in line with a study conducted using same value chain approach by Food and Agriculture Organization of the United Nations for Kenya. This study underlines the need for infrastructural development since one the major constrains in mango chain is unavailability of adequate infrastructural facilities the study also emphasize that , the development of adequate credit facilities also smoothes and transform the value chain of mango to a more competitive level that insure higher gain for the whole participant in the chain. (Sugar and Beverages Group, 2003)

7. Conclusion

Designing appropriate policy that brings more gain for the large proportion of the population is no easy task. In fact this needs more than just looking the aggregate figures in the given sector or individual link in that sector.

In other words to get any usable policy we need to consider the full range of activities that are required to bring a product or service from conception, through the different phases of production, transformation and delivery to final consumers.

Value chain analysis does just this. As a result this paper follows this approach to analysis the wheat value chain in Ethiopia and to some extent we saw what a wheat value chain look like.

Our next task would be to put forwarded some policy recommendations as to how to improve the working of the value chain so that each participant in the chain in particular small farmers in our case get the best out of their product.

Since more that half of what the framer produced is consumed directly with out any value addition, government should give priority in establishing institutions or farmers' cooperatives with capabilities to process wheat and sell the processed product so that farmers could be the major beneficiaries.

Our data indicates that more than 30% farmers sell their product right after harvest. This means farmers sell their hard earned agricultural product when the market price of their product is at its lowest. The reason for this is that farmers are expected to settle their financial obligation at this time. So if there is an institution that selectively gives credit service for farmer they could wait until the market price of their product is improved and they benefit more. Here we should be careful, that is, these institutions should give credit only for the needy farmers other wise if all farmers get credit and delay their sale then this policy become ineffective. In fact establish financial institution is not the only feasible solution. The government should set up a corporation that purchase wheat form farmers at

the time of harvest with prices that is higher than the prevailing market prices that takes into account the prices that will be observed at the time of off-harvest period.

The other point that we see in our data analysis part is that there is untapped demand for wheat but small farmers lag behind to full fill the demand and they are not even close. The reason behind this is mainly shortage of capital and low productivity. So government and other concerned bodies should train farmers on better farming techniques, provide high yielding seeds and facilitate farmer's access to better faming equipments that deems to boost productivity.

Finally in our quantitative part we try to model the determinant of farmer's share and found out that value addition and profitability are the two most important determinant of farmer's share. Therefore creating favorable environment so that farmers sell their product after adding some value should be given first priority and the government and other concerned body should work hard to make this a reality. Our model also suggest that infrastructure facility and better financial access contribute greatly to what framers gets out of retailer's value of their product. Therefore government should invest on the construction of feed roads, establish financial institutions that are more close to framers than formal financial institutions like micro-finance. Finally since farmers' cost of production especially prices of fertilizers is increasing at alarming rate government should facilitate easy access. In addition to this, there should be a buffer stock in view of stabilizing the prices of fertilizers.

The paper starts out to analyze the wheat value chain by giving special emphasis on the distributional aspect of small farmers. We more or less meet our target but to better understand the wheat value chain a more comprehensive study that deeply analyses the characteristics of all participants in the chain is needed.

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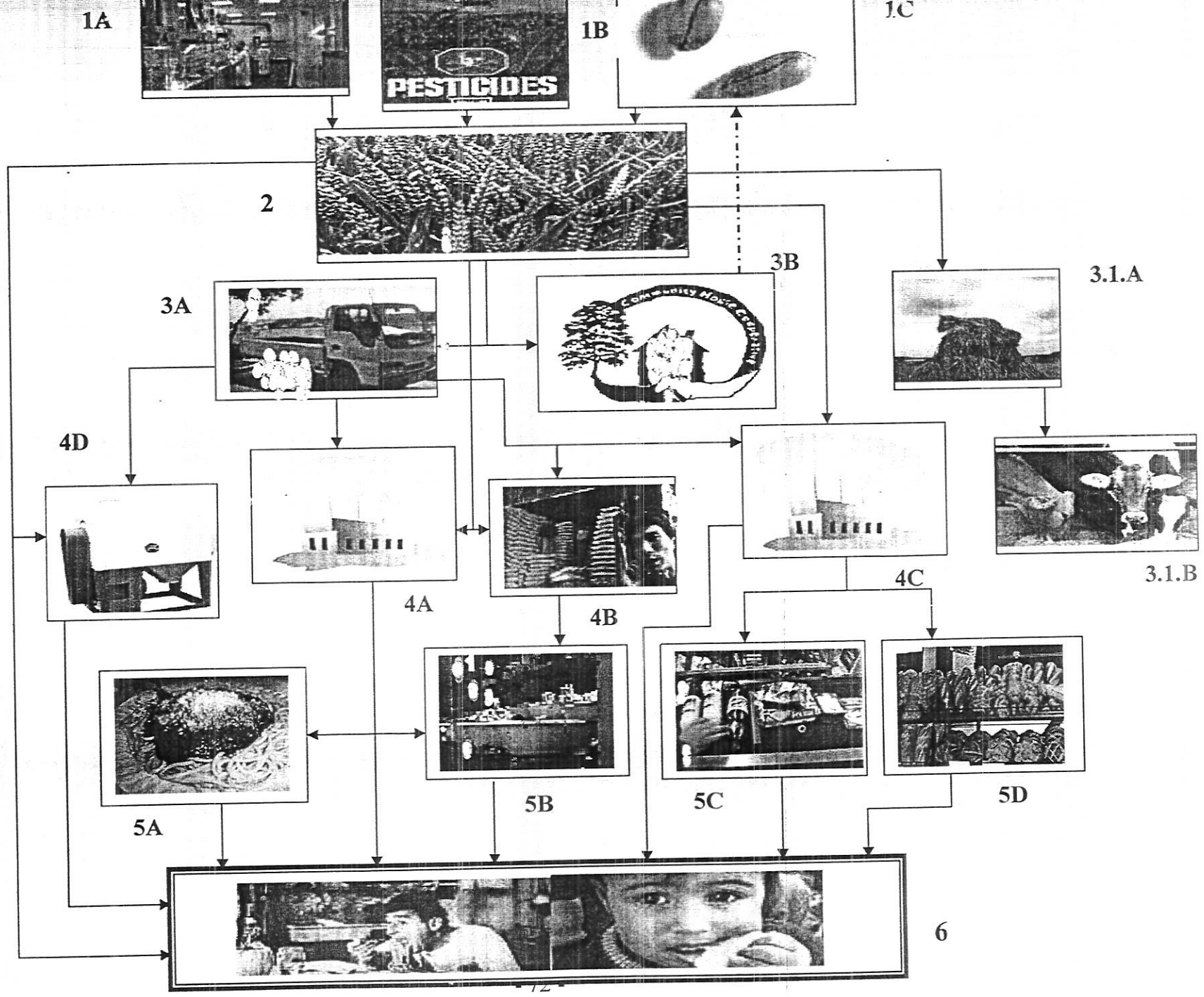
Annex i

Figure 12: *Self explanatory wheat value chain of map*



KEY

1. Input Providers

1A: Research facility to get new farming technology for farmers. This includes different NGO like CIMMTY

1B: Government and non-government body that provide the necessary agrochemical like pesticide/and herbicides

2. Producers Include Small Farmers And State Farms

3. Collectors

3A: Rural assemblers they collect wheat form farmers and load it in a truck to transport it to wholesaler or processors

3B: Cooperatives also buy form farmers not to resell though. But to feed back quality seeds to framers so that they can use is as input for next period

3.1. A Wheat production has a byproduct like chaff and straw which is used for animal fed

3.1. B The chaff or straw is used to fed castles

4. Processing Stage

4.A: Public processors

4.B: Wholesalers

4.C: Private processors

4.D: Wheat flour milling

5. Distribution Channels

5.A: Restaurant buy both from private and public processors

5.B: Grain retailers buy form grain wholesalers and resell to final consumers

5.C: Retailers like super markets

5.D: Bakery they buy wheat flour from milling factory or processing factory and sell their product (bread and pastry) to final consumers

6. The Final Consumers

The Only Link That Buy Not To Resell But To Consume.

GLOSSARY OF TERMS

Buyer-driven: The power lies with the buyer. In a value chain, the buyer sets the terms under which others in the chain operate.

Governance: The process of co-coordinating activities in a particular system, for example a chain.

Horizontal integration: The coming together of different processes and actors within same level of activity, e.g. production or distribution.

Interview: This is the process of putting questions to someone in order to gather information. Interviews can be structured, semi-structured or unstructured.

Key Informant: This is a specialized person with a lot of information about certain issues. He or she has a good overview and good contacts with others in the locality or industry.

Local market: This is a place for selling goods and services within one's location or home country. Buyers are within short distance from the seller.

Mapping: To make a plan of how activities or processes are connected. The arrangement is a pictorial representation of the actual reality.

Primary data sources: Information is collected directly from those who know (for example, retailers, factory managers, workers). In contrast a book, newspaper or statistical yearbook is a secondary source.

Questionnaire: A set of questions for use in an interview. A questionnaire can have open-ended (those with blanks for filling in responses) or closed questions (those with fixed alternatives).

Retailer: The person or firm that sells goods or services to the consumer. Retailers could be small (corner shop) or large (department store).

Secondary data sources: Published or unpublished information that has collected by someone else, either for research or other purposes. The most common secondary sources are unpublished data collected by government, research reports, books, journals, newspaper articles, etc.

Supplier: A person or organization which provides raw materials, machinery, or other inputs to an enterprise on the basis of an agreement.

Value: The worth of a thing in terms of money or its quality as measured by how desirable or wanted the thing is.

Value added: The worth that is added to a good or service at each stage of its production or distribution. A firm can calculate its value-added by subtracting the value of the inputs it purchases from the full value of its output.

Value Chain: This is the set of value-adding activities through which a product passes from the design to the consumption stages. The worth of the product increases at each point of the process, hence the term value chain.

Vertical integration: The coming together in a single firm of activities extending over more than one of the successive stages of the production-distribution process.

Wholesaler: Someone who sells goods and service in large quantities. They buy from the manufacturer to sell to the retailer for onward selling to the consumer.

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree award in any other university, and that all sources of materials used for the thesis have been duly acknowledged

Declared by

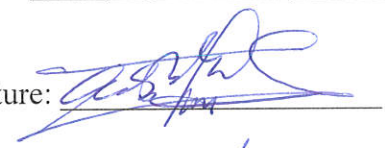
Name: Kaleb Shiferaw

Signature: 

Date: 07/11/08

Confirmed by Advisor

Name: Dejene Aredo

Signature: 

Date: 07/11/08

Place and date of submission: