EFFECTIVENESS OF COOPERATIVES IN COFFEE VALUE CHAIN: AN ANALYSIS IN SASIGA DISTRICT OF OROMIA REGION, ETHIOPIA

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ABSTRACT

Ethiopia is producing ranges of coffee varieties with unique flavors, quality and traditional organic and shade grown coffee by smallholder farmers for which actors including cooperatives are involved in adding values at each stage of the activities of the value chain. This study focused on examining the linkage between cooperatives and other actors in coffee value chain, and analyzing factors influencing the effectiveness of cooperatives in coffee value chain. The study was conducted in Sasiga district. All the five primary coffee cooperatives were selected purposively and 134 respondents were selected using PPS sampling technique. Both primary and secondary data collection methods were used. The data was analyzed using descriptive statistics and Binary logistic regression model. The result of the descriptive statistics showed that there was strong linkage among chain actors. The binary logistic regression model revealed that trust, technology, market information and training has statistically significant positive partial effect on the effectiveness of cooperatives in coffee value chain at P-value of less than 5% while timely delivery of products and financial support have statistical significant positive effect on the effectiveness of cooperatives in coffee value chain at p-value of between 5% and 10%. Though the result of the descriptive statistics showed that there is strong linkage among chain actors, greater attention should be given by all stakeholders to further strengthen the linkage by minimizing the adverse effect of practices which erodes members trust and affects the effectiveness of cooperatives in coffee value chain. On top of these, the chain actors should exchange technologies and market information to increase their competitiveness. Sustained training has to be offered to cooperatives based on need assessment to enhance their technical capacity to process coffee for adding value. Similarly, coffee cooperatives financial base has to be strengthened through promoting self-financing strategies and interventions.

Key words: *Coffee, Cooperative, Effectiveness, Linkage, Value Chain*

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BACKGROUND & LITERATURE REVIEW

Ethiopia—the birthplace of Arabica coffee grows a wide variety of highly differentiated, exemplary coffees, most of which are shade-grown without chemical inputs by small-scale farmers. Agricultural Cooperatives in Ethiopia (ACE) project, with funding from USAID, has enabled smallholder cooperatives to capitalize on these strengths and become market leaders in the fast-growing specialty coffee sector (Chambal and Ruth, n.d).

The production of coffee is of an enormous relevance for Ethiopia, playing a dominant role in economy, ecology, socio-cultural and spiritual terms. The agriculture based Ethiopian economy is highly dependent on coffee since it accounts for more than 25% of the GNP and 65% foreign currency of all export earnings. Coffee production in Ethiopia is the driving force since over a million coffee farming households and about 25% of the total population of the country is dependent on production, processing, distribution & export of coffee (World Bank 2009).

Ranking eighth in the world and first in Africa, Ethiopia's annual coffee production is approximately 280,000 metric tons (MT), almost half of which consumed domestically, often in the culturally rich traditional coffee ceremony. Smallholder farmers mostly produce coffee with fragmented landholding and small size ownership (1-2 hectares) living earning less than a dollar per day. With prices of approximately $1.20 to $1.50 per pound for washed coffee, the specialty market is an avenue for Ethiopian farmers to significantly increase their incomes and improve the quality of their lives. As the East African Fine Coffee Association (EAFCA), one-third of Ethiopia's coffee exports for the most recent year were washed (EAFCA, 2008). Small scale farmers which account for 90–95% of the total production produce most coffee with 1-2 hectares of land. The varieties of distinctively flavored coffee beans produced in Ethiopia, based on their contribution to the country's export, are Jimma, Gimbi, Lekempti, Sidamo, Yirgacheffe and Harar. These coffee types are internationally recognized and marketed either in blend or as 100% Ethiopian products and they command better prices. Ethiopia produces around 4% of world production and more than 30% of the total production in Sub-Sahara Africa and the government favors the export of high grade coffee and restricts its sale on the domestic market (MoARD, 2009).

Many advocate of fair trade consider co-operatives bring people together for economies of scale. Important horizontal linkages also exist at the union level. In addition to sharing market information and contacts, solutions to shipping and logistical problems have often come through the assistance of other coffee unions (Chambal and Ruth, nd). Coffee producers are locked into production chains: their produce reaches consumers in different countries having passed through the hands of intermediaries. Each of these intermediaries adds value to the final product. The concept of the value chain describes input and output relationships and identifies key actors who play a critical role in coordinating production in the chain.

The actors of a value chain as well as the input-output, and the territorial structure along with technical structure also define a value chain. Value chain actors are those involved in supplying inputs, producing, processing, marketing, and consuming agricultural products. They can be those that directly involved in the value chain (rural and urban farmers, cooperatives, processors, traders, retailers, cafes and consumers) or indirect actors who provide financial or non financial support services, such as credit agencies, business service and government, researchers and extension agents.

STATEMENT OF THE PROBLEM

Value chain analysis extends traditional supply chain analysis by adding values to each stage of chain. This can result in which value at one stage seen as being at the expense of value at another. Over the past decades, the coffee industry has witnessed dramatic falls in the producer (farmer) share of retail price.

Many researchers have found out that farmer who did not processing to their coffee cherries got just a very minute percent of the final retail value. In other words this indicate that, the percentage of the final retail value that is retained by the producers is much higher in if coffee value chain supported by a fair trade system through cooperative and other stakeholders in the system. Similar to other countries, Ethiopian coffee producers also face problems at different stages in relation with finance which supports farmers in production activities, building their knowledge about agronomic practice, and less awareness in the market area to whom they have sale their products and how? Moreover, input output relation at all level. For instance, coffee farmer's use inputs like selected seed varieties, compost, agricultural tools and poly bags. Among these the main and most important one highly demanded by the coffee producers is the coffee seed which must be disease resistant and of better quality (OCFSU, 2009).

With regards to coffee cooperatives, they were still faced with the reputation and lack of trust that came from their political use during the Derg regime. They were not seen as businesses providing services and adding income to their members. Coffee cooperatives with washing stations were inefficient, with some even running at a loss, the washed coffee was often of poor quality. The processing problems primarily flowed from poor technical and management operations. In many cases, cooperative farmer members received better prices and payments in cash for their cherries from nearby private washing stations. The cooperatives were selling to traders and in a few cases directly into the auction for below-premium prices.

The government recognized the serious problems that the coffee cooperatives faced, especially in terms of delayed payments from the private traders, and permitted them to sell directly to

buyers without going through the auction. This change is approved in 2001, but the cooperatives were not in a position to take advantage of this reform. There are several problems in coffee value chain in the study area like:

✓ Procedure of processing had not been maintained and upgraded through exchanging sufficient knowledge and skill between actors. Moreover, poor quality processing that created higher costs and reduced the quality of the beans reaching the markets. (EAFCA, 2008).

✓ Availability of loan funds to rural processors and traders to invest and operate their businesses is practically less intended for poor linkages in the value chain actors. (MoARD, 2009).

✓ Majority of cooperative members have a minimum awareness regarding to coffee value chain and inadequate knowledge and skills on quality coffee production systems among value chain actors. Hence, no attention is given for linking with actors. Due to this existing coffee production system suffered from poor returns.

Although coffee is an economically important commodity for country and individuals. However, there was no study conducted on the effectiveness of coffee cooperatives in coffee value chain. In light of this, the research tried to analyze the effectiveness of cooperatives in coffee value chain in Sasiga Woreda, Oromia region in general and attempts to explore the linkage between cooperatives and other actors in coffee value chain; and factors affecting the coffee value chain in particular.

OBJECTIVES OF THE STUDY

• To examine the linkages between cooperatives and other actors in the coffee value chain; and

• To analyze factors influencing the effectiveness of cooperatives in coffee value chain.
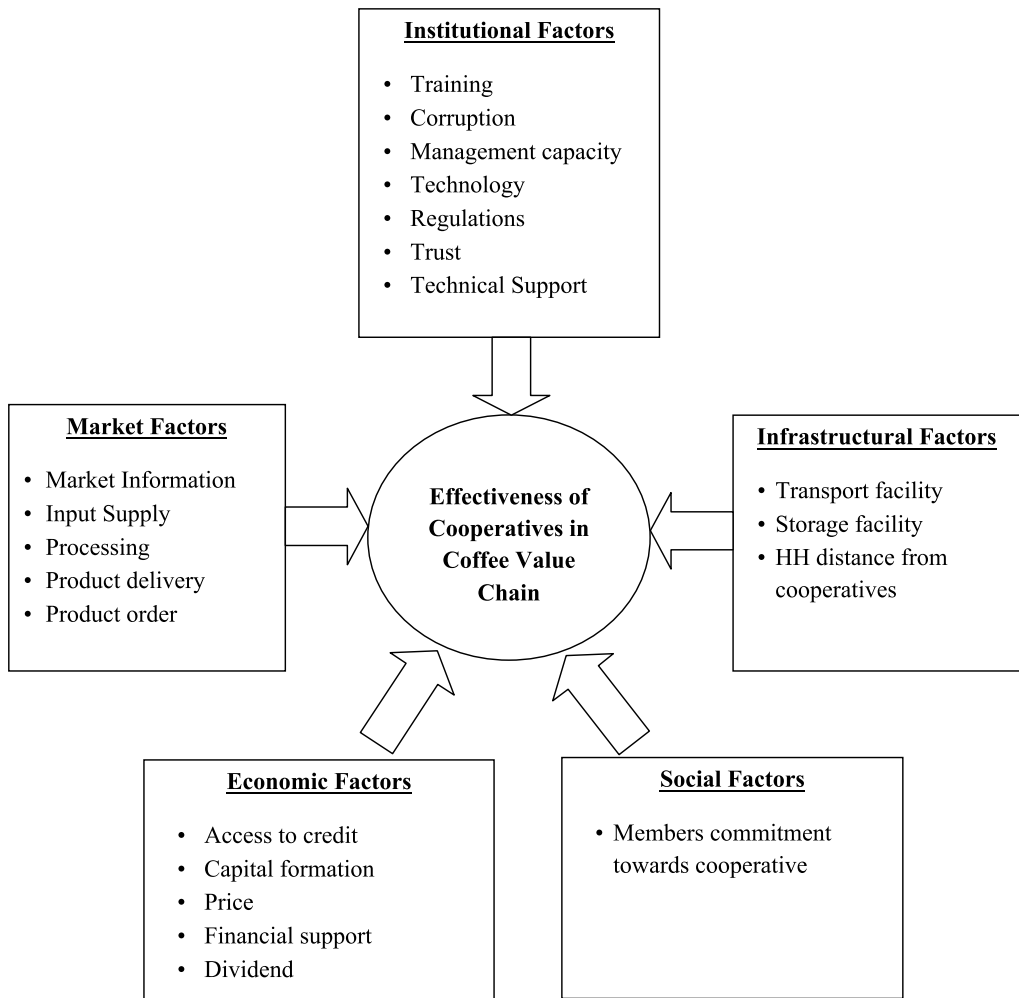
Conceptual Framework of the Study

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                          ┌─────────────────────────────┐
                          │   Institutional Factors     │
                          │                             │
                          │   • Training                │
                          │   • Corruption              │
                          │   • Management capacity      │
                          │   • Technology              │
                          │   • Regulations             │
                          │   • Trust                   │
                          │   • Technical Support        │
                          └─────────────────────────────┘
                                        ↓

┌──────────────────────┐          ╭─────────────────╮        ┌──────────────────────────┐
│   Market Factors     │          │  Effectiveness of │       │  Infrastructural Factors │
│                      │          │   Cooperatives in │       │                          │
│ • Market Information │   ⇒      │   Coffee Value    │  ⇐   │ • Transport facility     │
│ • Input Supply       │          │      Chain        │       │ • Storage facility       │
│ • Processing         │          ╰─────────────────╯        │ • HH distance from       │
│ • Product delivery   │              ↗       ↖               │   cooperatives           │
│ • Product order      │                                      │                          │
└──────────────────────┘                                      └──────────────────────────┘

        ┌──────────────────────────┐        ┌──────────────────────────┐
        │    Economic Factors      │        │      Social Factors      │
        │                          │        │                          │
        │ • Access to credit       │        │ • Members commitment     │
        │ • Capital formation      │        │   towards cooperative    │
        │ • Price                  │        │                          │
        │ • Financial support      │        │                          │
        │ • Dividend               │        │                          │
        └──────────────────────────┘        └──────────────────────────┘
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Figure 1: Conceptual Framework of the Study

METHODOLOGY

Sampling Technique and Frame

Sample Frame

The study was conducted in Sasiga Woreda coffee cooperatives. Using census method all five coffee cooperatives were selected. (See Table 1) for the study.

Table 1: Sample Frame of the Respondents

| S. No. | Name of the Cooperatives in the Woreda | Year of Registration | No. of Members | | | No. of Non Members | Total Population | Sample Proportion |
			`Male	Female	Total			
1.	Gaba Dilbata	1971 G.C	670	14	684	5116	5800	27
2.	Nanosanbat Dure	1971 G.C	737	19	756	6564	7320	29
3.	Tsige	1971 G.C	554	10	564	2896	3460	22
4.	Feyina Jimata	1971 G.C	766	46	812	6788	7600	32
5.	Gaba Jimata	1971 G.C	693	23	716	5324	6040	28
TOTAL			3,420	112	3,532	26,688	30,220	134

Source: Sasiga Woreda Cooperative Promotion Office (2013)

Sample Size

The sample size of the study or the number of member of the respondent was determined using Kothari (2004) sampling design formula.

$$n = \frac{p * q * z^2 * N}{(N-1)e^2 + z^2 * p * q}$$

Where;
n= sample size, 134

N= Total population   30,220

Z= 95% confidence interval under normal curve (1.96)

e= acceptable error term (0.05) and

P and q are estimates of the proportion of population to be sampled (p=0.1 and q= 0.9)

From five coffee cooperatives one hundred thirty four respondents were selected by using probability proportional to size of membership.

In addition, in this study actors in coffee value chain were selected and incorporated purposively due to having direct relationship with the activities of coffee value chain as shown in the Table 2.

Table 2: List of Respondents for KI and FGD

S. No.	Respondents	No. of Respondents
1	Management committee	5* 5=25
2	Wholesalers	5
3	Promoters	5
4	Local consumers	10
5	Private traders	2
6	Oromia coffee union staffs	5
7	Private exporter	1
8	ECX Staffs	2
Total		**55**

Method of Data Collection

The primary data necessary for the study were collected from sample respondents by using semi-structured interview. For data collection, five enumerators, who have acquaintance with socio economic concepts and knowledge of the culture of the society as well as Oromifa language proficiency were selected, trained and employed. The interview schedule consisted of different type of questions or items, related to the topic of the research and relevant variables to gather the needed information. Thus, the semi structured interview schedule was developed and used in order to allow the respondents to freely express their opinion on issue related to the research study topic. After formulating the interview schedule it was edited for its observed consistency and logical sequence with frame of reference of the respondents. Qualitative data were collected through personal observation, focus group discussions, and key informant interviews.

Type of Data Source

Primary and secondary data were used. Primary data were collected from respondents and the secondary data were collected from records of different books, reports from government bodies, journals, thesis, internet sources that are appropriate for the study.

Method of Data Analysis

Descriptive Analysis

In this study, data were analyzed using different quantitative and qualitative procedures and methods. Prior of analyzing the data collected, checking its completeness, editing, organizing and coding activities is carried out to attain the stated objectives of the study. Specifically, descriptive statistics like mean, percentage, frequency and minimum and maximum values were used by employing statistical software called Statistical Package for Social Science (SPSS). Version 16.0.

Econometric Model - *Binary Logistic Regression*

The logit and probit models will guarantee that the estimated probabilities will lay between logical limit 0 and 1 (Pindyck and Runbinfeld, 1981). Because of this and other facilities, the logit and the probit models are the most frequently used models when the dependent variable happens to be dichotomous (Maddala, 1989; Liao, 1994; Gujarati, 2004). In the analysis of data binary logit models is used with the view of addressing the objectives of the study. In order to understand the objective of this study the binary logistic regression model is employed to examine the effectiveness of coffee value chain. The built model can be used to approximate the mathematical relationships between explanatory variables and the dependent variables. This model is used because the dependent variable is binary (0, 1). This model is used to analyze whether coffee value chain is effective or not. Similarly a linear probability model may generate predicted value outside 0 and 1 interval which violate the basic tenets of probability (Gujarati, 1994) and this problem can be solved by using probit and logit models. Even though the Logit and Probit models are comparable, Liao (1994) as cited in Hilina (2005) reported that Logit model has the advantage that these predicted probabilities could be arrived at easily.

Therefore, in this study logistic regression model is fitted to estimate the strength of the relationships of each independent variable is controlled. Accordingly, in this model, the dependent variable takes the value of 1 if cooperatives are effective in coffee value chain i.e. cooperatives are effective in coffee value chain with the probability of Pi, otherwise a value of 0, i.e. cooperatives in coffee value chain is ineffective with the probability of 1-Pi. To estimate this type of relationship, it requires the use of qualitative response models. Specification of the model is as follows:

$$Pi = F\ (Zi) \qquad 1$$

$$Zi = Bo + \sum_{i=1}^{n} BjXji = \left(log\left(\frac{P}{1-P} \right) \right) = Zi = \propto + BiXi + \cdots + BnXn \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots .2$$

(Engleman, 1981 and Gujarati, 1988)

Where, Pi = the likelihood of the effectiveness of cooperatives in coffee value chain, the binary variable, Pi= 1, if cooperatives are effective in coffee value chain and Pi= 0, if otherwise.

Zi= Estimated variable for the ith observation,

F= the functional relationship between Pi and Zi. i= 1, 2….m are observation on variables for cooperatives in coffee value chain, n being the sample size 134.

Xji= the jth explanatory variable for the ith observation=1, 2……………n.

Bj= a parameter, j= 0, 1………………………n.

j= 0, 1…………………………, n. Where n is the total number of explanatory variables.

The logit model assumes the underlying index; Zi is a random variable that predicts the probability of effectiveness of Cooperatives in coffee value chain.

$$Pi = \frac{1}{1 + e^{-Zi}} \hspace{6cm} 3$$

$$1 - Pi = \frac{1}{1 + e^{Zi}} \hspace{6cm} 4$$

If Pi is the probability of effectiveness of cooperatives in coffee value chain, then (1-Pi) is otherwise

If the disturbance term Ui is taken into account, the logit model becomes

$$Zi = Bo + \sum_{i=1}^{m} BiXi + Ui \hspace{5cm} 5$$

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This section summarizes and concludes the discussions of the data analysis and gives policy recommendations of the study of coffee value chain conducted in Sasiga Woreda, Oromia National regional state with a special reference to Sasiga Coffee cooperatives.

Summary of Findings

The results of the study were analyzed using descriptive statistics and econometric models summarized as follows.

There is a strong vertical linkage and subsequent institutional linkage among the coffee value chain in Sasiga coffee cooperatives. Strong business linkage where private coffee seed multipliers and input supplier plays a major role in supplying the necessary input to farmers. Marketing, business development and technical support linkage is another major chain support facilities observed in Sasiga coffee cooperatives. Even though this is at its initial stage, it is showing promising results as Oromia coffee union is playing critical role in terms of creating and finding the best market opportunity for primary cooperatives. Technical support services are obtained from different actors from union, primary cooperative, agricultural office and cooperative office. These supports includes but not limited to: training on top of storage preparation, harvesting mechanism, quality keeping, and record keeping and planning on the overall cooperatives activities and members in particular.

In Sasiga coffee cooperative, there are multilateral horizontal linkages among different actors. These are characterized by the linkage structure where primary cooperatives are liked to many other primary cooperatives and share their experience to the extent of sharing resources (capital).

To describe the socio economic characteristics of the survey respondents, the majority of them are male respondents (79%). As far as the marital status is concerned, most of them (90%) are married. The religious composition of the respondents, 25.4%, 72.4%, 1.5% and 7% of respondents found to be followers of Orthodox Christians, Protestants Christians, Muslim and others respectively. As regards to their ethnic background, 100% of them are from Oromo ethicist background. Regarding their education status, more than 70% of them are illiterate.

The descriptive analysis showed that, about 62.7% of the respondents received any form of training related to coffee value chain. The study also revealed the majority of the farmers have trusted their cooperatives. This variable is found to be statistically significant in influencing the effectiveness of the cooperatives in coffee value chain.

Despite the fact that market information is a very important variable having positive effect on the cooperatives effectiveness in coffee value chain, only 46.3% of the sampled respondents in the area have access to timely market information. Cooperatives offer better prices as compared to other market actors as witnessed by 72.4% of the respondents. However, the same study witnessed that the prices offered by cooperatives is not sufficient for members coffee product as viewed by 56.7% of the sampled respondents. On top of this, the opinion of 82.8% of the respondents showed members obtain payment from their cooperatives on time. They have also sufficient transport facilities as evident from 84.3% of the sampled respondents.

The capacity of the management committee of the cooperatives in managing the cooperative was viewed as positive by many respondents (87.3%). One of the critical factors influencing the effectiveness of the coffee value chain are whether there exists sufficient input supply, financial support and timely delivery of the products. In these regard, 53%, 70%, 53%, and 82% of the respondents responded positively on the mentioned variables. These figure showed that coffee value chain in Sasiga coffee cooperatives seems to be more effective as far as these explanatory variables are concerned.

The discussion on econometric analysis of the factors influencing the effectiveness of the coffee value chain gives a good understanding of the strength of factors that affect the coffee value chain. In the regression analysis, eight variables were used to explain the effectiveness of coffee value chain in Sasiga coffee cooperatives. The Negelkerke R Square is used to measure the proportion of the total variation of the dependent variable explained by the predictor variable. Accordingly, in this study 89.5% of the variance in the dependent variable "effectiveness of cooperatives in coffee value chain" is explained by the variance in the predictor variables.

Out of the total eight variables included in the model, it was found out that only six of them have statistically significant partial effect on the effectiveness of cooperatives in coffee value chain. Accordingly, Trust(X_{24}), Technology(X_{16}), and Training (X_7) has significant positive partial effect on effectiveness of cooperatives in value chain at Wald ψ^2 ρ-value of less than 0.01, Market Information(X_9) is also has significant positive effect at p-value of 0.05. while Timely delivery of products(X_{19}) and Financial Support (X_{23}) have statistical significant positive effect on the effectiveness of Cooperatives in coffee value chain at ρ-value of less than 0.10. Other variables such Engagement in coffee processing (X_3) and product ordering (X_{20}) activities though they are not statistically significant have some positive partial effect on the effectiveness of cooperatives in coffee value chain.

CONCLUSION

The focal point of this thesis was to analyze the effectiveness of cooperatives in coffee value chain in Sasiga Woreda. Based on the specific objectives of the thesis the following conclusions were drawn from the data analysis.

Linkage between the actors in coffee value chain is characterized by both vertical and horizontal linkage. This linkage is characterized by a fair and good relationship among actors. There are different roles and mandates of service providers that ensure the effectiveness of the Sasiga Coffee cooperatives, but should work in a more synergetic way to maximize the effectiveness of the coffee value chain. The business linkage like supply of inputs and chemical are some of the important components of vertical linkage between actors. In addition marketing and technical

linkage was found to be other critical components in the coffee value chain in Sasiga coffee cooperatives.

Binary logistic regression model was used to predict the parameters of explanatory variables affecting the dependent variable. A step by step approach was employed to identify statistically significant predictor variables. Initially, eight variables were entered and only six of them were found statistically significant factors that influence the effectiveness cooperatives in coffee value chain. Accordingly, variables such as trust, technology, market information, training, timely delivery of products, finical supports were found to be critical factors influencing the effectiveness of cooperatives in coffee value chain.

Recommendations

Based on the results of this study, the following recommendations are given so as to be considered in the future intervention strategies to make the coffee value chain more effective and result oriented.

• Since the strength of the linkage among chain actors is one of the most determining factors for the effectiveness of the coffee value chain greater attention should be given by all stakeholders to design strategies on how to smooth their relationship and avoid any bottlenecks such as lack of trust, bribery practice and designing efficient customer service.

• Another factor that influence the effectiveness to coffee value chain whether or not the members received any form of training related to cooperatives and their production, marketing and etc. This training should be the major component of the service provided to members. This could be done in collaboration with other service providers and NGOs that deliver such kind of training in a more professional and adequate manner.

• Credit facility and the size of working capital owned by members are also significantly affecting the effectiveness of coffee value chain. Thus, sufficient credit facilities should be available in a timely manner to cooperative members. Microfinance institutions play a crucial role in this regard and strategies should be designed to link microfinance with the cooperatives and appropriate repayment arrangement and loan size should be negotiated in line with the business-financing requirement of the members of the cooperatives.

• Access to market information is a very important variable affecting the chain effectiveness. Dissemination of market information like price levels, linking farmers with the market is believed to enhance the chain effectiveness. Efforts have to be made to link farmers to the market and appropriate infrastructure should be in place.

- Regarding the prices paid by cooperatives to their members, the prices should be fair enough to compensate farmers for their cost of production as well and some profit margin. This could reduce the amount of leakage that is lost where farmers sell their product to informal markets. On top of this prompt payment is very important for farmers.

- Even if the capacity of many cooperative committee members is viewed as positive by many respondents, greater care must be taken in the recruitment and selection of these committee especially focusing on their character and ethical standards to reduce abusive and corrupt practice.

- Input supply to producers is found to be very important in determining the effectiveness of the coffee value chain. Thus, government (woreda level agriculture and development offices) needs to work hard in supplying inputs such as fertilizer, seed and chemical's needs.

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Annex 1: Correlation Matrix

		Constant	Trust	Financial Support	Technology	Training	Market Information	Product Ordering	Product Delivery	Processing
Step 1	Constant	1.000	-.798	-.530	-.715	-.650	-.464	-.423	-.493	-.514
	Trust		1.000	.355	.715	.433	.284	.070	.436	.419
	Financial Support			1.000	.347	.229	.203	.171	.117	.262
	Technology				1.000	.446	.234	.032	.251	.379
	Training					1.000	.299	.075	.053	.376
	Market Information						1.000	.109	.105	.248
	Product Ordering							1.000	.201	.087
	Product Delivery								1.000	.068
	Processing									1.000

Source: computed from survey data 2013

Annex 2: Logistic Regression Result of Partial Effect of Predictor Variables

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Trust	4.020	1.429	7.916	1	.005	55.687	3.386	915.951
	Financial support	1.782	.946	3.546	1	.060	5.940	.930	37.952
	Technology	4.481	1.271	12.428	1	.000	88.305	7.313	1.066E3
	Training	3.783	1.171	10.441	1	.001	43.944	4.430	435.947
	Market Information	2.211	.923	5.737	1	.017	9.126	1.495	55.730
	Product Ordering	1.650	1.074	2.360	1	.124	5.208	.634	42.746
	Timely delivery	1.883	1.016	3.433	1	.064	6.575	.897	48.207
	Coffee Processing	.396	.614	2.409	1	.121	1.849	.851	4.016
	Constant	-11.985	2.986	16.115	1	.000	.000		

a. Variable(s) entered on step 1: X_{24}, X_{23}, X_{16}, X_7, X_9, X_{20}, X_{19}, X_3. Source: Computed from survey data, 2013