

# **Ethiopian Economics Association (EEA)**



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## **PROCEEDINGS OF THE FOURTH REGIONAL CONFERENCE ON THE TIGRAY REGIONAL STATE ECONOMIC DEVELOPMENT**

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**Edited by**  
**Worku Gebeyehu**  
**Demirew Getachew**

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## ***FOREWORD***

The Ethiopian Economic Association (EEA) and its Mekelle Chapter are happy to issue the proceeding of the Fourth Annual Conference on the Tigray Regional State Economic Development which was organized on June 27, 2015 at Planet Hotel Conference Hall, Mekelle. EEA organized this important regional conference as one of its objectives of broadening its activities and coverage at regional level so as to contribute to the economic advancement of regional state through enhancing economic policy formulation capability; the dissemination of economic research findings; promotion of dialogue on critical socio-economic issues; promotion of education in economics in higher learning institutions; enhancing national, continental and global networks of professionals and institutions; and advancement of the professional interests of its members.

The Annual Regional Conferences that the Association has organized in collaboration with its Mekelle Chapter has created important forums for presenting and discussing development issues that are highly relevant to the Regional Socio-economy. These forums have also provided incentives for researchers to conduct research and present their findings on regular basis. Indeed, the Annual Regional conferences were organized in an interdisciplinary fashion, thereby widening the interactive coverage involving both economists living here in the region and those living outside the region and non- economists who are working and experiences on the region. The Fourth Annual Regional Conference on Tigray Regional State Economic Development has contributed towards a deeper understanding of the regional economy and the complex challenges it faces. It attracted about 85 participants including higher officials and expertise from Tigray Regional State council office, Tigray City Administration, Tigray Agriculture Research institute and Meles Zenawi Leadership Academy, Universities of Mekelle, Adigrat and Axum, NGOs, private sector representative and EEA members. The participants of the conference expressed their satisfaction on the organization of the conference and the content of the papers presented. They reflected that the papers largely focused on local issue that can contribute to the development of the region. They also recommended that the issues raised in

the discussion are critical that need due attention by policy makers and implementing organs of the region.

In this publication, all papers which were presented at the Fourth Annual Conference, and reviewed by external reviewers and comments and suggestions including editorial comments were communicated to authors for improvement. Finally, the papers which passed all the review and editorial process published in the Proceeding of the Fourth Annual Conference on the Tigray Regional State Economic Development.

I would like to take this opportunity to express my heartfelt gratitude, on my own behalf and on behalf of the Ethiopian Economic Association, to the many people and organizations that made the conference resounding success. First and foremost, I thank the authors of the papers and the audience whose active participations made the Conference meaningful. The staffs of the Economics Department of the Mekelle University which runs the EEA Mekelle Chapter, participants from Adigrat and Axum Universities and the staff of EEA Secretariat deserve a special recognition for their passion and perseverance in managing the conference from inception to completion. Mekelle University also deserves appreciation for hosting EEA Chapter by providing office.

Our special thanks go to our partners who have shared our vision and provided us with generous financial support to materialize the activities of EEA. These include; The Friedrich Ebert Stiftung of Germany, The African Capacity Building Foundation (ACBF), and The Think Tank Initiative of International Development Research Center (IDRC) of Canada.

A handwritten signature in black ink, enclosed within a hand-drawn oval. The signature is stylized and appears to read 'Alemayehu'.

Alemayehu Seyoum Taffesse (DPhil)  
President of the Ethiopian Economics Association



# **Corporate Social Responsibility: A Query on the Practice and Determinants among Large Manufacturing Industries in Tigray Regional State, Ethiopia**

*Amanuel Teklay Gebremichael<sup>1</sup>*

## ***Abstract***

*Recently, CSR has gradually become a leading issue in business. Robust corporate attention to CSR has not been entirely voluntary. Many companies awoke to it only after being surprised by public response to issues they had not previously thought were part of their responsibilities. But despite their intent, the practice and what drives them to engage is not lucid. Thus, the prime essence of this study was to assess the level and drivers of corporate social responsibility practice in large manufacturing industries in Tigray region. The study used both qualitative and quantitative research approaches. It solicited data from primary and secondary sources. Two types of structured questionnaires were used. The first -was used to get data from 61 respondents composed of managers/CEO of large manufacturing industries and the second one was used to get information from 39 trade (labor) union heads working in those large manufacturing industries. Focused group discussion was also carried out among inhabitants living around those manufacturing industry. Descriptive statistics and Logit econometric model have been used to analyze the data obtained from the different sources. Results indicated that domestic investors have less understanding and tendency of having CSR policy statement. Location negatively affects the use of CSR policy statement. Manager's educational level, governmental regulation and suppliers influences companies to design and integrate CSR policy statement in their organizational structure. The main driver for large manufacturing industry to engage in CSR is the need to meet their market place dimension of CSR which accounts to administrative/government related legal activities. Market place and workplace dimension has highest marginal effect and are the main drivers for CSR application. According to the group focus discussion, inhabitants' living around manufacturing industries indicated that the support they gain from the*

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<sup>1</sup> Mekelle University, College of Business and Economics, Department of Management  
E-mail - [newamanuel@yahoo.com](mailto:newamanuel@yahoo.com)

*companies in the name of CSR is insignificant compared to their annual profit but manufacturing industries are undeniably contributing for the alleviation of unemployment in their area. The result also implies that, the on-going effort on environmental management in terms of reducing the environmental impact on inhabitants living around large manufacturing industries is encouraging but not comprehensive. Above and beyond, large manufacturing industries work alone to reduce environmental hazards and they do not involve the community, suppliers and other concerned parties.*

**Key Words:** Corporate Social Responsibility, Large Manufacturing Industry

## **1. Introduction**

The impact of business activities creates both positive and negative externalities for both society and environment. The narration of business and society revolves around how business concerns bring forth more positive exteriorizes and minimize negative exteriorizes. The social expectation that businesses should proactively take care of the broader society and environment has increased in the last few decades. An experience of Corporate Social Responsibility (CSR) in Africa articulates the idea that business is part of society but neither the practice. With the pressure of multinationals and international institutions such as the UN Global Compact for which it states that CSR is being carried out both by local businesses and foreign investors, and is increasingly encouraged by many governments. Surveys of CSR amongst businesses in Africa have found that the most common approach to CSR issues is through benevolent support, in particular focusing on education, health and environment (Maya Forstater et al 2010).

In Ethiopian context CSR is almost immature like what John Morton (2011), states: work CSR in Ethiopia was intended to be inclusive in its approach, not to assume that “CSR” was a concept familiar to Ethiopian companies or that if it was it necessarily indicated the same thing as in the other. Rather we tried to capture a range of perceptions and behavior by Ethiopian companies that might loosely translate as CSR. Discussions of CSR in development lift up the question of “the business case” for CSR. The indication of “the business case” for CSR falls under criticism from various quarters: that it



privileges the fundamental values of business, brackets out from discussion a whole raft of questions about the role (or not) of business in poverty reduction, with “downgraded expectations of what the actions of business should contribute to society” that CSR activities based on the business case may simply not work and that there is no single or uniform business case to CSR.

In its principle CSR includes acting ethically, building trust, protecting people, assets, and information while organizations generating value for their customers and creating a safe, healthy and fair workplace to their employee. Moreover co-creating with their business partners, initiating honest dialogue with their stakeholders is also essential elements in CSR. Preserving the natural environment also request a due attention in the CSR initiatives. If a company falls under economic responsibility they follow the belief that they have an obligation to produce safety full goods and service that customer want to have, while making a profit which is taxed through legal manner.

As of research rationale, N. Craig Smith (2003), indicate that the genuine query about corporate responsibility today is “not whether but how. But the debate has not utterly vanished, and it is worth pausing to consider some of the arguments of those who doubt the whole point of it. Still, it is indisputably right to keep a wary eye on whether the things firms do in the name of good citizenship are truthfully in the best interests of society as a whole.

Having different sectors in an investment, manufacturing industry is highly exposed for CSR consideration because it needs huge investment amount and it’s significantly exposed for environmental pollution. Organizations are fundamentally could do with CSR but still they lack the management of this corporate social responsibility. The application of CSR is expected to create sustainable and long term benefit for an organization but there exits invisible placement of this corporate social responsibility in organization hierarchy, the same is true for the individual responsible for. Moreover, it unclear whether those manufacturing industries integrate CSR into their daily operations even there is indistinct and uncertain application of it.

For Ethiopia, the classification of firms into large manufacturing industry depends on a number of variables such as level of employment, capital investment, and production capacity, level of technology, subsector, and value of stocks raw material purchase. As the result of higher expansion in large manufacturing investment, the consideration of society as a customer and external stakeholder speculates around corporate social responsibility, but the low involvement of manufacturing industries in regard to corporate social responsibility makes it companies to concentrate only on profit maximization without consideration of philanthropic activist in the society. Basically, the application of CSR definitely benefits manufacturing industry in promoting their company image while maintains their moral obligation to serve the society. Moreover the application of CSR benefits the society by relieving existing problems due to lack of educational access, infrastructure, environmental protection and restoration projects. In contrary lack of CSR application way lead to a suspicious environment between manufacturing industries and society the same is true with their employees. There is no prior research done on this issue in Tigray region for which it indicates sporadic application of CSR in the region. So to assess the practice and finding the determinants of corporate social responsibility, the researcher found it that, it is the right time to investigate this issue.

The General objective of the study was to find the determinants and assess the practice of corporate social responsibility among selected manufacturing companies in Tigray region. Specifically, it assess the practice, investigates the determinants and finding out motive for practicing. Consequently, in order to investigate the objectives, the study has formulated four research questions like that solicited a response on how CSR looked upon as a strategy from a managerial perspective in the companies, what are the drivers of CSR, how manufacturing industries are applying corporate social responsibility and what are the benefits the company receives as a result of CSR involvement.

This paper has combined both quantitative and qualitative research approaches so as to investigate the determinants of CSR practice in large manufacturing industries in Tigray regional state. . Data has been collected using quantitative survey, key informant interview and focused group

discussion with managers /CEO and trade union heads (employee union heads) of each large manufacturing industry, local residents around manufacturing industries. Moreover, observation of CSR projects has been made.

Accordingly, in this study, the researcher has considered census of larger manufacturing industry in Tigray Region. According to *C.R Kothari, 2004* Census is appropriate when the populations can be easily identified like large manufacturing industries. It is expected that large manufacturing industries are actively pursuing and documenting CSR activities. There are some additional reasons that larger manufacturing industries are expected to involve in CSR, like they are considered as they have better access to financial and other resources because of their size (Brammer and Millington 2006 cited in Xiaou Han 2010), companies with good reputation is expected by the society to be involved in social responsibility activities. Moreover, Millington asserts that some times larger investments on manufacturing industry have high impact to environmental damage. Moreover, large manufacturing industries have large number of employee as compared to small and medium scale industries and create atmosphere a better chance to investigate the workplace dimension of CSR.

The classification by Tigray regional state agency of Investment and bureau of trade and industry shows categorization of manufacturing industry as small, medium and large. Accordingly there exists 73 large manufacturing industries in the region since 1983 Ethiopian calendar (1991 G.C) in which 8 of them are on pre implementation stage and 4 are inactive, hence, census of 61 large manufacturing industries has been considered in this study.

#### *Econometrics analysis*

In order to investigate determinants of CSR practice, Logit econometrics model has been employed. The general mathematical specification of the model is:

$$P_i = \frac{e^{Y_i}}{1 + e^{Y_i}}$$

Where,  $P_i$  is the probability of an outcome, in our case the probability of applying CSR regularly, and  $Y_i$  is the outcome equation of CSR i.e.

$$Y_i = \beta_0 + \beta_1 X_i$$

$i = 1, 2, 3, \dots, n$

$\beta_0$  = intercept and  $\beta_1$  = regression coefficients to be estimated

$X_i$  = Variables that affect CSR

In our model we have seen the regular application of CSR ( $Y_i$ ) taking the value 1 if companies are applying CSR regularly, and zero otherwise. This is regressed against the independent variables (environmental, community, workplace, marketplace dimensions and existence of policy statement for CSR) that are expected to affect the regular application of CSR based on the literature and specific context of the study.

The econometric model is specified as;

$$P(Y_i|X_i) = \beta_0 + \beta_1 X_i + e_i$$

This gives us the probability of applying CSR given the drivers of it. With this we can have insight in to which driver is contributing more to the regular application of CSR.

### Dependent variables

- Annual Environmental Study, Regular environmental community mobilization, CSR Policy Statement, community environmental protection, friendly raw production

### Independent variable

$$\beta_1 = (\beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \beta_6 + \beta_7 + \beta_8 + \beta_9 + \beta_{10} + \beta_{11} + \beta_{12} + \beta_{13} + \beta_{14} + \beta_{15})$$

market+ 10\*public+ 11\*gov+ 12\*stake+ 13\*emp+ 14\* envst+ 15\*envorg+€)

More specifically the model is specified as:

$$\text{Dependent variables} = \text{independent variables} \left( \beta_0 + \beta_1 \text{Age} + \beta_2 \text{profit} + \beta_3 \text{Edu} + \beta_4 \text{loc} + \beta_5 \text{Debt} + \beta_6 \text{Supplier} + \beta_7 \text{Foreign} + \beta_8 \text{Domestic} + \beta_9 \text{new market} + \beta_{10} \text{loccomm} + \beta_{11} \text{gov} + \beta_{12} \text{stake} + \beta_{13} \text{emp} + \beta_{14} \text{envst} + \beta_{15} \text{envorg} + \epsilon \right)$$

Where,

Regular application of CSR practice = the dependent variable

$\beta_0$  = is a constant

The value of  $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}$  are called the regression coefficients estimated based on the data.

- Age=It is a continuous variable, it refers to the number of years the firm engaged in production activity
- Profit=It is a continuous variable and is measured based on annual profit of firm in Birr
- Edu= It is a continuous variable and is measured based on years of schooling including higher education
- Loc=It is a continuous variable and is measured in kilometers of distance of firm from main road and urban area
- Debt=It is a continuous variable and is measured based on amount of firm debt in Birr
- Supplier=It is a continuous variable and is measured based on the number of suppliers
- Foreign= It is measured as a dummy variable taking value of 1 if the owner is foreign and zero otherwise
- Domestic= It is measured as a dummy variable taking value of 1 if the owner is domestic national and zero otherwise
- New market= It is a continuous variable, it refers to the number of new market targets a firm expand annually
- Loccomm= local community, It is a continuous variable and is measured based on the number of cases raised by local community In relation community dimension of CSR
- Gov= governmental pressure, It is a continuous variable and is measured number of cases and regulations forwarded by the government in relation to CSR

- Stake= stakeholder influence It is a continuous variable and is measured number of cases raised by stakeholders in relation to CSR
- Emp=employee pressure, It is a continuous variable and is measured based on the number of cases raised by trade union for negotiation
- Envst=It is a continuous variable and is measured based on the number of environmental studies annually
- Env org= It is a continuous variable and is measured based on the number of reports submitted to environmental organizations

Moreover, as per the conceptual framework, index has been created among four dimensions. Eventually, the highest mean index shows more response has been obtained regarding current application rate than others on the 5 point rate Likert scale. The following index has been adopted:

- Env= environmental dimension index
- Cmn= community dimension index
- Wp= work place dimension index
- Mp= market place dimension index

To assess the practice the study used descriptive statistics frequency, percentage and mean to describe the responses obtained. For such reason a questionnaire that has a five points of rating scale are prepared and categorized in to two mean ranges because of the nature of the questions in the questionnaire. Accordingly, the following mean range has been applied in order to obtain average response.

- ➡ 1-5 = which is strong disagreement/ very little extent up to strong agreement/very great extent
- ➡ 1-5= which is very high importance/ involvement up to no importance/involvement

Within these five points of scales, the interval for breaking the range distance in measuring the variables is going to be calculated by the formula adopted from Vichea, (2005).

$$\frac{(n-1)}{n} = \frac{(5-1)}{5} = \frac{4}{5} = 0.8$$

Meaning mean value of the variables falling within:

- 4.20-5.00 are going to be taken as strong agreement/very great extent and no importance/involvement as per the nature of the question.
- 3.40-4.19 are going to be taken as agreement/great extent and little importance/involvement as per the nature of the question.
- 2.60-3.39 are going to be taken as indifferent/some extent in the agreement and average importance/involvement as per the nature of the question.
- 1.80-2.59 are going to be taken as disagreement/little extent and high importance/involvement as per the nature of the question.
- 1.00-1.79 are going to be taken strong disagreement/very little extent and very high importance/involvement as per the nature of the question.

## **2. Discussion and Analysis**

In relation to theoretical and empirical issues, theoretically, as noted in our introduction, there is a no strong consensus on a definition for CSR. CSR has been used as a representative term for ethical business, indistinguishable to corporate philanthropy, and considered basically tuned to environmental policy. CSR has also been, though different, consistently used as a synonym with corporate social performance and corporate citizenship. The lack of consistency in the use of the term CSR makes it difficult to judge against results among different studies. In relation to empirical issues, McWilliams and Siegel (1997) indicates that CSR is a firm level measure and many socially responsibility activities occur at the plant level or the product level hence they declines to applaud applying event study as a methodology to measure CSR consequences.

### **2.1 CSR understanding and practice**

The meaning of CSR is not the same for everyone, corporate socially responsible areas of application might change overtime; accordingly its application among manufacturing industries varies as per their involvement. Policy statement of CSR shows remarkable (3.45 mean) attitude by those large manufacturing industry in designing policy statement for their CSR

activities in which this concern is significant in their embark for attainment of their CSR goal. Moreover, regardless of its success these firms CSR activities are closely related to their business strategy (3.50 mean), which entail as they have optimist stand in obtaining the benefit of CSR. Furthermore, while asking whether their CSR activities are conducted on regular basis, 37.70% of the respondent responded “yes” and the remaining respondent replied “No” which signifies that they are doing their CSR program when felt necessary even though they design policy statement.

**Table 2.1: Distribution Of Percentage And Frequency On CSR Source Of Finance**

Observation		Very high importance (1)		High importance (2)		Average importance (3)		Little importance (4)		No importance (5)		Mean
		Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
Annual allocation	61	37	60.66	10	16.39	4	6.56	-	-	10	16.39	1.95
Percentage of annual profit	61	6	9.84	41	67.21	4	6.56	4	6.56	6	9.84	2.39
Departmental funds	61	-	-	2	3.28	27	44.26	14	22.95	18	29.50	3.79
Ad Hoc funding	61	4	6.56	8	13.11	14	22.95	19	31.15	16	26.23	3.57
Employee financial contribution	61	6	10	2	3.28	6	10	4	6.56	43	70.49	4.24

Source: Own Survey, 2015

As of decision and implementation of CSR activities, there is no common concerned department in all those large manufacturing firms to decide on CSR related issues and to facilitate the implementation of CSR activities. Moreover, some respondents indicate that there are situations in which owners of the factory made their own decision to participate on CSR initiatives; CSR requires integration between decider and implementer of the activities. However, there is not sound integration between decision and



implementation in those large manufacturing industry especially when owners make unilateral decisions for which this disintegration lead to incapability of handling CSR activities.

Consequently, as per the result of this study those manufacturing industry are using annual allocation of funds and percentages of annual profit as their main source of finance so as to facilitate CSR programs. Basically, it is expected that any firm who are actually involving in CSR should allocate some amount of finance to the program. Accordingly, respondents highly agree(1.95 mean) on annual allocation essentiality as main source for CSR initiatives which is momentous for CSR success.

## **2.2 Corporate Social Responsibility and Environmental Dimension**

The environmental dimension of CSR contains a wide array of actions. Among these are hazardous waste management, recycling, pollution control and the use of environmental friendly inputs, accordingly the results show that, those manufacturing industry wants to address their environmental protection role via aspects related to pollution reducing activities.

In relation to establishment of a precautionary approach to different environmental challenges, 50.82% of the total respondent replied that they strongly established a precautionary approach the solid waste which signifies that companies are watchful to solid waste protection from destructing the environment.

Results of focused group discussion made with inhabitants living nearby to these factories indicate that, there has been noise and air pollution environmental destruction until recent times (estimated 2-3 years back) especially by those cement, limestone and tannery factories but now as a result of consultation with the administrators of the factories and concerned individuals the problem begins to ease but it is not fully eradicated. Also, residents live nearby some specific industry told the researcher that, leaked wastes are still affecting life of their livestock's while they searching for potable water and grass land. Moreover, the observation made by the researcher shows similar trend, based on the observation, those large

manufacturing industries are recently making huge investment in pollution reducing technology especially these cement, pharmaceutical and tannery factories which are found on the region owned by EFFORT (Endowment Fund for Rehabilitation of Tigray) are making a noteworthy investment to address their CSR environmental dimension.

Accordingly, the result implies that the current strive for environmental impact management and prevention is encouraging but not comprehensive in which it need a lot to do especially to reduce the environmental impact on inhabitants living around those large manufacturing industry. Moreover those large manufacturing industries are acting unilateral on the field to reducing environmental impact in which they are expected to work together with community, suppliers and other concerned parties.

### **2.3 Corporate Social Responsibility and Community Dimension**

Community is considered the most important stakeholder regarding CSR that they are either affected by, participating in or affects a company's CSR performance and activities. Based on the study result Despite positive responses from managers of those manufacturing industry on involvement of community support related CSR activities, the result of focused group discussion shows dissimilar, residents living around these manufacturing industry said that, "the support they gain from the companies in the name of CSR is insignificant comparing their annual profit" but the residents ascertain that these manufacturing industries are undeniably alleviating unemployment in their area. Hence, those manufacturing industries community dimension CSR involvement is not actually relative with societal expectation since the community expects high involvement in areas that can have noteworthy contribution for daily life like road and health center construction unlike building of sport facility, therefore this situation may leads towards unacceptable application of CSR by stakeholders.

The result shows, open dialogue with local community on adverse, controversial or sensitive issues that involve their firms regularly (accumulation of waste outside our premises, vehicles obstructing roads or environmental concern) is minimum despite some remarkable activities like

building of kindergarten for the community residing around the area they operate and construction of fences for rural area schools. Consequently, the study revealed that those manufacturing industry uses CSR to introduce themselves to local inhabitants by giving something back to the community when entering new areas so that they can gain acceptance to perform their business.

Using CSR as a strategy, companies receive protection from locals in the nearby surroundings and thereby reduce the risk for conflicts that otherwise could have occurred. CSR community dimension functions as a strategy, since it can create improved image and also increase its reputation.

## **2.4 Corporate Social Responsibility and Workplace Dimension**

Valuable labor relationship settings are the product of many factors, some of which arise at the workplace, while others exist beyond it. Whether or not a firm has a code of conduct, it will evince a pattern of behavior that includes compensations and excellent human resource practice towards its workers. In addition to the attitudes consciously and unconsciously adopted by various levels of management, the environment in which the firm operates also contributes to the development of first-rate workplace atmosphere (SomSekhar Bhattacharyya 2008).

The study revealed that, high agreement (3.79 mean) has been obtained for commitment to the health and safety of employees by the firms which indicates that unlike the existence of workplace discrimination (3.34 mean) those large manufacturing industry are committed for health and safety of employees. Moreover, respondent indicates their highest agreement (4.36 mean) to the existence of bonus for effective employees. Respondents also highly agreed (4.23 mean) that their respective firms have designed policy for a health, safety related issue. It also revealed that all employees are insured (4 mean) for work related damage. Despite positive responses from managers of those large manufacturing industry in relation to employee related workplace dimensions, the employees feel dissimilar in some aspects. Hence, the study shows high variation between management and employee of those large manufacturing industry in regard to enabling worker

representatives (labor union) to negotiate and confer with decision makers for which employees strongly disagree (1.10 mean) in contrary the firm's management agrees (3.54 mean) that they discuss with employees in decision. Moreover, employees disagree (1.66 mean) that the firm working environment are designed to be harmonious with disable employee while managers significantly agree (3.51 mean) that it is harmonious. These variation in response shows that the practice made by those large manufacturing industry in relation to workplace CSR is not consistent with the interest and will of employees in which it is solely designed and practiced with the consent of managers only.

## **2.5 Corporate Social Responsibility and Market Place Dimension**

Manufacturing industries relation with supplier and their respective trade union should be notable so as to improve their marketplace dimensions of CSR. In terms of legal requirements, CSR market place dimension requires companies to legally adhere tax related regulations and product safety requirements. As part of market place CSR, the respondent was depicted whether they are member of any trade union, consequently, 83.60% of the respondents replied that they are member of any trade union which found in Ethiopia while 16.39% of the respondent replied they are not.

Trade union members have responsibility to abide by the rules and regulations of their respective union in which it is believed that they are being a member in their consent so as to gain market related access. However, large manufacturing industries are aware of the rules and regulation of their respective trade union nevertheless they are not vigorous (3.32 mean) in regarding to the implementation of these rules and regulations.

## 2.6 Econometrics Results on Determinants of CSR Practice

**Table 2.2: CSR Policy Statements**

<b>Dependent Variable: CSR Policy Statement</b>		
<b>Variables</b>	<b>Parameter coefficient</b>	<b>Std. Err.</b>
Age of firm	.018	.02
Manager Edu	1.32**	.56
Profit	.15	.19
Location	-.64**	.31
Image	-.82	.56
New market	-.00003	.00002
Domestic own	-.07**	.03
Foreign own	-.0018948	.21
Local com pressure	.01	.007
Environmental orgs	3.28***	.62
Debt	-.92**	.41
Gov regulation	3.34**	1.37
Supplier	2.20*	1.33
Number of obs	61	
p>chi2: 0.0000		
LR chi2(12)	116.23	
Pseudo R2	0.4664	

\*\*\*, \*\*, \*, significant at 1% 5% and 10% level respectively

Besides, based on the interview made to representative of Ethiopian revenue and custom authority Tigray regional state branch office, the respondent indicate that in recent times the attitude for tax has been changed for good in favor of it, consequently, these manufacturing industry's also made significant change in attitude and moreover the interviewee said that based on the assessment they made recently they observe that all manufacturing industry's has fulfilled the legal procedures that the office demands.

Based on the results above manufacturing industry owned by domestic investors have less understanding and tendency to design CSR policy statement. This results due to the fact that their business orientations remain only relation to profit aspects and less attention to environmental protection. In addition, as compare to those firms located in urban areas those manufacturing industries located in rural areas has less consideration rendered for CSR policy statement. As it is apparent in the result, the

accumulation of debt negatively affects those companies to design CSR policy statement, this result due to the existing attitude which correlates CSR practice with abundant financial capacity. However, an environmental organization (significant at 1%) positively affects those manufacturing industry to design CSR policy statement. Still, manager's educational level, governmental regulation and suppliers exerts their influence on these companies to design and integrate CSR policy statement in their organizational structure.

**Table 2.3: Annual Environmental Studies**

<b>Dependent Variable: Annual Environmental Study</b>		
<b>Variables</b>	<b>Parameter Coefficient</b>	<b>Std. Err.</b>
Supplier	1.23	.95
Image	.86	2.69
New market	1.77	2.06
Manager Edu	.72**	.28
Profit	.74**	.27
Local com pressure	-3.07	2.95
Domestic own	-0.131	0.09
Foreign own	0.0194	0.02
Constant	.65	2.02
Number of obs	61	
p>chi2: 0.0001	10.34	
LR chi2 (5)		
Pseudo R2	0.1433	

\*\*\*, \*\*, \*, significant at 1% 5% and 10% level respectively

According to Henrik Selin and Adil Najam (2011), Environmental change and resource constraints are adding to the complexity in an already turbulent world. Consequently, conducting annual environmental study sound more in this regard. Accordingly, shown in the above table the managers' educational level and the firm's annual profit (both significant 5%) positively affect conducting environmental study. Environmental study is presumed to be a solution for any environmental related hazards while it is part of CSR activities.

The success of CSR highly depends on the integration of environment and society in which the latter play the major role especially in relation to enhancement of green economy. Shown on the above Table 1.5, local

community positively affects the task of Regular environmental community mobilization. This can be explained by the fact that those firms with high community pressure in relation to environmental issues tends to apply regular environmental community mobilization while the opposite is true for those firms with low pressure.

**Table 2.4: Regular Environmental Community Mobilization**

**Dependent variable: Regular environmental mobilization**

Variables	Parameter coefficient	Std. Err.
Age of firm	.001	.013
Manager Edu	.013	.014
Profit	-.0008	.01
Location	.12*	.07
employee	-.13	.09
stakeholders	.02	.02
Gov regulation	-.59	.54
Local com pressure	. 1.25*	.66
<hr/>		
Number of obs	61	
p>chi2: 0.0121		
LR chi2 (5)	11.20	
Pseudo R2	0.1333	

\*\*\*, \*\*, \*, significant at 1% 5% and 10% level respectively

The purpose of this statistical analysis is to see the direction and magnitude of main drivers for the application of corporate social responsibility in large manufacturing industry. The independent variable explains the variation among the values of the dependent variable, i.e., regular application of CSR. Company that has a regular (based on plan) application of CSR more notably has specific driver to engage in CSR than those who make CSR when felt necessary.

As per the conceptual framework, index has been created among four dimensions. Eventually, the highest mean index shows more response has been obtained regarding current application on the 5 point rate Likert scale.

**Table 2.5: Summary of Logit Results on the Regular Application of CSR**

Regaplic	Coef.	Std. Err.	Z	<95% conf. Interval>	
Policy stet	1.30816	.9258379	1.41	-.5064486	3.122769
Env index	.9507538	2.748392	-0.81	-7.624255	3.149243
Com index	1.88117	3.059931	0.61	-4.116185	7.878525
Wp index	.7123611**	.2975896	2.0	-2.523856	5.338459
Mp index	.7582633**	.3703565	2.34	-1.87844	4.004251
-cons	-3.107927	2.062952	-1.51	-7.151239	.9353841

\*\*= significant at 5%

Number of observation= 61; LR chi2 (5) =10.34; Prob>chi2=0.0661; Pseudo R2=0.1433;

Log likelihood = -30.922904

The model is statistically, for which Workplace dimension (statistically positive and significant 5% level) explains part of the variation on the regular application of CSR. Similarly market place dimension as a driver (statistically positive and significant 5% level) is also explaining on what drives large manufacturing industry for a regular application of CSR.

**Table 2.6: Marginal effects after Logit**

*Marginal effects after Logit*

$Y = Pr(\text{regaplic}) (\text{predict})$

$= .2170279$

Variable	dy/dx	Std. Err.	Z	[ 95% C.I. ]	
policy~t*	.2029128	.12845	1.58	-.04884	.454665
Env index	.1806161	.25289	0.71	-.315033	.676265
Com index	.2391383	.33883	0.71	-.424948	.903225
Wp index	.3196612	.27525	2.01	-.664313	1.30364
Mp index	.3802123	.365522	.19	-1.27652	.516091

(\*) dy/dx is for discrete change of dummy variable from 0 to 1

Based on marginal effect after Logit, probability of regular application of CSR increases by 20% with the existence of policy statement for CSR in the companies as compare to those who don't have policy statement. Those firms with a market place dimension programs have a 38 percent higher probability of regularly applying CSR as compared to those which do not.



Moreover, 1% increases in workplace dimension leads to 31.96% increase in the application of CSR regularly. Hence, the magnitude from these two dimensions shows that market place and workplace dimension has highest marginal effect and are the main drivers for CSR application based on their marginal effect after Logit result. Moreover, with 1% increase in the community and environment dimension, regular application of CSR increases by 23.91% and 18.06% respectively.

Hence, the result of the marginal effect after Logit implies, the main driver for CSR application in large manufacturing industries which are found in Tigray region is the need to meet their market place dimension of CSR, Subsequent to marketplace dimension of CSR, the next driver for large manufacturing industry to involve in CSR is workplace that includes valuable labor relationship. The least drivers for CSR involvement are community and environmental dimensions which denote the concern of these large manufacturing industry for environmental protection is low the same is true for community development in areas of healthcare, education, infrastructure, social activities.

However, it is undeniable that some companies are making good progress in regard to community dimension CSR. Hence, the result signifies that, those large manufacturing industry focuses more on governmental related legal issues rather than providing supports to the community and protecting environment in their CSR.

### **3. Conclusions**

There are different reasons that enforce large manufacturing industry to engage in CSR. This study found that the main driver for large manufacturing industry to engage in CSR is the need to gain marketplace related CSR benefits. Subsequent to marketplace dimension, the need to treat employee and protect them from work related damage is the main driver in those large manufacturing industry to engage in CSR. However, the need to ease community pressure in relation to their operation remains insignificant as driver. Local community around areas in which those large manufacturing industry operates plays an imperative role and has a major impact on large

manufacturing industry conducting business, conversely those large manufacturing industry conducting business in these areas are making little effort to achieve acceptance and authenticity in order to carry out their business activities. Based on the results domestic investors have less understanding and tendency of having CSR policy statement. Moreover, location negatively affects CSR policy statement. Indeed, manager's educational level, governmental regulation and suppliers influences companies to design and integrate CSR policy statement in their organizational structure.

There are misperceptions and misunderstandings regarding CSR even some have ambiguity regarding its definition. Moreover, some parts of local communities anticipate companies to boost their living standards based on CSR program. Additionally, large manufacturing industry also uses employee compensation system (indirect compensation) to address their CSR on workplace related issues. However, the application is not free from problem, like variation between employee and managers has been identified in the CSR workplace application especially factors related to wage and the existence of negotiation with employee, besides, anti-bribery and anti corruption policies are not fully established in those large manufacturing industry which paves the way for misuse of power.

#### **4. Recommendations**

At macro level, the government should design national guideline and framework of CSR, since activities that are performed in the name of CSR tends to be more market and profit oriented rather than philanthropist did. Moreover, some large manufacturing industry are actually performing CSR initiative without solid foundation that supported by the existence of good policy statement and code of conduct, hence, it is worth full for those large manufacturing industry to incorporate their CSR initiative with good organizational framework. In terms of notifying stakeholders regarding CSR activities, large manufacturing industries don't properly address social sustainability report and media as way of communicating CSR initiatives to stakeholder. Therefore, they should use media and social sustainability

reports a ways of informing their stakeholders since their accessibility is wide. Despite large manufacturing industries elementary involvement concerning reducing the noise and odor to nearby community, still there should be more to do in regard to environmental protection since its effect is severe and continuous. Moreover, tanner factories are also expected to alleviate the leak of their small amount of waste to the surface seeing that it is creating health problem on the life of livestock living around.

Furthermore, More of the involvement in regard to community support program comes in sport activities and facilities, despite the fact that involvement in sport activities has its own benefit to transform a society, what the community strive more is to have infrastructural investment through CSR that can significantly change their living standard and makes easy their way of live, like, that of road construction and building of health center. Hence, the activities of CSR have to be based on the interest of the community. Moreover, it is fundamental that, when entering new districts these large manufacturing industries should uses community dimension CSR to introduce themselves to local inhabitants.

## **5. Implication for Future Researchers**

Corporate social responsibility still is a quite new concept for companies in Ethiopia; there are plenty of questions regarding this subject that needs to be answered. The writer of this thesis believe that similar research could be made with similar sector( manufacturing industry) in a few years when the concept of CSR will be better known and adapted further among a larger amount of companies. Another important and interesting issue is that the researcher believes further research in regard to government attitude towards CSR, and specific relationship between CSR and business ethics should be conducted.

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# **Determinants of Sweet Potato Variety Adoption and the Impact of International Potato Center Nutrition Project on Rural Household Food Security**

*(The Case of CIP Nutrition Project Intervention in Tigray Region, Ethiopia)*

***Geletaw Alemu<sup>2</sup>***

## ***Abstract***

*Achieving food security at national and household level is one of the main challenges currently facing developing countries like Ethiopia. Root crop in general and sweet potato in particular have a great contribution in improving household's food security. Despite the high production potential of sweet potato, adoption of sweet potato variety was very low in the study area. These study generally aimed to investigate factors influencing sweet potato variety adoption and evaluate the impact of International Potato Center Nutrition Project on rural household food security using two round (2011 and 2013) household survey data of International Potato Center Nutrition Project. The study employed logit model to identify factors influencing sweet potato variety adoption and DID estimator to evaluate the impact of the project on household food security. The empirical result shows that, age of household head; farm size, access to off-farm activity, access to extension service, access to sweet potato vine (planting material) and participation on International Potato Center Nutrition Project were the main determinants of sweet potato variety adoption in the study area. On the other hand, the result of DID estimator revealed that, participation on international potato center nutrition project did not have statistically significant effect on household food security measured in calorie availability (Kcal) and diet diversity indicators. It implies that, project stakeholder should follow up the project and identify the specific project design and outcome indicators.*

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<sup>2</sup> Lecturer, Departments of Economics, Mekelle University; P.O.Box:451

E-mail: [gele2004@gmail.com](mailto:gele2004@gmail.com)

Phone:+251 914892060/948465110

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**Keywords:** Difference in Difference, Logit model, sweetpotato variety adoption, International Potato Center Nutrition Project (CIP).

## **1. Introduction**

### **1.1 Background of the study**

Technology adoption by rural smallholder farmers in both developed and underdeveloped countries is expecting to increase productivity of crops and animal products for a rapidly growing population food demand (B. Kafle and P. Shah 2012). The adoption of modern technologies, especially in subsistence farming, would governed by a complex set of factors such as human capital, information, location, resource endowments and institutional support. Farmers' acceptance and rejection of a particular technology depends on their needs, costs incurred and benefit accruing (Kassie, 2003).

According to united Nation Food and Agricultural Organization (FAO) (2012), Ethiopia's crop production are decreasing due to inadequate rainfall, land degradation and low adoption of modern farm inputs which results severe localized food insecurity. Efforts has been made to address these problem through grain led approach (cereals are the predominant staple throughout the country) have failed even to keep up with population increase. The spike in grain prices has exacerbated the situation and cereal crop price reach's 100 percent higher than the 2005-2008 average in which the country faced twisting price increase. New approaches is needed including breaking the "grain led approach" through promoting the consumption and production of less capital, labor and resource intensive root crops.

International Potato Center (CIP)<sup>3</sup> Nutrition Project in collaboration with Tigray Institute of Agriculture promotes production and consumption of

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<sup>3</sup> CIP Nutrition Project has working in collaboration with Tigray Institute of Agriculture in production, consumption (utilization) training and demonstration about root crops such as potato, sweet potato, cassava for the aim of reducing malnutrition and improving farm household's food security, which is financed by Irish Aid.

potato and sweet potato in five chronically food insecure districts of Tigray region in which cereal crops are failed due to erratic rainfall distribution, soil degradation. Sweet potato was particularly well suited in addressing food security problem and malnutrition. In addition, it is highly productive in short periods (100-120 days), provides higher yield even on marginalized soil, and it demands relatively low inputs as compared with cereals, thereby filling hunger gap before cereals are ready to harvest (Nunn, N., and N. Qian, 2008). Moreover, its market demand was increasing from time to time and thus providing farmers' alternative additional source of food and income (CIP, 2009)

Like the nation's economy, agriculture is the main economic base of Tigray region. Nearly 80.5 percent of the population earns their livelihood from agriculture. Despite the sector remains, the main source of livelihood in the region production is far from being adequate. Agricultural production in this area is highly constrained by degraded environment, inadequate rainfall, credit, capital, and limited access to technology. Besides, agricultural land in the area also characterized by fragile and fragmented smallholdings.

Farming, which is the main source of livelihood of the people, is largely dependent on rain fed, and the pattern of rainfall is erratic, short and one season (usually from June to September). In the absence or little rainfall cereal crops failed to meet rural household food demand. Even in a good season, onetime cereal crop harvest produces too little to meet the yearly household needs as a result majority of these rural households remain food insecure. Thus, focusing on cereal crop production alone may not be enough to mitigate the food insecurity problem of the area and therefore adopting drought tolerant root crops like sweet potato and potato might have paramount importance to sustain the rural people's livelihood.

Empirical literature on adoption of agricultural technology and innovation most importantly focused on cash and cereal crop, due to this fact, studies on root crops, particularly on sweet potato on the study area is scanty. Only, a small number of studies had shown that root crops particularly sweet potato and potato has nutritionally enriched and short season crop which fill hunger gap before cereal are harvesting (Ndolo, 2001). Ndolo (2001) and Kaguongo et

al, (2010) revealed that adoption and intensity of adoption of orange fleshed sweet potato variety could be influenced by farm household demographic, economic, access and social covariants. Accordingly, there was no any empirical study conducted in the study area about the determinants of sweet potato variety adoption. Thus, this study designed to identify determinants of sweet potato variety adoption and analyzing the impact of the CIP nutrition project on rural household food security of CIP Nutrition Project intervention district's of Tigray.

The overall objective of this research is to identify determinants of sweet potato variety adoption and estimating the impact of CIP Nutrition Project on rural farm household food security. More specifically, it is aimed (1) to identify factors affecting adoption decision of sweet potato by farm household specific to the study area, and (2) scrutinize does participation on CIP Nutrition Project bring farm households food security.

## **2. Data Source and Methodology**

### **2.1 Description of the study area**

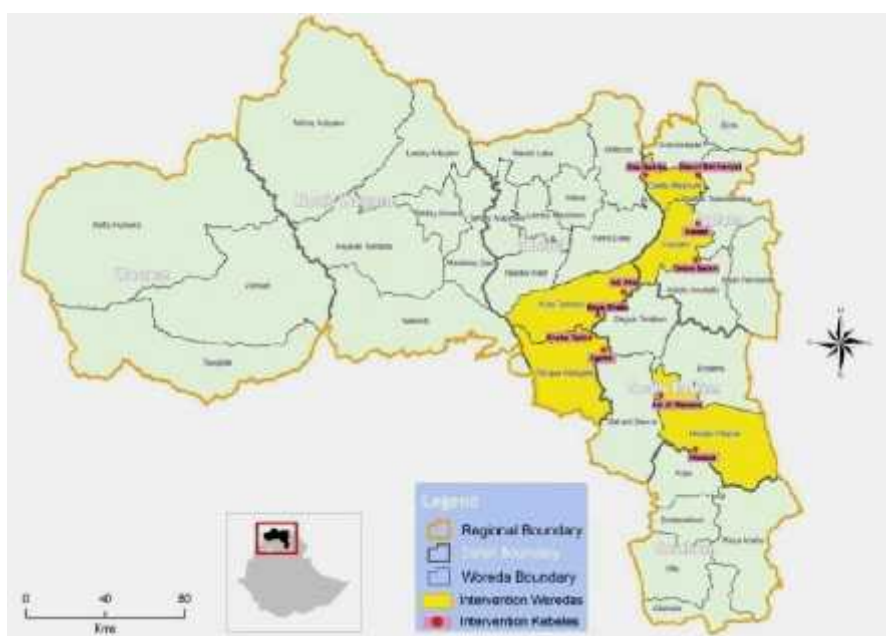
Tigray region is situated in the northern most tip of the country. The topography of the region is predominantly mountainous and the elevation ranges from 500 meters above sea level in the eastern part of the region (Erob) to 3900 meters in the southern zone near Kisd Kudo. The Central Statistical Agency (CSA, 2010) report shows that Tigray has a total population of 4,664,071 of which is rural dwellers and 51% are women. It has an area of 84,721.77 square kilometers and a population density of about 55 persons per square kilometer. The region livelihood is mainly depending on agriculture which is entirely rain fed. For many years, rainfall distribution was very low and erratic. As a result, repeated crop failure and scarcity of food have forced inhabitants to depend on aid in the form of food for work. International Potato Center (CIP) Nutrition Project with the support of Irish-Aid was intervened in five chronically food insecure districts of the region which is depicted in the figure below.



## 2.2 Data source and Sampling procedure

This study used household survey data collected in Tigray Region in two rounds (2011 and 2013) by CIP Nutrition Project in collaboration with Tigray Institute of Agriculture on a total sample of 150 households. Regarding sampling procedure, first, the survey includes only five districts based on sever food security problem, their agro-ecology suitable for potato and sweet potato production and proximity of districts to one another. Secondly, once districts were identified with respect to criteria indicated above, three *tabias* were also selected from each districts based on predetermined characteristics like availability of health center and the potential for sweet potato and potato production. From each *tabia* ten household were randomly selected from *tabia* list, and a standardized questionnaires designed by CIP nutrition project in collaboration with Tigray Institute of Agriculture, covering the above mentioned issues, was administered and data were collected.

**Figure 1: Map of Tigray Regionla State  
Project Intervention Weredas and Tabias**



Source: CIP nutrition project, 2011 report

## 2.3 Empirical model

In this section, empirical models that the study used in order to address the specified general objective in general and the specific objectives in particular are identified with their appropriate specification. Probit or logit models have been widely used to analyze factors that influence discrete behavior such as the adoption decisions (Gujarati, 2004). The logit model assumes cumulative logistic probability function whereas the probit model is associated with the cumulative normal distribution (Gugarati, 2004). Although, logit and probit models gives similar parameter estimates, a cumulative logistic regression model is preferred because of easier to compute and interpret than the Probit and Tobit models (Gugarati, 2004). The logit model has less restrictive assumptions and a simpler functional form than the probit model.

Thus, this study uses logit model to identify factors affecting farmers' decision whether to adopt sweet potato variety or not. According to the logit model, the probability of an individual farmer adopted sweet potato (i.e. farmers who planted sweet potato in 2013/14 mehar and belge season), given a well defined set of socio-economic and physical characteristics (X), the logit model specified as follows:

$$P(Y_i = 1) = \frac{1}{1 + e^{-(S_i X_i)}} \quad (1)$$

Where,  $P(Y_i = 1)$  is the probability that a farmer adopted sweet potato,  $Z_i$  is the function of a vector of 'n' explanatory variables,  $e$  represent's the base of natural logarithms. Thus, introducing the stochastic error term,  $\mu_i$ , the logit model can be written as:

$$Z_i = S_0 + S_1 X_1 + S_2 X_2 + \dots + S_n X_n + \sim_i \quad (2)$$

Where  $Z_i$  is unobserved index level;  $X$ 's are explanatory variables;  $\beta_0$  is the constant term;  $\beta$ 's are coefficients to be estimated in the model and  $\sim_i$  is a random error which is expected to be normally distributed with mean zero

and constant variance. The coefficients of the logit model were estimated using maximum likelihood and serve the purpose of indicating a direction of influence on probability. The marginal effect of each of the independent variables is calculated and indicated by the calculated changes in probabilities.

In addition, this study used Difference-in-Difference (DID) estimator to evaluate the impact of the CIP Nutrition Project on household food security. Evaluating the impact of a project or program on an outcome variable using OLS regression leads to biased estimate if the underlying process which governs selection into a project or program is not incorporated in the empirical framework. The reason for this is that, the effect of the program may be over(under) estimated if program participants are more (less) able due to certain unobservable characteristics, to derive these benefits compared to eligible non-participants (Zaman, 2001).

The major challenge in impact analysis is finding the counterfactuals of the treated group. If the counterfactual is inappropriately approximated the outcome of the method applied shows biased result. There are a number of quasi-experimental techniques, which handle the problem of counterfactual and biased created by unobserved variables. Different impact evaluation study proposed various methods of analysis for observational data which include propensity score matching(PSM), Heckman selection, instrumental variable method, and difference-in-difference(DID) for longitudinal data (Nichols, 2007).

Propensity Score Matching (PSM) ensures matching the treated and control groups through an estimated probability of participation. PSM works efficiently if the assumptions of conditionality, common support and unconfoundness are satisfied. One basic problem with PSM is that the assumption of all variables should be observable. However, in reality there are unobserved variables like soil fertility, motivation, and entrepreneurial skills; in which PSM failed to overcome this problem? The Heckman selection and instrumental variable approaches require that researchers find a valid instrument that determine the treatment status but not the outcome variable, which is a challenge in many empirical studies (Heckman,

1979). Difference-in-Difference (DID) method of estimation helps to capture the time invariant non-randomness problems in program participation that might happen because of self-selection and program placement bias created in the initial stage of the program. DID method controls time invariant unobserved variables, which may not yield a consistent estimate with panel data when unmeasured determinants vary over time. The key assumption of DID estimator is that the change in the observed outcome variable is due to the intervention after controlling for the observable and unobservable characteristics (De Janvry, 2011)

Based on the nature of the dataset and characteristics, it is easy to choose the methods of estimation. In this survey, the number of participant and non-participant households were 100 and 50 respectively. Hence, PSM show a good result if larger number of eligible non-participants compared to participants. As a result, considering dataset has two-time period (before and after) and if we believe there are time invariant unobservable variables, it is appropriate to use DID approach. Another importance of two-time dataset analysis is that it reduces the potential for specification errors relative to cross sectional data. This study assumes there are differences in unobservable variables among rural households but two round dataset is only 2 years difference, we could not expect these unobservable variables to change in this short period. Thus, we used DID methods of estimation to evaluate the impact of CIP Nutrition Project on rural household food security.

According to Khandker (2010), for any program or project impact evaluation on an outcome “Y” over a given household or individual consider there are two groups indexed by treatment status (in our case participation)  $T=0$ , where “0” indicates household who do not receive treatment, i.e. the control group (non-participant), and “1” indicates household who receives treatment (participant), i.e. the treatment group. Further, assume that households are observed in two time periods,  $t=0, 1$  where 0 indicates a time period before the treatment group receives treatment, pre-treatment, and 1 indicates a time period after a treatment group receives treatment, i.e. post-treatment. Every observation is indexed by letter  $i=1...N$ ; households typically have two observation each, one pre-treatment and another post-treatment. For the

essay of notation let  $Y_0^T$  and  $Y_1^T$  be the sample averages of the outcome for the treatment group before and after treatment (in our case before and after participation), respectively, and let  $Y_0^C$  and  $Y_1^C$  be the subsequent sample averages of the outcome for the control group (non-participant). Subscripts correspond to time and superscripts to the treatment status. The outcome “Y” is specified as:

$$Y_i = \Gamma + ST_{it} + \dots T_{it} + \lambda t + V_i \quad (3)$$

The coefficients  $\Gamma, S, \dots, \lambda$ , are all unknown parameters and  $V_i$  is a random unobserved error term which contains all the determinates of  $Y_i$  which our model omits.

By inspecting the above equation coefficients have the following interpretation.

$\Gamma$  = constant term,

$\dots$  = treatment group specific effect (to account for average permanent differences between treatment and control groups),

$\lambda$  = time trend common to control and treatment groups

$S$  = true effect of treatment which is the interaction between the post-program treatment variable ( $T_{it}$ ) and time ( $t=1\dots T$ ) gives the average DID effect of the program.

The purpose of project or program evaluation is to find a “good” estimate of  $S$ , i.e.  $\hat{S}$ , given the data that we have. A reasonable criteria for a good estimator is that it be unbiased which means that “on average “the estimate will be correct, or mathematically that the expected value of the estimator  $E(\hat{S}) = S$ . The following assumption needs to be considered for the DID estimator, thus are:

The model in outcome equation is correctly specified. For example, additive structure imposed is correct.

The average of error term is zero:  $E(V_i)=0$

The error term is uncorrelated with the other variable in the equation:

$$\text{Cov}(V_i, T_i)=0$$

$$\text{Cov}(V_i, t_i)=0$$

$$\text{Cov}(V_i, T_i, t_i)=0$$

The last of this assumptions, also called parallel-trend assumption which is the most critical assumption. It means that unobserved characteristics affecting program participation do not vary over time with treatment status.

Therefore, to estimate the impact of (CIP) Nutrition Project, as well as test for its robustness on the outcome variable (proxy to food security), we used (DID) estimator. This estimator assumes time invariant selection effects could eliminate by differencing the difference between the treated (participant) and control (non-participant) groups. Thus, these variables are assumed time invariant. Considering the above assumption DID estimator expressed as follows:

$$DD = E(Y_1^T - Y_0^T / D = 1) - (Y_1^C - Y_0^C / D = 0) \quad (4)$$

$Y_1^T$  &  $Y_0^T$  denote household average calorie intake (kcal per adult equivalent per day) or average diet diversity score (DDS) or average household food consumption score (FCS) which is a proxy variable measuring food security after and before intervention conditional to treatment or participation ( $D=1$ ).

On the other hand,  $Y_1^C$  &  $Y_0^C$  indicates household average calorie intake (kcal per adult equivalent per day) or average diet diversity score (DDS) or average food consumption score (FCS) after and before intervention (participation) conditional to non-participation ( $D=0$ )

### 3. Results and Discussion

#### 3.1 Descriptive Analysis

Results from descriptive statistics reveal that the average age of sample household head is 46.9 years. On average farm households have 3.7 *timad* (0.93 hectare) of land which is lower than the national figure 1.5 hectare. On average, sample household have a livestock of 5.5 TLU, and a household size of 5.6 individuals. From simple mean difference test statistics result below (Table 3.1), sweet potato adopter and non-adopter are statistically different by age of household head, landholding (in *timad*) and livestock holding in (TLU). However, there is no significance difference in family size.

**Table 3.1: Simple mean difference test of household's socio-economic characteristics by adoption status**

Characteristics	Adopter Mean	Non-adopter Mean	t-value
Household characteristics			
Age of household head	49.7(9.36)	45.9(10.46)	-1.9815**
Households total land holding in( <i>timad</i> <sup>4</sup> )	4.38(3.03)	3.51(2.54)	-1.8871*
Total livestock holding in(TLU)	6.33(3.33)	5.217(3.13)	-1.8865*

**Source:** owns computation based on second round survey result, 2014. \*\*, \* significant at 5 and 10 percent significance level. Note that: values in the brackets are standard deviations.

Almost 61% of the sample households are headed by male. Around 66.4% of the sample households participated in CIP Nutrition Project and the remaining were control households for the purpose of comparing outcome indicators of the project effect. About 45% of the sample household participated in farmer group association nearby the village, 40% of the sample household had access to off-farm activity. Only 42% of the sample household head can write and read. The chi-square statistics shows that, there is statistically significant difference between sweet potato adopter and non-adopter with respect to availability of sweet potato planting material, participation in CIP nutrition project and participation in farmer group association see Table 3.2.

<sup>4</sup> 4 *timad* is equivalent to 1 hectare

**Table.3.2: Household socio-economic characteristics by adoption status**

Characteristics Variables	Adopter		Non-adopter		2
	Freq	percent	Freq	percent	
Households participation in CIP project					0.067*
Participant	30	20.1	69	46.31	
Control	11	7.04	40	26.52	
Households access to sweet potato vine (planting material)					0.000***
Yes	30	20.13	37	24.83	
No	9	6.04	73	48.99	
Households head member in farmer group					0.015**
Member in farmer group	24	16.11	43	28.86	
Otherwise	15	10.07	67	44.97	

Source: owns computation based on survey result, 2014.\*\*\*,\*\*, \* significant at 1, 5 and 10 percent significance level respectively.

## **3.2 Econometric Results**

### **3.2.1 Logit Estimation Results of Determinants of Sweet Potato Variety Adoption**

Before estimation, data diagnostic tests such as model specification, multicollinearity, and hetroscedasticity tests were undertaken and data was cleaned accordingly. Out of the total hypothesized variables, six of them were found to be statistically significant in affecting sweet potato variety adoption. These are, age of household head, farm size in (*timad*), participation in off-farm activities, availability of sweet potato vine(planting material), access to extension service and participation on CIP Nutrition Project.

Age of the household head was found to be significant at 1% probability level and positively correlated with sweet potato variety adoption. As age of household head increases by one year the probability of sweet potato adoption increased by about 1.2% marginal effect.

Keeping other variable in the model constant, land holding is positively and significantly influenced the likelihood of sweet potato variety adoption at 1% significance level. The marginal effect implies that, the probability of sweet potato variety adoption increases by about 4 percent for a one (*timad*) increase in land holding. This perhaps because of the fact that large size of



farm land that farmers own, might increases households' yields to meet their food demand and further enable them to adopt new agricultural technologies.

Off-farm activity positively and significantly influence the probability of sweet potato variety adoption and significant at 5% significance level. From this result, those households who have access to off-farm activities are more likely to adopt sweet potato varieties than those who have not access to off-farm activities. The marginal effect in the model with regard to access to off-farm activities implies that, other thing held constant, the probability of sweet potato variety adoption increases by about 15.7 percent as household participate in off-farm activity than non-participant.

**Table.3.3: Logit estimation result for determinants of sweet potato variety adoption (using STATA 12 version)**

Dependant variable: adoption of orange flesh sweet potato variety: 1= if adopter and 0 otherwise						
Explanatory variables	Coef.	Odds ratio	Marginal effects	Robust SE	z	P> z
hhsex <sup>†</sup>	1.175	3.240	.175	.906	1.30	0.195
Fsize	.214	1.239	.028	.159	1.34	0.179
hhedc <sup>†</sup>	.697	2.008	.095	.501	1.39	0.164
Hhage	.096	1.100	.012	.035	2.72	0.007 ***
Lntlu	.299	1.348	.039	.528	0.57	0.572
Landhg	.302	1.353	.040	.088	3.43	0.001 ***
offact <sup>†</sup>	1.082	2.953	.157	.544	1.99	0.047 **
mfrmgruop <sup>†</sup>	.467	1.596	.063	.506	0.92	0.356
accspvine <sup>†</sup>	2.754	15.705	.403	.593	4.64	0.000***
participation <sup>†</sup>	1.640	5.157	.184	.617	2.66	0.008***
acssext <sup>†</sup>	1.097	2.996	.128	.527	2.08	0.037**
massmexp <sup>†</sup>	.045	1.047	.006	.561	0.08	0.935
_cons	-13.517	-	-	3.173	-4.26	0.000***
Number of obs = 141			Wald chi2(12) = 37.02			
Log pseudolikelihood = -55.728			Prob > chi2 = 0.000			
			Pseudo R2 = 0.313			

Source: owns computation based on Survey result, 2014 \*\*\* Significant at 1 percent and \*\* significant at 5 percent

(<sup>†</sup>) Dummy variable; marginal effect (dy/dx) is for discrete change of dummy variable from 0 to 1.

Availability of sweet potato vine (planting material) was found to be positively correlated with the probability of sweet potato variety adoption and statistically significant at 1% probability level. The marginal effect indicates that vine availability increases the likelihood of sweet potato variety adoption by about 40.3 percent. This is a likely reason that, availability of planting material has crucial role in enabling small holder farmers for adoption of sweet potato variety.

Moreover, the coefficient of household's participation in CIP Nutrition Project was found to be positively associated with the likelihood of sweet potato variety adoption and significant at 1% probability level. Other thing held constant, the likelihood of sweet potato variety adoption increased by 18.4 percent as households participate in CIP nutrition project.

As expected, access to extension service was positively correlated with the likelihood of sweet potato variety adoption and statistically significant at 5% probability level. The likelihood of sweet potato variety adoption increases by 12.8 percent as household got extension service than those who have not got extension service. Hence, extension plays a great role in raising awareness and a major source of information about new agricultural technology. Thus, the significance of information in decision making process is reducing risk and uncertainty about new technology and enable farm household to make well-timed right decisions for available technology.

### **3.2.2 The impact of CIP nutrition project on households' food security**

In this section the study evaluate the impact of CIP Nutrition Project on sample household's food security using different household food security indicators such as calorie intake (kcal) per adult equivalent per day, and the two commonly indicators of diet diversity i.e. food consumption score (FCS) and diet diversity score (DDS). Since, the study used two household survey (2011&2013) data with only 2-year difference. As a result, it is desirable to assess the household characteristics of both participant and control groups. First, let us see whether the counterfactual of the participant (treated) groups appropriately approximated. To do this, we should look at the household characteristics of participant (treated) and control groups depicted in the table below.

**Table 3.4: Socio-economic characteristics of treated and controlled groups in first round survey (year 2011) by selected quantitative variables:**

Households characteristics	Treated		Controlled		$x_t - x_c$	p-value
	$x_t$	$u_t$	$x_c$	$u_c$		
Age of household head	44.81	1.00	47.52	1.615	-2.71	0.139
Households family size	5.55	0.213	5.26	0.300	0.29	0.433
Households land holding in ( <i>timad</i> )	4.264	0.328	3.619	0.380	0.645	0.231
Households livestock holding in ( <i>TLU</i> )	5.825	0.378	5.038	0.738	0.787	0.293
Household calorie intake ( <i>kcal</i> )	1705.8	126.89	1521.3	158.56	184.6	0.381
Food consumption score of household	36.21	0.876	35.18	1.245	1.03	0.499
Diet Diversity score of household	4.25	0.129	4.16	0.210	0.09	0.703

Source: Owns computation based on baseline survey, 2014.

Where:  $x_t$  are mean and standard error for the treated and controlled groups respectively participants (treated) and (non-participants) control groups of the sample households on average share similar characteristics in selected variables for the first survey (year 2011). The p-value shows that the mean difference for those selected variables is insignificant. Thus, the result of the above summary table shows that there was no problem in the sample survey especially in the approximation of the counterfactuals. Therefore, the impact analysis is free from biases because of the fact that both groups do not have significant differences in the values selected variables.

Therefore, the impact of CIP Nutrition Project on household food security using the above mentioned indicators using DID estimation is depicted below.

As DID result reveals that, there is a change in three proxy indicators of household's food security. However, the change is not statistically significant between participant and control groups. It may be due to project duration which is short not more than two years.

**Table3.5: The impact of CIP nutrition project on sample households proxy indicators of households food security**

Group	Observation	<i>Food intake (Kcal) Indicator</i>		<i>DDS indicator</i>		<i>FCS indicator</i>	
		Mean	Std. Err	Mean	Std. Err	Mean	Std. Err
Treated	99	0.78	1.563	0.455	0.178	0.78	1.563
Control	50	0.73	1.050	0.42	0.294	0.73	1.050
Combined	149	0.76	0.870	0.44	0.153	0.76	0.870
Diff		0.053	1.849	0.035	0.326	0.053	1.849
P-value		0.977		0.915		0.977	

Source: own computation based on two survey data, 2014

## **4. Conclusions and Recommendations**

### **4.1 Conclusions**

The objective of this study was to analyze the determinants of sweet potato variety adoption in Tigray, Northern Ethiopia. The study adopted logit model to investigate factors influencing sweet potato variety adoption. The empirical finding indicates that adopters and non-adopters are statistically different with age of household head, land holding in (*timad*), total livestock holding (TLU), access to sweet potato planting material, participation in CIP nutrition project and household heads being member of farmer groups. The econometric result of logit model analysis on determinants of sweet potato variety adoption indicates that, age of household head, households farm size in (*timad*), availability of sweet potato planting material, participation in CIP nutrition project, access to extension service and access to off-farm activity are positively and significantly affect the probability of sweet potato variety adoption in the study area. Also, Difference-in-Difference (DID) estimation result shows that project participation has not statistically significant effect on any of the stated proxy indicators of household's food security in the study area.

## **4.2 Recommendations**

Based on the findings what we have got in the analysis part, in both descriptive and econometric analysis, we can indicate some directions about factors influencing sweet potato variety adoption and the effect of CIP nutrition project on sample household's food security in the study area.

Accesses to extension positively and significantly affect the probability of sweet potato variety adoption. Therefore, government and other development partners involved in agricultural development have to give more attention for the provision of more effective agricultural extension service through capacity building of the existing extension personnel and encourage extension organizations'.

Access to sweet potato planting material is found to be significant and positively determine the likelihood of sweet potato variety adoption. Unlike to cereal crops, sweet potato planting material does not have seed market as a result, agricultural research center and rural extension organization should give emphasis for multiplication of sweet potato planting material (vine) along with its agronomical package.

Off-farm activity enhances the likelihood of sweet potato variety adoption. Thus, strengthening existing off-farm employment opportunities and creating new off-farm activity will greatly help to mitigate farmer's liquidity constraint.

Regarding the impact of the project on households food security, the project effect specifically on household food security measured in both indicators stated in the empirical analysis is not clear. Therefore, project implementers have committed to look at the project specific design and its outcome indicator that help to continue their operation in the study area.

Finally, this study suggests further study may possibly undertake on sweet potato variety adoption especially on farm households preference on various sweet potato variety. Regarding to the project impact one can do further study using fixed effect method of analysis with inclusion food and non-food expenditure data. Since DID assumes that other covariate that would affect food security do not change across the year. But, variables could change over time; they should be included in the regression and controlled by fixed effect regression to get the net effect of the project.

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## **Appendix 1**

### **Dependant variable**

*Adoption of sweet potato variety*, indicates that does farmers grow or not grow any sweet potato variety during the 2013/14 (mehar and belge season); it is a discrete dependant variable valuing “1” for adopter and 0, otherwise.

Indeed, there is not a single internationally recognized indicator and standardized method applied in measuring food security. Among the proxy indicators of food security, calorie intake and dietary diversity were mostly applicable in many empirical literatures. Therefore, in this paper, the two food security indicator; calorie available to a household and diet diversity indicators of household food consumption score (FCS) with 7 days reference time and diet diversity score based on twelve food groups recommended by FAO were applied (program), 2008).

Kilocalorie intake (kcal), the amount of calorie available to a household. The quantity of food was calculated and converted in to dietary calorie equivalent based on Ethiopian health and nutrition research institute food consumption table. Then the food supply at a household level was calculated by dividing a total number of days per year (365) and adult equivalent value for each sampled households was used to calculate calories available per adult equivalent per day for each household.

Diet Diversity Score (DDS): is an important proxy indicator of food security because it is highly correlated with calorie, protein and other food adequacy of households. It is usually measured by summing the number of different food groups consumed over a reference period.

Food Consumption Score (FCS): The score was computed based on dietary diversity and the frequency of various food groups consumed considering the relative nutritional importance of various food groups.

### Summary of explanatory variables and their expected sign

Variables code	Description	Expected sign
<b>Hhage</b>	Age of household head in years	±
<b>Hheduc</b>	Education level of household head:0= illiterate,1= write, read and above	+
<b>Hhsex</b>	Gender of household head:1=male, 0 = female	±
<b>Hhsize</b>	Numbers of individual in the household	+
<b>Offfact</b>	Access to off-farm activity:1= had access, 0 = otherwise	±
<b>Tlu</b>	Household total livestock holding in TLU	±
<b>Tlandhd</b>	Household farm size or land holding in (timad)	±
<b>Accessext</b>	Access to extension service: 1 = yes,0 = otherwise	+
<b>Accspvine</b>	Farm households access to sweet potato planting material:1= yes, 0 = otherwise	+
<b>Massmexp</b>	Households access to mass media exposure:1= yes, 0= otherwise	+
<b>Participation</b>	Households participation in CIP nutrition project:1= participant, 0=control	+
<b>Mfrmgruop</b>	Household head member in farmer group in the community:1= member, 0= otherwise	+
<b>Accredit</b>	Households access to finance:1= had got credit, 0= otherwise	±

### Conversion factor used to calculate Adult Equivalent

Years of age	Men	Women
0-1	0.33	0.33
1-2	0.46	0.46
2-3	0.54	0.54
3-5	0.62	0.62
5-7	0.74	0.70
7-10	0.84	0.72
10-12	0.88	0.78
12-14	0.96	0.84
14-16	1.06	0.86
16-18	1.14	0.86
18-30	1.04	0.80
30-60	1	0.82
>60	0.84	0.74

*Source: Adopted from Dercon and Krishnan (1998) cited in Antigen (2010)*



### Conversion Factor for Tropical Livestock Unit (TLU)

	Animal Category	Tropical livestock unite (TLU)
1	Calf	0.25
2	We and calf	0.34
3	Heifer	0.75
4	Cow and Oxen	1
5	Horse	1.10
6	Donkey (adult)	0.7
7	Donkey (Young)	0.35
8	Camel	1.25
9	Sheep and Goat (adult)	0.13
10	Sheep and Goat (young)	0.06
11	Chicken	0.013

Source: Storck et al. (1991)

### Summary statistics of sample household is socio-economic attributes

Variable	Obs.	Mean	Std. Dev.	Min	Max
fsize	149	5.671141	2.097112	1	12
hhsex	149	.3892617	.4892273	0	1
mfrmgruop	149	.4496644	.4991377	0	1
hhage	149	46.9396	10.22201	24	69
offincome	149	.4026846	.4920924	0	1
tlu	149	5.509866	3.208974	0	13.8
accspvine	149	.4496644	.4991377	0	1
accssex	149	.6912752	.4635254	0	1
hhedc	149	.4295302	.4966786	0	1
participat~n	149	.6644295	.4737821	0	1
tlandhg	149	3.737517	2.698426	0	14

# **Decentralization as a Commitment to Rise Public Services and Improve Quality of Rural Life in Ethiopia: A Case Study**

***Sintayoh Fissah<sup>1</sup> and Meheret Brehanu<sup>2</sup>***

## ***Abstract***

*The main objective of this study is assess the effect of decentralization on education, health, and access to water point (service delivery) and improving quality of life of some Weredas of rural Tigray.. Both qualitative (phenomenological approach), and quantitative (household survey, and woreda level local government expenditure) data were used. Results indicate positive effect of fiscal decentralization on service delivery or expansion across all the study woredas. Likewise decentralization effect on improving quality of life is positive, although minimal. Over all finding reveals the positive change compared with the situation during the pre decentralization period but there are considerable differences on its corollary. First the expected achievements are by and large offset by the existing predicaments. Second the effect of decentralization is not the same in all the study woredas. The differences might have occurred due to variations in agro-ecological condition, location or space, and capability of the administrators.*

**Key words:** Decentralization, Service Expansion, and Quality of Life

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<sup>1</sup> Sintayoh F., Grant MacEwan University Instructor, Department of Economics, Edmonton, Alberta, T5J 2P2 ([sintayoh@yahoo.com](mailto:sintayoh@yahoo.com)) or [geberegziabbers@macewan.ca](mailto:geberegziabbers@macewan.ca).

<sup>2</sup> Meheret B., College of Business and Economics, Mekelle University, Mekelle, Ethiopia.

## **1. Introduction and Background of the Study**

The concept of decentralization began to attract more attention and since 1980's there is a consensus on outlawing of centralization system, reckon as necessary to transfer part of the power of the central government to regional or local authorities. In developing countries it become an issue and a major concern in the 1990s were several countries established national commission to introduce it as one institutional tool (Manor, J. 1999).

Attention to decentralization in developing countries was initially motivated by political reasons, for instance in South Africa (Ahmad, 1998), Moldova (IMF, 1999), and Philippines (Eaton, 2001). Nowadays almost all countries worldwide are experimenting with decentralization contemplated it as an exit to many different kinds of problems (James Manor 1999, vii cited Jumadi, M. Pudjiharjo, Maski, G., Khusaini, M. 2013).

Many disregard pre-1991 regimes instances of decentralization, date decentralization in Ethiopia to the establishment of Transitional Government of Ethiopia in 1991, which became as an institutional tool since then (Ayele, T. 2011, Tegegne and Kassahun, 2004).

The meanings of decentralization differ from scholars to scholars. In its basic definition, it entails the sharing of central government powers with other institutions, especially those geographically separated or responsible for specific functions (Ndegwa, 2002). It also refers to the transfer of responsibility and authority from the central government to field units of level of government, (Turner and Mulme, 1997; Schneider. A., 2003; Tegegne and Kassaahun, 2004).

G. Falleti (2005, P:329) noted how this definition poses important restrictions. First, decentralization is conceived as a process of public policy reforms and not as a description of the state of being of the political or fiscal systems at a point in time. Second, lower levels of government are not the main planner of the development strategy but are rather recipients of the transferred responsibilities, resources, or authority. Third, because decentralization is a process of state reform, it sequential, and a transition to

a different type of state necessarily implies the commencement of a new system.

The above contextual explanation and what it generally possesses is the same as in Ethiopia. Ethiopia understands the good will of power devaluation to the local level as a panacea to all kinds of economic and political problems being faced without having the precondition that made the system effective (Jumadi, M. Pudjiharjo, Maski, G., Khusaini, M. 2013). At present there is a general belief about the system and many share the view of: decentralization has reduced the legitimacy of the central government's action and created an environment that favors reducing the size of public sector while giving more power to both the market and local jurisdictions. But, in spite of accepting this generalization posing the question of: under which circumstance does decentralization enhanced development needs is necessary. Therefore this study is conducted to identify whether the initiatives of fiscal decentralization, helped to achieve the intended result or not?

## **1.2 Statement of the Problem**

The 1995 FDRE Constitution clearly laid down the foundation for a decentralized system of governance by giving decision making power to regional states. The Constitution made clear reference to and justification for the decentralization process to grant adequate power to the lower units of government to enable citizens equally participate directly in the administration of their own affairs.

Some scholars appreciated the move, and most government authorities in sub districts were very contented about this initiative. For instance, when the government officials in the study woredas were asked about its impact they often said it enabled them to achieve development needs (informant). However, there were debates on what has been gained (reference), implies achievement is debatable (LDI, 2013). Over all the emergence of decentralization in Ethiopia is very similar to other countries experience. It was essentially to ensure the following (Yigremew, 2005):

participation of citizens in state affairs (b) empowerment of citizens especially women (c) accountability (d) transparency in system of decisions (e) maintenance of peaceful conditions and (f) efficient and equitable allocation as well as efficient utilization of the country's resources including efficient quality of resources including efficient delivery of quality service to the poor.

However, the detailed legal framework governing decentralization was not found at the 1995 FDRE Constitution. Though the Constitution allows for the creation of weredas with their elected councils, the lack of power, resources and authorities has limited them to effectively engage in democratic self-rule. In addition, Regional authorities had a controlling, checking and monitoring power over the activities of wereda governments.

Owing to the shortcomings of first wave of decentralization, the central government of Ethiopia announced District Level decentralization Program (DLDP) in 2001; the Tigray Regional Constitution was revised in 2001, fiscal decentralization was launched. This creates situations closer to genuine local self rule through block grants, redeployment of skilled and experienced personnel to serve in local government sector offices and woreda autonomy in activity and budgetary planning, expanded freedom of operation in terms of raising and putting to use resources originating from "own" revenue resources, hiring required staff, etc.

The DLDP encompasses all the three major aspects of decentralization namely political, administrative and fiscal. Initially it was limited to the four regional states, namely, Oromia, Amhara, Tigray and South Nations, Nationalities and Peoples Regions. As the second phase of decentralization, DLDP has been implemented in the so called emerging regions (Afar, Benshangul-Gumuz, Gambella and Somali).

This initiative was made following the long tradition of theoretical analyses that verifies fiscal decentralization effects economic growth of the local (Oates (1993), Bird (1993) and Gramlich (1993)). However, the second phase of decentralization lacks clarity, and was also challenged by some technical and procedural related paucities that include:

First, the Regional Constitution broadly defines Woredas and tabias powers, roles and responsibilities. Woredas are empowered to plan for their rationalization but are also hierarchy subordinate bodies to the Regional Government.

Second, the role of local government in this case was so limited because of limited local resource and less capacity. A study conducted by local development international (LDI, 2013) shows some changes but appears only a matter of inter-governmental relations with less effect for local economic growth. Local economic growth has a very broad sense, not just to raise GDP per year in a region. For instance the economic activities undertaken by the regions to develop the economy and improve living standard is very low in the pilot study woredas.

This outcome was similar to other studies about decentralization. Fiscal decentralization policies designed poorly can also create a stimulus for local governments to perform Dangan spending less responsible and sustainable (Phillips, 1997).Decentralization may also have a negative impact on regional economic growth (Martinez and McNab (2001 Rondinelli, Cheema and Nellis (1983), Smoke, P. 2001).

From a country-wide perspective, even in Ethiopia some studies shows that there have been a number of important achievements since the inception of the woreda level decentralization policy (PASDEP, DLD Preview). But there are also studies that show its costs (Ayele, 2011, Sintayoh F. Meheret, B. and Mathijs, E. 2013). Particularly, in the study woredas<sup>3</sup> there are progresses in terms of citizens' participation in political activities, people attitude and perception has changed. Introduction of market oriented polices enable citizens to appreciate economic values, and people are working hard to increase their income. However, the opportunities created are not sufficient enough for community to be main role players in the market. In spite of the policy motto; market oriented neither the activity where people involved nor the infrastructure and the space (location) is favorable to enhance trade and exchange. Moreover, the capacity of collecting more revenue still remains as

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<sup>3</sup>Atsebi, Wekero, Hagereselam, and Tanka'abergele

challenge. Therefore advancement is said to be mixed with regard to citizens' empowerment and the strengthening of local governance (DLDP review, PPA, CIDA), which underlines on the necessity of redefining, and restructuring the system in the way that address the current problems.

To develop the argument this paper is organized into five sections. The first section defines the main concept and definition of decentralization, rationale of the study, objective, research question, hypothesis, scope and significance, and limitation of the study. Detail methodology used is presented in section two. Section three focuses on review of related studies. Discussion of the result is given in section four. Section five is conclusion and policy directions

### **1.3 Objective**

The main objective of this research is to investigate the effect of decentralization in improving quality of life or changing the livelihood of the rural communities' case of the study weredas (Wekero, Atsebi, Tankuabergele, and Hagereselam) of Tigray (northern part of Ethiopia). The following specific objectives are given:

- To assess the implication of fiscal decentralization on service delivery,
- To examine the link between service expansion and changing quality of life (welfare implication).

### **1.4 Research Questions**

Unlike the political scientist who draws from the liberal tradition that argues decentralization helps to deepen and consolidate democracy by devolving power to local governments (Diamond and Tsalik 1999). Economists mainly draw their ideas from a market theory of local expenditures. They argue that decentralization helps to improve resource allocation through better knowledge of local preferences and competition among localities (Oates 1972). This paper is aliened to the economic theory and tried to see the link between decentralization, service expansion based on local preference, and its impact on reducing poverty of the locals.

Poverty reduction in this context is explained following (Besley, 1997) who categorized approaches to poverty reduction into two: technocratic or institutional. The first refer to investigating of different development programs that enables to efficiently allocate the limited government resources to people who are in need. And the second discusses about the institutional related problems such as, lack political power, and lack of accountability and transparency of government officials increases public resource miss-use and hinders delivery of public services. Poverty reduction or improving quality of life in this paper therefore requires these two (technocratic and institutional). But, decentralization may facilitate more effective technocratic program designs because regional targeting may be facilitated, accountability of bureaucrats may be strengthened, and managing poverty reduction programs may be enhanced. It is based on this theory this study tried to answer the following questions.

- Does fiscal decentralization enhance service expansions?
- To what extent does service expansion improve the quality of life in a way that changes the livelihood (welfare) of the individuals?

## **1.5 Hypothesis**

This study has tried to verify the following.

H<sub>0</sub>: Decentralization led to the encouragement of public participation in development and thereby service expansion.

H<sub>1</sub>: Decentralization (both) led to the increasing of service centers

## **1.6 Scope and Significance of the Study**

In Ethiopia political decentralization has been introduced in 1991 as a major policy of the current government, and a federal policy of governance, built along ethnically based regions. (Yigremew, 2005).

Decentralization considered as one instrument for expediting the poverty reduction strategies of the country. It could also e argued that it provides the setting for the poor for increased participation in local decision making and



representation, which contributes towards reducing vulnerability and insecurity.

According to the draft of the development strategy of the country it was designed so as to grant opportunity of self ruling, self decision, and self governing authority to the lower level (weredas). Consequently, the institutional structure was adjusted. After a decade the government introduced second wave of decentralization, called fiscal decentralization or district level decentralization program (DLDP).

The main instrument of DLDP however, is the wereda block grant which made resource available to the weredas through transfer from the region. Accordingly Weredas managed to implement their strategic plan. Compared with the first phase of decentralization it is generally believed that the second phase encouraged them to establish a system of fiscal reform and institutional restructuring that fits to the existing socio-economic and socio-ecological condition that improves service delivery. A study conducted by (Dom and Mussa, 2006). Confirms this but there is no specific study conducted in the way that it shows its actual ramification. We also argue that empirical information on implementation of decentralization policy in the study woredas is largely missing and most of the study conducted about decentralization is desk study (Assefa and Gebre-Egziabher, 2007). Therefore conducting this study is crucial as it provides important information about the nature and extent of decentralization. It helps to examine the capability of local administrators to implement the policy (decentralization), provides a clue about the advantages of fiscal decentralization on service expansion and welfare of the community of Tigray.

This research was conducted considering the interest of MU-IUC project which was financed by the Flemish government. The project commissioned to conduct decentralization effect on public participation in diverse political and economic development matters. The financial constraint and objective of the project was the main factor for the study to be conducted in these specific woredas.

Therefore, conducting this information was significant as the investigation enables to fill the existed gap as it is conducted based the actual practices in each study woreda, and it provides policy makers, and government officials of the region with adequate, sufficient and reliable data about decentralization, that could contribute to the macro performance.

## **1.7 Limitation of the Study**

One of the major limitation of the study is it took larger period of time. This was due to problems occurred at the time of data collection. Even if researchers decided to go out to the field work after arranging all logistics the officials in charge of allowing data acquisitions were in accessible. Despite repeated appointments, individual who are supposed to be interviewed were out of office, and access to local officials was very difficult. Most of the time they were engaged in meeting held either at national, or regional level. Sometimes they were in a serious conference to the extent that they cannot spare a single minute to anyone. Likewise access to communities was not as such easy.<sup>4</sup>

Besides to all these officials were not also at an ease to provide the data we were looking for. Some they were willing to give the data but did not have the data recorded and shelved properly, expressed their discomfort about the data that it is fragmented and with a lot of errors and omissions. At times important questions were highly simplified and answered without looking its possible advantage and further implications; probing was almost impossible.

One of the common thing we observed from both of our target groups (wereda officials and some from the communities) was they were trying to hide even the common and familiar issues, they politicize every question, biased to the position they have been assigned and influenced by their expectation of the possible results.

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<sup>4</sup>In the rural areas communities or target groups are use of getting money for the information what they provide. In our case we could not offer them as the project had budget for it.

Last in most of the study woredas there was no access to secondary information. There were reports compiled but this report was more of presenting the regular routine about the office activities rather than data that shows the progresses. So as a secondary option we tried to collect from each service sector which served as supplementary information to the primary data we collected. Moreover, we compared the data collection with the data available at the region head bureau.

The topic and the existed situation hindered researchers from applying the planned methodology. To this kind of study collecting comparable data (from the woreda where they follow decentralization and not) was appropriate. However, in the region where this study was conducted there is no any woreda (small administrative region) that does not follow decentralization. This forced researchers to design another alternative approach.

This research was conducted considering the interest of MU-IUC project which was financed by the Flemish government. The project commissioned to conduct decentralization effect on public participation in diverse political and economic development. But, the total budget was so limited, which also restrict the research methodology applied.

## **2. Instruments and Methodology of the Study**

### **2.1 Selection of Study Weredas**

The weredas, Wekero, Atsebi, Tankuabergele, and Hagereselam here after would be denoted as the study woredas were selected considering their ecological condition, their institutional performance, and spatial location. First, they were selected because all these woredas are within the boundaries of Giba catchment where the socio-economic project<sup>5</sup> was operated, and this topic was one of the research agendas of the project. Following this their administration performance was taken into account. Prior to the study a discussion with the regional bureaus regarding administrative performance of the study woredas was made. This helped to learn about these weredas

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<sup>5</sup> IUC Project.

administrative performance (strong and weak performers). Besides to their administrative performance selection criteria's includes their resource allocation and contribution to the community development, and accordingly, Kiltawelaelo was selected as best performer followed by Hagerselam, Atsebi, and Tankuabergerle.

## **2.2 Sampling**

To conduct this study, multistage random sampling technique was used. Sampling of the respondents started from preparing the list of Tabias. From each woreda, a proportional sample size was used following a normative approach. The selection of equal sample size from each study woreda was to make appropriate comparison, while selection made the following steps were used.

Initially (in 2010) a total number of 300 samples were collected from each weredas, the sample size has been limited due to the financial paucity, enforced the researcher to set a certain boundary that is seventy five samples from each wereda. However, data collected using survey has been enriched through FGD, and key informant interviews. A series of FGD was made with the population of the weredas (two FGD from each). The FGD followed funnel approach in an exhaustive manner.

After the data collected researchers realized the necessity of conducting second round survey used to obtain more information from the community (both, administrators and civil). Therefore, the second round information, which was conducted in 2011, was gathered believing that administrators' skill might have improved through learning by doing in the way that improves their administrative efficacy.

In the second round survey purposive sampling technique was applied. A total of 200 questionnaires in four of the study weredas were distributed to total number of 32 communities and 18 administrators (50 from each Wereda). Government officials have been selected purposively picked one informant from each sectoral and administrative bureaus. This questionnaire was specifically tuned to evaluate impact of decentralization on service expansion, locals participation, and governance posing same question in the

form of Likert scale and expected them to get answer in the form of order (ranking based on the scale). Even in the second survey 8 FGD was conducted.

### **2.3 Data Collection (Data Sources)**

To generate the required information three instrument of data collection were developed. Initial interview with the households, key informants and focus group discussion was scheduled. Interview with the house hold key informants was used as a major source of information, and has two major components. It comprises of various open and close ended type of questions. This schedule helped to solicit information related to different aspects that are regarded as crucial to describe the research question about decentralization impact.

Simultaneously FGD and discussion with key informants) was made. This had helped to detect any changes related to the institutional system which is also directly linked to socio-economic and socio-political situations of the study weredas after the institutional change. To conduct this, a survey was made. The interview took 1 hr, and views given were transcribed verbatim for analysis. Probes were used for follow-up in the semi structured interview format. Notes were taken during and after the interview as part of an audit trail to maintain and ensure trustworthiness and dependability. During the FGD this study utilized a phenomenological approach, attempting to describe and understand the perceptions and experiences of the communities, and administrators practice of the heads of the woreda bureaus.

### **2.4 Data Analysis**

Once data has been collected it has been analyzed using two method of analysis. Simple descriptive statistics (percentage, table, ratio) and ANOVA statistical analysis.

ANOVA, a statistical technique invented by R.A Fisher. ANOVA can be one factor, the model assumes that the mean of a variable depends on only one factor, namely the sample from which the observation is taken. For a simple

one-way MANOVA, the data set should have one independent variable (grouping variable) and at least two dependent variables. If the model is a type in which it is assumed that two factor determines the mean value of a variable it is called two factor analysis of variance. In such cases variable to be observed can be thought of as being arranged in a rectangular array, and the mean value of a specified variable depends on both the row and the column in which it is located.<sup>6</sup> For a simple one-way MANOVA, the data set should have one independent variable (grouping variable) and at least two dependent variables.

In both cases (both models considered) it is assumed that the data are normally distributed with the same variance  $\sigma^2$ . The analysis of variance approach for testing a null hypothesis  $H_0$  concerning multiple parameters is based on deriving two estimator of the common variance  $\sigma^2$ . The first estimator is valid estimator of  $\sigma^2$  whether the null hypothesis is true or not, while the second one is a valid estimator only when  $H_0$  is true.

In addition when  $H_0$  is not true, this latter estimator will over estimate  $H_0$ , in that estimator will tend to exceed it. Since the two estimators should be close to each other when  $H_0$  is true, where as the second estimator should tend to be larger than the first when  $H_0$  is not true, it is natural to reject  $H_0$  when the second estimator is significantly larger than the first.

In this study the dependent and independent variable are more than two, this enforces researchers to use MANOVA (the model has more than two dependent and independent variables). These two independent variable are generated as a result of categorizing respondents based on space and responsibility. It's hypothesized that impact of decentralization to be influenced by the performance of the administrators and the development condition of the woredas. Thus, in this study space refers to the area of resident, wereda. The targeted wereda are not having the same access and agro ecological zone, which might have impact on implementing the

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<sup>6</sup> Statistics Analysis, 1998, Pulgrave Pub. Using two way ANOVA it is possible to show how to estimate the mean values and test the hypothesis that a specified factor does not affect the mean.

decentralization system. Similarly, individuals' perception (dependent variable) might differ as a result of the responsibility and administrative position they have, which enforced us to categorized respondents into administrators (Coded as 1) and communities (coded as zero). Where the first subscript refers to the group and the second subscript refers to the variable number. Given this categorization in this study MANOVA is preferred to multiple ANOVAs (or regressions with dummy variables) because

- Multiple ANOVA/OLS runs can capitalize on chance. For example, if you have 20 dependent variables, you expect X to have a "significant" effect on one of them if  $\alpha = 0.05$ . MANOVA does a global test of whether group means differ for any of the variables.
- ANOVA/OLS ignore the inter-correlations between the independent variables (IVs). Because MANOVA takes them into account, it can provide a more powerful statistical test. Manova uses more information about the data than ANOVA does.

Another common use of MANOVA is in a repeated measures design, where the same variable is measured at different points in time. Following this categorization impact of decentralization on service expansion (improving quality of life) has been evaluated by conducting a survey that asks many relevant questions that were believed as relevant, and are given below.

- Does decentralization lead to the increasing of public services?
  - Does decentralization lead to the improvement of individuals' capability and in turn rising their economic status (effect capability)?
  - Does decentralization lead to provision of short term trainings in fair manner?
  - What is the effect of decentralization on empowering women?
- MANOVA is used to identify interaction among the dependent independent variable, tried to see the response variable react to the independent variable.

## **2.4 Conceptual Approach to Measuring Quality of Life**

Economic progress of a particular county is usually captured using different indicators, and is a broader concept than economic growth. Economic Growth is evaluated by the changes in the rate of growth of GDP. Whereas poverty reduction is often measured using the commonly used approach (applying both qualitative and quantitative indicator).

In either of these studies the indicators of change or quality of life is more of subjective. The empirical correlates and explanatory factors of life satisfaction as an overall indicator of general subjective well-being are at the centre of a research field, which during recent years has attracted much interest and attention all around the world. Quality of life indicators allow governments to evaluate how well they are doing compared with the past. The changes in quality of life were measured using the following approaches.

Subjective wellbeing comes first and has developed in close connection with the psychological research and it mainly stresses on the notion of individuals are the best judges of their own status. Often perceived by the changes in the level of income, asset, or other wellbeing indicators. It is closely linked to the utilitarian tradition but has a broader appeal due to the strong presumption in many streams of ancient and modern culture that enabling people to be “happy” and “satisfied” with their life in a universal goal of human existence (WHO, 1997). Capability is another approach that conceives a person’s life as a combination of various “doings and beings” and of one’s freedom to choose among these functioning (Stiglitz *et al.*, 2010).<sup>7</sup> Another quality of life indicator is objective that living conditions can be judged to be favorable or unfavorable by comparing real conditions with normative criteria like values, goals or objectives. An important precondition, however, is that there is a societal or even political consensus about three key issues: *first*, about the dimensions that are relevant for

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<sup>7</sup>Some of these capabilities may be quite elementary such as being adequately nourished and escaping premature mortality while others may be more complex, such as having the literacy required to participate actively in political life (Stiglitz, 2010)



welfare considerations; *second*, about good and bad conditions; *third*, about the direction in which society should move. This may sometimes be the case, but it is certainly not always ensured (Noll, H. 2002).

This study mimics the points used in both (subjective and objective) indicators. Changes in quality of life in the study were as usually perceived by comparing the access to services (social indicators) post decentralization period. Household level of satisfaction was evaluated by distributing a questionnaire and asking questions. Emphasis was on education, health, water point, and road. Objective quality of life indicator measures at least some of these dimensions: economic wellbeing, health, literacy, environmental quality, freedom, social participation and self-perceived wellbeing or satisfaction (André and Bitondo, 2001). The effect of institutional change (decentralization) on service delivery is an objective variable used to describe living condition, it is a social indicator, and more closely activity related variable used to explain the changes. This underscores how the objective approach is indispensable to measure the minimal value of under provision, and thus political relevance. Convergence between these two aspects has made it possible to address new, more complex research issues (G. Falletti, 2005).

This study also stipulates how service expansion is not only necessary but is also sufficient condition for the increasing of income of the rural community. Writers strongly believe that the link between the objective and subjective indicator is direct as improvement in objective indicators is nexuses with subjective value. Any change of social value or social services led to the changing the wellbeing of the individuals'. Especially in the rural areas of Ethiopia this needs further strengthening because rural poverty in the county is still persistent and prevalent.

The social indicators (the services listed) in this context are used to see the changes (improvements made) obtained as a result of implementing decentralization policy, assess the effectiveness of institutional programmes and policies, identify social problems that require action, and to develop priorities and goals for action and spending.

### **3. Review of Related Studies**

#### **3.1 Theoretical Framework: Sequential Theory of Decentralization**

In Ethiopia decentralization was perceived as a process of policy reforms composed by a set of public policies where lower levels of government are the recipients of the transferred responsibilities, resources, or authority. Since fiscal decentralization in Ethiopia was introduced following the administrative decentralization, a transition to the second necessarily implies the beginning of a new decentralization sequence.

In Ethiopia political decentralization, which is interchangeably used with administrative has been introduced as a major policy of the current government, and a federal policy of governance, built along ethnically based regions (Yigremew, 2005).<sup>8</sup> It refers to re-distributing of authorities, responsibilities and resources among different levels of government. For administrative decentralization to be effective suitable capacities and institutional strength at all tiers are necessary. Though government are typically heterogeneous and complex entities that consists of national, regional, and woreda layers administrative to some extent decentralization enhanced devolvement but the center (region) is still the main source for any development strategies to be set. As Snyder (2001), presents under this system development agendas and political discussions in Ethiopia, never remain at national level, focuses were on small administrative units. The politicians were shifting the locus of their analyses from the national to the sub-national levels but in practice planning and decision making is not fully decentralized as the sub-national were main implementers of the development policy.

Fiscal decentralization) also entails the definition of authority over raising revenues or access to transfers and making decisions on current and investment expenditures (Von Braun, J. and U. Grote, 2000). Under this system the wereda block grants which made resource available to the

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<sup>8</sup> The main rationale for decentralization policy is democratization and participation of all ethnic groups in the country in the spirit of self determination and self administration.

weredas through transfer from the region. Accordingly Weredas managed to implement their strategic plan and policy implementers. Therefore, compared with the first phase of decentralization the second phase encourages to establish a system of fiscal reform and institutional restructuring that enable them to be more efficient in terms of implementing the development plans and identifying the priori needs of the locals.

Therefore, to discuss the effect of second phase of decentralization on service delivery in Ethiopia this paper employed sequential theory of decentralization (G. Falleti, T., 2005).

When local and state bureaucracies acquired new skill and knowledge through the practice of delivering new responsibilities and attaining of trainings administrative decentralization enhances organizational capacities. But administrative decentralization may effect to decreasing the autonomy of sub-national officials if sub nationals are not able to generate sufficient fund to run their economic and social activities but are still remaining dependent on the center.

With regard to fiscal decentralization higher levels of automatic transfers increase the autonomy of sub-national officials because they benefit from higher levels of resources without being responsible for the costs (political and bureaucratic) of collecting those revenues. On the contrary, the delegation of taxing authority that lack the administrative capacity to collect new taxes can set serious constraints on the local budgets, it increase the dependence of the local officials on the transfers from the center. Political decentralization, which was defined above invariably increases the degree of autonomy of sub-national officials from the center. The only case when political decentralization could have a negative effect is when by augmenting the separation of powers at the sub-national level it leads to divide sub-national governments. The above explanation unpacks how and when decentralization is effective and serves as a good guidance on when to say decentralization is effective to serve the intended target.

From one of the questions we posed during the survey we learned the advantages of fiscal decentralization in improving the quality of life of the

rural people. Nearly 63.8% stated their satisfaction; they justified the positive effect of decentralization on service delivery. But, referring to the theory we have learned about the existed gap. The policy reform regarding fiscal decentralization in Ethiopia does not fit to the theoretical explanation, presented by the author above. In one way or the other there are some gap between what is decentralization in Ethiopia now and what it is supposed to be. We have noticed the theoretical deviation, which could also be a reason for fiscal decentralization effect to don't be as it is prescribed by the policy. Fiscal decentralization can successfully take place only when the certain conditions are fulfilled (Tanzi, 2000). The problem related resource allocation by the center is one of the limitations noted. Small administrative units in Ethiopia are still dependent on region or center. They do not have the opportunity and the access to generate enough amount of resource, which is sufficient to finance their development activities. Woredas received their resource in the form of block grant scheme. But block grant is not fully established, there are several non-block grants transferred from different perspectives (training support, asset transfer, aid, contingency assistant), which are becoming facts for corruption and inappropriate utilization of public resources to be high.

Second, the technical skill and capacity of the region of most woreda administrators are not efficient. For effective fiscal decentralization (DLDP implementation) having the required skill and education is necessary. However, in the absence of the required skill and knowledge restructuring of any system or introducing of institutional change would not bring the desired outcome. The experience of most developing countries reveals that local governments suffer from a shortage of qualified personnel and managers to shoulder the new responsibilities. This may undermine the competence of local bodies to plan, coordinate, and execute the new tasks (Asante, 2003; in vanDijk and Tegegne, 2005).

Provision of training and long term capacity building measures in Ethiopia was hoped to grant opportunities to implement the fiscal decentralization effectively (Taye and Tegegne , 2007). In deed capacity building strategy had helped to bring some changes on the skill but did not manage to reverse the problem of inefficiency. Moreover, poor engagement in monitoring and

evaluation of delivery of public services at the local level, and lack of accountability of local government became a major factor for misappropriation of public resources. In some cases (delivery of safety net and provision of local oriented development incentives) local elite who have strong tie (network) has often direct access to and influence over local officials (informants).

The other problem noted was: regions as well as weredas are affected by promise that is supposed to come from different donors (which are really part of the budget) but remain as pledged. Finally there is always time gap in budget disbursement and allocation that leads to the increasing of inefficiencies, and resource wastages. In addition, despite fiscal decentralization emphasizes on the improving revenue generation there are some problems. First, small administrative units don't have much potential to generate sufficient revenue to the extent that finances some of their development activities.

Given all these limitations there are general arguments on its optimal effect, and impact on poverty. Empirical information on implementation of decentralization policy in the study woredas is largely missing. Therefore, this study is conducted taking into account the view and perception of the administrators and communities that they contemplate fiscal decentralization is better than centralization.

### **3.2 Empirical Evidences of Decentralization and Public Utilities Outcomes**

Since the time decentralization become as an institutional tool there are a number of studies conducted. All these studies find a beneficial effect of decentralization and not much was stated about its limitations, the reviews discussed below are used as supplementary evidence about the decentralization in Ethiopia and somewhere else.

Jumadi, M. Pudjiharjo, Maski, G., Khusaini, M. (2013) used panel data across districts and cities in East Java Province, which consists of 29 districts and 9 cities in 2007- 2010. This research was conducted using SEM to

identify the effect of fiscal decentralization on human development, physical development, and input factors on economic growth. Finding reveals a significant and positive effect between fiscal decentralization on human development; fiscal decentralization on physical development; human development on local economic growth; physical development to local economic growth, and input factors on local economic growth. Unlike these positive indicators it also presented the further concern Even though this study tried to show the clink it failed to sate the mail limitation of the model.

M. Khan, Q., Faguet, J., Gaukler, C., and Mekasha, W. (2013) study shows the implication of decentralization in enhancing spending efficiency through creating of better capacity, more transparency, and more citizen accountability in Ethiopia. However, the study is not that much detail as it also stated the necessity of considering other factors while evaluating impacts of decentralization. This study also verified the successful application of model proposed in previous study (WDR, 2004); improving Services for the Poor. World Development Report that linked improved services to improved accountability of service providers – both through a long (citizen influence service provider through the government) and short route (direct accountability between service provider and government).

The study confirms how woreda level spending on education and health is becoming pro-poor. After introduction of fiscal decentralization health and education-level spending is pro-poor, with 58% of the incidence accruing to the two bottom quintiles. On-going work on incidence analysis in the Ethiopian part of a multi-country study finds the overall incidence of health and education spending on the bottom 40% to be 33% which is not pro-poor compared to woreda spending. But this finds that primary education spending (which is mostly woreda based) is pro-poor. Similarly, woreda-level agriculture spending, primarily for agriculture extension workers, drives increases in output and the adoption of new, improved methods across all asset quintiles. This study provided a clue about decentralization effect on services but there is nothing that led us to say it is pro-poor as the beneficiaries of the program are both, poor and poorer in the same way.

Ayele, Z. (2011) study noted the little progresses attained in terms of social service provision in Ethiopia after introduction of fiscal decentralization. As an evidence it has used the report compiled by United Nations Development

Program (2010) shows the progresses attained related to human development, where Ethiopia was ranked first in Sub-Saharan Africa and 11<sup>th</sup> in the world based on the progress registered in the areas of primary education, primary health care, agricultural extension services and the like which are effect of decentralization initiatives. This study employed historical presentation and it also criticized the approaches of decentralization that Ethiopia is implementing. The paper underlines the further efforts required for the creation of democratic pluralism and autonomous local government which is responsive to local preferences and accountable to local people but is mere of general recommendation.

Mogues, T. et al. (2009), investigated effect of decentralization on specific public amenities, access to safe drinking water. The paper was conducted based on qualitative and quantitative surveys on rural public services. Result shows the slight changes; that access to safe drinking water has become better after fiscal decentralization but less coverage and poor quality water supply is still affecting the lives of all rural households. Moreover, gender comparison reveals women facing a major burden. Likewise women in this study were highly dissatisfied with the governance of water. Even though data for this study is from different regions it failed to show the variation among the woredas rather it assumed as if all regions performance after decentralization is homogenous.

A research titled: Does decentralization serve the poor? Was conducted by Von Braun, J. and Grote, U. (2000). Their general answer was “Yes” but also noted the pre and post comparisons required. This paper has tried to appreciate all these findings despite some limitations noted with each research. It is based on the points stated the research question for this study formulated. Therefore this research is very specific, and it compares the effect of fiscal decentralization in different woredas relying on the information obtained from households in each study woreda.

### **3.3 Conceptual Framework: The Model**

This model was developed based on the theory, and empirical evidences. It tried to see the link between the existed theories and the actual practices. The drive to decentralization and devolution of power to the local and regional entities has strengthened the rationale for regional and local development strategies and policies (Asfaw, A., Frohberg, K., K. S. James and Jütting, J., 2004).

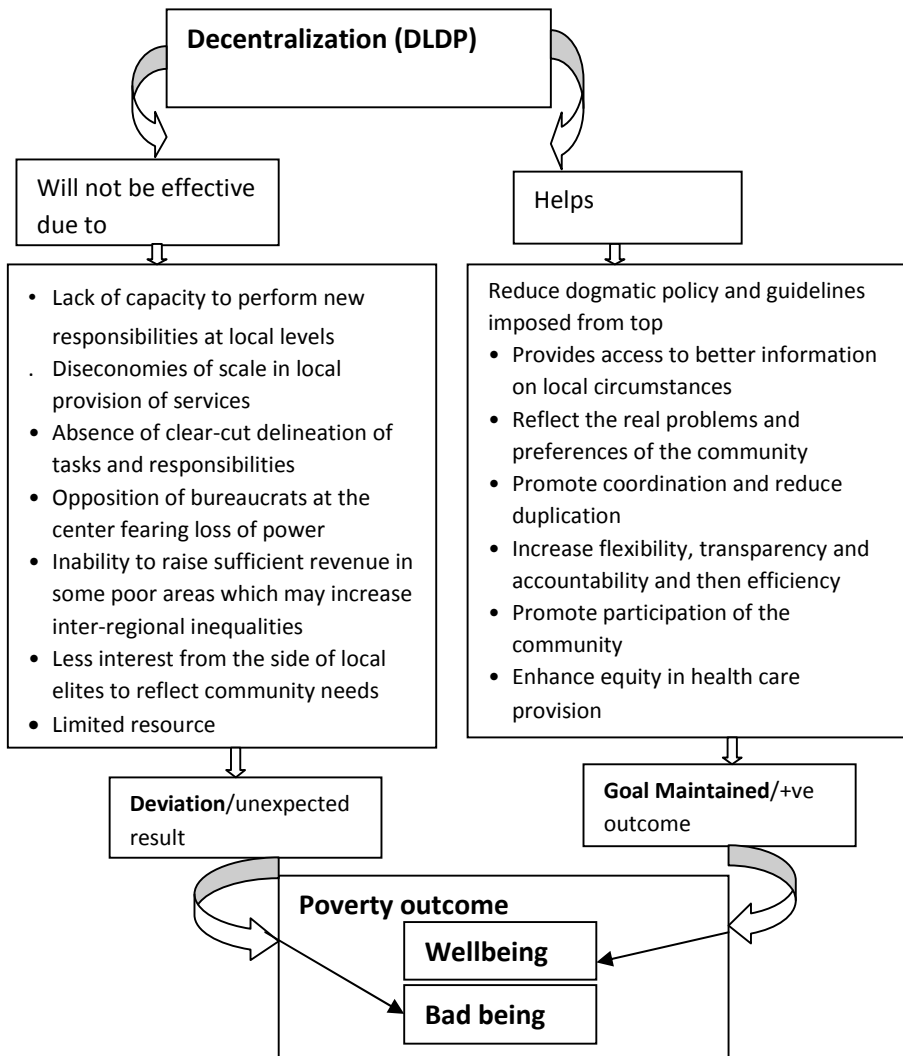
According to most informants (administrators), administrative decentralization has advantages in terms of smooth and efficient running of public affairs. It provides means for exercising checks and balances in the different structures and tiers of government, transferring of certain public functions such as planning, financing etc.

Better provision of public services is associated with fiscal decentralization has also given much space by the localities in the study woredas. It is considered as a tool to have effective public service delivery and local self rule (Piter van Dijk, and Tegene, 2005; Pokharel, 2000; von Braun and Grote, 2000). Service expansion is expected to have much wider opportunity in improving skill and capacity creating capability at grass root level and bringing about improvement in the livelihood of the community. Improvement in the livelihood of the community is directly correlated to improvement in the activities, assets and entitlement of the community (Tewodros, 2005). Generally the fundamental objective of decentralized development cooperation is “to ensure ‘better’ development prospects, by taking greater account of the needs and priorities expressed by the population. It consists on the one hand in bringing together and ensuring collaboration at different intervention levels of the potential economic and social actors. On the other hand, it consists of the active and determining participation of direct beneficiaries in decision- making and the different strategies of action that concerns them” (Hertogs, 1992:2 cited in Tewodros, 2005:52). This underlines on the necessity of achieving development through increasing of local participation. Pursuing participatory approaches to development includes the ability to make use of potential local resource (knowledge, skill, experience technology, etc), increasing efficiency and effectiveness of development programs, enhanced local capacity, better



reach of the poor, and ability to achieve objectives of improved and sustainable livelihoods (UNDP, 1999).

**Figure 1: Conceptual Framework that Presents Effect of Decentralization**



Enabling locals to participate in economic, political and social affairs ensures major change in development. "In localities where enabling environments for the participation of the community and CBOs in particular

created, *ceteris paribus*, it is likely to find the performance of local development programs in a better position than localities where this is not the case.”(Tewdros, 2005: p53)

A study conducted by the World Bank has also suggested that public goods and services such as health care should be provided by the lowest level of government who can fully bear the costs and benefits (World Bank, 2004).

Therefore, it is imperative to see how DLDP may affect overall performance of local development. Therefore, this model provides the summary of arguments cited in the literature in favor of decentralization and is discussed as follows.

First, it is argued that a decentralized system, by reducing ‘dogmatic policy and guidelines imposed from a center’ and increases the access to better information on local circumstances, helps to make rational and flexible decisions that reflect the real problems and preferences of the population, which leads to improving productivity and livelihood (wellbeing).

Second, decentralization passes responsibility and accountability to local bodies. This makes local governments work efficiently, flexibly, and creatively by mobilizing all the available resources in their localities to fulfill the targets. Their close relation with the local people enables them to know the local problems and needs, and they are ‘therefore in a better position to establish the right priorities than a central (or regional) government far away (World Bank, 2004).

Third, decentralization is expected to enhance the participation of local communities in development decisions. It is expected to create an environment for decision makers to have up-to-date information about the preferences and problems of the local people, an effective channel for the people to express their wants and priorities, and a motivating environment for the local decision makers to respond to the local needs quickly and effectively (Khaleghian, 2003).

Therefore, a well-designed and implemented decentralization policy is expected to improve quality of life. But, decentralization characterized by centralization rule; people participation is limited, community knowledge is ignored, information flow is symmetric, and existence of authoritarian tendency may lead to increasing of bad being.

The left hand channel of the conceptual framework presents various arguments. It is based on this model this study will answer the question of: does decentralization leads to increasing of efficiency that enhances quality of life (wellbeing) or not?

## **4. Results and Discussion**

### **4.1 Introduction**

Assessing the impact of decentralization on poverty reduction is so complex; can't be quantified easily. This complicates the matters for any comprehensive evaluation of optimal decentralization. However, similar to other policy advices evaluating its effect considering the different indicators would not be hard. Under well defined conditions it is still possible to see the linkages and identify whether there are generally positive and re-enforcing or not. The subsequent pages discuss the implication of fiscal decentralization (DLDP) on locals' participation in development basing the guidelines set to different layers of government such as public service expansion, and improving quality of life of the individuals exclusively living in the study woredas.

Access to social services is the most basic foundations on which livelihood rests on and can be used as one way of detecting improvements. In pre 1991, in all rural or small administrative areas of Ethiopia community had hardly access to services, which was the main factor for development performance in the rural areas to be extremely poorer.

Service are related with issues of sectoral development and are provided by different agencies, and is defined as accesses to basic developmental goods or services available to citizens that contribute to human needs or

development. The benefits of decentralization in relation to service delivery is usually underpinned by theorists (Steinich, 2000).<sup>9</sup>

In the woreda where this study was conducted decentralization might not had granted all the opportunities, but in one way or the other it had helped to achieve some. Citizens participation on power politics and development is highly promoted which effect to progresses related to resource allocation, and service delivery (Ahmed et al. 2005; Shah and Thompson 2004). It is challenging to define service delivery in a precise way. But service delivery in this aspect basically refers to the systematic arrangements of activities in service institution with the objective of fulfilling the needs and expectation of service users and other stakeholders use the optimum use of resource (Tesfaye, 2006).

In the woreda where this study is conducted decentralization has created opportunity and enhanced competition among the small administrative units. Similarly the role of administrators to control about the development strategies was facilitated by increased supervisory powers and enhancement of pro-poor choices of investment led to creation of some opportunities and accesses.

Since the time fiscal decentralization launched individuals participation in building public services in each woreda, and their commitment to devote free labor has increased. Proximity of local governments allows citizens more influence over local officials, enhanced competition among local governments, and improves accountability among others. Decentralization

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<sup>9</sup>More relevant to local needs( being clear to the people offers the possibility to express needs, increase the responsiveness of personnel, increase the peoples motivation to participate in the implementation of services);

More flexible (being closer to problems, more autonomous in reaction, gaining feedback due to participation mechanisms);

More innovative (due to more limited extent of consequences of “wrong” decisions, multiplication of learning centers, competition between local communities); Cheaper (due to the identity of payers and clients, thus preventing locally collected taxes to be diverted to higher levels).

promoted the link between local community and the administrators.<sup>10</sup> Regarding this even participants expressed their satisfaction about the institutional change (both administrative and fiscal decentralization) with their standard of living, which is associated to the effect of access related to education, health, road, water point, etc.

After introduction of decentralization local administrators of Tigray (sub national governments, woreda) are becoming the decision makers of their economic and political agendas. Compared with the past they are having the autonomy to decide on political matters, allocate resource, administer, and control of their budget. Their confidence on these matters has increased and as a result their roles in provision public centers have grown much but problem related to service quality, increasing of revenue collection, accountability, and creating of mechanism on how to increase the revenue of the regions is still missing.<sup>11</sup>

Confirms the limitations of implementing decentralization, that it does not guarantee if procedures and implementation modalities are not proper. It has not always been effective in improving service delivery by local governments if commensurate revenue assignments are not sufficient, access to financial markets are inadequate, and necessary administrative capacity on the part of local authorities are absent. In the places where this study was conducted community were astonished about the current gains (access to service) even though they had some reservation about the facilities provided. But, government officials had also mentioned that lack of adequate knowledge and skill has become a treat to the system.

From the data collected it is clear that in all the study weredas' there is expansion of public amenities (education, health, water point, and road) and communities have access to public services. But service alone is not necessary and sufficient criteria. For public service impact on wellbeing to

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<sup>10</sup> During the focus group discussion and key informant interview most government officials submit that their performance is lower and is due to lack of competitive skill.

<sup>11</sup> View of informants, mainly administrators acknowledge the advantages of decentralized system.

be positive the quality of the services provided matters. Even though access to services contributed to long living, improving capability, and increasing of income the stated challenges had affected decentralization outcome to don't be up to the expected standard.

Decentralized government has lead to information advantages about the development problems, but public services required in the localities, its flexibility in adapting to citizens' needs, and preferences still requires more institutional change (Informants view).

## **4.2 Result of Descriptive Statistics**

The previous paragraph discussed the general condition where decentralization is effective and helps the undernourished poor. Absolute poverty expressed as lack of the basic necessities of life which is often expressed food insecure today is effect of diverse facts were lack of services, and other access that creates opportunities is one of them. In this regard, there are number of instances that confirm how fiscal decentralization brought remarkable changes through creating of competition among regions.

A summary of the effects of fiscal decentralization on services delivery in the study woredas' is presented below and is taken from the quarterly, semi-annual, and annual reports compiled at each woreda administrative level, which was again crosschecked with the report available at the region. Moreover, results obtained based on the secondary data source was complemented using the views and opinions gathered during FGD and key informant interviews.

In Atsebi access to social services implies that there is a wider coverage and people access to education, health, safe drinking water, and others has shown improvement. In 2010, people access to safe drinking water and its coverage to rural areas was 73. Compared with 1991 the coverage has increased by 72.9% (Woreda Report, 2010).

Likewise access to education indicates the same trend, confirmed by the expansion of educational centers, and increasing number of teachers at

different school levels. In 2010 there were 48 school center (increased from 0 in 1991 to 48 in 2010), 3100 number students, and 661 teachers (with the training level of TTI (367), diploma (225), and degree (69)). The increasing number of enrollments, decreasing ratio of attrition was mentioned as evidence about the achievements. Despite these progresses researchers had also noticed challenges like schools are not equipped with the necessary materials that enhances teaching learning, Most of the schools were without the necessary furniture such as chair, desk, and appropriate blackboard. Excess class size is another major constraint. Class is too crowd, which makes class supervision to loose to the extent that teacher can hardly control the students performance.

Health sector in the woreda extremely appreciated by the community but it is still in a mal condition though it is still better when it is compared with pre-decentralization period. Even though the initiatives are encouraging health posts does not give the required service. Instead there are development agents (traditional health officials), which become as a health DA who become major helpers after attending a training. According to the survey conducted in 2010, in the wereda of the total population only 58,015 (only 4%) has access to health services, but availability of health facilities such as health centers, and clinks were still few when its compared with the total population ratio.

For quantity of services to be matched by quality complementing decentralization by an institutional related rules, and bringing divided groups into a formal, rule-bound bargaining process that puts both administrative and communities on the same path is crucial. Then fiscal decentralization as an instrument can echo about state development and state unity in the way that minimizes inequalities.

Access to road facilities is another determinant factor for improving standard of living of the households (increase rural urban linkage, create access to market for the rural people) as it creates opportunity to link rural urban, and build market oriented economy. In the wereda the total road constructed from the year 2002 to 2010 is 129 km. Of these nearly to 5 km has been constructed by the community and another 140 Km was constructed through

support by donors (NGO's). Services pertinent to construction of roads that links rural urban is good as kushets were linked better now than the past but the coverage and the standard still poses some question

One of the progresses observed in this woreda after the second phase of decentralization was the increasing of cooperatives, which are contributing to the rural community in two way. First it is providing opportunities to work in team; minimizing cost, and maximizing benefits. Beyond this establishment of cooperatives are encouraging farmers to adopt technology and application of better farming mechanisms. But, is this effect of the fiscal decentralization, or part of the broad agenda of human capital development still remains unclear.

Like that of Atsebi, in Wekero the report compiled in 2010 indicates there were an expansion of social services like education, health, public road, water and electricity facilities. In the wereda there were 2 pharmacy, and 2 health posts complemented by few number of health professionals.

Likewise there were 16 school centers<sup>12</sup> 325 teachers with a qualification 12 and plus one were 53, 139 diploma, 133 degree.<sup>13</sup> Over all coverage of social services such as education, health, and water was 100%, 85%, and 75% (Wereda level compiled report). On the other hand service related to road did not show much progress though there was an attempt. Unlike the access the quality of services provided by all centers does not correspond to the percentage given. Community have lot of complains about the service provided, and is the same as that of Kiltawelaelo.

In Hagereselam woreda access to education has been evaluated by availability of access to primary education of the first and second cycle within the given period (2001 to 2010). Since 2001 access to these (both, primary first and second cycle) in the Woreda on average has increased by

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<sup>12</sup> 4 are providing first cycle primary level, 3 second cycle primary level, 1 secondary school of 9 to 10<sup>th</sup>, 1 secondary school of 11<sup>th</sup> to 12<sup>th</sup>, 1 TVET, and one college.

<sup>13</sup> There were significant number of women instructors but larger of them were with a qualification of Diploma (54), TTI (41) and Degree (20).



11.81 and 17.57 percent respectively. In addition secondary education in the woreda had been growing on average by 18.24 percent.

The record related to drop out<sup>14</sup> helped to understand how the education system works in terms of the use of available resource and time; measure the efficiency of the education system in producing graduates of a particular cycle or level. In Hagerselam the growth rate of reduction of female and male drop out at primary level is also quite encouraging (reduced remarkably). The average growth rate of drop out of both male and female student at primary level indicates significant change (zero growth percent). Likewise, the growth rate of female and male drop out at secondary level is 101.24 and 46.15 percent respectively. This shows the growth rate of female drop out is twice much higher than that of male drop out, which points on the gender equality of education but still needs further investigation as the writers have reservation on the number (percentage) reported.

Similar to keleteawelaelo and Atsebi health posts<sup>15</sup> in Hageresleam has shown wider coverage. Coverage stands to the availability of the health posts but nothing was sure about the services provided. Over the last eight years it increased on average 9.7 percent. While Clinics are growing on average by 57.14 percent but there are no hospitals in the woreda.

The total number of reduction of maternal mortality in Hageresealm shows a growth rate of 108.33 percent over the last two years, which indicates maternal mortality has decreased. However, over the last five years the total number of child mortality is decreasing at a decreasing rate. In the same manner, the average growth rate of total number of maternal and child mortality is decreasing in Atsbi Womberta woreda over the last two years by -12 and -1 percent respectively. On the other hand drinking water in the last eight years (2001 to 2010) in Hageresealm have grown on average by 31.94 percent.

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<sup>14</sup> Leaving a school (Dropout) before completing a particular cycle or level of education is also wastage of resource.

<sup>15</sup> Health posts are one of the satellite facility focused services provision of a primary care unit. It is lead by health extension workers. One health post has 2 health extension workers.

In Tankaabergel wereda getting relevant data was not easy, which is one of the problems faced by researchers. Through a lot of efforts the team managed to get some data that shows the slight changes, which is really lower when it is compared with the other weredas. According to the secondary information obtained for the year 1997-2009, primary school coverage (grade level 1-4, 5-8, and 9-10, and 11-12) in number has changed from 12-22, 14-28, and 1-2. In this wereda there was no even preparatory school (grade 11-12) and decentralization did not managed to reverse these shortages. Similar to the period of pre-decentralization students have to go to other wereda/zone when they finish their second cycle primary school which is becoming burden to the student and costly to the parents. Likewise health sector had performed really poor indicated by limited availability of health posts, which were 16 only. Health coverage as indicated by percentage reveals from year 1997 to 20012 health post and health center (tenatabia) coverage has increased from 68.75 to 82.5 and from 32.5 to 75%.

It based on the above explanation it's possible to say decentralization has helped to increase access to services enhance public participation, implementation wereda planning which is aliened to the national plan, and environmental rehabilitation.

This was also justified by the response of the informants, who filled out the questionnaire. Almost all agreed the changes in the quality of life in the study wereda, they said "in the last 10 years it has improved." Participants expressed the highest degree of satisfaction with having access to public services like education, health, communication and networking facilities, availability of water point, and road access. All reported being at least somewhat satisfied with their overall living style (their lives) as a whole. From what they reported we have noticed that there were no major difference about their level of satisfaction between men and women on most of the issues discussed but in between the communities and the administrators there was a significant difference. Unlike the first groups (administrators) the second groups extremely exaggerate the effect of decentralization and sometimes failed even to mention the existed challenges. They tried to veil its impact by stating the positive achievements immensely. Nevertheless, communities in all the study weredas who

mentioned their reservation (dissatisfaction) in response to quality of public services related to education, health, and had a big fear about the issues of good governance.

Participants were highly dissatisfied with the level of management and administration provided. They mentioned about the late response to conflicts, discrimination of people (based on nepotism and networking), and lack of good governance. A majority of the community tried to express their view about democracy and governance comparing pre 1991 period (when they were informally administered by TPLF) where participation of community in creating good governance was cornerstone which they said it is affected by a growing apathy and selfish administration lately.

Another line of dissatisfaction raised by the community is with regard to quality of services provided by all the sectors and special focus was on health, and technology support to agriculture. Much of health spending is positively associated with women's access to services, including contraception, pre-natal care, and assisted childbirth. Access to these services has a strong impact in reducing maternal mortality. But, more needs to be done with regard to quality of services provided. Most of the health centers are without required medicines or staff.

The same is with the education, while everyone appreciates the strategies of universal education, and accessibility of primary school. Still there are concerns about the accesses to secondary and preparatory schools. Likewise participants identified a number of needed improvements in education such as valuing teachers, having smaller classes, access to school kits, and more parental involvement in a meaningful way.

Generally from the simple descriptive statistics result we have learned that despite the opportunities created in post decentralization system, issues pertinent to the quality of services are still a major concern. Implies how decentralization has become a tool for deflating secessionist tendencies but the central government in Ethiopia still controls most of the budget using the parameters of budget allocation and has a strong re-distributive function. Some also believe about the miss utilization of public budget that it is highly

fragmented. Most of the resources that come out of the government budget are not properly administered and monitored stated as a fact for increasing of inequality. Decentralization failed to minimize the problem of regional inequalities. The levels of inequality in between the regions and among the woredas are still the same if not worsening because there is no specific strategy designed to solve this problem. Moreover, donors often flow to each region (woreda) looking to the opportunists and other economic consideration, which led some to have more resource (budget) than others. For instance, of all study woredas Kileteaweledo was noticed as a woreda that attracts more donors.

Since economic conditions differ considerably within the country, even after fiscal decentralization large inequalities are likely to be maintained. Although the efforts of increased income and the expansion of services are expected to traverse the rural population in different regions, poverty is still sever and pervasive. Following these general finding it is possible to answer the question of does service expanded after decentralization? But, writers have noticed two major problems.

Given the above, impact of decentralization on service delivery in the study woredas was also evaluated by conducting the survey and distributing of questionnaire, which was believed to be relevant to evaluate decentralization impact in a better manner. Data collected was analyzed using the econometric technique; two way manova, and manova regression.

#### **4.3 Result of Statistical (MANOVA) Analysis**

Multivariate analysis of variance (MANOVA) is an analysis of variance in which there is more than one dependent variable. Manova provides multivariate tests involving *terms* or linear combinations of the underlying design matrix. The four multivariate test statistics are Wilks' lambda, Pillai's trace, Lawley–Hotelling trace, and Roy's largest root.

Respondents were expected to evaluate the change (effect of decentralization) using leakert scale measured by the responses of very good, good, average, and poor. The analysis result reveals the positive effects of

decentralization on service expansion, and improvement of skill, and changing quality of life. But, impact of decentralization on women empowerment was not the same as the other parameters used here. Implies service in the woredas was better post decentralization. Details about access to services in the study woredas is given below, computed on the basis of comparison of pre and post decentralization.

**Table 1: Comparison (post with pre decentralization) of access to public service facilities in Tigray computed using Stata.**

Response from Administrators					Response from Community			
No	Variable	Before	After	Difference	Variable	Before	After	Difference
1	Very good	49	59	10	Very good	74	82	8
2	Good	61	152	91	Good	71	311	240
3	Average	198	109	-86	Average	206	224	18
4	Poor	201	33	-168	Poor	668	60	-605

The analysis result was obtained comparing the service facilities in the study woredas which was computed using Stata. Fiscal decentralization effect on public services is evaluated by comparing situation of accesses to services (education, health, water point, and road) in the study woredas in post fiscal decentralization period, which is higher than before. Progresses attained was indicated by the increasing of the total responses of good and very good, and reduction of responses related to average and poor.

The computed value scored for the responses of good for both respondents (community and administrators) is the highest count in post decentralization, which was 311 and 152, which is higher than before, which was 71 and 61 respectively. On the other hand responses related to poor for both (administrators and communities) has reduced from 201 to 33, and 668 to 60 respectively.

However responses related to average did not change much confirms the perception gap between the two respondents (community dissatisfaction is higher). While the responses given by the administrators reduced from 198 to 109, community response has increased from 206 to 224.

From the result we have noticed the difference between the rate of decreasing of percentage of responses of average and poor, and the rate of increasing of percentage of responses of very good and good, while both changes are encouraging the percentage of rate of increasing (decreasing) of responses were not the same by both the respondents. This finding is consistent to what has been discussed above and shows the variation (opinion difference) between the two respondents about decentralization impact. Nevertheless, one of the interesting finding was to both respondents the impact of decentralization on service delivery is evaluated as “good” (for more comparison see the table above).

Multiple Analysis of Variance, or MANOVA, is an advanced form of the more basic analysis of variance, ANOVA. MANOVA extends the technique to studies with two or more related dependent variables while controlling for the correlations among them ([www.multivariate-statistical-analysis](http://www.multivariate-statistical-analysis.com)). Therefore, for this type of study MANOVA is an appropriate technique as it reveals the response of the woredas to the administrative/institutional changes (decentralization) introduced. MANOVA helps to evaluate how each dependent variable in each woreda are changed following the policy reforms (fiscal decentralization) evaluated by responses obtained to each of the questions posed about decentralization.

Our hypothesis is code (position of the respondents), and space (location of the woreda) would allow multiple effects of decentralization-related outcome such as measuring its effect on service delivery, gender equality, and skill development, but would be positive. Details were presented below.

This command produces different test statistics that are used to evaluate the statistical significance of the relationship between the independent variable and the outcome variables. The overall multivariate test is significant indicated by the, F-test (rejecting the null hypothesis). But, though

decentralization impact on the response variable is significant its effect varies based on the type of the administrator and location of the woreda.

**Table 2: Result of the manova statistical analysis**

manovapubservaicapabashotrainalivinawomempoa = place code							
Number of obs = 200							
W = Wilks' lambda				L = Lawley-Hotelling trace			
P = Pillai's trace				R = Roy's largest root			
Model	Source	Statistics	Df	F(df,	d(f2) =	F	Prob>F
Model	W	0.7276	4	20.0	597.9	3.01	0.000a
	P	0.2972		20.0	732.0	2.94	0.000a
	L	0.3413		20.0	714.0	3.05	0.000a
	R	0.2059		5.0	183.0	7.54	0.000u
Residual		184					
Place	W	0.7744	3	15.0	497.3	3.22	0.000a
	P	0.2386		15.0	546.0	3.15	0.000a
	L	0.2748		15.0	536.0	3.27	0.000a
	R	0.1996		5.0	182.0	7.27	0.000u
Code	W	0.9385	1	5.0	180.0	2.36	0.0419e
	P	0.0615		5.0	180.0	2.36	0.0419e
	L	0.0656		5.0	180.0	2.36	0.0419e
	R	0.0656		5.0	180.0	2.36	0.0419e
Residual		184					
Total	188						

e = exact, a = approximate, u = upper bound on F

Source: Own computed using Stata

The above analysis shows implication of decentralization on service deliver, building skill, and improving living condition is significant but its effect on women empowerment is not, it's beyond what is expected. Despite issues of gender is widely synchronized in each and every development frameworks there is an oversight and exaggeration about the agenda. Notwithstanding these strengths and challenges are said to be numerous too, stemming for the most part from limited capacity at all levels of government, poor

understanding, less commitments and less dedications. Gender and development policies and programs face the danger of miss interpretation. The fact that women and men are equally albeit differently affected by development related problems must be highlighted and complex multifaceted and ambivalent roles played by women and men in development must be engaged with to avoid the perpetuation of incomplete understanding.

The table above (manova output) lists the number of observations used in the estimation. It also gives a key indicating that W stands for Wilks' lambda, P stands for Pillai's trace, L stands for Lawley–Hotelling trace, and R indicates Roy's largest root.

The first column of the table gives the source. Writers also tested the two important variables in all the study woredas. The first denoted for the place (the study woredas), the code (administrators, and community representatives) were both terms are in the model, and we are using residual error for the denominator of the test. Four lines of output are presented for both, place and code, one line for each of the four multivariate tests, as indicated by the W, P, L, and R in the second column of the table.

The next column gives the multivariate statistics. Here Wilks' lambda for both ( place and code is 0.7744 and 0.9385, Pillai's trace for both is 0.2386 and 0.0615, the Lawley–Hotelling trace is 0.2748 and 0.0656, and Roy's largest root for both place and code is 0.1996 0.0656. Some authors report  $\lambda_1$  and others report  $\lambda_1/(1 + \lambda_1)$  for Roy's largest root. Stata reports  $\lambda_1$ . The column labeled "df" gives the hypothesis degrees of freedom, the residual degrees of freedom, and the total degrees of freedom. These are just as they would be for an ANOVA. We have 3 and 1 degrees of freedom for the hypothesis. There are 184 residual degrees of freedom and 188 total degrees of freedom.

The next three columns are labeled " $F(df_1, df_2) = F$ ", and for each of the four multivariate tests, the degrees of freedom and F statistic are listed. The following column gives the associated p-values for the F statistics. For place Wilks' lambda has an F statistic of 3.22 with 15 and 497.3 degrees of freedom, which produces a p-value small enough that 0.0000 is reported.



And for code Wilks' lambda has an F statistic of 2.36 with 5 and 180 degrees of freedom with p-value 0.0419 reported. Likewise the F statistics and p-values for the other three multivariate tests follow for both place and code on the three lines after Wilks' lambda.

The final column indicates whether the F statistic is exactly F distributed, is approximately F distributed, or is an upper bound. The letters e, a, and u indicate the three possibilities, as described in the footer at the bottom of the table. For this example, the F statistics of place (and corresponding p-values) for Wilks' lambda, Pillai's trace, and the Lawley–Hotelling trace are approximate. The F statistic for Roy's largest root is an upper bound, which means that the p-value is a lower bound. The Manova command above provides various statistics for testing whether the woreda, and administrators means differ on any of the four dependent variables. These tests show that the positive effect of decentralization on the parameters but its effect is not perceived in the same way. There are significant differences about effects of decentralization on at least one of the dependent variables.

Following manova we have used mvreg to estimate the coefficients in our model. mvreg command was applied to run a multivariate regression corresponding to the model just estimated by manova. The mvreg command gives the actual coefficient estimates along with tests for each dependent variable separately. Conducted by simply type mvreg to view the coefficients, standard errors, t statistics, p-values, and confidence intervals of the multivariate regression model underlying the previous manova. It ensures that the main effects are estimated correctly (Multivariate Analysis, Multivariate Multiple Regression (<http://www.philender.com>) (See Appendix 1).

Multivariate regression differs from multiple regressions in that several dependent variables are jointly regressed on the same independent variables. Multivariate regression is related to Zellner's seemingly unrelated regression (<http://www.stata.com/manuals13/mvrmvreg.pdf>). The individual coefficients and standard errors produced by mvreg are identical to those that would be produced by regress estimating each equation separately. The difference is that mvreg, being a joint estimator, also estimates the between-equation covariance, so you can test coefficients across equations. Mvreg is

interpreted much like the output from an OLS regression interpreted based on the values given on the table, the number of observations, number of parameters, RMSE, R-squared, F-ratio, and p-value. The mvreg result (see Appendix 1) reveals:

The column labelled P is significant for three variables (public service expansion, enhancing capability, and improving wellbeing).

In the column labelled R-sq, we see that the three predictor variables above explain 1%, 4%, and 5% of the variance in the outcome variables increasing public services, enhancing capability, and improving wellbeing respectively (this value is a standard R-squared, not an adjusted R-squared);

The second table contains the coefficients, their standard errors, test statistic (t), p-values, and 95% confidence interval, for each predictor variable in the model, grouped by outcome. As mentioned above, the coefficients are interpreted in the same way coefficients as OLS regression.

Following this result both correlation matrix and Breusch–Pagan test is applied to verify that our model passed the required test. The second is applied for testing heteroscedasticity. A Breusch–Pagan test is a type of chi squared test, which is significant and the Breusch –Pagan test is significant,

Given all these the results about decentralization effect on the given parameters, the variation in responses by the respondents could be due to the responsibility that they have, or due to the suspicion that they feel while requested they tried to exaggerate the overall changes obtained related to service expansions. For more details please refer the appendix 2, which is similar to the results computed.

By all the indicators used result implies how decentralization leads to increasing of services (welfare) even with all these challenges. We believe that the level of achievement could have been to the desired level if these repeatedly stated constraints (resource constraint, miss implementation of rule, capacity problem) are addressed.

Therefore, based on the finding we can say that to some extent outlawing centralization has enhanced public service expansions in small administrative unit of the rural woredas of Tigray. Despite the various limitation observed the implication of institutional change, introduction of fiscal decentralization helped to change the development of the periphery without which it would not have been realized. Empowering locals enhanced communication for development, increased public service expansion according to their priority needs and preferences of the grass root level. However, from the views forwarded by the community, and observation made by the researchers the effect of decentralization on improving quality of life of could have been to the desired level without the stated challenges. Despite the stated development agenda of the country that growth was expected to be pro-poor the growth process that results from having access, opportunities, and market forces still benefits the better to do proportionally more than the poorer. Consequently, the gap in well-being between the poor and the rich tends to persist, it's even get wider. Promoting pro-poor growth requires a strategy that is deliberately biased the specific groups (the poorer). Unlike the ongoing institutional system there should be a specific strategy and development plan that incentives the poorer so that the quality of life of the rural areas would change, and poorer benefit proportionally more than the rich or poor and could be out from the bottom end of distribution curve of consumption.

#### **4.4 Impact of Decentralization on Public Service Expansion and Welfare (Graphical Depiction)**

In order to explain decentralization effect on public service expansion and then welfare we used the following graph. Impact of decentralization could led not only to the increasing of service but could also help to improving of efficiency, and reducing of inequality (welfare gains). In order to present the effect of decentralization on welfare the following assumption were set. These presumption was set based on the reviews made, comparing the study woredas of Tigray with pre-decentralization period, and forecasting what the future would be? The assumption includes:

Pre-decentralization public service facilities in the rural woreda of Tigray was very poor.

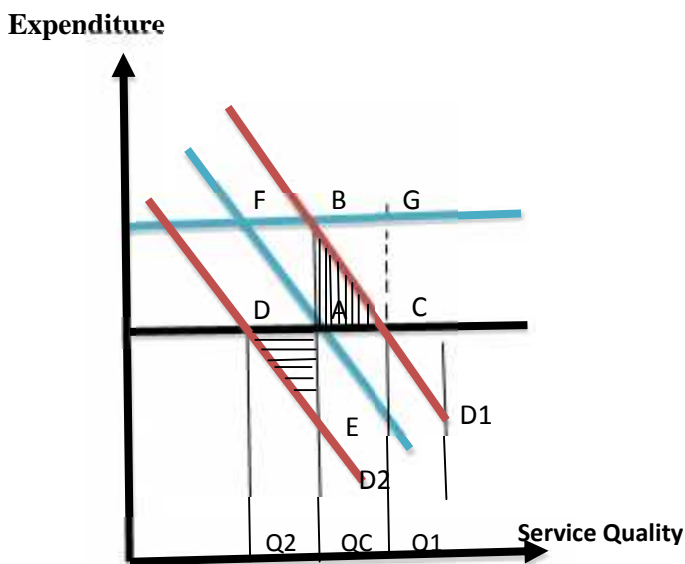
In any stable economy and in a normal situation any institutional or administrative change has a positive effect on wellbeing.

Availability of public services, or increasing of skill, or improving public participation contributes to the increasing of productivity.

Service expansion converges to income.

It is based on these assumptions over all gains and/or losses of decentralization effect on welfare (nexus) explained, and also presented by the figure below.

**Figure 2: The tradeoff between centralization and decentralization**



Welfare gains in this context was anticipated to occur as a result of increasing in income, which was expected to appear in return to the expansion of public services; that the theory of service expansion converges. Different writers (Ashenfelter and Rouse (2000), Heckman (2005))

discussed the effect of schooling on increasing income, decreasing of inequality in the long run.

In the figure above QC is the quantity of public services provided under centralization system, which is lower than the amount demanded by the locals; (1), but more than would be demanded by the representative individual (2). As a consequence (following centralization policy) each of these individuals would experience welfare losses of ABC (a loss that could have been minimized through implementing decentralization) and ADE (actual loss occurred following centralization). The first (ABC) is loss caused by the individual not consuming as much as they should if area one decided on the amount of the good to be provided (area one in this is nothing but decentralized government). Individual A is willing to pay  $Q_c B C Q_1$  to get  $Q C Q_1$  even though these would only cost  $Q C A C Q_1$  to be available. Similarly triangle ADE losses experienced by individual2 because he is consuming more than he would otherwise choose, paying  $Q_2 D A Q C$  for consuming  $Q_2 Q_c$  while valuing them at only  $Q_2 D E Q_c$ , implies welfare deadweight loss from centralization are greater the greater heterogeneity.

Indicates how institutional change could effect to improving of welfare. Decentralization can minimize dead weight losses as a result of addressing the heterogeneity differences. The figure shows the increasing of welfare (service expansion) by the area of AFD and ADE overcoming the losses that could occur when centralization system was implemented. Offsetting the differences in preference and empowering local administrators enables not only to solve the loss of welfare given by the area of ADE and ABC but result in the gain of more welfare but only when the all the stated challenges are alleviated.

If decentralization in the study woredas was not challenged by the stated problems its effect on welfare could have been the area of FGDC and AED (the total area of  $AFD + ABF + AED + ABC + BGC$ ). Writers believe that in spite of the current achievement the existed limitations are still affecting decentralization impact, which led welfare gains of decentralization to be far lower than expected. Therefore even though decentralization managed to reverse the long time problem (lack of public services) there are still further

assignments to be done. In the figure the total area of ABF+BGC is a welfare loss. This was confirmed during the survey; administrator repeatedly mentioned about the technical and skill gaps they are facing while designing plan, implementing development programs, or policies. Lack of technical efficiency hindered decentralization impacts on rural development, which also affect the revenue of the region. Practically there are no more firms or businesses owned by the individual that could help to rise the revenue collected by the woreda but still the capacity to collect from the existed is very poor. Therefore the total gain is AED+AFD+ABC.

This verifies how decentralization (DLDP) enhanced locals decision making to their preferences and priority needs. Outlawing centralization in Ethiopia helped to the emergence of civil society organizations, assisting to the transformation of the country economic and political arena somehow. Improving of service delivery which is consequence of increasing public participation in development, and increasing of efficiencies which in turn result to improving of wellbeing, indicated by the initial gains of the three areas. This confirms decentralized provision of public goods and services to be pare to-superior to centralized determination of public outputs.

Investing on public services to defend the prevalent poverty that exists within the communities is necessary. It is recognized as very important areas of development were the productivity gains are attributable to better allocation of resources and to economies of scale.

Implication of decentralization in minimizing gender inequality was also discussed as it was presented in the result of the descriptive analysis. In each woreda researchers were very curious of about this topic and questions was raised not only to what extent are women participating but also to what level are women practically heard, and bringing difference to the live of the rural women.

In all the FGD conducted, key informant discussion made participants were very much positive and highly satisfied about the gender related moves made so far; laws approved, development interventions introduced, and initiatives made. The rural women are very much happy of having women related

bureaus that addresses their question, and undertakes diverse women and development program. When they were asked about decentralization effect on minimizing gender related problems majority of them often said: the present situation is not comparable with the past were women didn't had any power to decide about their private and family affairs, women were highly dominated in everywhere. Their satisfaction about having representative women in the woreda council is also the same, as an evidence they mentioned the proportion of women in the Council, which is more than 30% and they believe that this is effect of the decentralization system that complement the other policy frameworks. But, researchers understanding are different. Even though women participation in woreda council, and other economic activity reveal that there is a remarkable change their actual contribution in various development activities (designing of laws, drafting of woreda plans and programs, reversing of decisions made by the majority men, etc), ability to persuade and change any laws, and decisions requires further investigation. There was an instance were number of women in all the study woreda from the community complain about the unfair implementation of land laws, divorce, and separation, which left the researchers with reservation. This was also indicated by the result (see above), which show impact of decentralization on women empowerment is not as it is expected. There are positive indications that women are permitted greater voice and have more awareness of their basic rights. At the same time slower change is occurring in the reciprocal engagement by public officials in this opening up of society the attitudes of officials on land law, property right, and divorce tend toward the unresponsive.

## **5. Conclusion**

This study tried to investigate the effect of decentralization on improving the quality of life, evaluated by its effect on provision of public services, increasing of skill and efficiency, empowering women. To conduct this study both, primary and secondary data was used and finding reveals the immense change of services such as education, health, and water point, it increased from extremely low to somewhat reasonable.

The issue of how all these achievement effects to the community was also investigated. From the interviews conducted and FGD held we have learned the effect of services on improving quality of life is positive; it helped to gain new insight. Availability of health posts led to the reduction of health related problems such as malaria, measles, maternal death, child death, etc. Similarly access to education had helped to improving of individuals attitude and perception. Nevertheless, service availability does not mean services quality. From the survey made and discussion conducted with informants we also learned that the issue of quality seems to lag behind and requires joint effort.

On the other hand implication of decentralization in reducing gender gap and inequality is not as such. Women participation in education and other public participation has changed remarkably but to what extent are their voices heard is still questionable, and is confirmed by the result While initiatives made so far are quite encouraging but its practical cause in reducing gender inequality in each and every decision making in the form of one to one still requires further step. It is not only policy reform related to decentralization but there could be many other factors that could led gender inequality to persist. Implies the need of realizing this actual differences rather than data or historical manipulations often stated about gender equality. This problem is common but it mainly weighs on the issue of gender were most women who have power or responsibility often assume as if women related problem in Tigray is 100% solved believing that what they gain is every women gain. This feeling makes the topic of gender more complex and identifying the core problem became so hard as problems are still masked.

To sum up it is quite clear that decentralization has helped to have some gains. The first major argument against decentralization is diseconomies of scale. Implementation of development programs may not be better if local administrators are ordering their needs ahead of the citizen, when public resource is not efficiently used and decentralization is coupled by corruption and nepotism. If all these are not solved following decentralization may led to several complex economic problems that affects the economies of scale that worsens the level of inequality and poverty.



Some respondents mentioned how corruption becomes so severe after decentralization.<sup>16</sup> Previous studies also shown that the level of corruption at local governments can be much higher than at the central level (Brueckner, 1999; Dethier, 2000 von Braun and Grote, 2000). The problem can be more severe if the expected participation of the community cannot be materialized. This is a major problem of the current system were most communities complain about the miss use of government responsibility for private use.

## **5.1 Implication for Policy and Research**

A special development intervention that minimizes the inequality of regions or small administrative units is necessary. This study tried to see the link between decentralization and changes in human conditions and quality of life expected to result from improvements in service delivery by local governments. Finding reveal improvements in quality of life, such as higher levels of education, lower child mortality, higher rates of immunization, and reduced environmental degradation, etc. But, the gains from decentralization in all study woredas were not the same. We noticed the variation in the distributional aspects of these improvements.

There should be a mechanism were small administrative units would prevail their financial independence. Even after the introduction of fiscal decentralization small administrative units does not create a constituency, and have low degree of change in their autonomy. The authority of the center or regional government still weighs. Because of the fiscal restraint small administrative units are still dependent on the region, and they are more likely to agree to the terms set by central or regional level, and reversals seems likely to occur.

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<sup>16</sup> Corruption is defined as exercise of official powers against public interest or the abuse of public office for private gains. Public sector corruption is a symptom of failed governance. Here, we define “governance” as the norms, traditions and institutions by which power and authority in a country is exercised—including the institutions of participation and accountability in governance and mechanisms of citizens’ voice and exit and norms and networks of civic engagement; the constitutional-legal framework and the nature of accountability relationship among citizens and governments (Shah, A. 2006).

Strengthen the capacity of the relevant local agencies. There is a wider gap between decentralization process, and the skill or capacity needed to provide services at the local level. Even though there were different programs set to train administrators it was mere of issuing certificate and it failed bring the required efficiency. This demand for an affirmative action, a well coordinated training approach that equips these government officials with practical and applicable knowledge is very crucial.

To solve the problem of gender gap need to have specifically designed target approach. There is a wider gap between the policy designed and its practical implication, and there is a limited understanding about the context of: Empowering Women is the same as Empowering Nation. On decentralization and on the gender issues in the study woreda, it is particularly important to carefully consider special intervention for likely achievement of results.

Designing a system that improves accountability and responsibility of the government officials. After introduction of fiscal decentralization the system of monitoring and evaluation is to lose which become a factor for increasing miss use of authority, and miss allocation of government resource.

In the process of decision making power about macro or micro level the issue of bargaining between national officials on the one hand and sub-national officials (both of the intermediate and local levels of government) on the other is fundamental. In this case, increasingly small administrative units (woreda) or regional governments are the focus of policy reforms and are being granted larger amounts of resources and responsibilities. The preferences of bargaining actors and the sequential logic could prove useful in analyzing negotiations between woreda and region government officials. This would allow us to account for within country differences in the level of power devolved.

To see the effect of fiscal decentralization in a better manner more research either within the region where this study is conducted or at national level the covers larger size of household is necessary.

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## Appendixes

### Appendix 1

mvregpubservaicapabashotrainalivinawomempoa = place code

Equation	Obs.	Parms	RMSE	"R-sq"	F	P
pubserva	189	3	.8269621	0.0108	1.011063	0.0358
icapaba	189	3	.7505533	0.0400	3.872899	0.0225
shotraina	189	3	.6498454	0.0158	1.494092	0.2271
livina	189	3	.7870433	0.0527	5.177543	0.0065
womempoa	189	3	.6954257	0.0094	.8803291	0.4164

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
+						
pubserva						
place	.0737197	.0537513	1.37	0.072	-.0323209	.1797602
code	.0446446	.1271278	0.35	0.726	-.2061531	.2954422
_cons	2.182767	.1108486	19.69	0.000	1.964084	2.401449
+						
icapaba						
place	.1339992	.0487848	2.75	0.007	.0377564	.2302419
code	.0461053	.1153815	0.40	0.060	-.1815194	.27373
_cons	.586177	1.1006065	15.77	0.000	1.3877011	.784654
+						
shotraina						
place	-.0089022	.042239	-0.21	0.833	-.0922312	.0744269
code	-.171	.0998999	-1.71	0.089	-.3680824	.0260824
_cons	2.325674	.0871073	26.70	0.000	2.153828	2.497519
+						
livina						
place	-.0664789	.0511566	-1.30	0.095	-.1674007	.0344429
code	-.3533246	.1209911	-2.92	0.004	-.5920158	-.1146333
_cons	2.630112	.1054978	24.93	0.000	2.421986	2.838238
+						
womempoa						
place	.0599125	.0452016	1.33	0.187	-.0292613	.1490862
code	-.0091488	.1069069	-0.09	0.932	-.2200547	.201757
_cons	1.523974	.093217	16.35	0.000	1.340076	1.707873

Source: Own computed

**Appendix 2**

**Correlation matrix of residuals:**

pubservaicapabashotrainalivinawomempoa

pubserva	1.0000				
icapaba	0.4746	1.0000			
shotraina	0.2053	0.2293	1.0000		
livina	0.2300	0.2508	0.2388	1.0000	
womempoa	0.4091	0.3833	0.1620	0.1825	1.0000

Source: Own computed



# Land Expropriation, Peri-urbanization and Income Diversification: Evidence from Peri-urban Tigray, Northern Ethiopia

*Tsega G. Mezgebo<sup>1</sup> and Catherine Porter<sup>2\*</sup>*

## *Abstract*

*Developing countries are urbanizing rapidly, incorporating rural villages through land expropriation and legislation. We provide empirical evidence on affected households' adaptation of income diversification strategies, in Tigray, Ethiopia. Our post-expropriation results show continued high reliance on agricultural income despite limited access to farmland. Combining farming with skilled nonfarm employment is the dominant strategy for better-off households. Surprisingly, the poor under urban administration participate less in nonfarm employment compared with households still classified as rural. Previous experience in the nonfarm sector, rather than the amount of compensation, drives participation in skilled nonfarm employments: an important implication for urban policymakers implementing expropriation.*

**Keywords:** *income diversification, non-farm employment, urbanization, Ethiopia*

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<sup>1</sup>Department of Natural Resource Economics and Management, Mekelle University ([tsegagi@gmail.com](mailto:tsegagi@gmail.com))

<sup>2</sup>Department of Accountancy, Finance and Economics, Heriot-Watt University ([Catherine.porter@hw.ac.uk](mailto:Catherine.porter@hw.ac.uk))

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## **1. Introduction**

Urban expansion continues to accelerate in most areas of the globe, and much of the focus in policy and research has been on those who migrate to cities. The urban population of the developing world is expected to be 64% by 2050 (United-Nations, 2012) and about 50% of the African population is expected to live in urban areas by 2035 (United-Nations, 2011). Urbanization is generally seen as a positive overall process, with economies of agglomeration leading to higher welfare in the longer-run (World Bank, 2009, Glaeser, 2011). However, urban expansion is land intensive and many countries have been re-classifying their urban boundaries to fulfill the increasing demands of urban land use (Webster, 2002; Simon et al., 2004). This process limits availability of arable land to the existing farming communities in peri-urban areas where natural resources based livelihoods are presumed to eventually vanish and be replaced by higher-productivity, non-farm activities.

Consequently, there may be very high transition costs for those less able to adapt. Ravallion et al (2007) observe that compared to other continents, urbanization has not contributed to a reduction in poverty in Africa. Analysis by Dorosh and Thurlow (2014) shows that relative poverty is likely to become increasing urban in Ethiopia, unless appropriate policies are put in place to improve urban growth and job creation. Hence, it is crucial to identify factors that contribute to a smooth transition from rural to urban livelihoods for those who are directly affected. Negative livelihood adaptation may occur when the household shifts from relatively rewarding activities (e.g. producing cash crops) to less rewarding (unskilled) nonfarm employment following the loss of land.

Studies on livelihood adaptation and diversification have focused to date on rural households (e.g. Davies and Hossain, 1997; Scoones, 1998; Ellis, 2000; Lanjouw, 2001; Ellis, 2005; Reardon et al., 2007a). However, peri-urban areas are different from the rural hinterland because dynamic rural and urban living styles coexist where the rural system eventually fades with the passage of time (Simon, 2008). Additionally, peri-urban areas have no uniform definitions (Cohen, 2004). Given the particular features of peri-urban areas, common

assumptions about rural livelihood diversification strategies may be less appropriate to policy.

More than for rural households, peri-urban farm households' diversification to the nonfarm sector is crucial to make a living. However, access to rewarding nonfarm activities is limited due to entry barriers (Barrett et al., 2000; Abdulai and CroleRees, 2001; Woldehanna and Oskam, 2001) and missing markets for credit, labor and land (Barrett et al., 2001b). This suggests that not only asset-poor farm households are likely to be marginalized in the shift from farm to nonfarm employment, but also households who were previously benefiting from diversified agricultural activities due to asset fixity (e.g., owning irrigation canals, hand-dug wells, and specific agricultural tools and skills). Further, households might have differential access to newly available income generating activities. Hence, identifying constraints and incentives that the households face to engage in specific income generating activities can offer important policy options that can improve the productive capacity of the poor.

Very little is known about income diversification strategies of the farm households in peri-urban areas, and how households respond to land expropriation and compensation. This paper partly fills the knowledge gap by investigating income diversification strategies using data collected from farm households in peri-urban Tigray, Northern Ethiopia for this purpose. Approximately half of the households in our sample were reclassified under urban administration, had their land expropriated, and received varying amounts of compensation. The only other comparable studies to date are Ghatak et al (2012) and Harris (2015). Ghatak et al (2012) find that households in West Bengal who lost land and received compensation were adversely affected, especially if the household head's main occupation was agriculture. The authors did not find that households used their cash payment to start new businesses. Harris (2015) also surveyed Ethiopian households, nearby to a town in eastern Amhara, one year on from the land expropriation. Harris finds that households who receive compensation increase their savings by keeping most of their land compensation in the bank. However, they do start more enterprises and participate more in non-farm activities. Our findings are slightly different – it is those who remain under rural administration who have higher participation in

non-farm activities. We explore these differences further in the discussion below.

In this paper, we examine factors that influence the household's decision to adopt specific income diversification strategies. We also compare whether the strategies and the associated driving factors are different depending on the administration that the farm households belong to, comparing urban and rural. The paper aims to contribute to policy in designing effective interventions for the poor in peri-urban areas to improve access to assets, and productivity of the assets they already own, including their labor.

The next section provides an overview of peri-urbanization in Ethiopia. Section 3 describes the farm household income diversification strategies framework in the peri-urban context. Section 4 describes the data, provides definitions of terms used for the analysis and the summary statistics. Estimation results are discussed in section 5. We conclude and offer some policy implications in section 6.

## **2. Peri-urbanization in Ethiopia: Overview**

Ethiopia is among the poorest and least urbanized countries in sub-Saharan Africa, with 19% urban population share in 2013, compared with 37% in sub-Saharan Africa as a whole (World Bank, 2015<sup>3</sup>). Ethiopia has recently achieved remarkable economic growth accompanied with rapid urban expansion. Annual urban population growth was about 4.9% in 2013, compared with 4.1% in sub-Saharan Africa (World Bank, 2015). This growth rate is expected to continue in the near future. To meet the growing demand of urban land, Ethiopian urban administrations have begun redrawing their boundaries by incorporating nearby rural villages.

Urban and rural areas of Ethiopia do have defined administrative boundaries but urban boundaries are expanding over time. Demarcation of a revised urban boundary can be enacted after the development plan of the respective urban center is defended in the local public hearing and approved by the local council

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<sup>3</sup><http://wdi.worldbank.org/table/3.12> accessed 28th April 2015.

(FDRE, 2008). As a result, the surrounding rural villages are officially incorporated into urban administration to implement the development plan. Incorporation of the rural villages is done in consultation with the rural administration or the regional council (FDRE, 2008). This procedure ultimately creates a new boundary to the urban center.<sup>4</sup>

In Ethiopia, land is public-owned and official land policy grants compensation to dispossessed households (individuals) when their land is expropriated for investment purposes (FDRE, 2005). As a result, the physical asset (land) of the dispossessed household is replaced by a financial asset (cash). Based on the development plan, each urban administration then allocates the peri-urban land (farmlands and common lands) to different entities (i.e. individuals or private or public organizations). Land allocation is followed by implementation of different investments such as construction of new residential houses, public (private) institutions, manufacturing plants or installations of other urban amenities in very short period of time. This is the stage where urbanization of peri-urban areas or peri-urbanization starts.

Peri-urbanization in Ethiopia generally follows formal procedures where all inhabitants of the targeted peri-urban villages are included into urban administration by law. This implies that those villages are under the umbrella of urban development priorities, causing a complete shift in the households' means of living in very short period of time. In cases like these, the dispossessed farm households likely face time and resource constraints to accustom themselves into the urban livelihood systems and benefit from the emerging labor markets. For instance, our survey data indicates that about 40% of heads of the dispossessed households still consider farming as their main job although they have no or limited access to farmland.

The rapid conversion of land use in urban peripheries – from subsistence agriculture to industrial, residential and other urban purposes – creates a heterogeneous social composition and economic structures in the locality. For instance, new residents engaged in different sectors of the urban economy migrate to the locality; subsistence agrarian activities are progressively (mostly

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<sup>4</sup> Urban center means urban administration and both are used synonymously.

within two to five years) overtaken by trade, service and manufacturing activities; new land administration put in place; and new land markets emerge resulting in commoditization of land and housing. Such transformations are similar to peri-urbanization situations of many developing countries (e.g. see Simon et al., 2004; Webster et al., 2004).

Ethiopia has followed a strategy of Agricultural Development Led Industrialization (ADLI) as a development policy since the mid-1990s (Devereux, 2000). The Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) recognizes the role of rural nonfarm sector in rural development (Ministry of Finance and Economic Development (MoFED), 2006). The rural nonfarm activities are quite similar to the micro and small enterprises (MSEs) in the urban context. The five years we focus on in this study from 2009/10 to 2014/15 is covered by the “Growth and Transformation Plan (GTP)”, which also emphasized the significance of MSEs in achieving sustainable economic development (Federal Democratic Republic of Ethiopia (FDRE), 2010). GTP sets out a clear policy direction to improve and strengthen the productive capacity of the sector and recognizes the role of MSEs in economic transformation.

In Ethiopia, urban and rural divisions are pertinent in the policy sphere. Rural areas are guided by agricultural and rural development policies with urban areas guided by urban development plans and strategies (FDRE, 2005). The Ministry of Agriculture and Rural Development (MoARD) is responsible for planning and implementing rural development policies. The operations of MoARD usually focus on productivity of the agriculture sector and have no clear direction on the nonfarm sector. This suggests that peri-urban farm households were benefiting from agricultural extension packages provided by this Ministry before the transition.

Urban development strategies are designed, implemented and monitored by the Ministry of Works and Urban Development (MoWUD). Development activities and operations of the ministry focus on the manufacturing, trade and service sectors. MSEs are emphasized in the operational documents and considered as a means to address urban unemployment, poverty, and income inequality (MoFED, 2006; 2010). Urban agriculture, however, is not recognized as a

source of livelihood in the operational documents of the Ministry. This implies a mismatch between the knowledge of most farm households in peri-urban areas and the policy direction of urban development.

Rural nonfarm activities are concentrated in peri-urban villages as well as the rural hinterland (Woldehanna, 2002; CSA, 2007a; Loening and Mikael-Imru, 2009). However, MoARD focuses mainly on the farming sector and has only made very limited investments in the rural nonfarm sector (Chanyalew et al, 2010). Similarly, MoWUD's development policies also overlook the importance of urban agriculture in reducing urban unemployment and poverty. Hence, it seems that the peri-urban areas are neglected by both urban and rural development priorities. This has a direct implication for the lives of farm households in peri-urban areas, especially during their transition to urban livelihoods

### **3. Conceptual Framework: Drivers of Income Diversification**

#### **3.1 Theoretical outline**

The driving forces of rural income diversification are grouped into “*choice or pull*” factors to accumulate wealth and “*necessity or push*” factors to survive (Ellis, 2000; Barrett et al., 2001b)<sup>5</sup>. Since the reclassification of the urban boundary can be seen almost as an exogenous shock to households, peri-urban farm households' decision to diversify to alternative income sources is more likely for *necessity* than *choice* reasons. As outlined earlier, urban expansion limits access to farmland and ultimately causes natural resource-based livelihoods to vanish in peri-urban areas, where farm activities decline and nonfarm activities eventually dominate. This suggests that farm households in peri-urban villages are obliged to diversify to the nonfarm sector in order to adjust and survive in urban livelihood systems.

Diversification is the norm for many smallholder farmers in developing countries (Barrett et al., 2001b; Davis et al., 2010) and rural nonfarm activities are concentrated in urban peripheries (Lanjouw et al., 2001; Woldehanna,

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<sup>5</sup> Discussions of the push and pull factors are present in many household studies that examine diversification (e.g., Ellis, 1998, 2000; Barrett et al., 2000).

2002). This suggests that peri-urban farm households do have a location advantage to diversify into the nonfarm sector compared to farmers in the rural hinterland. However, the constraints and incentives to diversify to the nonfarm sector depend on experiences, skills and asset ownership of the household (Haggabed et al, 2007).

Studies in rural Africa indicate that households' choice of income diversification strategy are influenced by differences in capital (i.e. human, physical and financial) endowments, location and shocks (e.g. Dercon and Krishnan, 1996; Barrett et al., 2001a; Bezu and Barrett, 2012). These studies focus on rural households' income diversification strategy where a farm household tries to allocate resources to supplement the farm income and maximize expected utility in the context of rural economy. However, peri-urban villages are contextually different from the rural hinterland. For instance, given missing markets for land and credit, farm intensification may not be a viable strategy in dynamic rural to urban livelihood transitions.

Following Bezu and Barrett (2012), we classify the nonfarm sector broadly to high-return activities (or skilled employments) and low-return activities (or unskilled employments). High-return nonfarm activities generally require skills and initial investments while low-return nonfarm activities are free of these constraints and are easier to enter. In contexts where markets for credit and insurance are missing, a farm household needs to possess the necessary capital (such as skills, tools and/or finance) to enter into high-niche nonfarm activities. Entry barriers to high-return nonfarm activities can thus exacerbate differential livelihood outcomes in the course of rural to urban livelihood transitions. For instance, farm households equipped with nonfarm skills and experience are likely have better access to rewarding activities and opportunities to compete in the urban labor market which ultimately help them to adjust to urban livelihoods. But others may be forced to diversify to low-return activities. In the absence of interventions that improve productivity of the household's agricultural capital, both possession of nonfarm capital and other skills and experience may play a crucial role in determining the outcome of rural to urban livelihood transitions.



Finally, some households may be unable to generate enough income from any of the above sources, and rely on transfer income. In Ethiopia the main source of government support is the Productive Safety Net Program (PSNP), which in 2011-12 reached 8 million beneficiaries<sup>6</sup> and was targeted mainly at rural areas. Many international NGOs also operate in Ethiopia, and may have provided benefits to households in urban or rural areas. Finally, private transfers such as remittances from migrant household members (either domestic or international) form part of this income.

### 3.2 Empirical methodology

Following the theoretical discussion above, we categorize households into three main income diversification strategies in our data, namely: i) farm with skilled nonfarm or skilled nonfarm only (“Skilled” response); ii) farm with unskilled nonfarm or unskilled nonfarm only (“Unskilled” response); and iii) farm with transfer income or transfer income only (“Transfer” response)<sup>7</sup>.

Households in the *skilled* group are those households with at least one member of the household earning income from skilled nonfarm employment. Households in the *unskilled* group earn income from all sources except skilled nonfarm activities and those under the *transfers* category are households that may be involved in farming and who earn from transfer income sources but are not engaged in any nonfarm employment. For the purposes of our estimation strategy, these three strategies are by definition mutually exclusive and independent.

The decision to pursue a specific diversification strategy thus depends on characteristics of the household and the local economy. The returns to farming will depend on the size and quality of the land, as well as the availability of household labor. We hypothesize that households with less land (especially significantly less land, e.g. post-expropriation) will not be able to generate

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<sup>6</sup>[http://www.wcdrr.org/wcdrr-data/uploads/482/SPL\\_DRM\\_TK\\_CS2\\_Ethiopia%20PSNP.pdf](http://www.wcdrr.org/wcdrr-data/uploads/482/SPL_DRM_TK_CS2_Ethiopia%20PSNP.pdf) accessed 22<sup>nd</sup> June 2015

<sup>7</sup> For instance, households engaged only in skilled nonfarm activities are merged with households that pursue farm with skilled nonfarm and the strategy is named as farm and skilled nonfarm or only skilled nonfarm.

enough production to sustain the household, and will therefore be “pushed” into the labor market. Whether such households can engage in skilled labor activities will depend on the human capital of the household, which itself will be a function of education, and experience. Setting up an enterprise would need skills, but also capital – which the rur-urban households did receive cash injection in the form of compensation for land. Access to official (government) transfers should be greater for rural households, as the PSNP was an exclusively rural program (in 2011-12). However, we do not expect there to be any reason for households to have differential access to remittances.

The household is assumed to choose one strategy from three mutually exclusive strategies to maximize utility. The household’s decision as noted above depends on demographic characteristics, asset holding, past experience in diversification, incidence of shocks and the local economy. Towns are used as a proxy to capture the incentives and constraints in the local economy including labor market opportunities. Maddala’s (1983) random utility framework is applied to examine the factors and the model is given as:

$$U_{ij} = \eta_{ij} + \varepsilon_{ij} \quad (1)$$

where  $U_{ij}$  represents the utility  $i^{th}$  household derives from choosing  $j^{th}$  strategy from the three strategies,  $\eta_{ij}$  is the expected utility of  $i^{th}$  household for selecting  $j^{th}$  strategy and assumed as a linear function of strategy invariant observables, and  $\varepsilon_{ij}$  is the random errors and are mutually exclusive.

The probability that household  $i$  chooses income diversification strategy  $j$  is given as:

$$\begin{aligned} pr(Y_i = j) &= pr\{U_{ij} = \max(U_{i1}, U_{i2}, U_{i3})\} \\ &= pr\{\eta_{ij} + \varepsilon_{ij} > \max_{j \neq k}(\eta_{ik} + \varepsilon_{ik})\} \end{aligned} \quad (2)$$

where  $pr$ = probability. We use a multinomial logit model (MNL) rather than conditional logit model to estimate the odds ratio since the specified strategies do not have a natural ordering and we wish to include explanatory variables that are included whatever the strategy adopted, in order to determine their

differential impact. We applied the Hausman (seemingly unrelated estimation) to test the independence of irrelevant alternatives (IIA) hypothesis, since this is the crucial assumption for MNL models.<sup>8</sup> The reported parameter estimates are marginal effects indicating the likelihood to utilize one strategy over the others. Standard errors are adjusted to account for stratification and clustering.

The data are treated as pooled cross-section to estimate the parameters to maximize the number of observations in each income strategy and dummy variable is included to capture the time effect. We are interested in policy relevant information for the two different groups; hence, after the pooled model for both types of household, separate estimations and discussions are presented for rur-urban and rural households (as for example one might analyze separately the choices of men and women in a gender analysis). Because farming is generally common to all the strategies, the discussions focus mainly on the household's decision to engage in skilled nonfarm, unskilled nonfarm or unearned income sources. The results will be presented in section 5, after we introduce the data.

## **4. Data, Summary Statistics and Descriptive analysis**

### **4.1 Data**

Our study is based on panel data collected in 2011 and 2012 from farm households in peri-urban villages of Tigray, northern Ethiopia. The data were collected from 17 villages in 9 districts (locally known as *woreda*); the 9 districts consist of the selected towns and rural *woreda* adjacent to the towns. The 17 villages were initially classified as rural villages but either incorporated into towns or split into town and rural administrations after the towns redrew their boundaries. The aim was thus to collect comparison households who were 'treated' into urban administration, but otherwise similar to the rural households just across the boundary line.

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<sup>8</sup>Using 'suest' command in stata 13, as this overcomes several important limitations of the standard Hausman test (<http://www.stata.com/manuals13/rsuest.pdf>, accessed 15<sup>th</sup> June 2015).

First, based on the census data of 1994 and 2007, four out of the ten largest towns in Tigray were selected purposively with regard to their growth rate – highest (6.5% Mekelle), medium (Adigrat 3.5% and Axum 4.0%) and lowest (Alamata 1.8%). The selected towns represent the urban expansion rate of Tigray Regional State (4.9%) particularly and Ethiopia (3.7%) in general.<sup>9</sup> From each town, rural (sub-) villages included in the town and the adjacent rural sub-villages were selected for the study using intensity of the town expansion as a criterion. A proportional sample was drawn randomly from each survey site and each town has two groups, which we call rur-urban and rural. Finally, a total of 478 farm households, 240 rur-urban and 238 rural, were selected randomly and surveyed in the first round. In the second round, the sample reduced to 461, giving a fairly low 3% attrition rate.

One group consists of farm households in sub-villages under urban administration, hereafter rur-urban households,<sup>10</sup> who: i) gave up fully or partly their farmland between 2006 and 2009, ii) received land compensation, and iii) are officially recognized as urban residents in the respective urban administration. The other group is drawn from sub-villages adjacent to the sub-villages of the rur-urban but under rural administration in 2010, hereafter rural households. Peri-urban villages, in this paper, refer to the rural villages within the radius of 15 kilometers from edge of the urban built up area.

Household income was collected from all sources. Collecting income data of subsistence farm households is difficult and highly susceptible to measurement error (e.g. see Dercon and Krishnan, 1998). Although considerable effort was made during the survey to minimize errors, this is less of a concern for our analysis as the focus is on contribution of the income sources and factors that affect diversification strategies of the household. Therefore if measurement error is at least consistent across categories, then it should not affect our estimates. Income earned by any adult member of the household is considered as income of the household.

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<sup>9</sup> The urban growth rates were computed by the authors based on the CSA census data.

<sup>10</sup> The word rur-urban created from two words – rural and urban – to represent the households' living style and the administration they belong.

Household income in per-adult equivalent units is calculated to account for the age and sex composition of the household, though not inflation adjusted, since it is analyzed as a proportion. To fix ideas, income sources of the household are classified into farm, nonfarm and unearned income. A household is said to be engaged in the specified category, if at least one member of the household has earned from the source. Farm income represents income earned from on-farm and off-farm sources. On-farm income is earned from the household's own farm whereas off-farm income is earned from farm employments not owned by the household and from collecting natural resources such as sand, stone, wild fruits, etc.

Nonfarm income consists of income earned from employments outside agriculture. Employment in the nonfarm sector is further classified to skilled and unskilled employment based on expected returns. Skilled employment refers to employments that require possessing non-agricultural skills or initial investments to be engaged in the activity and is relatively rewarding activity (e.g. commerce, plumber, masonry, carpenter, civil servant, etc.). Unskilled employment refers to employments in low-return activities (e.g. domestic work, daily labourer, street vendor, embroidery, blacksmith, etc.). The skilled and unskilled classification is convenient to examine whether the household is engaged in the nonfarm sector to accumulate capital or for subsistence.

## **4.2 Summary Statistics**

Whilst we would have expected the characteristics of the selected households not to differ a priori, given that the only difference is in the administration to which they belong, we do find some significant differences. Household heads, on average, are younger and more literate in the rural than the rur-urban households (Table 1). There are more female headed households in the rur-urban (about 33%) than the rural (about 27%). The rur-urban households own smaller farmland and are jobless compared to the rural. Additionally, incidence of other idiosyncratic shocks (health and joblessness) is statically higher for rur-urban than rural households. We therefore control for these factors in the subsequent analysis.

The land compensation given to the dispossessed farm households varies across towns. On average, farm households in Adigrat received higher amount of land-compensation (approximately 3291 USD<sup>11</sup> which is equivalent to six years' income at the Ethiopian poverty line, expenditure for a household with four adults assuming no inflation, while those in Alamata received the smallest amounts. However, residential houses for most rural-urban households in Adigrat were demolished and the households received additional compensation for the loss. If Adigrat is excluded, on average, land compensation is highest in Mekelle and lowest in Alamata. This could be attributed to land price differences between the towns. The amount of land compensation is determined by the local urban authority (FDRE, 2008) which again depends on land lease price in the locality. Female headed households, on average, received lower amount of land compensation compared to male headed. This is mainly driven by higher landholding of male headed households.

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<sup>11</sup> 1USD = 16.54ETB in December, 2010

**Table 1: Summary statistics of time-invariant variables by group**

Variables	Rur-urban	Rural	Mean
	Mean (StD)	Mean (StD)	Difference (Std.err)
Household head age	54.96 (15.30)	48.66 (13.64)	6.29*** (0.95)
Members above elementary school	1.87 (1.55)	1.65 (1.48)	0.18** (0.09)
Members in elementary school	0.33 (0.96)	0.51 (0.96)	-0.18*** (0.04)
Number of female adults	1.58 (1.03)	1.64 (0.99)	-0.06 (0.07)
Number of male adults	1.44 (1.15)	1.51 (1.05)	-0.07 (0.072)
Number of adults above 65 age	0.32 (0.02)	0.17 (0.39)	0.15*** (0.03)
Number of children	1.73 (1.69)	2.31 (1.66)	-0.57*** (0.11)
Land holding in <i>tsimdi</i>	1.52 (1.54)	2.82 (2.02)	1.29*** (0.12)
Female headed households (%)	32.91	27.09	0.06** (0.03)
Household head literate (%)	37.68	44.94	-0.07** (0.03)
<b><i>Incidence of shocks between 2006 -2010(%)</i></b>			
Member of the household jobless	13.89	7.09	0.07*** (0.02)
Separation, bankruptcy, shortage of food	20.60	16.98	0.04 (0.03)
Member of the household sick or death	17.26	12.90	0.04** (0.02)
Property loss due to theft, fire, etc.	8.63	6.02	0.03 (0.02)
Occurrence of drought, flood, pest, etc.	28.42	27.74	0.01 (0.03)
Food price, other input price increase	56.00	52.04	0.04 (0.03)
<b>Land compensation in ETB:</b>			
Male headed	46,732 (46,233)		
Female headed	36,896 (30,549)		
In Mekelle	49,094 (46,684)		
In Adigrat	54,441 (42,444)		
In Axum	32,282 (27,273)		
In Alamata	16,966 (10,200)		
N			

Note: one hectare is equivalent to four *tsimdi*s. ETB: Ethiopian Birr (currency).

StD = standard deviations, Std.err = standard errors. \*\*\* significant at 1%.

Both surveys were conducted at the same time in the year, towards the end of the main harvest season in the agricultural calendar of Tigray (and Ethiopia in general). Macro factors particularly rainfall and inflation are also crucial for households' welfare. Tigray region is known for low and erratic rainfall, where the amount and distribution of rainfall in the wet season (*kiremt*<sup>12</sup>) is crucial to

<sup>12</sup>*Kiremt* is the local name for the wet season which starts in June and stops in September.

food security and income diversification of the subsistence farmers. According to the respondents, in all the survey sites except in Axum, the amount and distribution of rainfall in *kiremt* 2010 was good but in 2011 the rainfall started late and stopped earlier than usual. As a result, agricultural production in southern and eastern parts of the region was negatively affected, which in turn had a direct negative impact on food security of the farm households in those parts, particularly in 2011/2012.

Whenever distribution of rainfall is below normal during the wet season, the Early Warning and Response Department of the Ministry of Agriculture and Rural Development of Ethiopia usually makes the necessary preparations to include more farm households in the productive safety net program (PNSP) to protect their food security and assets from stress selling. Hence more rural households are expected to have participated in the PNSP program in 2012 compared to 2011.

To add to the context, we note that to curb rising food prices in 2010, particularly on basic food items, the Federal government of Ethiopia introduced price ceilings for about 18 commodities in January, 2011 and the price ceiling was lifted for most of the goods in July, 2011 (Mesfin, 2011). However, the introduction of the price caps did not curb inflation, which increased from below 20% in January, 2011 to 40% in July, 2011. The impact of the rising food prices on urban residents between 2004 and 2008 has been analyzed by Alem and Soderbom (2012), who found that households with low asset levels in unskilled employment suffered the most.

Many heads of the rur-urban households (about 40% in 2012) still consider agriculture as their main job though the proportion decreased somewhat (Table 2). On average, the contribution of income from nonfarm and farm activities has improved between 2011 and 2012. Regarding the rural households, agriculture contributes half of the total income followed by nonfarm activities (i.e. about one third) in both years and without significant change in the proportions. In contrast to the rural households, the rur-urban households' livestock holding and share of transfer income decreased over a year.



**Table 2: Summary statistics of time-varying variables by group**

Variable	Rur-Urban		Rural	
	Year 2011	Year 2012	Year 2011	Year 2012
	Mean (StD)	Mean (StD)	Mean (StD)	Mean (StD)
Head main job farming (%)	46	37	70	62
Real value of livestock (000 ETB)	6.64 (1.15)	6.26 (9.62)	6.77 (6.99)	8.14 (9.34)
Share to total household income				
Farm income	0.28 (0.36)	0.33 (0.35)	0.51 (0.31)	0.50 (0.32)
Nonfarm income	0.66 (0.37)	0.65 (0.35)	0.35 (0.29)	0.33 (0.30)
PSNP income	0.05 (0.12)	0.02 (0.08)	0.13 (0.17)	0.17 (0.24)

#### 4.3 Income Sources: descriptive analysis

Distribution of the farm households' income sources across income quartiles in both years is reported in Table 3, where quartile 1 (Q1) is the poorest quartile 4 (Q4) the richest. Nominal household income, on average, improved between 2011 and 2012 for all cohorts, though in the context of high inflation. Agriculture remains an important source of income across the board; 90% of rural and 60% of the rur-urban households still engaged in agriculture despite limited access to farmland for the latter.

The proportion of households engaged in nonfarm employment is higher for rural than rur-urban; this is quite a puzzling result, and contrary to the current wisdom in the literature. A number of factors might contribute to this. Compared to the rural households, rur-urban households in the sample are possibly less suited to heavy labor, given that the household heads are on average older, and in households with higher proportion of older people (see Table 1). It is also important to keep in mind that both groups are a similar distance (15km) from the edge of the town, so should not differ in terms of access or opportunity. We control for the household composition in the multinomial logit analysis. A note on self-employment, which is included in the skilled/unskilled employment categories: rural households are mainly engaged in part-time or seasonal jobs, whereby they work on the market days and/or the

lean season. Therefore, during the survey, there is little participation in self-employment. In 2011, the proportion of rur-urban households engaged in self-employment was 27% of which 23% were in unskilled employments. However, in 2012, the proportion of rur-urban households engaged in self-employment reduced to 23% of which about 37% were engaged in unskilled.

Rur-urban households, generate on average 25% of their total income from crop and livestock production while for rural households the proportion is twice as high. Households in the lowest cohort mainly depend on agriculture and transfer income sources. However, the absolute amount of agricultural income in the lowest three cohorts together is less than that of the upper cohort. This suggests that not only agriculture is important but also the sector is dominated by better-off households.

Households in the upper quartile derive the major share of their income from agriculture and skilled nonfarm employment opportunities (e.g. in construction and service sectors). Income shares from skilled nonfarm activities increases as income per adult rises whereas the reverse holds regarding unskilled occupations. For instance, income contribution of skilled nonfarm ranges from 3% (5%) in the lowest quartile to 50% (32%) in the upper income quartile in rur-urban (*rural*) households respectively. Better-off households thus dominate the high-return nonfarm activities. These results are consistent with other studies (e.g see Woldehanna and Oskam, 2001; Bezu and Barrett, 2012) that document the presence of entry barriers to skilled nonfarm employment options.

**Table 3: Distribution of income source by income quartile**

	2011						2012					
	Q1	Q2	Q3	Q4	Average	Use	Q1	Q2	Q3	Q4	Average	Use
Rur-urban farm households												
Farm income												
On-farm (crop and livestock)	43	31	17	24	27	61	48	31	28	23	25	76
Nonfarm												
Skilled employment	1	21	49	50	44	40	5	25	25	45	39	35
Unskilled employment	5	17	18	9	12	18	12	29	31	18	18	32
Productive safety net (PSNP)	13	5	2	1	2	41	5	2	1	1	1	37
Rent, remittance, etc.	38	22	13	15	12	56	28	14	14	12	16	46
Mean income (ETB)	604	1774	3311	8251			1077	2673	4501	10862		
Observation (N)	60	60	60	60	240		59	58	59	58	234	
Rural households												
Farm income												
On-farm (crop and livestock)	40	42	55	60	49	92	42	54	49	52	49	91
Off-farm	2	2	3	3	2	14	3	2	2	0	1	7
Nonfarm												
Skilled employment	3	16	26	29	18	41	7	9	31	35	20	38
Unskilled employment	19	21	8	3	12	34	14	20	10	7	13	30
Productive safety net (PSNP)	21	13	8	3	11	73	14	11	7	4	9	63
Rent, remittance, etc.	15	5	1	2	6	35	19	3	2	2	7	26
Mean income (ETB)	1431	2622	3821	10358			1537	3023	4479	9255		
Observation (N)	60	59	59	60	238		57	56	57	56	226	

Note: Q1 =first (lowest income) quartile, Q4= fourth (highest) income quartile. Use indicates the percentage of households that earned income from the source or participated in the activity. Missing observations are excluded. All figures are in percentages except mean income and observations.

The proportion of households that earn income from the Productive Safety Net Program (PNSP) is higher in the rural than rur-urban households. Labor contributions to the community, mainly soil and conservation works, is mandatory for rural households with or without payment (Gebremedhin and Swinton, 2003) likely depending on wealth status of the household. Note also that some rur-urban households still own farmland either fully or partially in the sub-villages under rural administration and have an obligation to participate in the soil and water conservation works and might be paid via PNSP.<sup>33</sup>

The construction industry is growing rapidly in urban areas of Ethiopia, though the sector faces a skills shortage, and has created thousands of unskilled jobs for both men and women. Between 2005 and 2011 construction sector grew by 12% per annum (UN-HABITAT, 2014). Peri-urban farm households have location advantage to be engaged in the industry either in skilled employment (i.e. carpentry, masonry, plastering, etc.) or unskilled employment (e.g. as daily laborer in construction or domestic works). In our sample, 40% of rur-urban households and about 52% of rural households participated in the industry (Table 4). Unskilled employment in the construction industry might be common among the young until they acquire the skills to advance to skilled employments.

**Table 4: Percentage distribution of nonfarm employment**

	Rur-urban		Rural	
	2011	2012	2011	2012
Engaged in nonfarm employment	57.92	67.23	75.18	71.37
In construction	38.85	43.04	56.98	48.76
Outside construction	61.15	56.96	43.02	51.24
Observations (N)	240	234	238	227

In summary, agriculture remains the major source of living to households in the lower income cohorts, whether they remained under rural administration, or were reclassified as urban, lost land, and received compensation. On average, skilled nonfarm activities (47%) followed by agriculture (24%) are

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<sup>33</sup>Author's qualitative discussions with participants.

the top two contributors to income of rur-urban households in the upper income cohort. The picture is reversed for rural households with agriculture (55%) and skilled nonfarm employment (30%) the top two contributors.

#### **4.4 Classification of Income Diversification Strategies**

The distribution of the distinct income diversification strategies employed across the income quartiles is reported in Table 5. The proportion of households that entirely depend on a single strategy decreases as income quartile increases. Most rur-urban households in the upper income cohorts opt to combine farming with nonfarm employment (equally divided between skilled and unskilled) while those in the lower income quartiles mostly combine farm with transfer income sources (i.e. remittances, rents, pensions, etc.). The rural households' diversification strategies differ to rur-urban households in that more households in the lower quartiles appear to access both skilled and unskilled labor opportunities. The observed pattern partly reflects the positive correlation between farm and nonfarm income and captures the differential access to skilled labor.

Compared to the rural households, more rur-urban households pursue a single strategy to support their living. However, the proportion of rur-urban households that utilize a single strategy decreased between 2011 and 2012. Some households shifted from a single income of skilled non-farm or transfer income to a mixed strategy, i.e. farming with unskilled employment, which signifies the importance of farming as a coping mechanism for the rur-urban households. Even if availability of farmland is limited, the percentage of rur-urban households engaged in the farming sector increased by 14% in 2012 compared to 2011.

**Table 5: Distribution of income diversification strategies across income quartile**

	2011					2012				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
<b>Rur-urban farm households</b>										
Farm and skilled nonfarm	3	17	43	44	27	3	24	27	55	28
Farm and unskilled nonfarm	3	17	16	9	11	5	38	37	16	24
Skilled nonfarm	0	12	24	23	14	5	10	15	9	7
Unskilled nonfarm	3	9	9	5	6	10	5	12	7	8
Farm and transfer income	52	28	3	12	24	58	16	15	10	24
Transfer income only	38	17	3	7	16	19	7	3	3	8
Observations (N)	60	60	60	60	240	59	58	59	58	234
<b>Rural households</b>										
Farm and off-farm	0	5	2	2	2	0	0	0	0	0
Farm and skilled nonfarm	22	32	46	61	40	11	41	49	50	38
Farm and unskilled nonfarm	42	27	27	22	30	37	34	25	18	28
Skilled nonfarm	2	0	2	2	1	2	2	5	2	3
Unskilled nonfarm	5	7	5	0	4	0	2	4	4	2
Farm and transfer income	28	24	14	14	20	49	21	18	27	29
Transfer income only	3	2	0	2	2	5	0	0	5	3
Observations (N)	60	59	59	60	238	57	56	57	56	226

**Note:** Transfer income represents unearned income sources (e.g. productive safety net, direct supports, remittances, rents, pensions, etc.). Quartiles defined in Table 3. Figures represent percentages and missing observations are excluded.

**Table 6: Distribution of income diversification strategies by group**

	Rur-urban			Rural		
	2011	2012	Average	2011	2012	Average
<b>Diversification Strategy:</b>						
Skilled Employment	42	35	38	44	40	42
Unskilled Employment	18	31	25	34	31	33
Transfer Income	40	33	37	22	29	25
Observations (N)	240	234		238	227	

Note: Figures represent percentages.

As discussed above, for the econometric analysis we categorize households into i) farm with skilled nonfarm or skilled nonfarm only (“Skilled”); ii) farm with unskilled nonfarm or unskilled nonfarm only (“Unskilled”); and iii) farm with transfer income or transfer income only (“Transfer”). The distribution of these strategies by group is shown in Table 6. Many more rur-urban households have access to transfers in 2011, but the proportional difference with rural households narrows by 2012. Similarly, the proportion in rur-urban using the unskilled strategy increases

## **5 Estimation Results and Discussion**

Table 7 presents the results for the pooled estimate using multinomial logit (MNL), with marginal effects reported. The likelihood of having income earned from skilled employment is positively associated with head’s literacy, number of adults in the household and experience in nonfarm activities. The role of shocks appears to be significant: covariate shocks drive households into unskilled employment, and idiosyncratic shocks reduce the likelihood of being in skilled employment. The size of the local economy is also positively associated with unskilled employment. Being reclassified as urban has a positive effect only on the likelihood of being dependent on transfers, which is a discouraging result. Female headed households are also more likely to rely on transfer income. The cash received as land compensation (for urban households only) also has a negligible effect on the probability of skilled employment. In model (2), we incorporate further interaction terms to investigate differences in determinants of livelihood strategies for the urban households. We now see that the positive impact on skilled employment of previous experience appears to be only for the rural households. In appendix Table 1A we repeat the analysis using seemingly unrelated regression, which shows broadly similar findings.

**Table 7: Multinomial logit estimation of income sources, pooled data**

	1			2		
	Skilled	Unskilled	Transfer	Skilled	Unskilled	Transfer
Household head age	-0.007 (0.008)	-0.003 (0.008)	0.010 (0.009)	-0.006 (0.008)	-0.002 (0.009)	0.009 (0.009)
Household head age squared	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Female headed (yes=1)	-0.151** (0.050)	0.033 (0.047)	0.118* (0.052)	-0.159** (0.050)	0.031 (0.049)	0.128* (0.052)
Head main job (farming=1)	-0.123** (0.048)	-0.126** (0.042)	0.250*** (0.043)	-0.113* (0.049)	-0.121** (0.043)	0.233*** (0.042)
Head literacy (literate=1)	0.0998* (0.044)	-0.0835* (0.040)	-0.016 (0.042)	0.116** (0.044)	-0.079 (0.041)	-0.037 (0.040)
No. adults	0.043** (0.014)	0.015 (0.013)	-0.058*** (0.013)	0.038** (0.014)	0.012 (0.013)	-0.050*** (0.013)
No. dependent	0.012 (0.014)	0.001 (0.013)	-0.013 (0.013)	0.012 (0.014)	0.001 (0.013)	-0.013 (0.013)
Nonfarm experience (yes=1)	0.132** (0.041)	0.102** (0.038)	-0.235*** (0.034)	0.220*** (0.058)	0.149** (0.052)	-0.370*** (0.046)
Real value of livestock (000ETB)	0.003 (0.002)	-0.010*** (0.003)	0.007*** (0.002)	0.003 (0.003)	-0.010** (0.003)	0.007*** (0.002)
Farm size (in <i>tsimad</i> )	-0.014 (0.014)	0.011 (0.013)	0.003 (0.012)	-0.013 (0.015)	0.011 (0.013)	0.001 (0.012)
Idiosyncratic shock (yes=1)	-0.0932* (0.036)	-0.037 (0.032)	0.130*** (0.034)	-0.036 (0.050)	-0.019 (0.045)	0.054 (0.047)
Covariate shock (yes=1)	-0.0946* (0.038)	0.102** (0.034)	-0.008 (0.036)	-0.113* (0.051)	0.076 (0.045)	0.037 (0.050)



Town: base reference Alamata						
Mekelle	-0.035 (0.072)	0.173** (0.059)	-0.138* (0.060)	-0.033 (0.074)	0.179** (0.059)	-0.147* (0.058)
Adigrat	-0.141 (0.076)	0.169 (0.087)	-0.027 (0.069)	-0.142 (0.078)	0.175* (0.087)	-0.033 (0.067)
Axum	-0.085 (0.082)	0.160 (0.084)	-0.076 (0.063)	-0.079 (0.085)	0.170* (0.085)	-0.092 (0.057)
Location (urban=1)	-0.071 (0.054)	-0.088 (0.048)	0.159** (0.053)	0.016 (0.088)	-0.085 (0.086)	0.070 (0.080)
Time dummy (Year 2012 =1)	-0.027 (0.031)	0.054 (0.028)	-0.027 (0.029)	-0.031 (0.031)	0.052 (0.029)	-0.021 (0.028)
Urban*compensation(000ETB)	0.001 (0.001)	0.000 (0.001)	-0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	-0.001 (0.001)
Urban*nonfarm experience				-0.207* (0.081)	-0.132* (0.065)	0.339** (0.105)
Urban*Idiosyncratic shock				-0.096 (0.071)	-0.026 (0.065)	0.121 (0.072)
Urban*Covariate shock				0.011 (0.076)	0.056 (0.072)	-0.067 (0.065)
N	935	935	935	935	935	935
Log likelihood	-860	-860	-860	-850.5	-850.5	-850.5
chi2	207.7	207.7	207.7	337.8	337.8	337.8
P	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Marginal Effects. \* for  $p < 0.05$ , \*\* for  $p < 0.01$ , and \*\*\* for  $p < 0.001$ . Independence of irrelevant alternatives (IIA) assumption test results using suest are: 1<sup>st</sup> model: excluding “Transfer”,  $\chi^2(18)=0.23$ ,  $\text{Prob} > \chi^2 = 1.00$ ; excluding “Unskilled”,  $\chi^2(19)=23.64$ ,  $\text{Prob} > \chi^2 = 0.2104$ . 2<sup>nd</sup> model: excluding “Transfer”,  $\chi^2(22)=28.85$ ,  $\text{Prob} > \chi^2 = 0.1493$ ; and excluding “Unskilled”,  $\chi^2(22)= 15.84$ ,  $\text{Prob} > \chi^2 = 0.8235$ .

## **5.2 Rur-urban Households**

In Table 8 we present the results for the full model separately for rural and urban-reclassified households. Having large number of adults and past experience in the nonfarm sector increases the probability to engage in nonfarm employments more than transfer income sources as shown in the pooled model (Table 8). Having more adults in the household is possibly associated with some level of acquired skill which might help the household to engage in nonfarm activities. Past experience in the nonfarm sector is possibly associated with acquiring particular skills or social networks that play important roles in the nonfarm sector. The evidence substantiates the presence of entry barriers to better-paying nonfarm activities. The coefficients on compensation are significant in this model, however the economic significance is low: to increase the probability of being in skilled employment by 2% requires ETB10,000 of compensation. This partly suggests that finance is not a key factor constraining households from engaging in lucrative nonfarm activities, an important policy issue generally in development and particularly in Ethiopia. The evidence shows that securing access to finance might not bring the desired outcome if not backed with the required knowledge and skills on how to utilize it.

The size of the local economy is significantly associated with the probability of pursuing nonfarm employment. The likelihood of being engaged in skilled nonfarm activities is lower in Alamata compared to Mekelle and Adigrat towns. This is likely due to the differences in size of the local labor market, because Alamata is the smallest urban center compared to the other three by all measures.

## **5.3 Rural Households**

Similar to the rur-urban households, it appears that human capital matters for the households to pursue skilled or unskilled nonfarm diversification strategies (Table 8). The probability of engaging in skilled nonfarm employment is positively associated with literacy of the household head and number of adults in the household which partially captures the presence of entry barriers to the sector. Livestock holding is strongly and positively

associated with skilled nonfarm activities but the effect is insignificant. Female headed households are less likely to pursue skilled nonfarm activities compared to male headed households. Households with larger landholdings are likely to diversify into unskilled rather than skilled nonfarm activities. This likely attributes that these households engage in nonfarm employments during the lean season as part time job.

Similar to the rur-urban households, the likelihood to earn income from unearned sources increases when the head is older or considers farming as a main job. Experiences of shocks play an important role in the household's decision to choose among the income generating strategies. Size of the local market is also important. Compared to those in Alamata, households in Mekelle are engaged in skilled nonfarm employments while households in Adigrat and Axum pursue unskilled nonfarm employments.

**Table 8: Multinomial logit estimation, separate Urban and Rural**

	Urban			Rural		
	Skill	Unskill	Transfer	Skill	Unskill	Transfer
Household head age	-0.002 (0.011)	-0.004 (0.012)	0.006 (0.013)	-0.013 (0.012)	-0.001 (0.014)	0.014 (0.009)
Household head age square	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Female headed (yes=1)	-0.102 (0.069)	-0.029 (0.059)	0.131 (0.074)	-0.245*** (0.074)	0.093 (0.075)	0.152 (0.078)
Head main job (farming=1)	-0.208*** (0.061)	-0.173*** (0.049)	0.381*** (0.064)	-0.059 (0.074)	-0.053 (0.065)	0.112* (0.049)
Head literacy (literate=1)	0.033 (0.064)	-0.053 (0.052)	0.020 (0.066)	0.162* (0.065)	-0.085 (0.065)	-0.078 (0.049)
No. adults	0.0537** (0.019)	0.026 (0.016)	- 0.0799*** (0.018)	0.026 (0.022)	0.001 (0.024)	-0.027 (0.016)
No. dependent	0.022 (0.021)	-0.012 (0.018)	-0.010 (0.022)	0.011 (0.018)	0.009 (0.019)	-0.020 (0.015)
Nonfarm experience (yes=1)	0.127* (0.061)	0.042 (0.054)	-0.169** (0.058)	0.214*** (0.064)	0.123* (0.060)	-0.337*** (0.043)
Real value of livestock (000ETB)	0.000 (0.003)	-0.002 (0.002)	0.002 (0.003)	0.0183** (0.006)	-0.030*** (0.007)	0.012*** (0.003)
Farm size (in <i>tsimad</i> )	0.005 (0.021)	0.016 (0.018)	-0.021 (0.024)	-0.018 (0.021)	0.022 (0.020)	-0.004 (0.014)
Idiosyncratic shock (yes=1)	-0.163** (0.052)	-0.030 (0.042)	0.193*** (0.052)	0.004 (0.055)	-0.045 (0.050)	0.041 (0.040)

Covariate shock (yes=1)	-0.057 (0.057)	0.104* (0.044)	-0.047 (0.057)	-0.147** (0.056)	0.099 (0.053)	0.048 (0.040)
Towns: base reference Alamata						
Mekelle	-0.174 (0.112)	0.270** (0.090)	-0.096 (0.099)	0.081 (0.096)	0.126 (0.086)	-0.207** (0.066)
Adigrat	-0.234* (0.106)	0.245 (0.147)	-0.010 (0.117)	-0.091 (0.114)	0.201 (0.122)	-0.110* (0.052)
Axum	-0.007 (0.139)	0.215 (0.154)	-0.208* (0.089)	-0.253* (0.107)	0.296* (0.117)	-0.043 (0.063)
Time dummy (Year 2012 =1)	-0.055 (0.044)	0.138*** (0.036)	-0.083 (0.045)	-0.003 (0.051)	-0.022 (0.047)	0.025 (0.035)
Compensation(000ETB)	0.00194** (0.001)	0.000 (0.001)	-0.00158* (0.001)			
N	473	473	473	462	462	462
Log likelihood	-423.2	-423.2	-423.2	-385.9	-385.9	-385.9
chi2	138.1	138.1	138.1	129.2	129.2	129.2
p	0.000	0.000	0.000	0.000	0.000	0.000

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . Independence of irrelevant alternatives (IIA) assumption tests results are: Urban: excluding “Transfer”  $\chi^2(18) = 21.22$ ,  $\text{Prob} > \chi^2 = 0.2682$ . Rural: excluding “Transfer”,  $\chi^2(17) = 13.86$ ,  $\text{Prob} > \chi^2 = 0.6768$ ; and excluding “Unskill”,  $\chi^2(17) = 11.58$ ,  $\text{Prob} > \chi^2 = 0.8247$ .

## **6 Conclusion**

Urban expansion limits availability of farmland to the farming community in the surrounding (peri-urban) villages. Such villages are being incorporated continuously into the urban economy as a result, which is a phenomenon in Ethiopia as well as many other African countries. The Ethiopian government reclassifies land into urban administration, and some households have land expropriated, but are compensated for this loss of land. Farm households in the peri-urban areas adopt diversified incomes sources in their rural to urban livelihood transition. Other studies have indicated that better-paying nonfarm employments have entry barriers (Woldehanna, 2002; Bezu and Barrett, 2012), and this study confirms a similar pattern in the transition from rural to urban livelihoods. Hence, examining factors that influence the farm household's diversification in the context of peri-urban is crucial to mitigate hurdles of rural-urban livelihood transitions. We identified the important factors that determine the household's decision to adopt a specific strategy. The findings have drawn important lessons regarding income diversification strategies of the farm households in peri-urban areas.

Even if the farm households have limited access to farmland, the analysis shows that agricultural incomes continue to be important and mixed strategy (i.e. combining farm with nonfarm) is the dominant income diversification strategy. Farm households in the upper quartile derive their income from farm and skilled nonfarm employment regardless of the administrative boundary. This suggests that policy makers should note the close relationship between farm and skilled nonfarm income, in particular, and farm and nonfarm, in general. The evidence also shows income shares from skilled nonfarm activities sharply increase with income quartiles. In this sense, the lucrative nonfarm sector is dominated by better-off farm households and indicates the presence of entry barriers to the sector. Having large numbers of adults (labor) and past experience in the nonfarm sector improves the likelihood to partake the diversification strategy that combines farm and skilled nonfarm activities. Female headed households and households headed by older people are poorly placed in the nonfarm sector and depend on transfer income sources.

Is financial capital a key factor for nonfarm employment opportunities and earnings? The evidence shows that financial capital (land compensation) is not crucial for the rur-urban household's decision to participate in the nonfarm sector. This suggests that granting money without the required skills and knowledge is ineffective for the peri-urban farm household to benefit from the emerging nonfarm employment opportunities. The other important finding is production behavior of the better-off farm households is similar but different for those in the poorest cohort. Policy makers should consider providing trainings such as urban agriculture and investment advice towards specialization when revising and designing the land compensation packages.

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# **Determinants of Loan Repayment in Group Owned Micro and Small Enterprises Financed by Dedebit Credit and Saving Institution**

## **(The Case of Mekelle City, Tigray)**

*Yitbarek Kiros<sup>1</sup>*

### ***Abstract***

*Sustainable Microfinance Institutions (MFIs) that reach a large number of poor people who are not served by the formal financial institutions, such as the banks, has been a prime component of the development of Ethiopia. To operate successfully Microfinance Institutions have to ensure that the loan they disburse have to be repaid so as to have financially sustainable and viable operations. In light of this, the paper attempted to investigate factors affecting loan repayment by group owned Micro and Small Enterprises (MSEs) financed by Dedebit Credit and Saving Institutions (DECSI), Mekelle branch, by studying lender and borrower characteristics. Both primary and secondary data were used for the research. The primary data was gathered by distributing a questionnaire to 62 group owned MSEs financed by DECSI, Mekelle branch, and used census method. The secondary data was obtained from various issues of annual reports of DECSI. Descriptive analysis and econometrics model (Binary Logistic Regression) were used to analyze the data. The binary logistic regression result showed that among the variables hypothesized to affect loan repayment, initiation, repayment period, grace period, sector, and timeliness of loan release had a statistically significant effect on loan repayment. Variables like group composition, group size, and loan size had statistically insignificant effect on loan repayment by the borrowers. From the findings of the study, the study concluded that the amount of loan default for DECSI has been increasing over the given four years (2007-2010). Therefore, to improve the loan repayment performance of the group owned MSEs, all concerned stakeholders have to play a vital role.*

**Key words:** Determinant, Loan Repayment, Group Owned, MSEs, Logistic, Mekelle

## **1.1 Background of the study**

Well-functioning and organized financial markets are pre-requisites for sustainable development.

But such markets are often lacking in developing countries (Guush, 2004). The poor are usually excluded from credit facilities because of many reasons. These include insufficient collateral to support their loans, high transaction costs, unstable income, lower literacy and high monitoring costs (Mead & Liedholm, 1998). In the past many governments devoted resources to supplying cheap credit to farmers. In most cases, the result was rather disappointing. This was partly due to failures to implement prudent and innovative institutional approaches suited to local situations and contexts (Guush, 2004). Moreover, bureaucratic lending procedures and stringent collateral requirements, made the problem worse (Jemal, 2003).

At present, Microfinance Institutions (MFIs) are growing as an innovative means of widening access to financial services in developing countries. In most poor countries, the objective has been twofold: reducing the risk of income shocks to help reduce poverty and raising asset accumulation to encourage private activity (Armendáriz & Gollier, 2000). Additionally, Micro and Small Enterprises (MSEs) have been recognized as a major source of employment and income in many countries of the Third World (Mead & Liedholm, 1998). The World Bank claims that between one third and three quarters of total employment in most developing countries comes from informal sector (Norhaziah & Mohdnoor, 2010).

One of the methodologies of microfinance institutions in extending finance to the needy is group lending. Since the 1970s, group lending programs have been promoted in many developing countries. The idea behind group lending is that the group obtains loans under joint liability so that each member is made responsible for repayment of loans of his or her peers (Zeller, 1996). The threat of losing access to future credit incites members to perform various functions, including screening of loan applicants, monitoring individual borrowers' efforts, fortunes, shocks, and enforcing repayment of their peers' loans (Zeller, 1996). Lenders use the threat of banning the entire group from future loans if one or more of the group members fail to repay.

This induces borrowers to behave in the interest of the MFI by self-selecting each other and coercing themselves to monitor each other's projects (Guush, 2004).

Group based institutions have been able to perform so well while others failed. The successes of MFIs are because, in group based programs, the function of screening, monitoring, and enforcement of repayment are to a large extent transferred from the bank to borrowers. The main argument is that, compared to the physically distant banks, group members can obtain at low cost, information regarding the reputation, indebtedness and wealth of the loan applicant and about his or her effort to ensure the repayment of the loan. Thus, group members are able to access complex and sensitive information. Furthermore, group members can potentially employ sanctions or seize physical collateral of the defaulter. Group members also appear to be in a better position to know the reason for default and offer insurance services to members experiencing shocks beyond their control (Manohar & Zeller, 1997).

It is important to note, however, that group lending may not ensure high repayment rates at all times. Repayment problems become the main obstacle for MFIs to continue providing microcredit services (Norhaziah & Mohdnoor, 2010). When loans are received on the basis of joint liability, the risk of loan default by a particular member is shared by his/her peers. It may also be that a borrower's assessment of his or her peer's likelihood of defaulting triggers the borrower's own decision to default. Groups beyond a certain size may also experience increased difficulty of communication and coordination so that both information and monitoring advantages of the group can be diluted (Manohar & Zeller, 1997). In addition, lenders cannot observe the behavior of their clients, i.e whether they are honest or dishonest. Lenders only observe the outcome of the loans either clients repay or not (Norhaziah & Mohdnoor, 2010).

Hence, the problem of loan repayment is one of the major issues of MFIs that concerns many stakeholders where high loan default rate is the primary cause for the failure of MFIs. This research therefore, aims at investigating the factors affecting loan repayment of the group owned micro and small

enterprises (MSEs) financed by the Dede-bit Credit and Saving Institution (DECSI), Mekelle branch.

## **1.2 Statement of the problem**

In most developing countries, credit is the pivot on which the development of any sector rests. Microfinance institutions are different from other financial institutions mainly because their services are directed towards the lower income group of the society. They are particularly established to meet the credit needs of poor households who are often not well-served by the formal financial institutions mainly due to lack of appropriate and adequate collateral (Micka'el, 1996). Releasing credit to those beneficiaries, however, does not necessarily alleviate the sector from the problems it is faces. It is most frequently seen and many studies note, that MFIs primarily pursue the objective of sustainability and outreach. Sustainability of any MFI is measured in terms of generating enough revenues to cover the cost of all factors of loanable funds. However, outreach is a hybrid measure that assesses the extent to which the MFI has succeeded in reaching its target clients and the degree to which the MFI has met clients demand for financial services. One indicator of effectiveness of a loan disbursement is the repayment performance of borrowers; otherwise it adds an additional liability or burden to the client (Micka'el, 1996). Evaluating performance indicators is important to determine the efficiency, viability, and outreach of microcredit programs. The sustainability of MFIs is important to make sure that they can continually provide finance (loan) to MSEs without depending on donors and governments. Therefore, financial sustainability is a prerequisite for making micro financial services permanent as well as widely available. Therefore, MFIs must take great precautions to ensure that clients repay loans (Norhaziah & Mohdnoor, 2010). Many scholars have identified a number of factors that affect the loan repayment performance of MSEs (Armendáriz & Gollier, 2000; Bhatt & Tang, 2001; Manohar & Zeller, 1997; Njoku & Odii, 1999; Norhaziah & Mohdnoor, 2010).

In Ethiopia, a number of people (Abraham, 2002, Berhanu, 1999; Daba, 2004; Guush, 2004; Jemal, 2003; Mengistu, 1997 & 1999; Micha'el, 1996; Teferi, 2000) have conducted researches in the area and have identified factors that affect loan repayment. Loan repayment is affected by certain

factors in a specific situation. In fiscal year 2008 alone, DECSI Mekelle branch, extended loans that amounted to Birr 8,205,660.12 to group owned micro and small enterprises operating in Mekelle. However, the loan recovered was only 35.7% and the remaining 64.3% is still in arrears or default. This situation shows that only few micro and small enterprises repaid their loans and a significant number of them failed to do so. Therefore, this study aims at investigating the determining factors that affect loan repayment of group owned MSEs operating in Mekelle by taking into account lender and borrower characteristics.

## **2. Review of Literature**

Bruce and Kofi, (1999) conducted research on the determinants of loan default and delinquency in rural credit programs in Ghana using a logit regression. The study revealed that, a person who is married is less likely to default than one who is separated or divorced. A male is more likely to default than a female. Holding everything else constant, the larger the loan, the less likely a person is to default. Borrowers with elementary or secondary education are more likely to default compared to those with no formal schooling.

According to Ajayi (1992), the factors which influence loan default in mortgage with particular reference to the Federal Mortgage Bank of Nigeria using multiple regression analysis based on 128 samples showed that default has largely been positively influenced by cost of construction, monthly repayment, loan to value ratio, market value of property, age of borrower and the annual income of borrowers. The expected rental income from property, however, had a negative influence on default.

A study made by Njoku and Odii (1999) on the determinants of loan repayment in Nigeria by employing multiple regression model based on 300 sample beneficiaries indicated that poor loan repayment performance was as result of late release of loan funds, cumbersome loan application and disbursement procedures and emphasis on political considerations in loan approvals. In addition, loan diversion to non-agricultural enterprises as well as low enterprise returns resulting from low adoption rate of improved agricultural technologies contributed to poor loan repayment performance of



small holders. Loan volume, years of farming experience, farming as a major occupation, years of formal education, household size, loan period, farm size, farm output, value of assets and interest paid on loan were all highly significant determinants of loan default. The coefficients of loan volume, years of formal education, household size and interest paid on loan are positive while the coefficients for years of farming experience, loan period, farm size, farming as a major occupation, farm output, and value of assets are negative.

Kashuliza, 1993, used a linear regression model to analyze determinants of loan repayment in small holder agriculture in the southern highlands of Tanzania. His study showed that education, attitude towards repayment, farm income and off-farm income positively affect loan repayment with farm income being significant, while age, household expenditure and household size having negative influence on loan repayment performance with household expenditure being significant.

A study by Ade (1999) on the determinants of small holder loan repayment performance from the Nigerian micro-finance system found out that the proportion of borrowers with secondary education, number of times borrowers were visited by loan officials and the loan size were the major factors that cause loan default by the borrower.

A study made by Roslan and Mohd (2009) on the determinants of microcredit repayment in Malaysia using the case of an Agro bank, by taking a sample of 630 and employing probit and logit models indicated that the factors that influence loan repayment are gender of the borrower, type of business activity, amount of loan and training. According to the result the probability of loan default was higher for males, if the borrower was engaged in a production activity, if the amount of loan was higher and if the borrower did not take any training.

Vigano (1993) in his study about the case of a development bank of Burkina Faso employed a credit-scoring model. He found out that being women, married, aged, more business experience, value of assets, timeliness of loan release, small periodical repayments, project diversification and being a pre-existing depositor were positively related to loan repayment performance.

On the other hand, loan in kind, smaller loan than required, long waiting period from application to loan release and availability of other source of credit were found to have negative relations with loan repayment performance.

Chirwa (1997) estimated the probability of agricultural credit repayment utilizing data from five Agricultural Development Divisions in Malawi using a probit model. The result based on 1237 sample farmers showed that the availability of resources from crop sales and income transfers, the size of the club, the degree of diversification and the quality of information determined the probability of repayment. In contrast, other factors such as amount of loan, sex of household head, and size of household were not statistically significant. Crop sales, income transfers, degree of diversification and quality of information were positively related with the probability of repayment.

In an attempt to empirically analyze the loan repayment determinants in a credit group of microenterprises in Madagascar, Zeller (1996) employed a tobit model using information obtained at the household, group and community level. The result based on 146 sample groups showed that groups with higher levels of social cohesion had a better repayment rate. The result also led to the conclusion that it was not the level of physical and human assets of the group members but the degree of variance of risky assets among members that contributed to better loan repayment. The result therefore indicated that heterogeneity in asset holdings among members and related intra-group diversification in and off farm enterprises enabled members to pool risks so as to better secure repayment of loans. Furthermore, gains in the repayment rate due to risk pooling diminished at the margin because of increased costs of coordination, monitoring, and moral hazard that came with greater heterogeneity in groups.

A descriptive analysis made by Adeyemo (1984) on loan delinquency in a multi-purpose cooperative union in Kwara state, Nigeria, based on 1020 borrowers showed that 80% of the population revealed that natural calamities, crop failure due to pest, poor storage facilities, lack of adequate transport facilities, sales income, farm income, farm size, education, tenure status of borrowers are factors associated with loan delinquency.

Von Pischke (1991) attributed the cause of poor loan collection performance, by formal agricultural lenders in developing countries, to general conditions of low levels of economic development. Farm level causes of loan arrears as cited by him include small farmers' poverty, large farmers' political influence, low returns and lack of profitable innovation in tropical and sub-tropical agriculture, unfamiliarity with modern commercial practice among certain rural societies, cultural factors such as the weakness or absence of moral incentives or small group sanctions for timely repayment, illiteracy, lack of farm planning, insufficient supervision, and low level of formal education of typical borrowers. Problems at the lender side include deficiency in loan administration and lack of market information such as system of credit rating based on repayment performance. In addition, difficulty in enforcing contracts through judicial or administrative processes could be cited as a country level problem constraining lender performance. As far as source of credit is concerned (Miller, 1977) indicated that the principal reason for some loans to be in default was the anticipation of borrowers that the credit policy would change.

Jama and Kulundu (1992) in their study of credit repayment performance in Kenya found that loan diversion, farm income, borrowers' attitude towards loan repayment and source of income activity had statistically significant impact on loan repayment by borrowers.

Hunt (1996) examined the credit rationing technology of lenders and the repayment behavior of borrowers at a rural financial institution taking a sample of 504. Loan rationing equation and loan repayment equations, estimated employing tobit model using survey data at Guyana Cooperative Agricultural and Industrial Development Bank, revealed that only 33% of the criteria utilized identified creditworthy borrowers implying that the screening technology was not efficient and needed to be repaired. The results also indicated that tightening the loan contract terms by reducing the grace period on loans and rejecting applications which had long processing times enhanced the pool of credit worthy borrowers. Female borrowers were either not rationed differently from male borrowers nor were they worse payers than male borrowers (i.e. variable sex was insignificant) But wealthy borrowers were bad credit risks as their repayment performance was poor. In general, the study showed that only four out of twelve explanatory variables,

which were fishing, males in food crops and livestock, credit experience and sugar cane enhanced creditworthiness, while other variables especially grace period, delays, and joint borrowing contributed significantly to the default problem.

Okorie (1986) provided empirical evidence and quantification of the extent to which some factors influence loan repayment among smallholder farmers in developing countries with particular reference to small holders farmers in Ondo state of Nigeria based on 45 sample units. Based on obtained results, the factors and their correlation coefficients with their signs were identified as follows: number of disbursement (+0.372), time of disbursement (+0.658), number of supervisory visits by credit officers after disbursement (+0.411) and the profitability of enterprises on which loan funds were invested (+0.309).

Arene (1992) in an attempt to evaluate the credit delivery system of Supervised Agricultural Credit Schemes among smallholder farmers in Anambra State of Nigeria with emphasis on loan repayment rate conducted a multiple regression analysis. The result based on 95 sample farmers showed that timely loan repaying farmers had larger loan size, larger farm size, higher income, higher age, higher number of years in farming experience, shorter distance between home and source of loan, higher level of formal education, larger household size, higher level of adoption of innovations, and lower credit needs than defaulting farmers. The regression analysis showed that size of loan, farm size, income, age, number of years of farming experience, level of formal education and adoption to innovations were significantly and positively related to repayment rate, but distance between home and source of loan, household size, and credit needs had effect.

Padmanabhan (1981) mentioned some of the specific reasons for default in rural credit projects which a development banker can possibly guard against at the time of project preparation or appraisal based on Indian experience. These factors include: under financing, over investment, imperfect analysis, unrealistic repayment schedule, inadequate technical support, improper planning of infrastructural support, ineffective arrangements, inadequate communication between branch and head offices, cursory assessment of

responses from the farmers, reduction in the unit value of projects and high propensity to consume.

## **2.1 Empirical Studies in Ethiopia**

In Ethiopia, an econometric estimation was conducted by Mengistu (1997), based on survey data, on the determinants of loan repayment performance and efficacy of screening mechanisms in urban Ethiopia taking the case of Awassa and Bahir Dar towns. The estimation result, using binomial Probit model, revealed that for Awassa, the number of persons employed and weekly installment repayment period were significantly and positively related with repaying loan in full while loan diversion was significantly and negatively related. In terms of the probability of falling in either of the groups, it was found that there was a 53% probability of repaying loan in full. In the case of Bahir Dar, loan expectation and number of workers employed had a positive relation with full loan repayment while loan diversion and availability of other sources of credit have a negative impact. The predicted probability of full loan repayment in this case was 78%. The study employed 352 sample beneficiaries for the case of Awassa and 409 for Bahir Dar.

Berhanu (1999) and Teferri (2000) made an attempt employing a binomial probit model on determinants of loan repayment performance of micro enterprises with particular reference to POCSSBO in Addis Ababa and DECSI in Tigray. Birhanu found out that loan diversion, loan size and monthly income were undermining factors while beneficiaries' age, perceived cost of default and suitability of repayment period were enhancing factors of loan repayment. Based on 2348 sample beneficiaries, Teferri also came up with the result that education and size of loan were significant determinants in all the three cases (i.e. urban, rural and all sample beneficiaries) their sign being positive and negative, respectively. Other variables such as sex, timeliness of loan disbursement and monthly income were positively and significantly related to loan repayment in rural and whole sample beneficiaries while loan diversion was negatively and significantly related to full loan repayment in urban and whole sample beneficiaries.

Fantahun (2000) used a binomial probit model to estimate determinants for Agency for Cooperation in Research and Development (ACORD) based on 200 clients under the age of 18, in Community Based Organizations (CBOs) in Dire Dawa. The estimation result shows that the coefficients for other income sources, loan supervision visits, perceived cost of default, income from loan financed business and interest rate were all significant and positively related to full loan repayment.

In another relevant study by Abraham (2002) an investigation on the determinants of repayment status of borrowers with references to private borrowers around Zeway area who were financed by the DBE. The estimation result employing a tobit model revealed that having other source of income education, work experience in related economic activity before the loan and engaging on economic activities other than agriculture were enhancing while loan diversion, being a male borrower and giving extended loan repayment periods were undermining factors of loan recovery performance.

Bekele (2003) employed a logistic regression model to analyze the factors influencing loan repayment performance of small holders in Ethiopia. The study used data on 309 borrowers of input loans in the Oromia and Amhara National Regional States and found out that individuals who took larger loans had better repayment performances than those who took smaller loans. Further the results of the study revealed that late disbursement of inputs purchased was an important bottleneck in loan repayment while livestock were found to be important in improving farmers' repayment performance.

Retta (2000) employed probit models for loan repayment performance of Women Fuel Wood Carriers (WFCs) in Addis Ababa. She reported that educational level was negatively related to loan repayment while frequency of loan, supervision, suitability of repayment installment period and other income sources were found to encourage repayments and hence reduced the probability of loan default.

Mengistu (1999) also made an empirical analysis on the determinants of industrial loan repayment in Ethiopia with particular reference to manufacturing firms in Addis Ababa. The regression result employing a tobit

model based on 65 manufacturing firms revealed that total investment cost, ratio of value of collateral to total loan amount, the firm's grace period, number of disbursement installments, and time were statistically insignificant, while repayment period and number of supervision visits were significantly and positively related to loan recovery rate. However, coefficients of loan amount and ratio of pre-operating interest to total loan amount are significant at 10% and 5%, respectively, and negatively related with loan recovery rate. In this case, only information specific to the terms and conditions of loan during appraisal was employed. Other factors related to the borrowers' background and other economic factors were not incorporated in the analysis.

Kassa (1998) in his study of the impact of micro financing under the micro enterprise project scheme in southern Ethiopia reported growth in income, employment, consumption and medical expenditure of the beneficiaries after the loan. Using Wilcoxon Matched Pairs Non-Parametric test, he also indicated that the average income after the loan was greater than that before the loan, in all the three loan cycles. And according to Daba (2004), loan supervision had a positive impact on loan utilization and loan repayment.

Therefore, from the above empirical studies conducted in Ethiopia one can understand that most of them focused on identifying the determinants that affect the loan repayment performance of privately owned micro and small enterprises. However, to the best knowledge of the researcher there was no research conducted that focused on investigating the key determinants that affect loan repayment of group owned micro and small enterprises located in Mekelle and those financed by the DECSI Mekelle branch.

### **3. Materials and Methods**

To examine factors affecting loan repayment of group owned MSEs, the study draws empirical evidence from a 2012 survey covering 85 purposively selected MSEs from Mekelle. But only 62 grouped MSEs were located but the remaining 23 grouped owned MSEs were liquidated without repaying their loans. A semi-structured questionnaire and personal interviews were used to collect first hand data. The data collected was classified, summarized and presented using descriptive statistical tools like percentages, ratios, mean and standard deviation. In addition, an econometric analysis tool, that is

binary choice logistic regression model, was used to test the literature obtained hypothesis and draw conclusions.

### ***Model Specification***

In this study MSEs are assumed to be either defaulting or non-defaulting. Hence the binary logistic regression model assumes dichotomous dependent variable which takes either 1 or 0 (Gujarati, 2004).

Mathematically, the model is specified as follows:-

Let  $Y_i = 1$ , if the borrower repay the full amount of the loan within the given maturity period.

$Y_i = 0$ , if the borrower did not repaid the full amount of the loan within the given maturity period.

But  $Y_i = 1$ , if  $y^*$  is  $>0$

$Y_i = 0$ , if  $y^*$  is  $\leq 0$

Where  $y^*$  is a latent variable. It is unobserved variable which can affect the loan repayment by the borrower. Hence we cannot measure it.

The probability that a borrower will repay the loan is given by:

$$P_i (Y_i=1) = \frac{1}{1 + e^{-z_i}} \quad \text{or} \quad \frac{e^{z_i}}{1 + e^{z_i}} \quad (1)$$

If the probability of repaying the loan is given by equation 1, then the probability of non-repayment of the loan is:

$$P_i (Y_i=0) = 1 - P_i = \frac{1}{1 + e^{z_i}}$$

Therefore, we can write

$$\frac{1 - P_i}{P_i} = \frac{1 + e^{-z_i}}{1 + e^{z_i}} = e^{-z_i} \quad (2)$$

Now,  $\frac{P_i}{1 - P_i}$



Is simply the odd ratio- the ratio of the probability that the borrower will repay the loan to the probability that the borrower will not repay the loan.

$$LR = \frac{pi}{1-pi} = 0 + {}_1GP + {}_2TLR + {}_3LS + {}_4RP + {}_5SO + {}_6GS + {}_7IN + {}_8GC + U_i$$

Where:  $\frac{pi}{1-pi}$  = Natural logarithm of the odd ratio (logistic model), which is the marginal effect.

$$LR = 0 + {}_1GP + {}_2TLR + {}_3LS + {}_4RP + {}_5SO + {}_6GS + {}_7IN + {}_8GC + ei$$

Where: = Natural logarithm of the odd ratio (logistic model), which is the marginal effect.

LR= Loan repayment (Dependent variable) SO= Sector of operation

GP= Grace period GS= Group size

TLR= Timeliness of loan release

RP= Repayment period

GC= Group composition

SO= Sector of Operation

GS= Group Size

LS= Loan Size

IN= Initiation

### ***Lender or Institutional Characteristics***

#### **Grace period versus loan repayment**

If a long grace period is given, the borrower will have sufficient time for implementation of the loan (project) so that the borrower could properly utilize the loan for the intended purpose and this enables the loan (project) to generate adequate income after it starts operation. Therefore, the borrower will not face repayment problems (Abraham, 2002; Hunt, 1996).

***Hypothesis 1:** The longer the grace period, the higher the probability of loan repayment.*

#### **Timeliness of loan release versus loan repayment**

If loan is disbursed on time, it is unlikely that it will be diverted to non-intended purposes. The complicated appraisal and approval procedures might delay loan disbursement. Further, this could worsen the prospects of

loan repayment by diverting loans to non-intended purpose (Berhanu, 1999; Chirwa, 1997; Daba, 2004; Jemal, 2003; Teferi, 2000; Zeller, 1996).

***Hypothesis 2:** The timely the loan is released, the higher the probability of loan repayment.*

### **Loan size versus loan repayment**

This is the amount of loan or money a group borrows from a micro finance institution.

It is argued that the smaller amount of loans are insufficient creating cash flow problems to the borrower thus significantly affecting the project (Roslan & Mohd, 2009). Furthermore, the bigger the loan, the higher is the penalty cost associated with any delinquency or default and this puts more pressure on the borrower to reduce delinquency or default (Manohar & Zeller, 1997). Therefore, the larger the loan size, the better the prospects for loan repayment by the group.

***Hypothesis 3:** The larger the loan size, the higher the probability of loan repayment.*

### **Repayment period versus loan repayment**

Repayment period refers to the time during which the entire loan must be repaid (Roslan & Mohd, 2009). If it is relaxed, the amount of each installment required to be paid will decrease, the debt burden on the borrower will be smaller hence the borrower will not face any difficulty in properly meeting their debt obligations (Abraham, 2002). But in this study, the shorter there payment period, the better will be the loan repayment by the group. This is because if there payment period is longer the borrower might use the funds for other purposes hoping to repay the loan from later cash flows (Roslan & Mohd, 2009; Njoku & Odii, 1999; Berhanu, 1999; Teferi, 2000).

***Hypothesis 4:** The shorter the repayment period, the higher the probability of loan repayment.*

## **Borrowers' Characteristics**

### ***Sector versus loan repayment***

Sector implies the business area or activity in which the group operates. Borrowers that engage in the service sector as compared to other sectors like construction, manufacturing, and agriculture face a lower loan default or a better loan repayment. This is because, the service sector is less exposed to risk and uncertainty relative to other sectors of the economy (Roslan & Mohd, 2009).

***Hypothesis 5:** MSEs that are engaged in the service sector have a higher probability of loan repayment as compared to MSEs engaged in other sectors.*

### **Group size versus loan repayment**

It represents the number of the persons in a group. The larger the group size, the more imperfect are the flows of information likely to be between members. Hence, problems arising out of asymmetric information make monitoring and enforcing costly and less effective. Therefore, loan repayment by the group is expected to decrease with group size increasing (Arene, 1992; Bhatt & Tang, 2001; Manohar & Zeller, 1997).

***Hypothesis 6:** The smaller the group size, the higher the probability of loan repayment.*

### **Initiation versus loan repayment**

Initiation is defined as the cause for the borrower to engage in his or her current business activity. It is a dummy variable that equals "1" when the group is initiated by an outside agent and "0" if the group is formed on its own. It is hypothesized that screening is more effective with groups that are formed on their own than with those groups that depend on the intervention from an outside agent, indicating that delinquency or default rates are lower for groups that are formed on their own (Manohar & Zeller, 1997). In contrast to this, it is of no significance whether the group was formed at the initiative of the extension officer or not (Zeller, 1996). But, if the group is formed on its own, it is hypothesized that it is positively related to loan repayment.

***Hypothesis 7:** MSEs formed by the members themselves have a higher probability of loan repayment as compared to the MSEs formed by an outside agent.*

### **Group composition versus loan repayment**

Group composition is also a dummy variable whose value is “0” if the group is homogenous and “1” if the group is heterogeneous. Group homogeneity is defined as group members who share similar characteristics such as religion, age, and educational status. This study expects that group homogeneity to have a positive impact on loan repayment. This is because the cost of monitoring decreases if the group is homogenous and there is also unconditional help among group members as homogeneity increases social cohesiveness (Zeller, 1996).

***Hypothesis 8:** MSEs that are homogenous have a higher probability of loan repayment as compared to MSEs that are heterogeneous.*

**Table 3.1: Type, Codes and Definition of variables**

<b>Variables</b>	<b>Types</b>	<b>Codes</b>	<b>Definition</b>
<b>Dependent Variable</b>			
Loan Repayment	Dummy	LR	0= If loan not fully repaid (Default) 1= If loan fully repaid (Non Default)
<b>Independent Variables</b>			
Grace period	Dummy	GP	0= If grace period is enough 1= If grace period is not enough
Timeliness of loan release	Dummy	TLR	0= If loan is not timely released 1= If loan is timely released
Loan Size	Continuous	LS	Measured by the amount of loan group has taken
Repayment Period	Dummy	RP	0= If repayment period is enough 1= If repayment period is not enough
Sector of operation	Categorical	SO	0 = If sector is Agriculture 1= If sector is Construction 2= If sector is Manufacturing 3= If sector is Service 4= If sector is Trade
Group Size	Continuous	SG	Measured by the no of group members
Initiation	Dummy	IN	0= If initiated by the group 1= 1= If initiated by promoter
Group Composition	Dummy	GC	0= If group is homogenous 1= If group is heterogonous

## **4. Results and Discussion**

### **Model Tests**

For the econometric estimation to bring about the best results (unbiased, reliable and consistent), it has to fulfill the basic linear classical assumptions. The basic assumptions include: Nonlinear neglected Variable Test: for given explanatory variables the mean value and the variance of the disturbance term ( $U_i$ ) is zero and constant (homoscedastic). No exact linear relationship (multicollinearity) in the regressors and the stochastic (disturbance) term  $U_i$  is normally distributed.

### **OV Test (Omitted Variables Test)**

A p-value higher than 0.05 implies that there are non linear neglected variables, meaning that more variables is needed. But in this case, since the estimated p-value is less than 0.05 or 5% which implies that there are no neglected non linear variable. Therefore, there is no need for more variables.

Ramsey RESET test using powers of the fitted values of loan repayment.

Ho: model has no omitted variables

$F(3, 51) = 6.70$

Prob> F = 0.0007

### **Hetttest (Test for heteroskedasticity)**

An important assumption of the CLRM is that the disturbances  $U_i$  appearing in the regression function is homoscedastic. That is they have the same variance ( $E(U_i^2) = S^2$  where  $i = 1, 2, \dots, n$ ).

A p Value of less than 0.05 or 5% implies is there is a problem of homoscedasticity. Breusch-Pagan or Cook-Weisberg test for heteroskedasticity.

Ho: Constant variance

Variables: fitted values of loan repayment

$\chi^2(1) = 3.74$

Prob>  $\chi^2 = 0.0530$

Therefore, from the above result of p-value (0.0530) it can be concluded that the problem of heteroskedasticity does not appear in this study.

### **VIF Test (Test for Multicollinearity)**

Multicollinearity is a problem that standard errors may be inflated. As a rule of thumb if VIF with a value of 10 is observed, then the problem of multicollinearity exists. But in this study since all variables have a VIF value less than 10, it can be safely concluded that the problem of multicollinearity does not exist in this study.

**Table 4.1: Multicollinearity Test**

<b>code</b>	<b>Variable</b>	<b>VIF</b>
gracpern	Grace period	2.59
repperiodn	Repayment Period	1.79
initiatn	Initiation	2.91
loanszn	Loan Size	1.96
sectrn	Sector	1.91
grocomn	Group Composition	1.88
timlireln	Timeliness of Loan Release	1.34
grosz	Group Size	1.22
Mean VIF		1.95

### **Estimation of Results**

The result of the binary logistic regression model reveals that out of the eight independent variables included in this study five were found to be significant at 1%, 5%, and 10% level of significance. The significant variables are initiation, repayment period, grace period, sector (service), and timeliness of loan release. The remaining variables, are, group composition, loan size and group size are found to be insignificant and this implies that these variables have no effect on loan repayment.

### **Grace Period vs. Loan Repayment**

It is, hypothesized that borrowers with shorter grace period divert the loan more than those with longer grace period since they may not have enough time for implementation of project. The survey result shows that 45(72.6%) of the respondents believed that the grace period was enough for the implementation of the project out of which only 6(13.3%) respondents failed to fully repay the loan within the maturity period. The remaining 17(27.4%) of the respondents believe that the grace period given by DECSI was not

enough for the implementation of the project, and hence the loan could not generate enough cash flows to settle the debt within the given repayment period. Among them 7(41.2%) failed to repay the loan within the given repayment period. According to the respondents, the reason for their default was that they could not fully implement the project within the given grace period due to shortage of working materials.

### **Grace Period**

It had a positive relation with loan repayment and was statistically significant at 1% level of significance. The marginal effect of -0.923 implies, holding other variables constant, the probability of repaying the loan decreases by 92.3% for those borrowers who seek a longer grace period as compared to those borrowers who did not. The possible reasons as to why defaulted borrowers prefer a longer grace period is that, with a shorter grace period the loan cannot generate enough cash flows to settle the debt within the given repayment period since the project cannot be fully implemented within the given grace period may be due to shortage of working materials and also it might be difficult for the group to find markets for their products within the given grace period. The finding is similar with the findings discussed above on the descriptive analysis but it contradicts with the findings of Abraham (2002) and Hunt (1996). However Mengistu (1999) found out that the variable grace period was a statistically insignificant factor. Hence, “*the longer the grace period, the higher the probability of loan repayment*” is rejected.

### **Timeliness of Loan Release vs. Loan Repayment**

The survey result shows 49(79%) of the respondents said that the loan was disbursed on time with 41(83.7%) respondents were able to settle the loan within the repayment period and 8(16.3%) did not. But 13(21%) of the respondents argued that the loan was not disbursed on time out of which 8(61.54%) have settled the loan fully with 5(38.5%) defaulting. The delay to release the loan on time were due to lengthy processing DECSI took and failure by the borrowers to provide the necessary documents quickly.

### **Timeliness of Loan Release**

Timeliness of loan release is another important factor that improves loan repayment by borrowers. If the loan is released on time it is unlikely that it

will be diverted to non-intended purposes. In line with this expectation, the variable was found to be significant at 10% level of significance and had a positive relationship with loan repayment. The marginal effect of 0.221 implies, other things remains constant, the probability of loan repayment increase by 22.1% for those borrowers who had received the loan on time as compared to those borrowers who do not. This is because timeliness of loan release is important especially when loans are used for seasonal activities. The complicated appraisal and approval procedures that could delay loan disbursement and influence program of seasonal loans. Further this could in turn worsen the prospect of timely loan repayment. The same result was obtained on the descriptive analysis and with the findings of Chirwa (1997), Berhanu (1999), Daba (2004), Jemal (2003), Zeller (1996), and Teferi (2000). Hence, “*the timely the loan is released, the higher the probability of loan repayment by the MSEs.*” is not rejected.



**Table 4.2: Summary result of logit model on factors affecting loan repayment**

Variables	Odds Ratio	Robust Std. Err.	z	P> z	[95% Conf. Interval]	dy/dx
Group composition	6.69465	8.171198	1.56	0.119	.612052 - 73.22636	.003853
Initiation	0.000463	.0017075	-2.08	0.037**	3.3607 - .6374646	-.3876986
Repayment period	5.494288	9.114265	9.36	0.000***	212757.9 - 1.4208	.0148471
Grace period	2.8906	6.0406	-6.11	0.000***	4.8308 - .0001735	-.9233988
Group size	3.3912	6.2811	-1.43	0.154	5.9928 - 19205.88	-.0236417
loan size	.9454144	.3877628	-0.14	0.891	.4231564 - 2.112241	-.0000502
With reference to service sector						
Construction	7.2607	9.8107	-10.46	0.000***	5.1408 - .0000103	-.8483283
Manufacturing	4.6108	5.1308	-15.18	0.000***	5.2109 - 4.0807	-.9930386
Timeliness of loan release	3.203125	2.224194	1.68	0.094*	.821324 - 12.49204	.2213501

Source: STATA output from survey data (2012).

\*\*\* Significant at 1%, \*\*Significant at 5%, \*Significant at 10%

dy/dx is a marginal effect after logistic which is discrete change of dummy variable from 0 to 1.

### **Loan Size vs Loan Repayment**

It is argued that smaller amount of loans may be insufficient for running a business and thus create cash flow problems to the borrower. It is also believed that larger loans put pressure on the borrower to reduce default since the penalty cost associated is high for larger loans. From the survey result the average loan size for non-defaulters is Birr 140,047 and for defaulters it is Birr 126,010. In terms of standard deviation or variance from the mean, defaulters have a S.D. of 77,238. This implies that the loan repayment performance for defaulters highly varies or deviates from the mean as compared to non-defaulters. From the logit result, it can be observed that the variable loan size is statistically insignificant at a level of 1% confidence. Hence, it can be concluded that the variable loan size has no effect on the repayment of loan or loan default.

### **Repayment Period vs. Loan Repayment**

Loan terms such as the repayment period might lead to defaulting. From the survey result, 47(75.81%) respondents believed that the repayment period was enough with only 6(12.76%) respondents unable to repay the loan within the given period. The 15(24.2%) respondents believed that the repayment period set by DECSI was not enough and 2(13.33%) were unable to settle the loan as per the established schedule. The respondents suggested that it would be better if the grace period was from three to five years. The reason they gave was that if the repayment period was relaxed the amount of each installment required will decrease. Hence, the debt burden on the borrowers would be smaller and the difficulty in properly meeting their debt obligation would be avoided.

**Repayment Period:** It refers to the period during which the entire loan must be repaid. As per the finding of this study the variable “Repayment Period” has a positive relationship with loan repayment and is statistically significant at 1% level. The marginal effect 0.148 implies, *ceteris paribus*, that the probability of loan repayment decreases by 14.8% for those groups who seek a longer repayment period as compared to those groups who do not seek. The possible reason might be that as repayment period gets longer the probability that the loan is subject to risk and uncertainty will increase and the borrower might also be tempted to spend the income in the early months of the project resulting in a potential difficulty of making loan payments

during the later months of the project. The same result was obtained in the descriptive analysis. The result of this study is also similar with the findings of Njoku and Odii (1999), Roslan and Mhod (2009), Berhanu (1999), and Tefferi (2000). But it contradicts with the findings of Abraham (2002). Hence, *“the shorter the repayment period, the higher the probability of loan repayment by the MSEs” is not rejected.*

**Sector:** The construction and manufacturing sectors had a negative relations with loan repayment and statistically significant at 1% level of significance. By taking the service sector as reference, the construction sector has a marginal value of -0.848 which implies that the probability of loan repayment decreases by 8.48 % for those borrowers who are engaged in the construction sector as compared to those borrowers who are engaged in the service sector. The same is true for the manufacturing sector, the marginal effect for the manufacturing sector is -0.993 which indicates that the probability of loan repayment decreases by 99.3% for those borrowers who are engaged in the manufacturing sector, which may be due to marketing problem. The market problem arises due to frequent fluctuations in the price of input materials possibly because of unsustainable supply of the input materials. This finding is similar with the result obtained from the descriptive analysis and with the findings of Roslan and Mohd (2009). Therefore, *“MSEs that are engaged in the service sector have a higher probability of loan repayment as compared MSEs engaged in other sectors”* is not rejected.

**Initiation:** It refers to the cause of the borrowers to engage in their current business activity. It is hypothesized that screening and selecting of creditworthy borrowers is more effective with groups that are formed by the members themselves than the groups that depend on the intervention from an outside agent indicating loan default is lower for the former groups. In line with this expectation, the variable “initiation “ has a positive relation with loan repayment and is statistically significant at 5% level of significance. The marginal effect of -0.388 shows, other things remaining constant that the probability of loan repayment decreases by 38.8% for those groups who are initiated by an outside agent or promoter as compared to those groups who are initiated by the members themselves. The possible reason as to why groups initiated by members themselves have performed better in repaying

the loan is that, members can obtain at a low cost information regarding the reputation, indebtedness and effort of a group member to ensure the repayment of the loan.

Hence, screening is more effective with groups that are formed by the members themselves and this enables the group to select creditworthy group members. The result is consistent with that obtained by the descriptive analysis and with the findings of Manohar and Zeller (1997).

But it contradicts with the findings of Zeller (1996). Hence, “*MSEs formed by the members themselves have a higher probability of loan repayment as compared to the MSEs formed by an outside agent*” is not rejected.

**Table 4.3: Hypothesis Decision**

No	Hypotheses	p-value	Decision
1	Grace Period Vs Loan Repayment	0.000***	Reject Hypothesis
2	Initiation Vs Loan Repayment	0.037**	Accept Hypothesis
3	Repayment Period Vs Loan Repayment	0.000***	Accept Hypothesis
4	Service Sector Vs Loan Repayment	0.000***	Accept Hypothesis
5	Timeliness of Loan Release Vs Loan Repayment	0.094*	Accept Hypothesis

Source: STATA output from survey data (2012).

\*\*\* Significant at 1%, \*\*Significant at 5%, \*Significant at 10%

## 5 Conclusions

In developing countries like Ethiopia where unemployment is high, micro and small enterprises have a crucial role in creating jobs. Currently, micro and small enterprises are dominating the business in the urban areas. However, micro and small enterprises face scarcity of capital to develop to medium and large scale enterprises. To tackle the problem of capital deficiency of MSEs, credit is a fundamental requirement. However, it is important that borrowed funds must be used for intended purposes. This will also help financial institutions to run profitable business ventures so that MSEs can continue to get sustainable source of finance. In microfinance institutions, there are severe problems of loan default which significantly erode institutions' liquidity position. It is with this intention of identifying

the factors that influence loan repayment by MSEs, particularly those group owned MSEs who are beneficiaries of DECSI microfinance, Mekelle branch that this study was launched. Therefore, based on the findings of the study, the following conclusions are drawn along with some recommendations to the attention of the institution (DECSI) and other concerned stakeholder like the Regional Bureau of Trade and Industry and Regional MSEs development agency.

To collect the necessary data both secondary and primary sources were employed. Secondary data was collected from various issues of annual reports of DECSI. The primary data was collected from 62 group owned (MSEs) which had taken loans from DECSI. Originally the borrowers were 85 groups, but 23 were liquidated without repaying their loans. In the identification of the most important explanatory variables that affect loan repayment by the group owned MSEs is conducted using a binary logistic regression model. The model reveals that among eight explanatory variables which were hypothesized to influence loan repayment by borrowers five were found to be statistically significant at 1%, 5%, and 10% levels of significance. These variables are: initiation, repayment period, grace period, service sector, and timeliness of loan release. The remaining three variables were found to be statistically insignificant in affecting loan repayment performance of the group owned MSE. The three variables are group size, group composition, and loan size.

When triangulating the findings of this research with those of different researchers described in Chapter Two similar results were obtained with Chirwa (1997), Berhanu (1999), Daba (2004), Jemal (2003), Zeller (1996), and Teferi (2000) were obtained regarding timeliness of loan release, that is timely released loan have a positive and significant effect on the loan repayment by the group. Repayment period also have consistent and same sign (positive) with findings of Njoku and Odii(1999), Roslan and Mhod (2009), Berhanu (1999), and Teferri (2000). That is, groups who did not seek longer repayment period were found to be better performers in repaying loan as compared to groups who sought longer repayment period. The same result was also obtained from Roslan and Mohd (2009) with regard to the sector,, which states that the service sector was positively related and had a significant effect on loan repayment by the MSEs as compared to

construction and manufacturing sectors. The possible reason for service sector to have performed better than construction and manufacturing sectors was that, it may be less exposed to risk and uncertainty than construction and manufacturing sectors. Besides, construction and manufacturing sectors face frequent fluctuations in price of input materials and unsustainable supply of input materials. This could affect loan repayment by the MSEs operating in construction and manufacturing sectors.

With regard to grace period, those groups (MSEs) who seek a longer grace period were found to be less performers in loan repayment as compared to those MSEs who did not seek. This result contradicts with the findings of Abraham (2002) and Hunt (1996). But Mengistu (1999) found out that grace period was a statistically insignificant factor. With regard to initiation, groups that were formed on their own were found to be better in loan repayment those formed by an outside agents. The reason might be that groups formed by members themselves select and screen credit worthy members since they can access complex and sensitive information about them. Hence, group members can easily identify the creditworthiness of group members. This result concurs with the findings of Manohar and Zeller (1997) but it contradicts with the results of Zeller (1996). The same result was also obtained in the descriptive analysis part of this paper with regard to the effect the above mentioned variables have on the dependent variable (loan repayment).

## **5.1 Recommendations**

Mekelle branch of DECSI provides credit services to urban group owned MSEs. The borrowed funds should be invested on productive purposes and generates additional income so that the disbursed loans can be repaid and DECSI can have a sustainable and workable credit scheme year after year. Therefore, to improve loan recovery of DECSI the following recommendations are forwarded based on the findings and conclusions of this study: Both descriptive analysis and logit estimation result shows that timeliness of loan release have positive and significant effects on loan repayment by borrowers. DECSI should provide loans on time and it has to ignore loan issuing loans to late applications. Loan issued at the right time reduces the possibility of loan diversion for non-intended purposes and this

enables borrowers to use the loan properly. As discussed in the analysis part of the study, 23 groups were liquidated or dissolved without repaying their loans. Most of these groups were engaged in the construction sector. The machineries and other working materials used by these groups have still there without any use for two years and four months. Therefore, DECSI must take the necessary measures to settle the loans unpaid by the 23 groups.

According to one loan officer of DECSI, one reason for low loan repayment by MSEs is the wrong credit perception of borrowers, who consider loans as donations. Therefore, DECSI should create awareness among clients before disbursing loans. Groups operating in construction and manufacturing sectors had shown lower loan repayment performance compared to groups engaged in the service sector. These two sectors (construction and manufacturing) had lower loan repayment due to shortage of market for their outputs and frequent increase in price of input materials. . Therefore, special attention should be given by the concerned stakeholders (DECSI, BTI, and Regional MSEs development agency) in providing these two sectors with market linkage and a continuous supply of inputs until these two sectors build capacity to operate on their own. Particular attention is needed for the two because they can play a decisive role in reducing unemployment in the city since they are labor intensive.

One of possible reason for the increasing loan defaults that DECSI encounters is due to ineffectiveness of the system DECSI uses to follow up its clients. Therefore, by strengthening its IT systems, DECSI can easily facilitate the supply of up-to-date loan repayment statements and early detection of potential slow borrowers and defaulters. This will facilitate appropriate action including, follow-up, counseling or serving demand notices.

The screening and selection of applicants should be conducted by DECSI. This is because, giving the long experience of DECSI in the microfinance industry, DECSI in a better position to effectively screening and select creditworthy borrowers. And this could reduce significantly loan default DECSI is sustaining since creditworthy borrower can be selected from the very beginning.

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