

# Factors influencing the intensity of market participation among smallholder wheat (*Triticum aestivum*.) farmers: A case study of Jabi Tehnan District, West Gojjam zone, Ethiopia

Yaregal Tilahun Geremewe

Department of Agricultural Economics and Natural Resource, Mizan Tepi University, Mizan Tepi, Ethiopia.

Email: yaregalti@gmail.com, Phone number: +251918565940.

**Abstract**— Participation in commercial agriculture holds considerable potential for unlocking suitable opportunity sets necessary for providing better incomes and sustainable livelihoods for small scale farmers. In developing countries like Ethiopia, most smallholder farmers are characterized by poor market participation because they lack market information on marketing of agricultural products. This study examined factors that influence the intensity of market participation among smallholder farmers in JabiTehnan district using survey data collected from randomly selected 120 farmers. The aim of this study was to analyze market participation of smallholder wheat farmers in JabiTehnan district. Both qualitative and quantitative data were collected from primary and secondary data sources using cross sectional data. Probit model regression result showed that, perception of wheat market price, quantity of wheat produced, size of land allocated for wheat and frequency of extension contact had significant and positively effect on market participation decision, while distance to nearest market, family size had significant negative effect. Based on the study policy interventions like family planning, awareness to farmers to supply wheat to the market when price is fair for them, strength extension service and infrastructure like market access, improve land management practice by use of a right input at a right time as a means to enhance wheat market participation.

**Keywords**— wheat, participation, intensity, smallholder farmers.

## I. INTRODUCTION

Agriculture continues to be a strategic sector in the development of most low-income nations. It employs about 40% of the active labor force globally. In sub-Saharan Africa, Asia and the Pacific, the agriculture-dependent population is over 60%, while in Latin America and high income economies the proportions are estimated at 18% and 4%, respectively (World Bank, 2006). Ethiopian economy is highly dependent on agricultural sector which account for about 38.8% of national GDP (Wondifraw *et al.*, 2016), 87% of export earnings and remains the main source of employment; generating 72.7% of total employment (UNDP, 2015).

Wheat (*Triticum aestivum*.) is one of a strategic food security crop that attempts to bridge the persistent food gap in Africa. It also plays an important role in the

development of the agricultural sector and improvement in the income levels and livelihood situations of the farmers' in developing countries. Today, wheat is among the most important crops grown in Ethiopia both as a source of food for consumers and as a source of income for farmers. It is an important staple food in the diets of many Ethiopians, providing about 15% of the caloric intake of the country's over 90 million populations. This makes wheat the second-most important food, behind maize (19%) and ahead of *teff*, sorghum, and *enset* (10-12% each) (FAO 2015). In terms of the gross value of production, wheat is ranked fourth or fifth, after *teff*, *enset*, and maize and approximately tied with sorghum (ATA, 2015).

Agricultural market participation has been conceived as the integration of subsistence farmers into the input and output markets of agricultural products with a view to increasing

their income level and hence to reducing poverty (Mignounaet *al.*, 2015). Improved market participation is a key precondition for transformation of the agriculture sector from subsistence to commercial production (Salami *et al.*, 2010).

In Ethiopia, agricultural products from small scale or family farming are marketed in very small volumes, low return and a wide range in quality. According to Degyeet *al.*(2009) wheat production and marketing system in Ethiopia is dominated by smallholder farmers and the market system is not well-integrated and not performing well. This may due to the existence of poor coordination among chain actors, poor information flow, inadequate market outlet alternatives and absence of well integrated extension service marketing in the product value chain. Furthermore, the poor do not possess the level of assets required to protect themselves from market, natural, political and social shocks (Mmbando *et al.*, 2015).

The involvement of the smallholder farmers in the use of formal markets will result in proper co-ordination and allocation of resources, goods and services thereby reducing poverty and improving livelihoods of households (Jari and Fraser, 2009). However, smallholder farmers are resource poor and are unable to produce a stable amount of output each year. Inconsistent production (surplus) makes it difficult for them to acquire contracts with traders in the market (Makhura, 2001). The nature of the product on the one hand and lack of properly functioning marketing system on the other, often resulted in lower producers' price. Therefore, it is important to identify the factors influencing smallholders' market participation. The identification of technical, social and institutional factors and the extent to which they influence decisions to market through different channels could assist in the formulation of policy interventions and institutional innovations. The policies may enhance future market participation amongst smallholder farmers. So these studies are very essential for reliable assessment and formulation of appropriate wheat production and marketing policies. Through considering the above conditions, the main objective of this study is to analyses the factors influencing the intensity of market participation among smallholder wheat farmers.

## II. METHODOLOGY

### 2.1. Description of the Study Area

Jabi Tehnan is one of the woredas in the Amhara Region of Ethiopia. Part of the Mirab Gojjam Zone, Jabi Tehnan is bordered on the southeast by Dembecha, on the

west by Bure, on the northwest by Sekela, on the north by Kuarit, and on the east by Dega Damot. The town and separate woreda of Finote Selamis surrounded by Jabi Tehnan. Towns in Jabi Tehnan include Jiga, Maksegnit and Mankusa. Based on the 2007 national census conducted by the Central Statistical Agency of Ethiopia (CSA), this woreda has a total population of 179,342, of whom 89,523 are men and 89,819 women; 12,609 or 7.03% are urban inhabitants. The majority of the inhabitants practiced Ethiopian Orthodox Christianity, with 97.96% reporting that as their religion, while 2.02% were Muslim. The 1994 national census reported a total population for this woreda of 194,942, of whom 97,601 were men and 97,341 were women; 24,572 or 12.6% of its population were urban dwellers. The largest ethnic group reported in Jabi Tehnan was the Amhara (99.61%). Amharic was spoken as a first language by 99.7%. The majority of the inhabitants practiced Ethiopian Orthodox Christianity, with 97.1% reporting that as their religion, while 2.83% were Muslim. Mixed agriculture is the main activity and plays important role in the district. From the total land area of district which is 979.26 km<sup>2</sup> of which 900.92 km<sup>2</sup> (92%) are considered suitable for agriculture. At Jabi Tehnan, maize, wheat, *teff*, pepper, *noug*, bean, and barley are the major annual crops grown by the majority of farmers. Pepper, wheat and *teff*, *maizenoug* are also marketable crops.

### 2.2. Types, Sources and Method of Data Collection

The data for this study were collected from both primary and secondary sources. Before a start of actual data collection, facilitative works such as training of enumerators on interview procedures, and preliminary assessment to sampled *kebeles* were made. Primary data were collected by use of pre-tested and semi-structured questionnaires that were administered through direct interviews and observation with the selected actors. Both open and close-ended questions in line with the objective of the study were included in the questionnaire. Structured questionnaire was administered on selected households to collect data on household characteristics, resource ownership, access and institutional variables and others which is relevant to meet the objective of the study. Secondary data required for the study were taken from the Central Statistical Agency, published and unpublished sources, district agricultural and natural resource office, and trade and industry office of the districts. To triangulate the answers provided by sample respondents, key informant

interviews and focus group discussions were held with farmers and development agent by using checklists.  $Z^2$

### 2.3. Sampling Procedure and Sample Size

#### Determination

Two stages sampling technique was used to select sample households for data collection. In the first stage, in consultation with agriculture and natural resources office of the district, four *kebeles* were selected from 15 wheat producer *kebeles* using simple random sampling technique. In the second stage, from list of wheat producer households in the sample *kebeles*, 120 sample wheat producers were selected randomly using probability proportional to size using sample size determination formula developed by Cochran's (1977). The reason for choosing simple random sampling technique over other sampling techniques for selection of *kebeles* and sample was, because it gives equal chances for *kebeles* and households to be included within the sample frame

$$n = \frac{Z^2 * p * q}{d^2}$$

Where; Z = Standard normal deviation (1.96 for 95% confidence level), p is the estimated proportion of an attribute that is present in the population, in this case proportion of wheat output market participants to wheat farmers in the district, but data on proportion of market participant at district level was unavailable. The rule for sample size determination in case where variability in p unknown is to assume p = 0.5 (Ajay and Mucah, 2014). In this study, due to time and financial constraint, the variability in p taken as 0.11 which is used by Efa *et al.*, (2016) based on the assumption that randomly selected sample is representative, q = 1-p, d = is degree of accuracy desired (0.05).

#### 2.4. Methods of Data Analysis

Two types of analysis, namely descriptive and econometric analysis were used to meet the objectives of the study. Descriptive analytical tools such as mean, range, percentage, frequencies, and the like were used to describe households' demographic and socio-economic characteristics, and others. T-test and chi-square test were also used to compare market participants and non-participants over demographic and socio-economic, and other factors.

The market, supply data was censored that means there were households that produce wheat and do not supply to the market. Tobit model was selected to identify factors determining the supply of wheat by smallholder farmers. There are several occasions where the variables to be

modeled is limited in its range. Because of the restrictions put on the values taken by the regress and, such models can be called limited dependent variable regression models (Tobin, 1958). Hence, a probit model answers both factors influencing the probability of selling and factors determining the magnitude of sale.

Statistically, we can express the Tobit model as:

$$Y_i = \beta_0 + \beta_i x_i + u_i \text{ if } RHS > 0$$

$$Y_i = 0$$

Where RHS = right-hand side. Additional X variables can be easily added to the model.

Where:  $Y_i$  = Volume of wheat marketed (dependent variable).

$\beta_0$  = An intercept.

$\beta_i$  = Coefficients of  $i^{\text{th}}$  independent variable.

$x_i$  = Independent variable.

$u_i$  = Unobserved disturbance term or error term.

## III. RESULTS AND DISCUSSION

### 3.1. Demographic and socio-economic characteristics of sample households

Table 1 discloses demographic and socio-economic characteristics of sample households in the study area. The study showed that, out of 120 sample households in the survey, 72% were market participant while the remaining 28% were non-participants of market. It also showed that majority of the households (i.e. 88% of the households) were male headed and the remaining 12% were female headed households. Among market participants, male headed and female headed households constitute 91% and 9% respectively. Out of non-participants, 81% were male headed while the remaining 19% were female headed households. Chi-square test of proportional difference shows, the existence of statistically significant difference between two groups (Market participants and non-participants) at 1% significance level.

The average age of participants was 47.6 years, while for non-participants it was 43.5 years, and 45.3 years for combined sample. The average number of household members of participants was 5.4, while 7.4 among non-participants, and 6.3 for pooled sample. Chi-square test of proportional difference shows, the existence of statistically significant difference between two groups (Market participants and non-participants) at 1% significance level. On average, the number of years that had been spent in formal school by participants was 4.3 and for non-participants, 3.5 years, and for the total sample 4.2 years. The average experience in wheat production for the

combined sample was 37.8 years, while for participants and non-participants it was 38.1 years and 36.4 years respectively. Likewise other factors, it is important to understand access to institutional and market access factors in market participation analysis as they proxies the accessibility of production, marketing, information, and transaction costs. Survey result shows that, 21% of the households had access to credit; while among participants and non-participants, 24% and 13% of households respectively had access to credit.

Out of the total survey respondents, 18% of sample households were members of cooperatives from this 23% of households were members of cooperatives from participants where as 12% of households were members from non-participants. On average, the sample households travelled 47.76 minutes to arrive at extension service center. The

average travel time taken among participants and non-participants to arrive at extension service in minutes was 47.71 and 47.78 respectively. The mean distance from the nearest market for the whole sample was 12.13 kilometers. The mean distance from the nearest market for market participants was 11.9 kilometers while it was 12.4 kilometers for nonparticipants. T-test result shows that, there was statistically significant difference between participants and non-participants in distance from the nearest at 10% significance level. The average use of improved seed for combined sample was 35.4 with the mean use of improved seed for participate and non-participate was 44.6 and 32.7 households respectively. T-test result shows that, there was statistically significant difference between participants and non-participants for use of improved seeds at 5% significance level.

Table 1: Demographic and socio-economic characteristics of sample households

Variables	Mean/Proportion			
	Total	Participate	Non-participate	T-value/ $\chi^2$
Number of samples	120	86	34	
Sex of household heads	0.88	0.91	0.81	12.3***
Age of household heads	45.3	47.6	43.5	0.71
Family size	6.3	5.4	7.4	-2.45**
Education level	4.2	4.3	3.5	0.75
Use of improved seed	35.4	44.6	32.7	3.41**
Farming experience	37.8	38.1	36.1	0.4
Credit access	0.21	0.24	0.13	2.36
Cooperative membership	0.18	0.23	0.12	0.94
Distance to extension service	47.76	47.71	47.78	-0.06
Distance to nearest market	12.13	11.9	12.4	-0.86*

\*\*\*, \*\* and \* indicate significance at 1%, 5% and 10% respectively

Survey result, 2017/18

### 3.2. Factors affecting the intensity of market participation for the smallholder farmers

From the Probit Regression Result, the level of crop production was found to have a positive impact on the decision of smallholder farmers to engage in output selling. It is statistically significant at 1% level indicating that households with high level of production tend to participate in the output market than those with lower production level. The Pseudo R<sup>2</sup> is 0.714, indicating the variables included in

the model explain 71.4% of the variation in the decision of market participation of households. The Wald chi-square value of 43.2 for market participation decision model is statistically significant at 1% indicating that at least one of the explanatory variables included in the model jointly explain the probability of participating in wheat market. An average household had a 79.3% predicted probabilities of market participation.

Table 2: Factors affecting the intensity of market participation decision

Variables	Coefficient	Robust Std.Err.	Average Marginal Effect
Quantity of wheat produced	0.45	0.069	0.034***
Experience in wheat production	0.03	0.043	0.067
Family size	-0.02	0.032	-0.012*
Education level	0.11	0.076	0.023
Land allocated for wheat	3.57	1.213	0.746***
Ownership to transport	0.03	0.025	0.058
Non-farm activity	-0.04	0.095	-0.074
Distance to nearest market	-0.25	0.096	-0.024**
Amount of credit taken	0.05	0.011	0.046
Frequency of extension contact	1.03	0.451	0.131**
Use of improved seed	0.96	0.658	0.479
Perception of wheat market price	0.56	0.810	0.062**
Constant	-2.96	1.18	
Number of observations	120		
Pseudo R <sup>2</sup>	0.714		
Wald $\chi^2(15)$ , Pr > $\chi^2$		43.21***	
Log likelihood		-24.68	
Predicted probabilities		0.793	

\*\*\*, \*\* and \* indicate significance at 1%, 5% and 10% respectively

Source: Survey result, 2018

**Quantity of wheat produced:** quantity of wheat produced positively related to probability of market participation and was significant at 1% significance level. The principle is that as households who produce more quantity of wheat had also participated more to the market. Because of most households as wheat is the major cash income for wheat producers of the district, markets are the most important factors motivating producers to produce and participated in the study area. The average marginal effect was 0.034; meaning that a quintal increases in quantity of wheat produced increases the likelihood of market participation by 3.4%. This finding is in line with the finding of Moono (2015) shows that, likelihood of participation in rice market increases with quantity of rice produced.

**Family size:** The coefficients of family size for volume of wheat marketed was negative signs and significant at 10% significance level. As the result of marginal effects of intensity shows that one number increment of family size in the households decrease amount of volume of wheat marketed by 1.2%. This means that large amount of wheat is required for consumption rather than sold when number of family member in the household increases. The result of marginal of effect indicates how likely family size has

chance to sell wheat. This is in line with the study by Hasen (2016) and Astewel (2010), as family number increases supply of wheat and rice to the market decreases respectively. The study conducted by Fantahun (2010), also indicates that large family size has an effect in decreasing the supply of malt barley in Amhara Region

**Land allocated for wheat:** size of land allocated for wheat production was significant at 1% significance level. Among the give variables found significant in affecting market participation decision of households, size of land allocated for wheat production has strong explanatory power to other variables. Average partial effect of this variable implies that, for a hectare increase in land allocated for wheat, probability of market participation increases by 74.6%. This is because, as the size of land allocated for wheat crop increases, the production of wheat increases which in turn increase farmers' probability of being seller in wheat output market. The result is in line with Bedada *et al.* (2015) large farms were providing large yield than small size farms. In addition to this, Efa *et al.* (2016) have also found positive and significant relationship between extents of *tiff* marketed surplus and land allocated for *tiff*.



**Distance to the nearest market:** distance to the nearest market negatively and significantly influences household's decision to participation in wheat output market at 5% significant level. The longer the distance of the market, it is more costly and time consuming to travel with output forcing smallholder farmers to hold more output particularly which is common in rural areas where transportation facility is poorly developed. As the distance from the nearest market increases, transport costs increase and this discourages smallholder farmers and their probability of participation in a market decreases. The size effect implies that, when the household is located one kilometer away from the nearest market, the probability of participation in wheat output market decreases by 2.4 %. This result is consistent to findings of Berhanu and Moti (2010), Aman et al., (2014), Agwuet *al.* (2013), Yaynabeba and Tewodros (2013), and Berhanu *et al.* (2009).

**Frequency of extension contact:** frequency of extension contact positively related to probability of market participation and was significant at 5% significance level. Result of the finding indicated that one more additional contact of extension agent with wheat producers increase market participation of wheat by 13.1%. This is due to the fact that as wheat producers get extension service frequently through different means of awareness creation and demonstration techniques; this helps producers in availing up-to-date information regarding the technology which improves production. This helps wheat producers to produce more and supply it to the market. This is in line with Tadeleet *al.* (2016), Girma (2015) and Muhammed (2011) who confirmed that as *tiff* producers more number of extension contact the amount of *tiff* supplied to the market increases.

**Perception of farmers toward wheat market price:** The estimated coefficients of perception of wheat market price for volume of wheat marketed was positive signs and significant at 5 percent significance level. This is in line with the hypothesis made. The marginal effect of result indicates that perception of households towards wheat market price shows that for one percent increment of wheat market price causes to an increase intensity of volume wheat marketed by 6.2%. Marginal effect of probability indicates households had chance to sell their wheat produced at market price they want by 34%. The study is in line with the study of Wolelaw (2005), on determinants market supply of rice, he found a significant positive relationship between rice sold and market price. Adesiyane *et al.* (2012) also found that an average price of paddy

received by farmers affects marketed surplus of the crop positively.

#### IV. CONCLUSION AND RECOMMENDATION

##### Conclusion

This study was aimed to evaluate the market participation status of smallholder farmers in wheat output market and identifying the factors affecting smallholders' market participation decisions among small holder farmers. The data were collected from both primary and secondary sources. The primary data were collected from individual interview using structured and semi-structured questionnaire from 120 randomly selected potato producer households using probability proportional to size. Secondary data were obtained from different sources like published and unpublished documents and internet sources. Descriptive results revealed that, out of surveyed sample households, 28% of households were non-participants. The t-test of mean difference and chi-square test of proportional difference showed that existence of statistically significant difference between market participants and non-participants in terms of sex of household heads, family size, use of improved seed and distance to nearest market. The survey result indicated that lack of infrastructure (market access, transport and road facility), distance to nearest market and disease are the major problems of wheat production and marketing in the study area.

Econometric result of probit model indicated that quantity of wheat produced, family size, land allocated for wheat production, distance to the nearest market, frequency of extension contact and perception of farmers toward wheat market price were affected the enhance of smallholders' probability of wheat market participation significantly. From this distance to the nearest market and family size affect negatively and significantly while the other affected positively at different significant level.

##### Recommendation

Possible recommendations that could be given based on the study to be considered in the future intervention strategies that are amid at the promotion of wheat supply and marketing of the study area are as follows: The result shows that family size decreases wheat market participation which indicates that large family members in households used wheat for home consumption rather than supply to market. Therefore, intervention should be provided on teaching households on family planning to rural community. It is obvious that most farmers were not balance their family size with their income from their

activities. Therefore, strengthening family planning is required from the government side.

Quantity of wheat produced and size of land allocated for wheat production was affected smallholders' market participation decision positively and significantly. However, increasing landholding size cannot be an option to increase wheat market supply since supply of land is limited by nature. Hence, increasing productivity of wheat per unit area of land is better alternative to increase marketed surplus of wheat through introducing improved varieties, application of chemical fertilizers and controlling disease at a right time with a right quantity with strengthen existing extension service provision.

Distance to nearest market had negative and significant effect on smallholders' decision to market participation indicating their role in enhancing smallholders' market participation. Therefore, attention should be given to rural infrastructure development in general and, road and market access in particular and sufficient transportation system as well. Furthermore, price of wheat found to be positively related to market participation. There should be a system for which suppliers could not fix price below some threshold limit. As farmers are the pro-poor groups who need to be prioritized in any intervention, legal tactics and conditions (for instance prevailing price ceiling and price floor) under which such practices of offering unfair price would not likely to prevail should be implemented. Government and other NGOs must stand besides farmers to safeguard them by offering fair price.

#### REFERENCES

- [1] Adesiyon, O. F., Adesiyon, A. T. and Oluitan, R. O. 2012. Market supply response of cassava farmers in Ile-Ife, Osun State. *Canadian Social Science*, 8(3): 61-63.
- [2] Agwu N.M., Anyanwu C.I. and Mendie E.I. 2013. Socio-economic determinants of commercialization among smallholder farmers in Abia State, Nigeria. A paper presented at the 4th International Conference of the African Association of Agricultural Economists, Hammamet, Tunisia.
- [3] Aman Tufa, Adam Bekele, and Lemma Zemedu. 2014. Determinants of smallholder commercialization of horticultural crops in Gemechis district, West Hararge zone Ethiopia. *African Journal of Agricultural Research*, 9(3): 310-319.
- [4] Astewel Takele. 2010. Analysis of rice profitability and marketing chain: The case of Fogera district, south Gondar zone, Amhara national regional state, Ethiopia. MSc Thesis, Haramaya University, Haramaya, Ethiopia.
- [5] ATA (Agricultural Transformation Agency) .2015. Wheat Production, marketing and consumption in Ethiopia.
- [6] Bedada, B., Messay, Y., Eshetu, L., Tesfaye, S. and Tarekegn, E. 2015. Characterization of crop production and marketing to improve food security in Arsi zone, Ethiopia. *Academic Journal*, 7(4): 87-97.
- [7] Berhanu Gebremedhin ,MotiJaleta , and Hoekstra D. 2009. Smallholders, institutional services, and commercial transformation in Ethiopia. *Agric. Econ.* 40(1):773-787.
- [8] Berhanu Gebremedhin and MotiJaleta. 2010. Commercialization of smallholders: Is market participation enough? Contributed Paper presented at the Joint 3rd Africa Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference, Cape Town, South Africa.
- [9] DegyeGoshu, Belay Kassa Admasu Shibru. 2009. Spatial price dynamics and pricing conduct of wheat markets in Ethiopia. *Ethiopian journal of economics*, 18(2): p, 31-70.
- [10] Efa Gobena, DegyeGoshu, TinsaeDemisie, and Tadesse Kenead. 2016. Determinants of market participation and intensity of marketed surplus of teff producers in Bacho and Dawo districts of Oromia State, Ethiopia. *Journal of Economics and Sustainable Development*, 7(1): 2222-1700.
- [11] FAO (Food and Agriculture Organization). 2015. Food Balance Sheets. FAOSTAT. Rome. Available at: <http://faostat3.fao.org/download/FB/FBS/E> (Accessed on: March 22, 2017).
- [12] Girma Alemu. 2015. Market Performance and Determinants of Marketed Surplus of Tef: The Case of Bacho District in South West Shewa Zone, Oromia National Regional State, Ethiopia. M.Sc. Thesis, Haramaya University, Haramaya, Ethiopia.
- [13] HasenDeksiso. 2016. Supply and Performance of Wheat Markets in Digelu-Tijo District of Oromia Region, Ethiopia. An MSc. thesis submitted to University of Haramiya, Ethiopia.
- [14] Makhura, M.N., Kirsten, J. and Delgado, C. 2001. Transaction costs and smallholder participation in the maize market in the Northern Province of South Africa. In Seventh Eastern and Southern Africa Regional Maize Conference, Pretoria, South Africa.
- [15] Mignouna D.B, Abdoulaye T, Alene A, Akinola A.A. and Manyong V.M. 2015. Drivers of market participation decisions among small-scale farmers in yam growing areas of Nigeria and Ghana. A paper contributed to International Conference of Agricultural Economists, Milan, Italy.
- [16] Mmbando F.E., Edilegnaw Wale and Baiyegunhi Lloyd J.S. 2015. Determinants of smallholder farmers' participation in maize and pigeon pea markets in Tanzania. *Agrekon*, 54 (1): 96-119.
- [17] Moono L. 2015. An analysis of factors influencing market participation among smallholder rice farmers in Western

Province, Zambia. An MSc. thesis submitted to University of Nairobi, Nairobi.

- [18] Muhammed Urgessa. 2011. Market chain analysis of teff and wheat production in Halaba special district, southern Ethiopia. M.Sc thesis, Haramaya University, Haramaya, Ethiopia.
- [19] Salami, A., Kamara, A. B. and Brixiova, Z. 2010. Smallholder agriculture in East Africa: Trends, constraints and opportunities. Working Papers Series No. 105, African Development Bank, Tunis, Tunisia.
- [20] Tadele Melaku and Ashalatha, D. 2016. Determinants of teff and wheat market supply in Dendi district, West Shoa zone, Ethiopia. *International Journal of Current Research*, 8(10): 40716 - 40721.
- [21] UNDP (United Nations Development Programme). 2015. Ethiopia: Key economic and social indicators. UNDP Ethiopia's Policy Advisory Unit, No. 2.
- [22] Wolelaw Sendeku. 2005. Factors determining supply of rice: A study in Fogera district of Ethiopia. MSc Thesis, Haramaya University, Haramaya, Ethiopia.
- [23] Wondifraw Zerihun, James Wakiaga, and Haile Kibret. 2016. African Economic Outlook, Ethiopia.
- [24] World Bank. 2007. Explaining sources of food price inflation in Ethiopia. A just in time policy note, World Bank (Draft), pp. 14-28.
- [25] Yaynabeba Abayneh and Tewodros Tefera. 2013. Factors influencing market participation decision and extent of participation of haricot bean farmers in Meskan district Ethiopia. *International journal of management and development studies*, 2(8): 23200685.