

## AN ASSESSMENT IN THE USE OF AGRICULTURAL INPUTS WITH PARTICULAR REFERENCE TO MECHA WEREDA: WEST GOJJAM

**Arega Bazezew**

Lecturer in the Department of Geography, Bahir Dar University

**Abstract:** The general objective of the study was assessing the currently running extension package program for agricultural development and to identify the multifaceted problems facing the use of agricultural inputs in the Wereda. The analysis and presentation of the study were made using primary and secondary data. The primary data was collected from 100 sampled households living in four peasant associations in the Wereda. The secondary data was obtained from different literatures and from various offices in the Amhara Regional State. Some non-parametric tests were computed to find out the relationships between the variables and the use of agricultural inputs. According to the analysis, education, farm size, number of oxen and price of output were found to be important variables affecting the use of inputs positively and significantly. Therefore, it is suggested that increasing the number of extension agents to increase contact between farmers and extension agents, expanding the use of complementary inputs, improving transport facilities to be efficient in input distribution and assisting relatively poor farmers to have pair of oxen to increase the agricultural production for sustainable development.

### INTRODUCTION

Ethiopia is one of the least developed countries in the world and it is the most populous country in Sub-Saharan Africa. For the country as a whole, agriculture is the most important economic activity. It contributes 45.7% of the GDP and 96 % of the foreign earnings while as high as 95% of the rural economically active population is engaged in agriculture (Befakedu and Berhanu, 1999). Thus, the development of the agricultural sector largely determines the pace of economic development of the nation.

At present many scholars in Ethiopia are discussing the issue as to why the agricultural sector remained backward and failed to generate surplus production. Hence, finding new ways or means of increasing production from the existing farmland becomes a necessity, because raising productivity through the traditional measures is becoming increasingly impossible due to many factors. Major factors responsible for the poor performance of Ethiopian agriculture emanates from some inherent natural environmental deficiencies and others from human induced factors. The very nature of subsistence farming, tenure insecurity, weak agricultural research base and extension system, low use of agricultural

inputs, imperfect agricultural markets, poor infrastructure, poor soil and water management are human induced institutional and policy factors.

Ethiopia's agricultural extension package system has been far more inadequate. For instance, when chemical fertilizer is available there may not be credit access; when the market is liberalized the price of inputs increases well beyond the farmers purchasing capacity which results in the low use of inputs; when the farmers produce surplus, there is little storage or marketing facility and in most cases, farmers poor as they are forced to make distress sales on low prices in the purchasers' market. This is known as the tragedy of self defeating system caused by lack of harmony among the ingredients of the package system (Tesfaye, 1999).

Given the current food crises being faced by rapidly growing population, the Ethiopian government has shown a decisive effort, but it has so far not made much headway towards reaching the ultimate food security goal; or even near it. As such it seems rational to augment the determination by launching an effective production boosting extension package to reach the farmers.

Majority of the research works that have been done on the issue related to the use of inputs promoted by the new extension package program in Ethiopia are very general and they consider the problems at national level. Thus, the extension package designed at national level may fail at regional, and very much at local levels, because of the time and variable nature of localities. Moreover, such kinds of studies were not done in West Gojjam at Mecha Werda. Therefore, the primary objective of this research is an assessment in the use of agricultural inputs promoted by the new extension package program in a small locality of moisture reliable agro-ecological zone, Mecha Werda in West Gojjam, in the Amhara Regional State.

## **METHODOLOGY**

Like other most similar studies, this study has used a number of sampling procedures in selecting the households to be interviewed. In the first stage of the sampling process, West

Gojjam was selected purposely on the basis of its relative importance in the use of inputs and its accessibility. Mecha Wereda is also selected purposely because of its accessibility and farmers' hopeful use of agricultural inputs. In the third stage of sampling procedures 4 peasant associations were selected from the 37 peasant associations using random sampling techniques. In the fourth stage of sampling procedures, 100 respondents were selected using systematic random sampling techniques. Because of a number of reasons such as financial as well as time constraints, the size of the samples is usually limited and can not be expected to produce highly reliable estimates for all parameters.

Both primary and secondary data were collected for the study in order to achieve the desired objectives. Thus, the primary data collection step was started by preparing good and appropriate questionnaires. The prepared questionnaires were tested and verified on a pilot survey and those questionnaires that were unproductive were corrected and reworked on again. Secondary sources such as research results, documents, and other related literatures were also used as secondary data in the research.

The data collected were presented using manual works such as percentages and tables. Besides, non-parametric tests such as chi square and Kruskal Wallis were used in the analysis of the data. The targeted variables such as input supply, age and education of farmers, extension contact, credit availability and marketing conditions, price of inputs and outputs among sampled farmers with various degrees of application of agricultural inputs have been discussed quantitatively and qualitatively.

## **RESULTS AND DISCUSSION**

### **The Use of Artificial Fertilizers in the Study Area**

Some modern inputs like mineral fertilizers, pesticides, improved seeds have been used in crop production by the sampled farmers during the 2003/04 crop season. Among these, the most widely used farm inputs by almost all the sampled farmers were mineral fertilizers.

In the study area, majority of the sampled farmers (94 %) have grown local or improved maize varieties with the application of fertilizers, while for the rest of crops as the respondents indicated, applied to small quantities or they cultivated with out the application of fertilizers. This shows that the per hectare application of fertilizers in the study area was not at the recommended rate given by the agricultural experts. This is mainly due to the fact that fertilizer is a costly input and poor farmers face challenges to afford sufficient quantity of fertilizers per hectare as recommended by the agricultural expertise. In this regard sampled farmers were asked why they did not use the quantity recommended by the agricultural expertise (Table1)

Table1. Reasons for not Using Recommended Rate of Fertilizers by the Survey Households During the 2003/04 Crop Season.

Alternatives	Percentage responses of sampled farmers
High price of inputs	54
Fertilizers were not available	27
Production were not encouraging	19
Total	100

As can be seen from Table 1 high price of fertilizers is the main factor discouraging the use of recommended rate of fertilizers by the sampled farmers. Besides, fertilizers were not available when needed. Fertilizer is a scarce resource as well as costly farm input. It's over or under use of it results in lower farm outputs and profits. Thus, as much as possible it is indispensable to optimize its use. Accordingly, farmers need to be motivated to use new farm practices as a package and there should be a need to modify the recommended rate from time to time in order to make effective utilization of this and other costly inputs.

One of the major problems often mentioned by sampled farmers and development agents is untimely delivery of inputs particularly of fertilizers. Sampled farmers were asked whether artificial fertilizers were distributed on time or not during the 2003/04 crop season. Thirty one percent of the farmers interviewed have the feeling that fertilizers were distributed to them at the right time and the remaining percentage on the other hand indicated that fertilizers were not delivered at the right time.

Factors such as lack/or scarce of crop land, unable to buy sufficient amount of fertilizers, lack of credit and be short of oxen, limited farmers' potential in the use of fertilizers during the 2003/04 cropping season. In this study, it has been found out that lack the of credit was not so much a serious problem, but majority of the sampled farmers (72%) suggested that the lack of cash to pay the credit was a serious problem in the use of fertilizers.

### **The Relationship between Size of Farms and Use of Fertilizers**

To show the relationship between size of farms and the use of inputs a *chi-square test* has been used. The tabulated value is 7.01 and the calculated value is 72. This means that, computed value is greater than tabulated value. Thus, the null hypothesis is rejected at a 0.05 significance level. This shows that there is strong relationship between farm size and the use of inputs, that is, the smaller the size of the farms the lower the use of fertilizers in the study area keeping other conditions constant (Table 2).

Table 2. Distribution of Sampled Farmers by Farm Size and the Amount of Fertilizer Used in the 2003/04 Crop Season

Farm size (ha.)	No. of respondents	Amount of fertilizer consumed (Kg)
0- 0.5	30	1547
0.6-1.0	40	4387
1.0-2.0	25	5564
Above 2.0	5	1422

As observed in the field, farmers have potential to plough or cultivate the land if they do have relatively sufficient amount of farmland. But one of the serious problems the farmers faced in the study area, which is also true all over in rural Ethiopia, is the growing number of population which created the farmland to be further sub -divided into smaller plots which in turn affects the consumption of fertilizers and other new technologies.

### The Relationship between Education and Use of Fertilizers

To investigate whether there is a relationship between education and the use of fertilizers a chi-square test was computed. Thus, it is found that the computed value is 200 and the tabulated value is 11.07. Since the calculated value is by far larger than the tabulated value the null hypothesis is rejected. This indicates that there is a strong relationship between education and the use of inputs in the study area. That is, as the level of education increases the use of inputs also increases. Therefore, to sustain the agricultural production or for better agricultural production, educated farmers give paramount importance for the productivity of the agricultural sector (Table3).

Table 3. Distribution of Sampled Farmers by Education and the Amount of Fertilizer Used in the 2003/04 Crop Season

Education level	No. of households	Amount of fertilizer consumed (Kg)
Illiterate	43	3654
Can read and write	23	3849
1-4	17	2373
5-8	14	1761
9-12	3	1000

### The Relationship between Number of Oxen and Use of Fertilizer

To examine whether there is a significant relationship between number of oxen and application of fertilizer the Chi-square and Kruskal Wallis tests were used. In the case of chi-square test the calculated value is greater than the tabulated value (calculated value =64 and tabulated value = 7.81). This implies that there is a strong relationship between number of oxen and the use of inputs. In the case of Kruskal Wallis test the calculated value is greater than the tabulated value (calculated value =42 and the tabulated value = 8). This again indicates that there is strong relationship between number of oxen and the use of inputs (Table5).

Table 4. Distribution of Oxen among Sampled Households During the 2003/04 Crop Season

Number of oxen owned	Number of households	Total amount of fertilizer used ( kg)	Average of fertilizer used (kg)
None	8	605.6	75.70
One ox	29	2424	83.59
Two oxen	49	6745.5	137.66
Three oxen	8	1260	157.50
Four oxen	6	1415	283.00

Farmers having more oxen can plough large areas of land twice or three times a year and they can apply significant amount of fertilizer because the product obtained is encouraging. On the other hand, farmers having less or equal to two oxen, cannot fully prepare their land and the product obtained may not be encouraging and thus, they may not use large amount of fertilizers. This means that the higher is the number of oxen, the higher is the consumption of fertilizer.

As it can be seen from the Table 4 a significant number of farmers (84%) have less than or equal to two oxen for the purpose of farming. About 12% of the sampled farmers have no ox of their own. However, the distribution of oxen in the study site may appear better because over half of the peasants in Ethiopia do not have a pair of oxen (Fissaha, 1996; Tegegne, 2000, Assefa, 1995).

The availability of oxen determines the timing of cultivation, which will in turn affect the total production since the growing period in the study area is generally short. A delay in planting time may reduce yields by up to 50% (Gryseeles, 1988). In relation to this, questions were asked to the sampled farmers whether they faced shortage of oxen during the 2003/04 crop season or not. Forty seven percent of the respondents stated that they faced this crisis and the remaining percentage on the other hand, indicated that they did not face such problems. The solutions for these problems pointed out by the respondents during the time were: oxen sharing, using of hoe and asking for help from relatives.

### **Organic Fertilizer: As one of Land Augmenting Factor**

Appropriate use of organic fertilizer together with high yielding crop varieties, will increase yield and improve profits, but almost 90% of sampled farmers interviewed indicated that commonly used land augmenting input is found to be artificial fertilizer.

To look into their awareness about the use of natural fertilizers a question was asked to the sampled farmers: "According to your opinion of the natural and artificial fertilizers, which one makes production more sustainable?" About 94% of them suggested that artificial fertilizer makes production more sustainable than organic fertilizers. To examine the problems faced by the sampled households for their less amount of organic fertilizer used in their farmyard during the 2003/04 crop season; another question was asked to the sampled households: "What factors impose you not to use much organic fertilizer particularly animal manure on your farmland to increase production and to make production more sustainable?" Sampled farmers justified their reasons in the following ways: low cattle population, lack of grazing land, land could not give much production with out artificial fertilizer, to move the manure from the farmstead to the field needs much labor, we cannot keep our cattle in the night outside the home because of uncontrolled thievery. In this regard, almost all the sampled farmers in the study area unanimously indicated that their cattle were kept in the houses through out the night to protect them from thieves. This will result in two situations. Firstly, the waste of animals may make them uncomfortable and will cause many diseases. Secondly, the urine and waste of the animals, which are very important for the fertility of the soil, may be left with out significant use in the field. In the study area, preparation of compost to use as a natural fertilizer is almost unknown and a lot of works have to be done in this regard.

### **Improved Seed**

For the last few years the sampled farmers use the following improved seeds: teff, maize, wheat and barely but due to its poor quality and high cost farmers in the study area have forced to stop using these varieties. Almost all of the sampled farmers responded that at present new maize varieties are used in the study area. The other crops are produced by local varieties with low level of disease resistance and low yields per unit of area. Lack of

continuous supply of high quality seeds and the high price of seeds were important factors discouraging them in the use of the new varieties (Table 5).

Table 5. Reasons for the Less or not Using Improved Seeds by the Sampled Farmers during the 2003/04 Drop Season

Responses	Number of sampled farmers	%
Price was too expensive	30	27.02
Improved seeds were not available on time	58	52.27
Production was not encouraging	12	10.81
Most crops do not have improved seeds	10	9.0
Total	111	100

As can be seen from Table 5 more than half of the farmers (52.27%) responded that distribution of improved seeds were not available during the time when it was needed.

### Agricultural Credit

Majority of the farmers (about 80%) in the study area buy inputs on credit. This implies that credit is crucial in modernizing the agricultural sector since it helps to remove or reduce financial constraints faced by small scale farmers. Such a credit given on time is considered to be a complementary input to other growth promoting technologies. Quite a small number of farmers (20%) did not take credit during the 2003/04 crop season. In this regard questions were asked to the respondents and their responses are summarized in Table 6.

Table 6. Reasons for not Taking Credit during the 2003/04 Cropping Year

Response	Number of respondents	%
Credit was not available on time	3	15
We were not able to pay credit	5	25
High cost of fertilizers or improved seeds	12	60
Total	20	100

As indicated in Table 6 large percentage of farmers said that the high cost of fertilizers or improved seeds discouraged them to take credit for the coming cropping year. As observed in the field and on information obtained from the offices of farmer's association, farmers are not volunteering to pay the credit taken for the previous agricultural season. The main reasons given by the sampled farmers were; the time asked to pay credit was the months in

which the price of crops was the lowest or the time of depressed sales in the season. Sampled farmers indicated that in the past they paid their debts by selling sheep, goats or other livestock in addition to agricultural crops. "But today with the scarcity of grazing land, we do not have significant number animals to be sold at the market to pay our debts", they said. In this regard 50% of the sampled farmers responded that they do have one ox, one cow, one goat and slightly above two sheep. The interviewed household heads were also asked whether they would take credit or not in the future. About 90% of the sampled farmers responded in the positive. This shows that farmers have become quite conscious about the advantages of credit for their sustenance and use of new technologies. But the high prices of inputs and relatively low price of outputs discourages them to take credit.

### Extension Services

The study revealed that in the study Woreda, each extension agent is assigned to give advice for 1020 farm households. This figure indicates that there is a serious shortage of extension workers to give better services to the farmers. Moreover, there is little direct contact between farmers and the extension agents. In this regard, many of the interviewed farmers stated that farmers usually contact DAs when they faced certain problems and not so frequently (Table 7). This implies that there is a very low level of linkage, if at all, between the farmers and the extension agents. As a result, follow up by the DAs were low which directly or indirectly affects the dissemination of information to the farmers.

Table 7. Frequency of Visits by Extension Agents

Alternatives	Number of Sampled farmers	%
Less than 3 times/month	68	68
3-5 times/month	22	22
6-7 times/month	10	10

Development agents also reported that they are assigned to visit an average of two to three kebeles. Besides, they are tied up with the distribution of inputs and other administrative matters. It may be, therefore, difficult for extension agents to make regular visits to the assigned households and discuss the issues in detail since they are attached to many assignments. In line with this, the sampled farmers were interviewed and their responses were given in Table 8:

Table 8. Main duty of Extension Agents Stated by Sampled Farmers

Alternatives	Number of sampled farmers	%
Collection of tax and agricultural credit	3	3
Leadership in the community	1	1
General agricultural education	39	39
All of the above	57	57
Total	100	100

Responses related to agricultural training to the sampled farmers were investigated. Of the total sampled farmers, 64% indicated that they did not get any training in the 2003/04 crop year. A question was asked for those participated in the training. "Did the training you participate have helped you to improve crop production?" 56% of them responded that it was not much helpful to improve their production. The reason given was that the time of training was too short that they could not acquire sufficient knowledge and skills to improve their productivity and production.

The other question given to the sampled household heads was: "Are you satisfied with the services you get from extension agents?" Almost majority (92%) of the sampled farmers responded, "NO". The reasons given were: most of the extension agents were not capable to answer the questions asked, they did not invite them for discussions, they were reluctant to receive ideas from them and they did not respect and give value to their culture and way of living. This implies that the new extension program currently running in the study area was not able to satisfy the needs of the farmers. Besides, effective and continuous training and shortage of innovations are other constraints which limit the efficient utilization of the extension system in the study area.

### Extension Workers

In the study area in particular, and the country in general, extension workers are not in a position to accomplish their job effectively because of so many controlling factors. From the interview made with the extension workers in the study area, it was learnt that dissatisfaction among extension agents was widespread. Accordingly, DA workers in the

Woreda were asked to give reasons for their dissatisfaction and their responses were indicated as follows:

“The works that they were assigned to accomplish and the amount of salary paid were not equivalent (the amount of salary paid is not satisfactory), they face poor transport services, poor working conditions and they face lack of chances to upgrade themselves”. Regarding this, 74% of them claimed that they did not get any job training to upgrade their knowledge and refresh their skills in the 2003/04 cropping season. Further more, they said that the chances to live and work in/ nearer the urban areas, where services are relatively adequate, are very low.

As far as their qualification is concerned the agricultural workers in the study area are below graduation and majority of them (96%) are diploma graduates and 4% are 12<sup>th</sup> completed. This indicates that the educational level of the agricultural workers in the study area is very low, and what needed is qualified agricultural workers. With these constraints, to develop the agricultural sector in general, and the extension services in particular, would be very difficult.

As the extension workers indicated, there are some problems that limit the effectiveness of the extension services in particular and the sector in general. Among the many factors, inadequate and outdated instructional materials and equipment, failure to attract the best students, training largely confined on campus, decline in the quality of education, difficulty in retaining the already limited number of qualified academic staff due to poor conditions of service, low salary payment and the curriculum in this sphere that neglects problem identification, conflict resolution, critical thinking and listening skills, should be highlighted.

It is true that extension workers should be risk managers. They have to know what the market demands, and what the customer wants. To accomplish this job effectively, they need skills not only in science and technology but equally important skills that address the community's demand for managerial communication and other human relation capabilities which gear them towards sustainable agricultural and rural development. In short, the

extension workers, need the following skills: ability to work in participatory model of extension rather than a linear, technology- transfer model of extension; ability to search information from any source, identifying clients' needs, ability to consult clients and to judge the relevant technology or project to the farmers, ability to communicate with their clients and listen to the ideas of each individual as well as ability to keep records and reports after identifying opportunities for training .

### **Price of Output and Consumption of Inputs**

It is estimated that about 90% of the farmers' annual grain sales in the study area occur immediately after harvest season (December to March). Accordingly, Mulat (1999) also indicated that about 79% of the farmers' annual grain sales occur immediately after harvest (January to March). As a result prices drop when most farmers are selling their produce and go up later during the year when many poor farmers run out of food stock and start buying from the market.

To investigate the reasons behind the depressed crop sales at the above said months a question was asked to the sampled households: "Why were you forced to sell your products immediately after harvest?" The rationales given were: This was the time we obtain relatively surplus production, we needed to have some money for some celebrations and we want to buy clothes for our family, we have to pay for the inputs taken on credits for the last crop year and we should have to pay our tax and also to compensate credits that were taken from relatives, money lenders and neighbors.

Certainly fair increase of output price will increase the use of new technologies. On the other hand, unfair output price discourages the use of agricultural inputs as summarized in Fig 1. As can be seen from the Fig 1 consumption of inputs has decreased particularly in the 2001/02 crop year due to dramatic reduction of prices of outputs. This situation discourages the peasants' motive to apply production increasing technologies. Thus, the unremunerative prices of the farm outputs on the one hand, and ever increasing farm input price which the farmers spend, on the other hand, would never allow the growth of crop production and food

self sufficiency. To sum up, consumption of modern farm inputs and price of outputs have usually positive relationships.

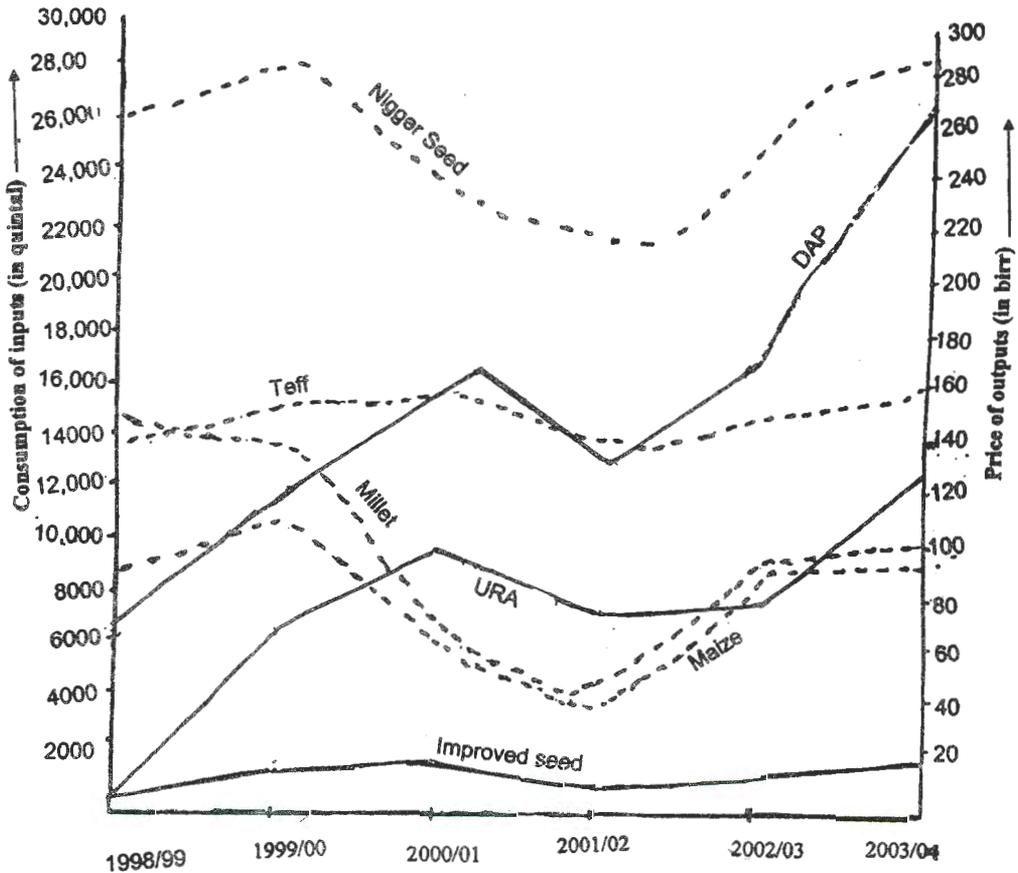


Figure 1. The relationship between consumption of inputs and price of outputs in Mecha Woreda

Source- Woreda Agricultural Offices

———— Consumption of inputs  
 ----- Price of outputs

### Price of Farm Inputs and Consumption of Inputs

In this topic price of farm inputs refers to fertilizers and improved seeds. More production can be obtained if the farmers properly use the agricultural input technologies. However, the

ever increasing price of inputs is found to be an impediment to the wider consumption of inputs. In connection to this idea Heady, et al (1967) pointed out that in the USA, 1% change in fertilizer prices is predicted to have a greater relative effect on fertilizer use than a similar change in prices of crops. Though the price of inputs steadily increased, the consumption of inputs also increased mainly due to the farmers' purchasing power was raised as a result of the increment of output prices.

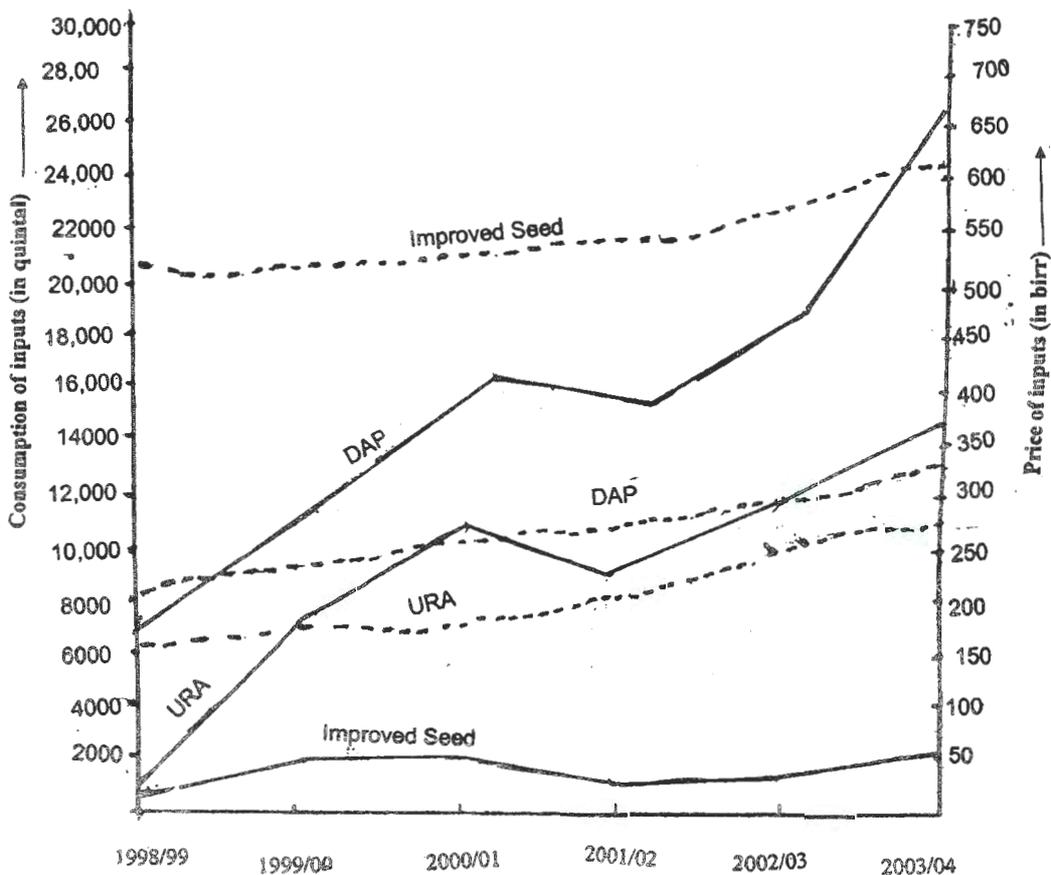


Figure 2. The relationship between price of inputs and consumption of inputs in Mecha Woreda

Source- Woreda Agricultural Offices

----- Price of inputs  
 \_\_\_\_\_ Consumption of inputs

As it can be seen in Fig 2 Consumption of inputs before 2000/01 was higher and the graph showed a very steep slope particularly for DAP and URA. But in between 2000/01 and 2002/03 consumption of inputs was low but input price was gradually increasing. From 2002/03 onwards, consumption of inputs increases though the prices of inputs were steadily growing with the exception of improved seeds. As observed from Figure 2, the price of improved seeds was found to be the highest that probably lowered the consumption of improved seeds. In general conditions, the price of inputs and consumption of inputs have a negative relationship. At times when the price of inputs was low, the consumption of inputs was high as can be seen in Fig 2.

### CONCLUSION

- Due to high price and scarcity, farmers in the study area did not apply the recommended rate of fertilizers for their crops suggested by agricultural experts.
- The relationship between size of farm, education, number of oxen and the use of fertilizers have positive relationships.
- The study revealed that the use of organic manure in the study area is very low. Almost all sampled farmers indicated that there is only one improved maize variety in the study area.
- It has been found out that contact between extension agents and farmers is found to be low mainly due to the fact that the ratio between extension agents and farmers was very high.
- The study identified that extension agents are not able to satisfy the needs of the farmers mainly due to their low experience in the field and low commitment in their job.
- The study discovered that price of inputs and consumption of inputs are negatively correlated. On the other hand, price of outputs and consumption of inputs have a positive relationship.

## RECOMMENDATIONS

Based on the analysis made and the conclusion drawn a number of policy measures could be suggested. The following recommendations are forwarded to alleviate the problems observed in the use of agricultural inputs.

1. Price of inputs is found to be negatively correlated to the use of agricultural inputs. This means that the government should make fertilizers available to the farmers at an acceptable price and expand the knowledge of using fertilizers appropriately, in an economic and eco-friendly manner.
2. The study indicated that extension services given to the study area is weak mainly because the agents are tied up with many works. Besides, the ratio between extension agents and the farmers is very wide. Thus, extension agents have to be placed close to the farmers with lesser number of households assigned for their visit.
3. Because of its unavailability/or scarcity, farmers in the study area use fertilizers and improved seeds as a complementary package for only one crop, which is maize. In this regard a lot of works should be done for the farmers to use complementary inputs for the other crops. This means that the system has to be changed and the existing extension system should address to the integrated system as a whole.
4. Lack of access to the desired production inputs at the right time and place is one of the major problems facing smaller holder farmers. Thus, the improvement in transport facilities for the efficiency in input distribution has to be given top priority.
5. The study revealed that draught power is an important means in the agricultural process and positively correlated in the use of inputs. Therefore, some assistance has to be given to the relatively poor farmers to have their own pair of oxen.
6. Farmers in the study area are focusing on artificial fertilizers giving little value to organic fertilizer. Excess use of chemical fertilizers raises the acidity of the soil. To reduce the problem of increasing acidity, fertilizers should be used mixing with organic fertilizers such as manure, crop residue, and household wastes. Moreover,

- organic fertilizers improve the water holding capacity of the soil. Therefore, emphasis should be given both to organic and inorganic fertilizers as an option for soil management practices. Especially animal manure in the study area is restricted to their homestead but not to their field due to a number of factors. Hence, a thorough investigation has to be done to identify the problems behind their less use or non-use of animal manure or even compost.
7. Farm size in the study area is very small, an average of 0.8 ha, mainly due to uncontrolled growth of population. If this rate continuous, some time in the future, the number of landless peasants will increase considerably. Therefore, family planning methods have to be declared soon to combat the high fertility rate of the population.
  8. The study revealed that farmers in the study area did not apply the recommended quantity of fertilizers to their crops or act as suggested by agricultural experts. This is mainly due to high price and scarcity of the fertilizers. Therefore, the price of fertilizers has to be lowered by establishing fertilizer plants in the country, which guarantees the availability of fertilizers in the local market. Besides, a strict follow up should be done during the applications of these scarce materials in order to increase production per unit in the area.

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