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Impact of Input and Output Market Development Interventions in Ethiopia

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Abstract

This study estimated the impact of input and output market development interventions of the IPMS project at Alaba and Dale PLW, SNNPR on institutional and organizational changes of agricultural markets, marketed surplus and market orientation of the participant households. The study has used cross-sectional sampled household survey. A propensity score matching method was applied. The intervention has resulted in positive and significant effect on marketed surplus and to be market oriented in contrast to the non-participant households on top of improving institutional and organizational setup of agricultural markets in the study areas. Based on the results obtained scaling out or the extension of such market development interventions, both input and output market, has a paramount importance for the achievement of growth and transformation plan of the country in the short run and welfare improvement in the long run.

Key words: Input and output market development intervention, propensity score matching, Pilot learning woreda

1. Introduction

1.1 Background

Agriculture is central to the Ethiopian economy. However, agricultural production and productivity is very low and the volume in agricultural output is incompatible with the growth in population. The incompatible increase in volume of agricultural outputs and the country's population result in a widespread food insecurity and poverty in the country. Hence, the country is continuously confronted with a challenge of feeding its growing population. To overcome this problem the country needs to speed up production and increase productivity thereby to achieve economic growth. This can be done by the introduction of improved technologies, supply of market information and development of market facilities.

The possible increment in output resulting from the introduction of improved technologies could not be exploited in the absence of convenient marketing conditions (Eleni *et al*, 2004). Hence, efficient, integrated, and responsive market mechanism is of critical importance for optimal use of resources in

agriculture and in stimulating farmers to increase their output. To this end, IPMS project has been implementing input and output market development interventions since 2005 in ten PLWs. However, the impact/ effect of those market development interventions have not yet been studied.

In developing countries, evaluating the development interventions has greater importance for the economical allocation of scarce resources. Project evaluation is a step-by-step process of collecting, recording and organizing information about project results, including short-term outputs (immediate results of activities, or project deliverables), and immediate and longer-term project outcomes (changes in behavior, practice or policy resulting from the project) (Government of Ontario, 2006). Project evaluation performed skillfully, identifies key consequences of proposed project and provides quantitative information about them in order to guide policy makers (Kenneth, 1998).

Despite the fact that the project is implemented for about five years, its impact has not been evaluated yet. Hence, this particular study was initiated to empirically evaluate the impact of the project on outcome variables as indicators of the impact of the project.

1.2 Objectives of the Study

The study had a general objective of assessing the impact of input and output market development interventions of the IPMS project at Alaba and Dale PLWs. The Specific objectives were to:

- Describe changes in the organizational and institutional aspects of agricultural markets due to the intervention in the districts;
- Estimate the impact of the market development interventions on household marketed surplus from the commodities of intervention and market orientation of households.

2. Methodology

2.1 Description of the Study Area

2.1.1 Dale district

Dale district is found in sidama zone of Southern Nations and Nationalitities Peoples' Regional State (SNNPRS). The district is located 47 kms far from the regional as well as zonal capital city, Hawassa and 322kms from Addis Ababa, the capital city of Ethiopia. The district has a total area of 28,444 hectare; total population of 222,068 and 37,027 households. Out of the total households 34,962 are male headed households and the remaining 2,065 are female headed households. The district has 36 kebeles out of this 15 PAs (105 HH) are reached by IPMS intervention. The district is also characterized by 1% *dega* and 99% *woinadega* agro-ecologies (DDoA, 2009).

2.1.2 Alaba special district

Alaba Special district is one of the eight special districts in the SNNPR. The district is found 85 kms away from Hawassa and 335 kms from Addis Abeba. It has a total area of 973.8 square kilometers and a total population of 210,243. Out of the total population 104, 517 are male and the remaining 105, 726 are female. In the district there are about 79 rural kebeles and 2 urban kebeles out of these 18 PAs (107 HH) were targeted by IPMS market development interventions (ADoA, 2009).

2.2 *Description of the Interventions*

Ethiopia faces problems of food insecurity because of traditional agriculture as a result of lack of improved agricultural technologies and efficient input and output market. To this end the IPMS project has been implementing different and multifaceted interventions using a participatory commodity development value

chain approach to develop input and output markets. The input market development interventions that are put in to effect are innovative credit, capacity development and dissemination of market information.

Regarding the provision of innovative credit, the project has provided innovative credit to the cooperatives so that they can supply input. Pertaining to capacity development of farmers and extension workers the project facilitated short-term and long-term trainings to enable them to develop their technical knowhow. The project also provided market information on commodity price using billboards and loud speakers at market places.

2.3 Sources and Method of Data Collection

Primary and secondary data sources were used for this study. The primary data were collected from sampled households and secondary data were also collected from published and unpublished sources.

2.4 Sampling Techniques and Sample Size

A three-stage sampling technique was employed to draw sample respondents from each PLW. In the first stage PA's where the intervention has been made for some time was selected purposively. In the second stage, 6 PAs (3 PA's from each PLW) were randomly selected. Accordingly, Dagiya, Debub kege and Soyama from Dale and Galeto, Hulegaba Kukie and Andegna Ansha from Alaba were selected. In the final stage, a total sample size of 200 households comprising 100 participants and 100 non-participants was randomly selected from the two PLWs.

2.5 Method of Data Analysis

A Propensity score matching (PSM) approach was used to estimate the impact of the project on specified outcome indicators. And STATA Software was employed for the analysis of the data.

Since the first step in PSM is to know the propensity to participate, the first task in matching is to estimate this propensity. To get this propensity scores logistic probability model was fitted. Any resulting estimates of program effect rest on the quality of the participation estimate, where the dependent variable is 'participation' and the independent variables are the factors thought to influence participation and outcome.

So the binary logit $Pr\ (pp) = f(X)$ was fitted to get the propensity to participate. Where *pp* is project participation, $f(X)$ is the dependent variable project participation and X is a vector of observable covariates of the households.

$$X = [L, Fs, DDA, MktD, Ed, A, Ls, S]$$

Where:

L	represents the total cultivated land holding of household in ha;
Fs	represent Family size;
DDA	represents distance (km) between the DAs office & the sampled HH residence;
MktD	represents nearest market distance from samples household residence;
Ed	represents education level of household head;
A	represents age of household head;
Ls	represents Size of Livestock holding;
S	represents sex of the household head.

After obtaining the predicted probability values conditional on the observable covariates (the propensity scores) from the binary estimation, matching was done using a matching algorithm that is selected based on the data at hand. The matching estimator which was fitted the data set of Alaba was kernel with 0.1 bandwidth and for Dale's kernel with no bandwidth. Then the average effect of household's participation in the project on specified outcome variables was estimated. In non-experimental studies one has to introduce

some identifying assumptions to solve the selection problem. The following are two strong assumptions to solve the selection problem.

1. Conditional Independence Assumption:

Given a set of observable covariates (X) which are not affected by treatment (in our case, intervention participation), potential outcomes (input use intensity, level of productivity, total net income) are independent of treatment assignment (independent of how the intervention participation decision is made by the household). This assumption implies that the selection is solely based on observable characteristics, and variables that influence treatment assignment (intervention participation decision is made by the household) and potential outcomes (input use intensity, productivity level, total net income) are simultaneously observed.

2. Common support:

This assumption rules out perfect predictability of D given X. That is $0 < P(D = 1 \mid X) < 1$. This assumption ensures that persons with the same X values have a positive probability of being both participants and non-participants.

Given the above two assumptions, the PSM estimator of ATT was:

$$\tau_{ATT}^{PSM} = E_{P(X)/D=1}\{E[Y(1)|D=1, P(X)] - E[Y(0)|D=0, P(X)]\}$$

Where P(X) is the propensity score computed on the covariates X. The above equation is explained as; the PSM estimator is the mean difference in outcomes over the common support, appropriately weighted by the propensity score distribution of participants.

In the final stage the robustness of the evaluation results were tested for their sensitivity for the hidden variables that may affect participation decision of households.

3. Results and Discussion

3.1 Descriptive results of pre-treatment characteristics

Participants and non-participants at Alaba were found to be significantly different with respect to sex, education level of the household head, cultivated land holding and relative distance to market place. In contrast to non-participants, participants are male headed, have higher level of years of schooling, larger size of cultivated land holding and situated at a relatively nearer distance to market place. The difference between the two groups with respect to education level, sex, cultivated land holding and market distance were statistically significant at 1, 5,5 and 10% probability levels, respectively.

The result depict that there is statistical difference between participants and non-participants at Dale with respect to education level, cultivated land holding, livestock holding, market distance and family size. A look at the years of education indicated that participants has relatively completed higher level of education than that of non-participants and this is significant at 1% level of significance. Compared to non-participants, participants have larger size of cultivated land and more family size which were significant at less than 1% significance level each. In addition, participants were situated nearer to market places than that of non-participants and this difference was significant at 10% probability level.

3.2 Institutional and organizational changes

3.2.1 Credit facility

With regard to credit facilities, about 72 and 62% of the sample respondents reported that they received credit in 2008/2009 production season at Alaba and Dale, respectively. All of participants (100%) at Alaba and 86% at Dale had received credit as compared to non-participants, which are about 24% at Alaba and 38% at Dale.

The main problem in getting credit as reported by 60% of the respondents was limited source and inadequacy of credit. In line with the above problem, 40% of respondents' rate credit availability and accessibility as poor at Alaba. The difference in rating credit availability between participant and non-participants was significant at 10% level. The major source of credit for non-participants is microfinance institution which account for 40% of the total credit received. The type of credit dominantly provided by microfinance was reported to be cash credit. On the other hand, participants received input credit from IPMS project indirectly. About 50 and 43% of participants received credit from IPMS project in kind like haricot bean seed and pullets both at Alaba and Dale, respectively.

Project participants indicated that the IPMS project has contributed much in availing input credit in kind both at Alaba and Dale study sites. At Alaba, the project has provided bee hive, haricot bean seed and three months old chicken. Similarly at Dale haricot bean seed and pullets of day old were supplied in kind via credit by the project in collaboration with other institutions like 'Weinenata' local co-operative, Melkasa and Awassa Agricultural research centers and WoA. This indicates that the project has brought about a change in institutional aspect; typically credit availability via creating linkage among farmers, concerned institutions (Research and extension) and local cooperative. Moreover, the project has strengthened the co-operative, 'Weinenata', capacity by providing financial (loan) support.

3.2.2 Agricultural extension service

Agricultural extension services provided by agricultural development offices are believed to be important sources of information about new and improved agricultural technologies. About 99% of the sample respondents in Alaba and all respondents in Dale reported that they have contact with agricultural extension agents and get technical advice thereof, either in-groups or individually. To this end the project has been strengthening the service by providing short and medium (B.Sc. and M.Sc.) training to the development agents as well as the experts so that they are able to give better service to the farmers. Moreover, the project involves in strengthening linkage among the institutions which are supposed to work together: research institutions, extension and farmers. It has also been providing the FTCs with necessary equipment like satellite dish, television, computers, chairs, tables, electric power supply and CDs to facilitate the farmers training program. Furthermore, the project introduces new ways of agricultural practices and technologies to the respective sites.

3.2.3. Farmers organization

At Alaba, most of the respondents had no membership to formal organizations other than Peasants Association (PA). About 74% of the respondents were not members to any formal organizations at Alaba site. When one compare membership to formal organization other than PA between the two farmers group the proportion is more for participants (36%) than for non-participants (16%) at Alaba site. This shows that formal farmer-institutions, which may serve as important information and input sources on agricultural technologies, were not well established in this particular study area though membership proportion seems better for participants.

With the initiative of the IPMS project, currently there is a start of organizing farmers in to cooperatives based on the commodities of intervention in collaboration with the WCPO. This is line with the information obtained from WCPO which indicates that currently there are about 2 co-operatives particularly on *Teff* seed multiplication and apiculture; similarly, 2 co-operatives are on the process of establishment on poultry and haricot bean seed multiplication with the initiative of the IPMS project for its intervention commodities. Furthermore, there is input shop which is functional by co-operative named 'Mencheno' at Alaba. This particular shop supplies important farm inputs such as fertilizer, herbicides, etc at a relatively reasonable price and better quality and the project provides innovative credit so that the shop is able to supply quality and timely inputs. Moreover, the project has trained private farmers to give paravet and crop protection services.

At Dale, there is a well organized co-operative named 'Weinenata' which is operational throughout the district. Formerly, this co-operative has been functional only on coffee marketing. However, the co-operative has widened its scope to haricot bean through the encouragement and support of the IPMS project. The project has given financial support and created a link to the important institutions which can provide the full package to the targeted commodity. As a result of these, the cooperative has started to handle the different marketing functions like storage, grading, labeling, packaging, etc of improved haricot bean seed which is collected from farmers and to be sold for them at different amount (packagels) when they need. Speaking differently, the project has facilitated input divisibility to farmers as per their demand. This, in turn, indicates that the project has brought about organizational and institutional changes in input marketing.

3.2.4 Market information

With regard to market information, the market intervention has included market information delivery system through billboard and loud speakers at Alaba and through DAs at Dale. Accordingly, about 84% of respondents know and get market information on input and output price using the bill board directly and indirectly at Alaba. Of those who have access to the bill board information, about 20% of respondents reported that IPMS has brought benefit to them in providing market information. Owing to price information delivered, farmers reported that they are able to reduce frequency and cost of transportation as they only go once to the market and sale their product to the market by the indicated price with no hesitation. However, of those who know the market information delivery system, about 80% face a problem in using the information from the billboard due to illiteracy.

In addition, the project promotes new practices and technologies at the market place using loud speaker. From this about 60% of respondents are informed about the message delivered by the project using the speaker. Furthermore, the intervention has included balance calibration at hot pepper market which increases farmers benefit, enables them to make informed decision and saves them from being cheated. Whereas at Dale, even though there is no practice of using the above means of market information delivery systems, the project trains the DAs and experts of MoARD on market orientation related issues to support and advise farmers about market oriented production and give market information.

3.3 Econometric Model Results

3.3.1 Propensity scores

Prior to running the logistic regression model to estimate propensity scores, the explanatory variables were checked for existence of sever multicollinearity problem. A technique of Variance inflation factor (VIF) was calculated to detect the problem of multicollinearity among the explanatory variables. Accordingly, the VIF (X_i) result shows that the data had no serious problem of multicollinearity. This is because, for all the explanatory variables, the values of VIF were by far less than 10. Therefore, all the explanatory variables were included in the model. Moreover, hetroscedasticity test was done using Breusch-Pagan / Cook-Weisberg test for hetroscedasticity and the P-value was 0.8972 which is insignificant implying the absence of the problem of hetroscedasticity.

A logistic regression model was used to estimate the propensity scores of respondents which helps to put in to practice the matching algorithm between the treated and control groups. The matching process attempts to make use of the variables that capture the situation before the start of the intervention. The logit result revealed a fairly low pseudo R^2. The pseudo-R^2 indicates how well the regressors $\boldsymbol{X}$ explain the participation probability (Caliendo and Kopeinig, 2005). A low pseudo R^2 value means participant households do not have much distinct characteristics over all and as such finding a good match between participant and non-participant households becomes easier (Yibeltal, 2008).

The maximum likelihood estimate of the logistic regression model result shows that participation was influenced by 4 variables at Alaba and 3 variables at Dale study sites. At Alaba education level, cultivated land holding, sex, and number of livestock holding in tropical livestock unit affect the chance of participation. Meaning those farmers who have better level of schooling, male headed and relatively larger land holding has high chance of being participant. In addition, households having higher number of livestock are more likely to be a participant in the market development interventions of the IPMS project and this is on the contrary to the finding of Zikhali (2008) in Zimbabwe.

At Dale, participation was significantly influenced by cultivated land holding, family size and livestock holding. Speaking differently, those farmers who have larger size of land, more number of family size and higher number of livestock holding have high chance to be included as participant. Cultivated land holding influenced participation moderately at 5% significant level while, family size and livestock holding influenced the probability of participation at 10% level of significance.

According to Caliendo and Kopeinig (2005) there are two approaches to map a common support region for the propensity score distribution, these are minima & maxima and trimming approaches. Moreover, Leuven and Sianesi (2003) recommend the use of both the “common” and the “trimming” approaches at the same time for the identification (imposition) of a common support. Even though it is recommended to use both approaches together, in evaluation studies using PSM the approach that yields in good match is preferred. Thus, the data set resulted in good matches in the case of minima and maxima approach. Therefore, this approach was employed to identify the common support region for this particular case.

3.3.2 Matching algorithms of participant and non-participant households

The choice of matching estimator is decided based on the balancing qualities of the estimators. According to Dehejia and Wahba (2002), the final choice of a matching estimator was guided by different criteria such as equal means test referred to as the balancing test, pseudo-R^2 and matched sample size. Therefore, a matching estimator having balanced (insignificant mean differences in all explanatory variables) mean, bears a low pseudo R^2 value and also the one that results in large matched sample size is preferred.

In line with the above indicators of matching quality, kernel with no band width is resulted in relatively low pseudo R^2 with best balancing test and large matched sample size as compared to other alternative matching estimators. Then it was selected as a best fit matching estimator for Alaba’s dataset. Similarly kernel with 0.1 band width was selected as the best matching estimator for Dale’s dataset.

The initial observations were 50 participant and 50 non-participant households at each study site. After the identification of the common support condition using minima and maxima approach, participants having a pscore below 0.0136 (0.0215) and above 0.7878 (0.8893) are dropped for Alaba (Dale) sites, 39 participant households were matched with 50 non-participants both for Alaba and Dale cases using respective matching estimators. This makes from 100 sample households of each study site, only 89 households were identified to be considered in the estimation process.

3.3.3 Treatment effect on the treated (ATT)

In this section, the project's impact on the outcome variables (market orientation and marketed surplus of households) is evaluated for their significant impact on participant households, after the pre-intervention differences were controlled.

The market development interventions of the IPMS project had positive and significant impact on participant households in terms of their market orientation. With respect to proportion of land allocated to the commodities of intervention, as a proxy for market orientation, participants at Alaba have allocated 6% and 10% more of their proportion of land to haricot bean and teff, respectively. Correspondingly at Dale, participants have allocated 18% more of their proportion of land for haricot bean as compared to non-participants. The reason why there was a more than fivefold increase in proportion of land allocation to haricot bean both at Alaba and Dale might be due to the fact that haricot bean has become better rewarding cash crop both in local and export markets. Moreover, formerly farmers used to plant haricot bean by intercropping it with maize with little agronomic practice as a security crop during the time of food shortage. Currently, due to its increased market demand and better return, farmers started to cultivate it as a sole, cash crop and undertaking necessary agronomic practices which contribute to better yield.

Pertaining to consideration of market signal in production planning, most participants at both study sites consider market signal to decide on production planning than that of non-participants. The difference was statistically significant at 1% for Alaba and 5% level for Dale site. Therefore, as all the above proxy measures resulted in significant difference between participants and non-participants of the project, the intervention has resulted in a considerable impact on participants in terms of their market orientation. This again indicates that participants are more likely to be market oriented than that of non-participants.

Regarding marketed surplus of households, there was a statistically significant difference between participants and non-participants of the market development interventions of the IPMS project except for teff and poultry commodities at Alaba and coffee commodity at Dale. The estimation result provides an estimate of amount sold as a proportion to what is produced in that particular year, 2009 at individual commodity level. However, considering only amount sold there is a change in Alaba's finding and no change for Dale's case. With regard to the amount/ quantity sold at Alaba, the amount of teff and poultry heads supplied to the market is statistically significant between the two groups of respondents though it was found to be insignificant in considering proportion of sold to what is harvested.

Looking in to individual commodities of intervention at Alaba, participants supplied 10% more of honey to the market over non-participants and this difference was significant at 10% level of significance. Likewise, for teff, the intervention has increased the marketed surplus of participants by 2% to that of non-participants. The difference was insignificant when considering proportion but it is significant for amount sold. Considering haricot bean, participants supplied 30% more to the market than that of non-participants and the difference was found to be significant at 5% level.

Correspondingly, at Dale the intervention has resulted in an increase of poultry marketed surplus of participant households by about 21% more to that of non-participants. This difference was significant at 5% probability level. Compared to non-participants, participants of fruits seedling production have supplied 4% of what they have raised and this was found to be significant at 5% level of significance. Participants supplied 17% more of haricot bean as compared to non-participants and the difference was significant at 5% level. Coffee participants have supplied a 1% more of coffee seedlings to the market over non-participants but the difference was not statistically significant between the two groups. The insignificant impact of coffee on marketed surplus of households may be due to, as noted above; its comparative

advantage over the other varietal seedling has not been promoted. For this reason farmers hesitate to plant this particular variety seedling.

3.3.4 The sensitivity of the evaluation results

This is for the issue of whether the final evaluation results are sensitive with respect to the choice of the balancing scores or not is addressed. Matching estimators work under the assumption that a convincing source of exogenous variation of treatment assignment does not exist. Likewise sensitivity analysis was undertaken to detect the identification of conditional independence assumption was satisfactory or affected by the dummy confounder or the estimated ATT is robust to specific failure of the CIA. Accordingly, the analysis revealed that ATT values of both marketed surplus and proxies of market orientation were found to be robust to the dummy cofounder, to the CIA identified.

4. Conclusions and Recommendations

4.1 Conclusions

This particular study has evaluated the impact of input and output market development interventions of the IPMS project at Alaba and Dale pilot learning woredas of the project in the SNNPR. Specifically the study was focused on examining the impact of the IPMS's market development interventions on institutional and organizational changes of agricultural markets, marketed surplus and market orientation of participant households as compared to non-participant households. The study used cross-sectional data collected from both participant and non-participant sample households and the data were analyzed using PSM method.

The important variable of interest in PSM approach impact evaluation is average treatment effect on the treated (ATT). This is the mean difference in the value of the outcome variable with and without the intervention. Here, one can understand that the '*with*' and '*without*' condition cannot be observed from the same household at the same time. There exists a problem of unobserved outcome. To get out of this problem is the use of the counterfactual outcome to obtain the comparison. The PSM tries to use propensity score of participation which is estimated from the pre-treatment characteristics to compare the difference due to the intervention. After conditioning on pre-treatment characteristics like socio-economic, demographic variables, matching was done to compute the average treatment effect on the treated (ATT) which is the vital variable of interest in impact assessment.

The initial sample comprising 50 participant and 50 non-participant households at each study site were conditioned in such a way that 39 participant households to be matched with 50 non-participants using kernel matching estimator with no and with 0.1 bandwidth for Alaba and Dale cases, respectively. This makes from 100 sample households of each study site, only 89 households were identified to be considered in the estimation process from each PLW.

Considering market orientation, in contrast to non-participants, participants at Alaba allocated about 6 and 10% more proportion of their land to haricot bean and teff, respectively. While at Dale participants allocated about 18% more of their land owned to haricot bean over the non-participants. With respect to consideration of market signal in production planning, as a proxy for market orientation, about 61% of participants at Alaba and 46% at Dale make production decision based on market signal and this was found to be significant at 1 and 5% level of significance, respectively.

Marketed surplus of commodities of intervention were in terms of proportion of produce supplied to the market. Accordingly, participants at Alaba were able to offer about 6% more of poultry, 10% more of honey, 2% more of teff and 30% more of haricot bean to the market than that of non-participants at Alaba. In the same manner at Dale, participants supplied about 21% more of poultry, 1% more of coffee seedling, 4% more of fruits seedling and 17% more of haricot bean produce to the market over the comparison groups. Except for the marketed surplus from poultry and teff at Alaba and coffee seedling at Dale, marketed surplus of commodities of intervention were found to be significant.

Therefore, after controlling the pre-treatment differences the PSM, Kernel matching estimator, has resulted in a positive and significant impact of marketed surplus and market orientation of treated households. These estimates were also found to be robust for bootstrapping and sensitivity analysis (dummy confounder).

4.2 Recommendations

The policy implications that can emanate from this finding are as follows. As the finding of this study reveals a positive and statistically significant impact of the project on participant households, in terms of marketed surplus and market orientation, an effort of such kind plays a vital role in making smallholder farmers market oriented and makes them better off by making their farming a business enterprise. In an effort for making smallholder farmer market oriented their needs a holistic approach (improved technology provision, knowledge management, market information, institutional and organizational improvements and capacity development) which the experience of IPMS showed.

The development of institutional and organizational set up market supports more farmers in being able to produce more according to the signals from the market and to be able to market oriented. Moreover this development creates opportunities for farmers to get on time farm inputs, market information and bargaining power over price. The development of input market of such kind which is participatory-supplied by the private sector, integrated (multifaceted), and sustainable with the provision of market information and new ways of doing can increase the welfare of the communities in the long run and income in the short run.

In addition, it was observed that the interventions that were delivered by the project were not the kind that develop dependency syndrome among the beneficiaries. It was a kind of making beneficiaries self reliant as to from where input is found, as to how to plan farming, to whom to sell and more interestingly as to how to make informed decision regarding output marketing (pricing). Therefore, there has to be such an institution which serve as a bridge among the stakeholders which facilitates the linkage between research-extension-farmer, energizer for the experts of MoA & the farmers' institution (co-operatives) and 'knowledge broker' in the country. Moreover, scaling up of the best practices of the project to other places has paramount importance for the growth & transformation plan and development endeavor of the country.

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