Targeting Extension Service And The Extension Package Approach in Ethiopia

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“Results of agricultural and rural development projects have too often been disappointing, falling well short of their objectives. ...”

“Such projects failed on the human level: the attitudes & behaviour of the people they were setting out to help did not change sufficiently for them to integrate the innovations into their daily life and work or, equally important, perhaps the innovations were in appropriate to their needs, at least as they saw them.” (FAO)

Targeting extension services and introducing an efficient communication system might be a solution.
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Introduction

Ethiopia is endowed with natural resources, especially in Agriculture, which sustained its inhabitants for thousands of years without receiving any technological support from outside. Like any other sectors of the economy, agriculture in Ethiopia has not been open to outside information and consequently, its technological progress has been restrained for long.

In the history of Ethiopian agriculture, it is only recently that development interventions began to penetrate into rural areas with the aim of improving the life of the people. Especially after the second half of this century, various extension intervention programs have begun either in the form of fully fledged programs or as pilot projects. Unfortunately, the impacts of all of these development interventions were not that much significant in terms of improving the life of the rural population in general and the mode of farming and productivity in particular. There were only few changes such as the introduction of artificial fertilizer and the use of improved seeds and animals. But in general productivity per unit area was not significantly improved over the traditional.

Promising results, however, are being attained since very recently with the introduction of technology packages through the Sasakawa Global 2000 project and its successor; The National Extension Intervention Program (NEIP) of the government.

Although this program is very successful from the outset, it has not been yet promoted to most parts of the country, and there are some differences of understanding among actors involved in its implementation at the field level.

Three major differences are identified which relate to the geographical area, the approach and the speed of program implementation. Considering to the geographical area of the program, it is to be clear that each specific package
has its own area of adaptability both in terms of agro-climate and socio-economy. It is not possible to cover the whole country using similar packages. It is necessary to formulate an extension package for each geographical area which demands each regional state to target its regional extension service.

Currently, a national extension system - Participatory Demonstration and Training Extension System (PADETES) is designed under this frame work and implemented in Ethiopia. However, PADETES indicates only the general statements and directives envisaged by the central government. Specific objectives to be met, detail activities to be carried out, the methods of communication for each activities, the clients to be served and finally the organization required to achieve the objectives set should all clearly be defined for each regional and local government depending on it’s specific political, social and economic context.

Chapter one of this booklet deals with elements of targeting the communication intervention with the aim of providing information on issues that needs to be carefully considered when trying to target an extension service.

The second difference relates to our understanding of the program itself. NEIP has its own approaches and strategies of implementation that have led to our success in the last four and five years. Implementers of the program at the field level needs to be aware of these features and use them as a guide line so as to sustain the program and expand its coverage smoothly.

Chapter two - the SG 2000 extension approach and the national extension package program, is therefore, aimed at introducing the approaches and the essence of the program as a whole.

The third major difference lies on the speed at which the program has to be applied and on its limits. In some areas development agents are trying to register all of the farmers under their center to be involved in the demonstration program. This is a case which also happens at district and
zonal levels. Others are trying to complete the task of demonstration in a given area within a short period of time.

Chapter three of this booklet, therefore, presents the role and importance of extension package program planning. It gives guidance as to how much, where, when, and how a certain activity needs to be implemented.

In general, this booklet is prepared with the aim of providing some guidelines to field level extension staff involved in the implementation of the NEIP on how it can be implemented in a better, steady and sustainable manner.
1. Targeting elements of the communication intervention

It is not possible to employ similar mode of intervention to all agro-ecologies or socio economics. Adopting a suitable approach for each target category (targeting) is therefore the primary task of an extension organization in trying to promote agricultural technologies. Targeting involves all elements of the program/system including the objectives, the target clientele, the offering, the methods of communication and the organization and each element has a pervasive influence on the other. For example if the clients of an extension intervention program in a certain community is decided to be the female group of the society, then, we need to look for a different and appropriate form of objective, media, program content and organization than when we were working with male farmers. Introducing a capital intensive technology requires a target category of people who would have access to capital either in the form of a credit or by owning.

The Objectives :

Extension approaches vary in their objectives. Some focus on local needs, others try to satisfy central needs; still others attempt to carry on both objectives without discrimination. Some give special emphasis to qualitative rather than to quantitative objectives, such as, emphasis on the importance of empowering the society through organization instead of emphasis on achieving higher per capital income or gross domestic product.

Some extension approaches underline the importance of achieving national food self-sufficiency, while equity receives the highest priority of other systems. These are the various issues that need to be carefully considered when setting the objective of an extension approach. Decisions are taken depending on the prevailing political, social and economic realities. In general, present day extension approaches especially in developing countries, focus more on equity than on food self-sufficiency mainly because of political rather than economic reasons. However, in Ethiopia, at least for the short term, food-self sufficiency seems to receive priority attention of the government. As a matter of fact, the question of equity is not that much important under Ethiopian condition. Probably because of the land reforms taken at different times, farmers do not own a holding of more than two
hectares each, and as a result, they happen to be equally poor and there exists no major discrepancy in wealth.

The clientele :=

Extension, often is faced with the dilemma on deciding where to work and which clientele to serve. This will be a challenge especially when resources allocated for extension are short in supply or scarce. The challenge is faced in terms of agroecology, level of wealth, and gender.

Refering to agro-ecology, farmers are living in all agro-ecologies including in high potential areas, marginal areas, nomadic areas and degraded areas. Regarding to wealth, there are resource rich farmers, small farmers and the rural poor. With respect to gender, there are women, the youth and adolescents. Now, the question is where shall we invest our scarce resources in terms of agro-ecology, wealth and gender?

The answer to the first two challenges lies on the objectives set by the government. If the objective is equity, then the focus will be on poor, small-scale farmers and in low potential areas. Extensionists who argue for the equity, advocate that one can not allow large proportion (usually 60-90%) of a country’s inhabitants (small farmers) to be neglected or to be squeezed out of agriculture without developing alternative employment opportunities. They want to hold the poor in rural areas. On the contrary, when the objective of an extension system is decided to be national food self-sufficiency, then high potential areas (which usually host resource rich farmers) receive the highest priority. Scholars of these second category argue that a country cannot develop as long as 60-80% of its labour force is tied up in low productivity or traditional agriculture of one hectare or two. It is not wise to allow the use of scarce national resources on small farmers in marginal areas where there is no economic return on capital. available knowledge in plant and animal breeding, disease control, fertilisation and modern management techniques should be used to produce the required yields of the fast growing population. The potential to use these technologies lies only on those high production potential environments. They also argue from an environment point of view; they say that high-technology agriculture requires less destruction per unit of output than inefficient and low-technology agricul-
ture. For those living in low production environments, governments should create through investment, income generating opportunities; so that, those who need food, would have the income to purchase it.

Gender is another important factor that need consideration in targeting. Most extension services usually target their services at the head of the family and forget to consider the other members, assuming the effect of trickle-down process which may not always happen in reality. There are practical examples where family well being were challenged because of following such a wrong approach in our recent efforts of the package program of SG 2000 and the National Extension Services:

**Case 1.** Family clash caused by an introduction of a vertisol package by SG 2000 Ethiopia

At the early days of SG 2000 promotional effort in Becho area (West Shoa zone of Oromia region) a DA fails to consider the house wife in promoting his vertisol package, and after an extended discussion with the house-head, they agreed to shift the traditional wheat planting time from September to June and implement the whole elements of the package in place of the traditional practices. The ill informed house-wife heard a rumor from her neighbors about the resolution passed by her husband and the DA in a distorted way. She was told by neighbors that her husband had violated the traditionally accepted planting and management method of wheat and as a result her children were at risk of starving if crop failure were to happen on that season. She then tried to negotiate with her husband if he may change his decision. The answer was no. The disappointed woman, secretly drank a poison and fell helpless. Luckily enough, a project staff was around the village to take her to a clinic and save her life. After harvest, the woman regretted about what she has done. The husband harvested ten times more than the traditional harvest from the same land.

Although the final achievement was promising, the approach of the DA was not correct in that it has created a family clash. He had to be accessible for all family members who are important in passing decisions concerning the family affair. After all, the end result of extension should be improving the well being and quality of life of the family as a whole.
The offering:

The offering or the message to be conveyed to the farming community is the other source of variability between extension approaches. Some focus on a certain commodity while others try to address the whole farming system. Some depend only on transfer of technology; for others, human resource development is more important. Others give equal emphasis to all so that they reinforce each other.

The last ten to fifteen years promotional efforts, for example in Ethiopia, were concentrated on human resource development (HRD) and gave emphasis to organizing and strengthening peasant associations, service cooperatives and producers cooperatives. Presently, the package program to extension seems to exert its energy on transfer of technology (TOT) putting less emphasis to farmers organizations. However, the advancement in technology promotion is hampered by the lack of farmer organizations in rural areas creating a burden to the extension service. A practical case can be given as an example. It happened in Southern Region, Sidama zone, Gara Rikta DC: where SG 2000 Ethiopia Started its activity in the early 1993. A farmer named Genole from the village, got the chance to participate in the EMTP program during the first season. He received the inputs of the package from the DA on credit basis for the first two years as part of the skill training exercise. After Genole had mastered the knowledge and skills required to implement the package, he was left to continue on his own and the DA passed on to give similar advice to other farmers who were not included before.

What happened next is an interesting case that gives a lesson to extension practitioners to equally consider both TOT and HRD in trying to promote extension advices.

This was what happened: Genole started his third year package program by trying to purchase the required inputs for maize production (improved seed, DAP and urea).

He managed to buy his fertilizer from the open market, as there was no private agency or service co-operative engaged in input retailing in his village. The problem was the seed. He could not buy improved seed and decided to replant seeds from his crop from the previous year; it was Beletech: a composite maize variety. He had been using it for two consecutive years as there was no option to get fresh seed. But in the third
year, the yield went down and forced Genole to look for other options. There was only one possibility, he had to beg the DA to register him as fresh EMTP farmer and provide him the necessary inputs. Although the DA knew that input provision is not his professional role, he did not want to disappoint Genole and destroy his social relation in the village. He gave him BH 140: a maize hybrid variety. Genole has now a clean and very lovely plot. But the sad side of this story is that he may not continue having the same kind of clean looking farm in the future like this year, if there is no any service cooperative to supply him with fresh hybrid seed. Extension has failed in that village to strengthen the human resource element of the package, indicating the urgent need to embark on the formation of credit, saving and marketing cooperatives.

The method of communication:

Farmer organizations are pre-requisite to some extension organizations to implement their tasks and thus employ group approaches to extension: Others, advocate on the importance of reaching as many clients as possible through the use of mass methods. Some believe that the provision of information alone is insufficient to bring about social change, and hence, try to find ways and means by which their target clientele can acquire skills. These types of approaches to extension prefer the use of individual methods in extension. This last communication method is usually used by NGO’s who have limited scope both in terms of area, content and type of clients. Government extension services try to employ a variety of methods consisting of individual, group and mass methods. It has also been seen in practice that the use of a variety of methods has a reinforcing effect to bring about a desired change. In the first year of the package program, DAs in the Amhara region exhausted their energy trying to convince farmers to join the program by the use of the individual extension method (face-to-face contact). Positive results, however, were achieved when they started a video-show program that dealt with the success story of the SG 2000 program in the Southern and Oromia regions. After a year’s experience, the effect of person-to-person communication through field days had resulted in the registration of thousands of farmers and DAs in some localities were unable to cope with the needs.

Local radio programs and newspapers have created a competitive spirit among farmers in Tigrai region and have helped to win the confidence of
farmers to join the program. All these examples underline the importance of the use of various formal and informal methods of communication on top of the face to face communication method normally employed by the DA.

The Extension Organization:-

There are controversies on how an extension service should be organized. There are cases where extension is organized functionally by agroecology (highland extension, pastoral extension, irrigation extension, ......) or commodity wise based on enterprise (crop extension, livestock extension, forestry extension, coffee extension,......). If the second option is chosen, there is a problem of integration. Designed extension messages contradict with the needs of the farming system. The first option usually alleviates this problem, although it demands a skilful management system that has the ability to coordinate and efficiently utilize available resources which is not usually achieved by many government extension organizations.

In relation to organizational matters, there exist also the question of accountability. The following questions are commonly raised in regards to accountability.

should the extension agent be answerable to the community?, to the government?, or should it be a go between the two ?. Shall extension play a facilitating, advisory or persuasive role ? Who has the ability to decide on community affairs related to farming ? (the community itself or the agent ?). What would happen when a community rejects an extension program ?

The answers to these questions should always be sound both politically, professionally and ethically if a harmonious extension intervention program is desired to be promoted. However, the answer which seems to be politically sound may not be acceptable by the agent in view of his professional commitment and moral values. There are usually contradictions between central and local needs. The victim to these conflicts is usually the extension agent. He is not always free to think and practice according to his professional orientation. Trying to mediate between the two parties is accepted to be the role of the DA by many development interventionists although the two extremists are always there.
2. The SG 2000 Extension Approach and the National Extension Package Program

The SG 2000 Extension Approach:-

A focus-centered effort and a systematic approach of intervention are the central ideas of the project when compared to conventional approaches. The major elements of SG 2000 extension model are:-

**Realistic size demonstration plots (half a hectare):**- Crop yield results obtained from small on-farm demonstration plots, traditionally established by past conventional extension approaches were too small to easily be counted by using measurable standards like quintals or tons. They had to require extrapolation by the development agent to make it understandable for the farmer. On the contrary, the size of the SG 2000 demonstration plots (Extension Management Training Plots - EMTPs) is about half a hectare. The size of the land does not only help the participating farmers to assess the yield to be obtained, but it also attracts neighbouring and passing by farmers to learn about what is happening.

The fact that the size of an EMTP is big, does not exclude the very small scale farmers to join the program as many people think. If they don’t have sufficiently large plots, they can come in agreement with adjacent farmers to consolidate their plots into one half a hectare and be registered to participate.

**Physical availability of technology packages:**- Transfer of messages or information alone, cannot provide a sufficient basis for adoption. Hence in the case of the SG 2000 approach extension is taken as a process which requires the provision of means (inputs) along with the required information and skills. Traditional extension approaches on the contrary, rely heavily on transferring information alone and do not care much about the availability of the inputs (package) to be extended and hence are not certain whether their clients have access to the package they are going to apply. Even if farmers have access to the inputs, they may not apply the technology because they may lack the skills required. The success story of the SG 2000 project emanates from this inherent nature of integrating the provision of information and skills with the physical inputs which make the educational process a more complete one. This by any means does not imply that the
project is engaged with input provision to the entire farming community, but instead inputs are provided to participating farmers (on credit basis) as educational aids and to help farmers acquire the skills required to implement the technology.

**Farmer Financial Self-Reliance:** Participating farmers are required to pay a 25 to 50 percent down payment for inputs provided to them and are expected to pay the rest after harvest. Apart from promoting self-reliance the partial cash payment for packages extended to participating farmers is believed to speed up the adoption process, since farmers, as stakeholders, pay more attention and care better to their own resources in order to reduce expected risks of losses.

**Participation:** Some people understand participation as something that starts and ends in the village. These people do not want to acknowledge the role of outside information in the development process. This however, is not an acceptable paradigm. As long as an outside information or development process integrates best into the local system, fits with and improves on traditional practices and is manageable with the knowledge and skills of the local people, then this approach can also rightly claimed to be participatory. This is essentially, what is happening with the SG 2000 program. Demonstrations are conducted on farmers own plots and the management of plots is the farmer's own responsibility, albeit with extension backstopping. With former extension approaches in Ethiopia, extension workers were mainly used to take the responsibility of managing demonstration plots themselves, usually, in fenced government plots and invite farmers to learn by observing the results obtained. The idea behind the project's approach is essentially that when farmers conduct demonstrations on their own, they get the chance of evaluating technologies, develop skills and establish firm decisions on its future use or to reject the technology. This is in contrast with their relatively passive role under previous approaches.

**Hands-on practical training:** Training grass-root level extension agents, supervisors and subject matter specialists are some, among many of the elements of the model. Training is conducted on practical and actual field operations supplemented by field days, travelling workshops and study tours.
Research - extension linkage:- Although there were efforts to attain proper research and extension linkage, these were limited functional only at macro and office levels. The linkage mechanisms designed were not effective at the field level. With the introduction of the SG 2000 extension approach, joint definition of extension packages, joint evaluation of programs, joint field visits and review meetings have all made research extension linkage a reality rather than a theory as depicted in most literatures that deal with the subject.

The National Extension Package Program

Elements of Extension Package

The term and phrases ‘package’, ‘technical package’, and ‘extension package’ are usually used interchangeably as having the same meaning. There are distinctions however, among the three; ‘Package’ is a general term used to denote a group of separate items packed together as a single unit. It does not give a complete meaning without a prefix attached to it like in “extension package”, “program-package” etc. ‘technical package’ is a subset of ‘extension package’. We cannot have an extension package without a technical package in it. The elements of the Ethiopian extension package popularized as the extension intervention program include:-

Technical package:- This refers to the technological components of the package. A dairy package for example consists of a 50% incalf heifer, feed, housing, and medical treatment.

Credit:- Credit is provided for those who lack the capital. Farmers cannot change their traditional practice only through a behavioural change involving knowledge and skill. They need to have access to the physical means that effects the change.

Communication method:- One of the strong elements of the extension package program is its communication method. Farmer managed commercial size demonstration plots (EMTPs) are indeed a very powerful communication media. The extension worker plays a facilitating role in the management of the plots. The farmer is responsible for the establishment and management of the EMTPs, not the other way round, as it was often the case
in previous years. Farmers, rather than demonstration plots are primary
targets as opposed to previous practices as illustrated by the following
model.

\[
\begin{align*}
\text{DA} & \quad \quad \text{Farmer} \quad \quad \text{Farm (plot)} \quad \quad \text{Farmer managed demonstrations (like that of SG 2000 EMTPs)} \\
\text{DA} & \quad \quad \text{Farm (plot)} \quad \quad \text{Farmer} \quad \quad \text{DA managed Demonstrations (like that of previous approaches)}
\end{align*}
\]

Fig 1. Comparative role of a farmer at technology demonstration with SG 2000 and conventional extension approaches.

Availability:- A technology can be technically feasible, economically payable and socially acceptable. However, it may not be physically available, thus hindering the technology promotion process. In the extension package program, availability is considered as the most important component; If a technology is not physically available in the market, then we don’t waste time in promoting the information (knowledge) alone. In the former training and visit program, availability was the missing element in the package and as a result the extension effort was restricted only to transferring information and hence was named a ‘talk and vanish’ extension system. A farmer in Awassa, addressing a field day has underlined the importance of availability as an element of any promotional effort as follows:

It was June 1994. The Southern Region Agricultural Bureau was running a field day around Awassa (Gara-riketa DC). An elder has put the following remark after being invited to deliver a speech on the occasion.

“--when the DA came to our village to nominate 10 EMTP farmers (his plan of the season), we did not want to disappoint him by rejecting his invitation there was no volunteer farmer and thus we chose ten victims. We promised them to compensate what they may lose in trying the package. It was later in time that we realized who were the losers. We were, not them. And now all of us want to join the program. But I am afraid that the same story may happen to this village. It was this, long time ago when vaccinators visted our village, we hide our healthy cattle and gave them the sick ones which we have accepted them to die. This was a test. When the vaccinators passed the test and we
became volunteer to vaccinate all of our cattle, they did not come back. So
now, we are afraid that the DA might not be ready to satisfy the village as a
whole. He may not have enough inputs for all of us. We beg you to get
prepared in such respect----"

The extension campaign-chronology

Following the successful introduction of improved agricultural technologies
by SG 2000 project to some parts of the country, the government of Ethiopia
did not take much time to decide and launch a national program with the aim
of reaching as many numbers of farmers as possible in a relatively short time.
The Government also diversified the program content from the original
cereal package to post harvest, livestock and high economic value crops. In
addition to the regular extension campaign through field level extension
workers the national mass-media are also used to support the campaign.

Major Events

The last five years accomplishment of the SG 2000 extension program and
the National Extension Intervention Program (NEIP) is presented as follows.

1993:- The SG 2000 project started its operation in Ethiopia. Available
agricultural technologies within the country were assessed with the
support of the national research and extension institutions. Techno­
lology packages for maize and wheat production were defined and
demonstrated to 160 farmers in a total of seven districts in two regions
(Oromia and Southern regions). Some maize farmers harvested up to
a maximum of 9.4 t/ha and the average yield of maize demonstrations
was 5.1 t/ha. The average for the wheat demonstration plot was 2.8 t/ha. Farmers who harvested the highest maize yields and wheat yields
from the demonstration plots were given awards. This has helped a lot
in speeding up the technology dissemination process by creating
intusiasm and competition among producers.

1994:- In 1994 the project expanded its field program both in terms of crops
and area. Sorghum and Teff were added to the demonstration program
and the number of participants increased to 1600. Several field days
were held. Which has helped to attract the attention of the mass-media which in turn created a general awareness at the policy level. The yield increments attained by participating farmers were even higher than the previous year. Some farmers harvested up to a maximum of 10 t/ha of maize.

1995:- The Government of Ethiopia took the initiative to run the program on its own and launched the National Extension Intervention Program (NEIP) in 1995. In this third year the SG 2000 program reached a maximum of 3500 farmers, while the NEIP covered 35,000 farmers. The beneficiaries were mainly those farmers who live in a relatively moisture reliable agro-ecological zones of the country. This was the year when the maximum productivity of sorghum, wheat and teff EMTPs had reached 8.4, 6.8, and 3.3 tones per hectare respectively. (Annex 1 and 2 indicate the economic advantages gained from the maize and wheat packages)

1996:- The SG 2000 project scaled down the number of its demonstration plots to only 2500 EMTPs. The Government, on the other hand, expanded the number of its demonstration plots by ten fold as compared with the previous year and reached more than 350,000 farmers. At this juncture both the national extension service of the government and the SG 2000 project have shifted their attention from direct involvement in the establishment of demonstrations to staff training and overall program co-ordination. Regional and local governments have gained the capacity to implement the program on their own. During this production season, because of conducive weather and impact of the package program, the country produced surplus maize and exported not less than two million quintals to Kenya.

1997:- Regions are set to expand their agricultural extension demonstration program and conduct some 650,000 EMTPs. The program is also diversified to include livestock, (dairy, fattening, poultry programs) the high value crops (oil crops, pulses, vegetables, spices) and the post harvest (handling, transport, storage) packages.
Lessons learnt

The importance of *linkage* and a *stepwise approach to development* are the two among the many lessons learnt from the National Extension Intervention Program.

*linkage*:- Collaboration among the concerned Government institutions was very effective during program implementation. All concerned bodies have come together to contribute to the success of the NEIP so as to enable the country attain its noble objective- ‘National food-self-sufficiency’. Existing linkage mechanism designed to implement NEIP can be explained by the following model.

![Fig 2. Linkage module of the NEIP](image)

**Where:-**

1  =  policy (central government)
2  =  Technologies (IAR, universities)
3  =  Technical package (Technology departments of MoA)
4  =  Extension package (Extension Department of MoA, SG 2000)
5  =  Program implementation (local gov’ts, agricultural bureaux, credit institutions, input agencies)

*Policy:*- Policy directives including the scope of the program and the direction to be followed concerning NEIP originates from the Federal Government. Policy support would especially be critical in the future
progress of the program as its success depends on the integrated efforts of many sectoral ministries. Extension intervention alone could not solve the problem of food shortage. Creating a conducive environment for agricultural diversification, encouraging the development of agro-industries and private sector investments, improving transport and railway systems and improving export capacities for agricultural produce are some of the areas that may need policy intervention.

- **Technologies:** Without persistent research efforts in technology generation, it is not possible to talk about NEIP. The Institute of Agricultural Research (IAR) is the major source of information although agricultural universities have important roles in the generation of agricultural technologies. In general, collaborative work between research and extension has become very encouraging. As a result, shelved research technologies were promoted effectively during the last four to five years. Research, however, needs to be strengthened if it has to cope with the existing dynamism in extension.

- **Technical package:** Users of research findings may utilize each component independently or in a package form depending on their objectives. Technology departments of the ministry of agriculture are responsible for identifying available technologies and assembling them in a way that is appropriate for the set goals and objectives of the country's agricultural development. For example livestock, high value crops, and post harvest technical packages have already been formulated and presented to the extension department by those departments. Presently agricultural research is not covering all agro-ecological and socio-economic systems of the country. It is important to strengthen technology departments of the Ministry of Agriculture so that they would assist with verification trials and thus fill gap in the information generation and promotion process.

- **Extension package:** A technology can not be adopted if it does not fulfill three conditions. It has to be technically feasible, economically payable and socially acceptable. A research institution can not guarantee its findings to possess all of these qualities. It usually focuses on technical feasibilities. Even such technical aspect may need to be tested for adaptability when
taken to a very specific farming system. The art localizing a technology to fit into the social, economic and political situation of a specific society is the duty of an extension professional. Therefore, once a technical package is formulated by technology departments of the ministry, Extension or some other technology popularization organization such as SG 2000 should play the pioneering role of refining and confirming its usability by different target groups and makes it ready for mass dissemination. The extension department may then formulate appropriate credit and communication strategies and prepare a detailed extension program plan that may not contradict with the operational calendar of the community and may play the role of coordinating the program.

Program Implementation:- This is the task of regional governments, input agencies and credit organizations. Local government councils and agricultural bureaux are the core government institutions who take the grass-root program management responsibility. The ability of local governments to mobilize material and human resources during critical periods like planting, input distribution, and credit repayment is appreciable. Designed incentive structure both for staff and farmers has become an engine for proper functioning of the whole extension campaign. Upgrading the technical competence of grass root extension staff and keeping professionalism at a higher level would be one of the most important measures required to be taken by the government if the NEIP is to be implemented in a more effective and sustainable way.

Step wise approach to development:- The synergic effect was much higher than the impact of applying each individual packages to bring about a positive change towards achieving the general goal of the NEIP. This is clearly noticed in the last five years' experience of the package program. The implementation of the cereal extension packages prior to the introduction of the other extension packages (livestock, post harvest packages-- ) has created a conducive environment for the adoption of the later packages. We could not have enjoyed these advantages if we had introduced all of them at the same time.
Some of the advantages of this approaches:

- **Creation of positive attitudes by participants:** After the successful introduction of the crop packages, DAs built confidence and gained credibility. The community has opened its heart to accept innovations and consequently introduction of new practices took shorter time as compared to previous efforts. Some farmers have already started seeking information from extension workers. This is a welcome development. If one happens to visit a development center during January and February when the main agricultural season begins, he should not be surprised to see farmers lining up in front of the DA’s office to be considered as an EMTP farmer.

- **Savings for investment:** One of the major production constraints dictating the decision of farmers to adopt or not to adopt new technologies is the lack of capital necessary to purchase inputs. Farmers who have participated in the NEIP during the previous years have some savings to enable them purchase new technologies and start new programs as compared to those farmers who have not participated in the program.

- **Spare land:** Land is one of the major production factor which constrained small farmers to improve their farming system through diversification. Graduate farmers have now the ability to produce more on a given unit of pollt which spares them additional land to be used for other programs like fattening and dairy production.

2. **Extension package program planning:**

Once extension packages are defined, its implementation begins by preparing the detailed program of action. The plan can be prepared at all stages starting from the grass-root development center up to the central level. Planning helps to avoid waste of resources (time, money, material). It also reduces the risk of failures caused by mistakes and misunderstandings. However, it has to clearly state what people should learn to do within a given period of time. It is useless having a program that does not clearly state what degree of progress is required to be achieved by the people within a given time. It is therefore advised to avoid vague generalizations or political slogans. The cycle starts by survey and ends by evaluation. The tasks to be
accomplished at each stage of Extension program cycle and the method of preparing the matrix is explained as follows.

The cycle:

1) Situation analysis and identification of existing potentials is the primary stage of program planning which is called the survey. 2) At the second stage, the extension program stage, the root causes of development problems and their possible solutions are determined. Extension packages are prepared based on the findings of the extension program phase in the program planning process. 3) The third stage, the plan of work, summarizes the kind, place and magnitude of work to be accomplished in a specified time and how it could be achieved. It is a detailed statement of action indicating how the program will be carried out. 4) The calendar of work illustrates when each activity has to be carried out and by whom. This is a time table for the various operations identified in the plan of work. It could be presented in a skeleton form indicating what would be happening in a year or more ahead, but more often it covers the next few weeks or months and shows the definite dates when each operations are to be carried out. In a long-term plan, the skeleton calendar will be supported by a series of detailed subset calendars, at intervals of 1-3 months. A carefully prepared calendar of work is essential to the orderly progress of any plan of work.

Equally important to its preparation is the distribution i.e., every participant of an activity (local leaders, extension workers, experts, department heads---) should have access to it. Without a calendar of work, time is wasted, people loose interest and plan stagnates.

5) The final stage of the cycle is the evaluation. An evaluation is necessary to be carried out on completion of each plan of work in order to find out what progress the people have made, whether the teaching methods used were successful and whether the extension program should be modified to suit the changing needs of the community. It is essential to know how many of the people have reached the objectives or goals set, how many are going to reach them, why they have not done so yet, how many have forgotten what they were previously taught, as well as which teaching methods were effective and which were not.
The five essential steps of extension program planning are illustrated as follows.

**3. Plan of work**
- what?
- where?
- how much?
- how?

**4. Calendar of work**
- when?
- by whom?

**2. Extension program**
- problems,
- solutions,
- objectives,

**5. Evaluation**
- measurement of targets
- methods

**1. Survey**
- situations
- potentials

Fig 3. Extension program cycle

**Extension program matrix**

Extension program matrix is an adoption profile for a certain area to be achieved as a result of launching an extension intervention program. The matrix can be prepared for each DC, woreda, zone, region and even for the country as a whole. Very important is how it should be prepared. It has to be prepared in a bottom-up process and not the vice-versa. A carefully prepared program matrix gives a clear picture about our progress and the potentials available to improve traditional agriculture into a better farming system. To establish the extension program matrix of a DC, for example, one needs to have information on extension worker to farmer ratio, the farming system of the development center, the length of period of adoption for each enterprise, and on the copying rate.
For more clarification, a hypothetical program matrix is presented for ‘Alefa DC’ as follows.

Given

a) DA: Farmer ratio = 1:1000
b) enterprise combination/mix of the DC.
   - maize farmers = 1000
   - wheat farmers = 1000
   - dairy farmers = 100
   - poultry farmers = 100
c) adoption period length = 1 year
d) copying rate = 1:9 farmers (90%)

<table>
<thead>
<tr>
<th>enterprise</th>
<th>total no. of farmers a*</th>
<th>Total no. of EMTPs to be conducted b*</th>
<th>no. of EMTPs to be conducted each year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>maize</td>
<td>1000</td>
<td>100</td>
<td>30</td>
</tr>
<tr>
<td>wheat</td>
<td>1000</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>dairy</td>
<td>200</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>poultry</td>
<td>100</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>sum</td>
<td>2300</td>
<td>230</td>
<td>47</td>
</tr>
</tbody>
</table>

b* = 10% a*

Table 1. Hypothetical program matrix for alefa DC.

As it is clearly shown in table 1 above, the DA has accomplished his phase one task in the 3rd and 4th year, i.e. the amount of EMTPs to be carried out directly to change the whole farmers in the DC is accomplished in the 3rd year for maize, dairy & poultry and in the 4th year for wheat. The rest of the farmers are expected to learn by copying. For example in case of maize, the DA needs to run only 100 EMTPs and the rest 900 farmers shall learn by copying, since copying rate is determined to be 90%. In the following years’ (year 4 and above), the DA is required to run only very few EMTPs (5 & 2 in this
hypothetical example) in each enterprise to sustain the program. The very few numbers of EMTPs kept are used as check points or technical standards for the community. At this stage the task of the DA changes from educative to facilitative role which we call the second phase of extension or the production campaign. He doesn’t spend much time in running EMTPs for the purpose of teaching but he leaves few only to keep standards. However, his major task at this stage would be to help farmers on how to get access to inputs and credits. He can also provide market information. This facilitating role would not last long. Farmers may need to learn new farm management techniques and as a result there may come a time when the community needs to change the farming system as a whole in order to cope up with the changing environment: (advancement in agricultural technology, change in the demand of consumers, change in production objectives of farmers—). When such a situation occurs the role of the DA and the program matrix or demonstration curve changes once again. This cycle continues indefinitely with the change in the environment.

The effect of a change in a farming system on demonstration curve can be illustrated as in figure 4.

![Diagram](image)

fig 4. The role of DA in a changing farming system.
Annex 1


<table>
<thead>
<tr>
<th>Description</th>
<th>Operation</th>
<th>Cost in birr/ha</th>
<th>Conventional</th>
<th>Improved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>w/s</td>
<td>wo/s</td>
</tr>
<tr>
<td>CULTURAL PRACTICE</td>
<td>Tilling</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>Furrowing</td>
<td>-</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Planting</td>
<td>40</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>First weeding</td>
<td>120</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Side dressing</td>
<td>-</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Second weeding</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Harvesting</td>
<td>40</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Shelling</td>
<td>130</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>TOTAL LABOR COST</td>
<td></td>
<td>650</td>
<td>790</td>
<td>790</td>
</tr>
<tr>
<td>INPUTS</td>
<td>25 kg seed</td>
<td>25</td>
<td>58</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>100 kg DAP</td>
<td>-</td>
<td>178</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>100 kg Urea</td>
<td>-</td>
<td>168</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>180 Grs. Marshal</td>
<td>-</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Input delivery</td>
<td>-</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>TOTAL COST</td>
<td></td>
<td>675</td>
<td>1284</td>
<td>1495</td>
</tr>
</tbody>
</table>

Average production in Q/ha | 20① | 57 | 57 |
National average producers price① | 74 | 74 | 74 |
Gross revenue              | 1480 | 4218 | 4218 |
Net revenue                | 805  | 2934 | 2723 |
Cost difference due to technology | 609 | 820 |
Additional income due to technology | 2129 | 1918 |
Value Cost Ration          | 3.5  | 2.34 |

w/s = with fertilizer subsidy, wo/s = without subsidy
Annex 2

Cost of wheat production per hectare on non Vertisols: Conventional versus improved practice and their profitabilities. 1995 season

<table>
<thead>
<tr>
<th>Description</th>
<th>Operation</th>
<th>Cost in birr/ha</th>
<th>Conventional</th>
<th>Improved</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>w/s</td>
<td>wo/s</td>
<td></td>
</tr>
<tr>
<td>CULTURAL PRACTICE</td>
<td>Tilling</td>
<td>300</td>
<td>300</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Broadcasting Seed</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Broadcasting Fertilizer</td>
<td>-</td>
<td>10</td>
<td>10</td>
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</tr>
<tr>
<td></td>
<td>Covering</td>
<td>40</td>
<td>40</td>
<td>40</td>
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</tr>
<tr>
<td></td>
<td>Weeding</td>
<td>150*</td>
<td>10</td>
<td>10</td>
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</tr>
<tr>
<td></td>
<td>Swathing</td>
<td>40</td>
<td>60</td>
<td>60</td>
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<tr>
<td></td>
<td>Transporting for threshing</td>
<td>15</td>
<td>25</td>
<td>25</td>
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<tr>
<td></td>
<td>Threshing</td>
<td>30</td>
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<td>60</td>
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</tr>
<tr>
<td></td>
<td>Winnowing &amp; bagging</td>
<td>20</td>
<td>40</td>
<td>40</td>
<td></td>
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<tr>
<td>TOTAL LABOR COST</td>
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<td>605</td>
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<tr>
<td>INPUTS</td>
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<td></td>
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<tr>
<td></td>
<td>100 kg Urea</td>
<td>-</td>
<td>168</td>
<td>240</td>
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</tr>
<tr>
<td></td>
<td>Herbicide a) Broad Leaf</td>
<td>-</td>
<td>80</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Grass Weeds</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Input delivery</td>
<td>-</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>TOTAL COST</td>
<td></td>
<td>867</td>
<td>1351</td>
<td>1495</td>
<td></td>
</tr>
<tr>
<td>Average production in Q/ha</td>
<td></td>
<td>12*</td>
<td>32</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>National average producers price*¹</td>
<td></td>
<td>120</td>
<td>120</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Gross revenue (grain + Straw)</td>
<td></td>
<td>1440</td>
<td>3840</td>
<td>3840</td>
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</tr>
<tr>
<td>Net revenue</td>
<td></td>
<td>573</td>
<td>2489</td>
<td>2345</td>
<td></td>
</tr>
<tr>
<td>Cost difference due to technology</td>
<td></td>
<td>484</td>
<td>628</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional income due to technology</td>
<td></td>
<td>1916</td>
<td>1772</td>
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<tr>
<td>Value Cost Ration</td>
<td></td>
<td>3.96</td>
<td>2.82</td>
<td></td>
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</tr>
</tbody>
</table>

* Hand weeding
*¹ = CSA Stat. Bulletin 149
*² = CSA Stat. Bulletin 152
w/s = with fertilizer subsidy, wo/s = without subsidy
Bibliography


"The fact that we live in an information and communication epoch has accelerated the drive to use the media more purposefully and systematically for development. If attitudes and behaviour are being constantly influenced by communication on the commercial and political fronts, why can not it do the same on the rural development front?"

(Communication for rural development - FAO.)