National Agricultural Extension Systems in Nepal

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Executive Summary

Agricultural extension service is one of the major under takings of government to educate, disseminate information and support the livelihoods of the Nepalese farmers. The extension service provides both productive inputs and services to teach farmers about improved technologies so that they can improve their productivity, incomes and standard of living. The extension service also helps to empower the farming communities by forming farmers groups to help them to decide on how best use of available local resources and to articulate the needs of farmers.

Since 1950, government has implemented several extension models and approaches with donor support or support from the government's own resources. The models / approaches adopted in Nepal are conventional, T and V, Block Development, IRDP, Tuki, Farming System Research, Farmer Group Approach, Contract out / Partnership of Extension Programs, IPM (Farmers Field School) and others. These approaches all have some strengths and weakness but all of these approaches / models have made significant contribution to educate and transfer of technology to the farmers.

Initially, Agricultural Extension System in Nepal was mostly used as synonymous to government/public services. The economic globalization, liberalization, privatization and advent of information and communication technologies have been brought tremendous changes in the field of agriculture development. The needs and interests of the farmers, knowledge and information on production technologies and production objectives are changing rapidly. Thus, farming is now closely linked with quality production, market competitiveness and sustainability rather than the increasing production alone. As a result of this paradigm shift in agriculture, the role of government extension services has also changed. There is a shift for government to play more of facilitation role and for more services to be provided by the private sectors. Now, there are different types of organizations other than government agencies providing extension services to the farmers on contract out or partnership basis. The extension service providers in Nepal can be identified as governmental, community based organizations (CBOs) such as farmers associations and cooperatives, developmental and institutional organizations (IAAS, NARC, vocational Trade Schools, NGOs, training institutions, etc.) and private service providers (agrovets, traders/processors, contractor/consultant, etc.)

In spite of the significant efforts made by extension system, however, there are still several problems and issues that require attention to perform its function more efficiently and effectively. One of the major challenges for agricultural extension system is how to serve the majority of rural poor and socially disadvantaged groups who had long been neglected by extension and other services. Other problems are inadequate linkage among research and extension, education, farmers and other stakeholders, poor infra-structural development, insufficient number of extension personnel etc. to carter diversified agricultural services.

Government has decided to implement the full fledge devolution modality in 14 district out of 75 districts to provide quality services based on the needs and interests of local communities. But it seems that there are several issues to be resolved in this modality, particularly the full fledges devolution of agricultural extension programs. In past, agricultural sector had always been placed at lower priority both in terms of program planning and budget allocation in district level planning, which may create both financial as

well as managerial problems in the long run. It should be noted that it is agricultural services that have the most direct impact on increasing the incomes of poor rural farmers.

The country paper consists of different technical chapters including one main theme paper on Review of Agricultural Extension System in Nepal. There are all together 7 chapters in the paper. The first part of the paper attempts to provide an overview of the agricultural service system in Nepal including historical perspectives of extension organizations, comparative analysis of different models and approaches adopted in past and at present and out comes of these approaches in over all agricultural development.

The paper also describes the national extension strategy of the country, with historical background and periodic reformation of the system. This paper has made an attempt to justify the need of national extension system. The second chapter has tried to analyze the different organizations of National Agricultural system, agencies involved in the system, extension planning process of the country, coordination mechanism between public and other different agricultural development sectors. It also describes the aspects of devolution, some experiences of devolution practices adopted in different countries. It has also discussed about the possible consequences of agricultural extension devolution in Nepal and has made some suggestions to move ahead.

Third chapter consists of institutional reform including partnership and collaborative effort in agricultural extension. The paper has made an attempt to foster the areas of partnership, comparative strength of public and private service providers and some experiences of partnership program in Nepalese agricultural extension system. This chapter also describes the accountability hierarchy in over all government system in Nepal related with Agricultural Extension Development and over all management information system of the nation. Fourth chapter is trying to explore on human resource development and capacity building and fifth chapter regarding the linkage system, mechanism and their importance for the development of agriculture. Sixth chapter provides an over view of monitoring and evaluation system of agricultural extension system of Nepal in general. The paper has thoroughly analyzed the common features and issues in extension service delivery with more emphasis on agricultural extension system with some meaningful recommendation.

The paper is trying to indicate that legislation on agricultural extension is essential to provide the policy mandate, direction and necessary support to build a stable and effective extension system.

1. Introduction

Nepal is a land locked country situated between the People's Republic of China in the north and Republic of India in the remaining sides. It has an area of 147181 km² of which 51817 km² are covered by Mountain region, 61345 km² are covered by Hilly region and 34019 km² are covered by Terai region. Nepal has a population of nearly 30 millions.

Around 85 per cent of Nepal's people live in rural areas. They draw their livelihood primarily from agriculture and related activities. The share of agriculture in GDP was 39.16 in 2002/2003. However, majority of people still continue to depend heavily on agriculture sector for income and employment opportunities. The 2001 census indicate that till now 65.6 per cent of economically active population in Nepal are employed in agriculture and related activities (Economic Survey 2000/2001). Women constitute about 60 per cent of labour force. They have little access to alternative employment opportunities. They are among the poorest in the country. With small operational land holding averaging even less than half hectare, agriculture reflects low level of productivity and absence of viable employment opportunities for the rural people and thus poverty perpetuates.

Nepal is a multiethnic and multilingual society. The 2001 Census identified 103 caste or ethnic groups and subgroups of the population. Similarly, same Census lists 93 different languages or dialects prevalent in the country. These languages originated from two major groups: the Indo-Aryans, who constitute about 85 percent of the population, and the Tibetan-Burmese, who constitute about 15 percent of the population. Nepali is the official language of the country and is the mother tongue of about 49 percent of the population. Newari, Maithali, Awadhi are other languages spoken in the country.



Map of Nepal

Nepal, noted for her majestic Himalayas, the roof of the world, Sagarmatha, Mount Everest (8848 m) in the north and the lowest point Kechanakal (70 m) in the south. The Himalayas which in Sanskrit means the home of snow, the water towers, which supply water to the Indo-gangetic plain of Indian subcontinent, are the proud of the mountainous and hilly country, Nepal. Its shape is roughly rectangular, about 650 kilometers long and about 200 kilometers wide. Climate of Nepal varies from cool summers and severe winters in north to subtropical summers and mild winters in south.

Agriculture sector still has prime role to play in Nepalese economy. This sector has 38 percent contribution to the National GDP and 13 percent of the total foreign trade of the country. Keeping in view of the contribution, the agriculture sector was given priority for its development from the onset of the periodic plans till the Eighth Five Year Plan. In this background, the major objective and challenge of agriculture is to reduce poverty and to support the development of non-agricultural sectors through high growth in agriculture.

1.1. Review of Agriculture Extension System in Nepal

1.1.1. Agriculture Extension in Conceptual Framework

Different extension specialists have conceptualized agriculture extension in different ways. This is natural that the definition has been retuned on the basis of changing context. The basic concept of extension is to transfer the appropriate technologies to the farmers and get them adopted for their benefit. Extension always puts emphasis on educating the cliental to solve the problems absorb the changes and stand on their own. However, some of the concepts have been mentioned below:

- (i) Agri. Extension relates to the process of carrying the technology of scientific agriculture to the farmer in order to enable him to utilize the knowledge and a better economy. It seeks to impart the necessary skills to the farmers for undertaking improved agriculture operations, to make available to them timely information about improved practices in an easily understandable form suited to their level of literacy and awareness, and to create in them a favorable attitude for innovation and change (Benor *et. al* 1984)
- (ii) The extension is an ongoing process of getting useful information to people (the communication dimension) and then in assisting those people to acquire the necessary knowledge, skills and attitudes to utilize effectively this information or technology (the educational dimension). Thus extension is central mechanism in the agriculture development process, both in terms of technology transfer and human resources development (Samantha, 1993).
- (iii) Van dun and Hauking (1997) states that synthesized perspectives of extension are:
 - Transferring knowledge from researchers to farmers.
 - Advising farmers in their decision-making.
 - Educating farmers to make similar decisions in the future.
 - Enabling farmers to clarify their goals and possibilities and to realize them. Stimulating desirable agricultural development.
- (iv) To fit into current context, the agriculture extension should be capable enough to provide advisory services to farmers, processors, traders and other stakeholders involved in the value chain system of agriculture.

1.1.2. Historical Background of the Department of Agriculture

- 1942: Agriculture Office was established as an institutional effort.
- 1952: Department of Agriculture was established.
- 1966: Restructuring of Department of Agriculture and establishment of five Departments:
 - Department of Agriculture Extension
 - Department of Fishery
 - Department of Horticulture
 - Department of Livestock Health
 - Department of Agricultural Education and Research
- 1972: Lack of effective coordination among the departments again led to the creation of the Department of Agriculture.
- 1972: The need and sensitivity of agricultural markets gave rise to the establishment of the Department of Agricultural Market Services.
- 1979: In view of effective program implementation of agriculture and livestock sectors two separate departments; one for agriculture and another for livestock were established Department of Agriculture and Department of Livestock Services.
- 1990: Establishment of Department of Horticulture.
- 1992: under one umbrella policy all the five Departments Horticulture; Crop and Fishery; Food, Agriculture and Market Services; Livestock Health and Food Research Laboratory were brought into one department called the Department of Agricultural Development. Under this department one Director General and seven Directors were posted.
- 1995: Under the new restructuring program three departments came into existence; viz -Department of Agriculture, Department of Livestock Services, and Central Food Research Laboratory.
- 2000: To enhance the effectiveness of services and supports to the Department of Agriculture, 11 Technical Divisions at the center were reorganized into nine Program Directorates.
- 2004: Program Directorates were reorganized and established 12 Program Directorates and 14 National Programs under the Department of Agriculture.

1.1.3. Agricultural Extension in Nepal

The Tribhuvan Village Development Program (TVDP) included agriculture extension as one of the components, which was the first in its kind. It was essentially an integrated development program, where promotion of agriculture was the core component. Following "Block Development Approach" TVDP encompassed other social components like education, adult literacy, health and the general community development activities. However, TVDP could not continue longer.

The subsequent approaches followed in agriculture extension included the establishment of Zonal Agriculture Development Offices (ZADOs) and District Agriculture Development Offices (DADOs) and recruitment of field level extension workers - Junior Technicians (JTs) and Junior Technical Assistants (JTAs), the JT/JTAs with a modest training in general agriculture, which also included agriculture extension as one of the subjects, were supposed

to make the farmers aware and persuade them towards adopting new technologies, considered superior to those already in practice.

Awareness raising methods among the farming communities were used. These included individual contacts, group contacts and mass contacts. Attempts were also made to convince the farmers about the superiority and usefulness of the modern/improved advocated technologies, applying the most common extension tools, such as method and result demonstrations, agriculture fares and farmer's day, farmer's field visit and observation tours, and use of audio-visual aids.

The traditional extension approach was based on the "Trickle down" theory of the dissemination of technologies. The underlying assumption of this approach was that if innovation is introduced to small number of farmers (progressive/contact/leader farmers) the diffusion process would automatically take place, and there will be multiplier impacts of the interventions. This approach was successful to a limited extent. There was inadequate motivation for the poor farmers to take the benefit of technology adoption. To overcome this problem, the need for deliberate attempts to reach such farmers was realized. To support and provide reinforcement to the field level extension workers -(JT/JTAs), Para extension workers (such as "Agriculture Assistants", and 'Tukis") were employed. However, these grassroots level extension support workers very soon became non-functional as they were poorly paid and inadequately motivated. And the JT/JTAs again remained the sole extension agents with a lot of limitations. More emphasis was laid on technical support while social mobilization was neglected.

It was considered important that government alone may not be able to cater fully to the needs of providing necessary production inputs and technical service to all farmers and in all geographical areas. Realizing this, the government has adopted the policy of farmers' group approach and involving the Community Based Organizations (CBOs) and Non-Government Organization (NGOs) in the development efforts. It is assumed that it will be easier for the extension workers to reach the maximum number of farmers and would be sustainable even after the phasing out of the external assistance.

Despite many perceived weaknesses in farmer group approach, the government is pursuing this approach to serve as the vehicle for bringing socio-economic changes at the grass root level. The government is trying at best to remove the weaknesses identified so far about the group and redefine the role of government.

Past Efforts

The history of agricultural development can be traced since 1950 and even before. But to have a comprehensive idea it can be divided into two parts, as follows:

Before 1950: This period includes the opening of Nurseries, Veterinary Hospitals, Central Research Farm, and Technical School etc. Administration was centralized, and there was no problems regarding linkages and coordination. Level of farmer's awareness and ambitions were very low and the farming was almost subsistence type.

After 1950: Systematic efforts towards national development began in the fifties with the formulation and subsequent implementation of the first five-year plan in 1956. All the plans formulated since then have emphasized generation of appropriate agricultural technologies and their effective dissemination.

The agriculture extension program was first included as a build in component of the comprehensive Tribhuwan Village Development Program (TVDP), implemented through USAID assistance. It was essentially the integrated village development program, where promotion of agriculture was the core component. Following "Block Development Approach" TVDP encompassed other social components like education, adult literacy, health and the general community development activities. However, TVDP could not continue longer.

The subsequent approaches followed in agriculture extension included the establishment of Zonal Agriculture Development Offices (ZADOs) and District Agriculture Development Offices (DADOs) and recruitment of field level extension workers - Junior Technicians (JTs) and Junior Technical Assistants (JTAs), the JT/JTAs with a modest training in general agriculture, which also included agriculture extension as one of the subjects, were supposed to make the farmers aware and persuade them towards adopting new technologies, considered superior to those already in practice.

Various extension methods such as individual contacts, group contacts and mass contacts were used for awareness rising among the farming communities. Attempts were made to convince the farmers about the superiority, usefulness and profitability of the advocated technologies, applying the most common extension tools, such as method and result demonstrations, agriculture fares and farmer's day, farmer's field visit and observation tours, and use of audio-visual aids. This traditional approach of extension continued for many years before some of its basic weaknesses were recognized as the limiting factors in motivating adequately the farming community to adopt the recommended agricultural practices. It was realized that these were some inherent drawbacks in the system in a way that majority of the farmers could not be reached. Specially, the poor and deprived communities remained, by and large, out of the reach of the extension services. The main reason attributed to such situation was the limited number of field level extension workers, as compared to the vast number of farm households, combined with difficult terrains especially in the hill and mountain.

The traditional extension approach was based on the "Trickle down" theory of the dissemination of technologies. The underlying assumption of this approach was that if innovation is introduced to small number of "progressive farmer" "contact farmer", "leader farmers" and likes, the diffusion process will automatically take place, and there will be multiplier impacts of the interventions. This approach met with limited success, mainly due to the limited resources in terms of technical advice, production inputs and credit, service in remote areas. Adequate motivation and persuasion were not there for the poor farmers to take the benefit of technology adoption. To overcome this problem, the need for deliberate attempts to reach such farmers was realized. To support and provide reinforcement to the field level extension workers - (JT/JTAs), Para extension workers (such as "Agriculture Assistants", and 'Tukis") were employed. However, these grassroots level extension support workers very soon became non-functional as they were poorly paid and inadequately motivated. And the JT/JTs again remained the sole extension agents with a lot of limitations.

Carrying out agriculture extension activities solely by JT/JTAs was not only the numerical problem of non-availability, but it also suffered conceptually. Under this system, too much emphasis was laid on technical support, and social mobilization aspect was neglected. It was deemed necessary that delivering the technical services without social preparedness, at the receiving end, is not going to achieve the purpose of agricultural development. Restoration

of multiparty democracy in the country in 1990 gave Nepal a new multiparty democratic constitution in 1991, which appropriately recognized decentralization as a means to ensure optimum involvement of the people in the governance. In this context it was therefore realized that social mobilization at farmer's community should be done through farmers groups empowered to effectively participate in development programs. It was also considered important that government alone may not be able to cater fully to the needs of providing necessary production inputs and technical service to all farmers and in all geographical areas. Accordingly, the government has adopted the policy of carrying out the extension activities through following the farmers group approach and involving the Community Based Organizations (CBOs) and Non-Government Organization (NGOs), in the development efforts of the government, It is assumed that it will be easier for the extension workers to reach the maximum number of farmers through groups; and the groups if properly developed can efficiently manage its activities through their capacity build up. The approach may be sustainable even after the phasing out of the external assistance. Despite many perceived weaknesses in farmer group approach, the government is pursuing this approach to serve as the vehicle for bringing socio-economic changes at the grass root level. The government is trying at best to remove the weaknesses identified so far about the group and redefine the role of government.

1.2. Review of Extension Approaches

1.2.1. Approaches adopted in the past

- (i) **Training and Visit System:** This system was based on the principle of single line of command with continues training and contacts. Research extension linkage was stronger though material support for adoption was quiet weak.
- (ii) **Integrated Rural Development Approach:** This approach was based on the integration and coordinated management of resources for rural development. Technology support was not adequate.
- (iii) **Tuki Approach:** This approach had the thrust of utilizing trained local farmers based on self-motivation principle. These farmers were also working as agri. input dealer, so that the technological message could go along with inputs required.
- (iv) Farming System Research and Extension Approach: This approach viewed research and extension in the whole farming system perspective, so that cropping system research could be done. Farmers would know the interdependencies between components and could relate to physical, biological and socio-economic factors.
- (v) **Block Production Program:** This program was based on the principle that intensive use of resources consolidated together in an area called "Block" could increase the productivity. This was not effective for scattered area.

1.2.2. Approaches at present

(i) **Conventional Educational Approach-** Besides the group members, the key farmers are involved in the process of motivation and education. The farmers themselves in a wider area disseminate the knowledge and skills taught to them. This approach has been effective to facilitate the adoption of new innovation by interested farmer, which eventually radiated demonstration effect to neighboring farmers.

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(ii) **Pocket Package Approach-** Pocket package approach refers to the production strategy on pocket area basis. The feasible pockets for a certain commodity are selected and then a project is developed through bottom up process. This has been positive to introduce the package of technologies as demanded by pockets. It has also helped to develop the crops/commodities on commercial scale.

- (iii) **Projectization Approach** Every commodity based production program has been implemented on the basis of Project-designed within the frame work of time duration, budget expenditure and expected output Package of activities which are required to achieve the output are identified and included in the Project. This approach has been adopted in all the seventy-five districts with a priority in the production pockets.
- (iv) **Farmers Group Approach** The principle is to put the farmers of same interest together and carry out the activities on group basis. This has been very effective to bring the innovation to the groups, which in turn expand to its command area farmers. The limited manpower and other resources can be well utilized by means of group.
- (v) **Farmers Field School Approach**-This is based on the principle of adult learning. This has been very effective approach in reaching farmers and helping them to have an access to the knowledge and skills required for crop management. This approach is becoming popular because of its democratic and participatory process.
- (vi) **Partnership Approach-** Government organizations is undertaking partnership approach with other organizations like Department of Irrigation, NGOs, CBOs, Private Organizations etc, to effectively deliver the extension services. This strategy has encouraged relevant stakeholders to join hands in development.

Comparative Performance Indicators of Various Extensions Approaches Adopted in past

S.	Particular	T & V	IRDP	Tuki	FSR/E	Conventional	Block
No.							Production
1.	Relevancy of Technical recommendation	Low	Low	Low	High	Low	High
2.	Agent client ratio	1:1621	1:1244	1:1154	1:451	1:1270	1:192
3.	Research Extension Linkage	High	Poor	Medium	High	Poor	Medium
4.	Coordination	Low	Low	Low	Low	Poor	High
5.	Contact cost by JT/JTAs (Rs.	3.59	2.13	7.69	8.74	6.37	7.59
6.	Information flow	Effective and Rapid	Effective and Slow	In effectice	NA	Ineffective and slow	Effective and Rapid
7.	Visit to farm	High and Scheduled	Low and non- scheduled	Non- scheduled	Non- scheduled	Low and Non- scheduled	Non- scheduled
8.	Generation of Technology	No	No	No	Yes	No	Yes
9.	Competency of workers	Low	Low	Low	NA	Low	High
10.	Privatization of inputs	No	No	Yes	Yes	No	No
11.	Training of field staff	Regular and Scheduled	Irregular and Non-scheduled	Irregular and Non- scheduled	Irregular and Non- scheduled	Irregular and Non-scheduled	Irregular and Non- scheduled
12.	Clarify in job description	Yes	No	Yes	Yes	No	No
13.	Supervision and Monitoring	Yes	No	No	Yes	No	yes

1.3. Latest National Agricultural Extension Strategy

Background

With the devolution of agricultural extension function to the local elected bodies (District Development Committees) as per the letter and spirit of the Local Self Governance Act 1999 (LSGA), the Ministry of Agriculture and Cooperatives has been attempting to formulate National Agricultural Extension Strategy (NAES) consistent with the LSGA, APP, national agricultural policy and national periodic plan. The work was initiated by the World Bank supported Agricultural Research and Extension Project in 2001. As we all know, a taskforce was formed and a national workshop was held in September 2001. Several excellent working papers were prepared and presented at the seminar. However, efforts of AREP to reformulate NAES by accommodating changed political, institutional, social, and economic landscape and the visions on service delivery approaches appropriate to the 21st century remained incomplete. The AREP was terminated as it completed its planned period. Prior to the above, we recall to other National Agriculture Extension Strategy which was formulated in 1994 keeping in view of the upcoming Agricultural Research and Extension Project. Despite that the official status of the 1994 strategy is not known, the Agricultural Research and Extension Project (AREP) was approved by the World Bank after the formulation of this strategy and that the MoAC and World Bank both were happy with the then strategy formulated in 1994. Implemented in 19 Terai districts and 4 hill districts of Nepal between 1997 and 2002, AREP is credited for its attempts to introduce several reform measures, methods and approaches in the agricultural services delivery, which, among others, include the farmer centered participatory group approach, projectization, privatization and partnership (GOs, NGOs and private sector) approaches in agricultural service delivery. The influences of this project in Nepal's agricultural history will remain for many years. With the termination of the AREP, the Agriculture Perspective Plan Support Program implemented by the MoAC in July 2003 with the support of the DFID agreed to support the Ministry of Agriculture and Cooperatives to resume the task of formulating NAES. A new taskforce was formed under the chairmanship of Mr. Aseshor Jha (Then Joint Secretary of MoAC) in April 2004 recognizing the need for a nationwide strategy to provide new directions, mechanisms and processes for the service delivery. This taskforce prepared two reports- a Background Paper on NAES, 2004, and the draft NAES 2004. However, prior to the presentation of the draft NAES to different key stakeholders and its subsequent approval by the government, further actions related to the NAES formulations were deferred by the APPSP. The reason was the initiation of a higher level study on APP Review* which aimed at the formulation of the Agriculture Perspective Plan (APP) Implementation Action Plan (APP-IAP). The postponement was necessary as APP would provide policy framework and contexts for the NAES. It is very important that the NAES and the APP-IAP be consistent to each other and the one reinforces the other. As the APP implementation Action Plan has been prepared and is now within the MoAC for further discussions and actions, the APPSP is expected to expedite the completion of the NAES.

1.3.1. The Rationale for National Agricultural Extension Strategy

Issuance/ proclamation of a national agricultural extension Strategy (NAES) is necessary for the Ministry of Agriculture and Cooperatives as the global and national environment and contexts for agricultural extension has tremendously changed in recent years. Business as

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usual will not meet the increasing expectations of the people. Poor and disadvantaged groups will continue to be greatly ignored and their access is likely to be limited. Gaps between the policy and its implementation are a reality. Nepalese agricultural extension services which is now at the verge of transition from production focused to people focused, from hard systems thinking to soft systems thinking and from transfer of technology types of approaches to that of participatory approaches which are driven by the ethos of participation and put people at their centre.

1.3.2. Reforming Agricultural Service Delivery, a National Agenda

In Nepal, agricultural extension is dominated by the activities of the two departments under the MoAC- the Department of Agriculture (DOA) and the Department of Livestock Services (DLS). Despite many encouraging evidences with regard to the performance of public sector agricultural extension in the past, Nepalese public sector agricultural extension is often criticized for its strong technology transfer and seemingly failure to contribute to sustainable agricultural growth. Problems such as the following are often noted with regards to Nepal's public sector agricultural extension:

- Domination of supply driven approaches rather than demand driven.
- Failing to cater the needs of the specialized client and demand for location specific extension services as required by the commercialization of agriculture.
- High cost, low impact of extension programs.
- Insufficient face-to-face contact between extension worker and farmers.
- Inadequate funds for operational purpose.
- Inadequate technical qualifications of grassroots extension workers such as JTs/JTAs.
- Inefficiency of extension personnel
- Dilution of impact by thin coverage.

MoAC's efforts to facilitate the evolution of self-standing and self-sustaining groups and their empowerment to become self-reliant and capable of articulating their needs and problems effectively have hardly matched with the resources, opportunities and capacities of the public extension system. Furthermore, the current extension system is still out of reach of majority of people. The extension worker: farmer ratio is very wide.

WTO Membership

After many years of efforts, exercises and controversies, with effect from April 23, 2004, Nepal has become 147th member of the WTO Accession to the World Trade Organization is often heralded as a major breakthrough in Nepal's trading history. Getting membership in the WTO was crucial for Nepal in the sense that no country, whether developed or developing, can exist in isolation without trade with other countries. And the WTO is a global body that makes global trade more disciplined and equitable. However, benefits to WTO accession are potential and intangible; the costs are immediate and real. Unless domestic policies, which include services delivery approaches and method, are reformed, likelihood of benefiting from WTO membership for countries like Nepal is bleak. For producers to benefit from the WTO, they need to be aware about the quality standards imposed by the importing countries, produce quality products at competitive prices and know all necessary phyto-sanitary rules and regulations, otherwise let the country be

prepared to observe the share of agricultural exports in total exports being declined, and the economy of the country moving towards collapse.

While above problems remain, the government has devolved agricultural extension to the local bodies. The devolution of the agricultural extension to the local elected bodies, has however, created new challenges and opportunities.

Furthermore, the formulation of NAES has become crucial for the following reasons:

- Institutionalizing the participatory demand driven extension system;
- Sustaining the institutional parallelism within the public sector agricultural extension service delivery;
- Making extension service delivery pro-poor and inclusive;
- Mainstreaming gender concerns in the agricultural extension services
- Strengthening the devolved agricultural extension systems
- Shifting the focus of agricultural extension system from the production to the people, from the technology to the innovation system, and from farming to livelihoods;
- Making the public sector agricultural extension system work within the present conflict situation (conflict sensitive service delivery approach)
- Revisiting the current agricultural extension educational methods the norms for which have been so formulated that the materials and expenditure criteria hardly differ either with the changes in the geographic diversities and physio-graphic conditions of the district nor with the nature of technology;
- Strengthening the research, education and extension triangle and so forth
- Making extension efficient and effective in helping traders, producers and consumers to benefit from the WTO membership and the implementation of SAFTA.

1.3.3. Global Context

While national needs have necessitated us to formulate the national agricultural extension strategy, changing global context, demands and expectations have made it urgent. The following highlight a few global concerns.

Millennium Development Goals

A global development agenda, agreed by all the world's countries, is now in place. The agenda is set out in particular in the UN Millennium Declaration which was adopted in 2001. The Millennium Development Goals (MDGs) represent concrete step-by-step objectives and targets in specific areas. The MDGs consists of eight-time bound, mutually-reinforcing and interrelated goals. These include:(a) eradicate poverty and hunger, (b) achieve primary education, (c) promote gender equality and empower, (d) reduce child mortality, (e) improve maternal health, (f) combat HIV/AIDS, Malaria and other diseases, (g) ensure environmental sustainability and (h) develop a global partnership for development. Achieving MDGs would be remote if we go with the same approaches and methods of service delivery.

Food Security

The challenges facing agriculture and of assuring global food security and the sustainable management of natural resources are manifold and immensely complex. Achieving the food security requires two things. First it should be placed in a broad context and secondly it is necessary to acknowledge the "multifaceted character of food security, as has been argued

in" The Rome Declaration on World Food Security" in 1996. For this, the "business as usual" will not work any more.

Globalization

Globalization refers to interdependence and linkages of the world economies, markets, services, and people. It presents both emerging challenges and new opportunities. For enabling Nepal's agriculture to enter through new doors and get benefits from new opportunities created under globalization by escaping its threats and meeting the challenges requires reforms in the service delivery approaches and strategies.

A Rights Perspective on Development

The rights perspective comprises democracy and respect for human rights. Central to rights based perspective is the realization that democracy and human rights are mutually reinforcing, and one can't exist without the other. The rights perspective focuses on discriminated, excluded and marginalized individuals and groups. It urges that people must be able to enjoy their rights regardless of sex, age, disability, ethnic background and sexual orientation. This perspective helps to identify areas in which special actions are required to ensure that the effects of various decisions are as fair as possible. Gender equality is a key element of the rights perspective. It is necessary to give attention to the different conditions, interests, capacities and needs of women and men, girls and boys. As many women are among the poorest of the poor, securing women's access to land, credit, clean water and other resources as well as their participation in decision making is vital to their prospects of overcoming poverty.

Good Governance

There has been increasing realization among development stakeholders that good governance is needed for achieving sustainable development and poverty reduction. Likewise, there is increasing recognition that the highly centralized institutional structure that characterizes many government administrative systems can lead to losses in effectiveness of development investments and policies. During the 1990s, pluralistic democracy replaced authoritarian regimes in many countries including Nepal. The nature of governance also changed. The concept of good governance, which rests on the four pillars (ownership, equity, transparency and accountability, and efficiency) transcends the idea of governance as just "methods that societies use to distribute power and manage public resources and problems" to champion a process that "provides an enabling environment for human development and eradication of human deprivations" (NHDR 2001).

Sustainable Livelihoods

Because livelihood strategies of the poor people are complex, a livelihoods perspective will provide better insights into the ways in which agricultural growth can reduce poverty and vulnerability. Needless to say, poor people in rural areas, including those with no land, typically derive half their household income from farming. This includes working on the farms of others.

Therefore, Sustainable Livelihoods Framework is gaining popularity for it offers a conceptual and analytical framework to understand causes of poverty, analyze relationship between relevant factors at micro, intermediate, and macro levels. The approach explicitly

requires going beyond sectoral barriers, to look at more of the context in which people live. The framework for sustainable livelihoods dynamic recognizes changes due to both external fluctuations and the results of people's own actions. The starting point for the sustainable livelihoods perspective is to look at first the vulnerability context within which people operate.

Shrinking Funds and Resources

While investments in agricultural research and extension grew at a rapid pace, estimated at a global average of over 6% per year during the 1960's and 70's, it has begun to stagnant or decline from the 1980s, and this has been more drastic in the case of extension. Most of the developing countries, extension services are often widely seen as having become grossly inefficient, burocratised and ineffective. Donors are no longer willing to bear the running cost of extension organizations for they are often viewed inefficient, monolithic and costly.

1.3.4. National Agricultural Extension Strategy

Mission

The mission of the NAES is "the efficient and cost-effective need-based participatory delivery of agricultural services, prioritized and targeted to the needs of different categories of farmers, particularly focused on small, poor and deprived.

Overall objective

The overall objective of NAES is to reform and reorient public sector agricultural extension service in order that it will strengthen decentralized agricultural extension services and ensure the access of the poor, deprived and socially excluded to the agricultural extension service.

Specifically, it will

- 1. Provide a common framework for funding and delivery of agricultural extension services which will (a) be responsive and flexible to farmers' needs (b) ensure farmers' equitable access to opportunities and benefits created provisioning of services, (c) be transparent and disciplined in actions and (d) ensure active participation of all relevant actors and stakeholders as to the nature of innovation/technology.
- 2. Create favorable opportunities and appropriate environment to support and sustain currently initiated learning centered participatory service delivery approaches.
- 3. Increase farmer's capacity and self-reliance to improve their livelihoods through farming systems.
- 4. Develop pro-poor professionalism in agricultural extension and keep the frontline extension workers active, motivated, disciplined and updated to both (a) technical knowledge and skills and (b) social skills.

Thrusts of the NAES

- Poverty Reduction: NAES is oriented towards attacking poverty through multiapproaches and actions at multi-layers in a coordinated and coherent way.
- Sustainable Livelihoods: In harmony and coherence with long-term NARC research vision, the NAES will centre around the sustainable livelihood approach (SL approaches) which is gaining popularity as an approach for addressing poverty.

• Food Security: NAES will be directed towards improving food security in line with the commitments made in the World Food Summit 1996, and followed by World Food Summit, 5 years later.

- Conservation of Agricultural Biodiversities: NAES will work towards fulfilling our commitments on improving biodiversity conservation and respond to declining agricultural biodiversities.
- Equity and Inclusion: The NAES will aim at reforming service delivery modality, particularly the dominant blue print approach- the Transfer of Technology Model, in order that many, who are excluded from the present agricultural development efforts due to factors such as the socio-economic reasons, sex, effect of the dominant trickle down model of development, geographical isolation, remoteness, cultural factors, the lack of the capacity poor to present their voices and concerns etc., are included
- Commercial Agriculture: The NAES will facilitate the implementation of centrally supported/ administered programs in close collaboration with the Nepal Agricultural Research Council (NARC) and concerned program directorates for the development of the commercial farming sectors.

NAES Framework

- Decentralized agricultural services Delivery: In the last four decades, Nepal has traveled a long road towards decentralization in an attempt to bring government closer to the people. When power is brought closer to the citizens, the political process is expected to become more tangible and transparent. As a result, more people can become involved. The LSGA lays down the vision for decentralization, the end goal where Nepal wants to go.
- Institutional pluralism (promote the private and community driven extension to operate competitively, in roles that complement, supplement, and work in partnership with public sector extension and outsource some of the activities performed by the public sector extension)
- Agricultural Knowledge and Information Systems (AKIS): AKIS views
 agricultural research and extension as necessary but, by themselves, insufficient
 elements in complex innovation-oriented institutional arrangements. It emphasizes
 towards achieving synergy among diverse and complex institutional actors and
 stakeholders.
- Participatory extension to enhance the capacity of the local people to actively take
 part and influence decision making process about the cause of development that
 affects their livelihoods.

Key Programmatic Elements

Key programmatic elements of our NAES include the following:

- Enhancing local bodies capacities
- Projectization approach (Cluster approach)
- Establishment and operation of demonstration farms (Resource centers and private demo- farms)
- Convening village workshops
- Farmers' group organization and development
- Coordination and linkages

- Livelihood analysis
- Developing and mobilizing community based organizations and locals resource persons

1.4. Contribution of Agriculture Extension in Agriculture Development:

Until the faculty system was established, whatever was done in agriculture, it was considered to be the contribution of agriculture extension and research Faculty system in spite of its positive aspects has significantly compartmentalized the manpower of the department, creating confusions misunderstandings and rivalry within the organizations. It is really difficult to demarcate the contribution made by research and extension, which are considered as the two pillars of agriculture development, yet it can be said that they share almost equal level of contribution in general. However, the contribution of Agriculture extension could be noticed as follows:

1.4.1. Extension as a vehicle

Agriculture extension, as a matter of fact, is serving as a vehicle for carrying messages to farm communities and in turn bringing back the solution seeking feed back to the concerned organizations and so on.

- Massive awareness: Extension agents tried to reach the farmers as much as they could. They started answering the questions raised by the farmers and gradually farmers started using improved technologies in their field. They heard about new things and they applied them in the practice and ultimately obtained benefit from it. In this way farmers raised their level of awareness in getting information, knowledge and skills for using the information in the field and then generate income out of it. The extension educational activities, trainings and vigorous interactions with farmers tremendously helped to make the farmers aware, alert and educated in agriculture.
- Introduction of modern concepts and approaches: It is well known that every thing in the universe is changing. What is today does not necessarily remain tomorrow. So is the case with agriculture. Now concepts, approaches and technologies of agriculture generated around the world greatly influenced Nepalese farmers also by means of different media such as contacts by the extension agents, exposure visits, publications, telephones, electronic media and so on Farmers now are very much aware of different actors of development and know to join hands with them. They have been professional to go into the depth of the techniques and use them to improve their farming.
- Adoption of new technologies/innovations: The main job of agriculture extension is to communicate, educate and convince the farmers about new technologies or innovations that are suitable to adopt in their conditions. In this context, several extension techniques such as demonstration, group discussion, educational visit, trainings are applied, so that the farmers are motivated and also become technically able to adopt new technologies in their field.

1.4.2. Creation of farmer's demand for the facilities and services

Farmers when realized the importance of agriculture extension started putting their demands for facilities and services. They used to ask for Agriculture Service Centers, qualified

JT/JTAs, input and credit facilities, irrigation, marketing centers etc in their area so that they could make use of them in their farming purposes.

1.4.3. Improvement in the Production System

Towards Commercialization: Agriculture extension by using several tools and techniques, attempted different concepts and approaches towards improving production system. Pocket package strategy as pinpointed by APP was implemented for the commercialization of agriculture by focusing one or two main commodities in the pocket. Farmers with similar interest were put into the group or lager organizations to consolidate and establish a working mechanism towards commercialization. In this context one of the major extension services these days has been to transfer subsistence farming into commercial farming.

Cropping Intensity: With the efforts of extension services the cropping intensity in many cases has been increased even up to 300 per cent and per unit area production per year thus has increased in the country,

Towards Food Security: Several attempts have been made to increase production and productivity to address food security issues. Needs regarding the production inputs have been catered both by private and public sector. Local farmers have been involved in generating resources such as seeds, seedlings etc. Some of the special programs implemented for this purpose are as follows:

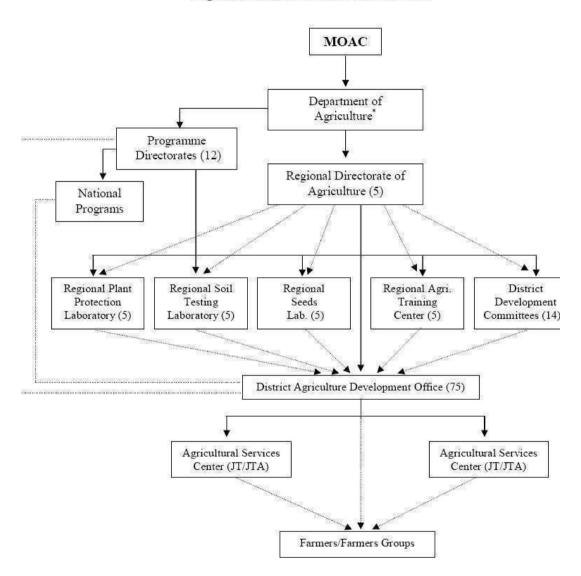
Small Irrigation Scheme: Small irrigation scheme program has been implemented in the needy are as or needy farmer groups of all the seventy-five districts. Since, these schemes could be scattered even within the district, it could in deed hit the problem. The small and marginal farmers, women farmers and disadvantaged sector are specially paid attention while deciding the schemes.

2. Extension Organizations

Organizational structures of agriculture extension are changing several times. Some times there is one department and some times different departments. So far as the specific extension organization is concerted it stunted as Agriculture Extension Section first and gradually enlarged to Directorate of Agriculture Extension and its main mandate is to facilitate the working by supplementing the operational guidelines for field extension activities to be conducted as per their technical standard. However, after the restoration of democracy two major changes occurred in the organizational front. In 1991, first the responsibility of agricultural research was detached from the then Ministry of Agriculture (MOA) and handed over to Nepal Agricultural Research Council (NARC), an independent and autonomous research organization. Second, the Department of Agriculture (DOA) and the Department of Livestock Services (DOLS) were merged into a single Department of Agriculture Development (DOAD). But merging two departments into one could not continue for longer. Following Local self Government Act 1999, HMGN since 2001/02 has devolved the agriculture extension services to District Development Committees (DDC) adding one more dimension to the ongoing reforms in the delivery aspect. All the regional and district organizations have been adjusted accordingly. Recent structural change has substantially reduced the number of Agriculture Service Center (4 per Tarai district, 6 per hill district and 4 per high hill district. This has resulted for JT/JTA to serve quite large area

and farm families. Special working mechanisms need to be established to properly address the emerging issues faced by the farmers and other stakeholders involved in the system.

Organization of DOA Extension Services



2.1. Agencies Involved in the Extension System (GO and NGO)

2.1.1. Public Level

There are various service delivery institutions to ensure the agriculture service delivery to meet the need and demand of farmers in Nepal. The detail of different institutions is attached at annex 1 (Organizational Chart of MoAC). Following are the agriculture extension service delivery institutions.

District Agriculture Development Office (DADO)

District Agriculture Extension Offices (DADOs) are the service providing organization at district level regarding agriculture and livestock sector respectively. Likewise, District Livestock Offices (DLSOs) are concerned with delivery of extension services on livestock.

Agriculture Service Centre

The Agriculture Service Centres (ASCs) are the grass root institutions to provide the agriculture extension service that work closely with the farmers. As the numbers of ASCs are limited, some supplementary provisions have been made to provide the services for the farmers. These include:

Contact Centre

After the restructuring of MoAC in 2061 BS, the numbers of ASCs per district were reduced. This created the pressure in the ASC to cover the larger clientele. In this context, DoA provided flexibility to districts to establish contact centers (*Samparka Kendra*) to effectively utilize the existing physical resources such as Agriculture Sub-Service Centers as well as demand of VDCs.

Model Agriculture Service Centre

The concept of model service centre was put to increase the efficiency and implement the service delivery with improved effectiveness so that it could be internalized in other service centers. Priorities have been given to improve the physical condition and equip with essential facilities. Such model service centers have been established in following five districts in each development region.

- 1. Agriculture Service Centre, Urlabari, Morang
- 2. Agriculture Service Centre, Gunjanagar, Chitwan
- 3. Agriculture Service Centre, Shishawa, Kaski
- 4. Agriculture Service Centre, Ramghat, Surkhet
- 5. Agriculture Service Centre, Attariya, Kailali

Community Agriculture Service Centre

The concept of Community Agriculture Service Centre (CASC) has been put forward by MoAC with the objective of making service delivery more inclusive as well as to help commercialization in agriculture through best utilization of local resources and skills of local individuals. Though the establishment of 25 CASC was announced by Nepal Government in annual budget and program of FY 2065/66 it has not been implemented yet. The proposed model emphasize the participation of farmers groups and cooperatives in the management and implementation of program at service centre level to make service more responsive and client oriented. The contribution of local government bodies (VDC/DDC) and concerned NGOs/CBOs/private sectors is also expected. Farmers improved access is expected to through the representation of each groups and cooperatives in a management team for CASC.

Similarly, recently farmer's cooperatives are equally utilized in the delivery of agriculture extension service.

2.1.2. International/National Nongovernmental organizations (I-NGOs)

There are ten thousand nongovernment organizations involved in community and rural development sector (Three year interim plan). I-NGOs have played very significant role in Nepalese society in a number of ways including successfully arousing consciousness and making advocacy of/for a number of developmental issues and other global democratic values (good governance, civil society, globalization, privatization, liberalization, transparency, responsibility, participatory democracy and development, decentralization).

NGO Strengths

- The majority of NGOs are small and horizontally structured with short lines of communication and are therefore capable of responding flexibly and rapidly to clients' needs and to changing circumstances. They are also characterized by a work ethic conducive to generating sustainable processes and impacts.
- NGOs' concern with the rural poor means that they often maintain a field presence in remote locations, where it is difficult to keep government staff in post,
- One of NGOs' main concerns has been to identify the needs of the rural poor in sustainable agricultural development. They have therefore pioneered a wide range of participatory methods for diagnosis³ and, in some contexts, have developed and introduced systems approaches for testing new technology,
- NGOs' rapport with farmers has allowed them to draw on local knowledge systems in the design of technology options and to strengthen such systems by ensuring that the technologies developed are reintegrated into them
- NGOs have also developed innovative dissemination methods, relying on farmer-to-farmer contact, whether on a group or individual basis
- In some cases, NGOs have *developed* new technologies such as by Li-bird and SEAPRED
- Undoubtedly, one of the main strengths of NGOs has been their work in group formation. This has been in response to perceived needs at several levels.

NGO Weaknesses

- NGOs' small size means that their projects rarely address the structural factors that
 underlie rural poverty. Small size, independence, and differences in philosophy also
 militate against learning from each other's experience and against the creation of
 effective forums, whether at national or district levels.
- Some "fashionable" locations have become so densely populated by a diversity of NGOs that problems have arisen not merely of competition for the same clientele, but of some undermining the activities of others
- NGOs have limited capacities for agricultural technology development and dissemination and limited awareness of how to create effective demand-pull on government services.
- Some NGOs are more accountable to external funding agencies than to the clientele
 they claim to serve. Donor pressure to achieve short-term impacts, combined with a
 lack of cross-learning, has led in some cases to the promotion of inappropriate
 technology,

The I-NGOs have either interacted or linkage with the beneficiaries, user groups, self help organizations (SHOs), CBOs, and other people's organizations or part of them and have also linkages with external actors/forces, they have successfully mediated or played the role of mediators and communicators between the state /government and the people and tried to bridged the gap. They have played important role in empowerment (poor, women, marginalized, Dalits, Adibasi janajaties, powerless, voiceless, vulnerable groups, and empower the poor for self help development and networking), governance, capacity building (e.g. Of institutions, development planning, information exchange, training of personnel, institutional building) and management(coordination of activities monitoring control evaluation feedback and reporting). They have also played significant role in identifying developmental needs priorities and activities and recommending the policy makers to correcting their weakness and for their effective implementation .Some I-NGOs have also worked as umbrella organizations including many intermediary institutions voluntary organizations and associations, user's groups .CBOs and SHOs. Some have even tried to penetrate in a remote rural areas contributing or monitoring the developmental activities of the local organizations. Some of them have even contributed to strengthen the developmental power of the people to overcome their existing problem, issues, challenges (e.g. poverty, illiteracy, malnutrition and powerless), miseries and inequalities.

2.1.3. Community Based Organizations

A CBO is an organization that provides social services at the local level. It is a non-profit organization whose activities are based primarily on volunteer efforts. This means that CBOs depend heavily on voluntary contributions for labor, material and financial support.

Indigenous CBOs were well established traditions in Nepal in the past. Their powerful presence, which existed among all ethnic communities prior to the unification of Nepal in 1768, has since eroded. Most indigenous CBOs treat ethnicity as a major focus. These culture sp0ecific organizations are characterized by social, religious and developmental practices, quite unique to each ethnic group. Some examples of these ethnic groups are:

Dhikuri- associated with the Thakalis, Bhotias and Gurungs of western Nepal.

DharmaPanchayat- a sociopolitical and legal organization of the Thakali ethnic community that helped them exercise local autonomy even during the feudal Rana regime.

Guthi- an indigenous social and religious organization of Newars of the Kathmandu valley.

Rodi- a unique social organization of the Gurungs of western Nepal.

Bheja- an indigenous social political, economic and legal organization of the Magars.

Kipat- a similar organization of the Limbus.

These organizations function within their own traditional practices and codes of ethics, but are quite different from the emerging modern concept of local NGOs in Nepal.

Funding agencies should be aware that in rural areas, the rural elites tend to have overriding decision making powers. The rural population is highly heterogeneous in terms of caste ethnicity and socioeconomic status. In some cases user groups such as water or forest user groups being promoted in grass root projects may not be representative of the majority population of the area.

CBOs are recognized as organizations that provide development services to grass root communities at village and district level through the mobilization of paid members or unpaid volunteers. CBOs are rooted in the communities they serve.

CBOs in Nepal sometimes are based in ethnic group, seeking benefit for a particular ethnic group. It is important to differentiate between induced and indigenous CBOs. CBOs that originate with projects are regarded as induced.

Characteristics of a CBO

- It is non-profit;
- It relies on voluntary contributions;
- It acts at the local level: and
- It is service-oriented.

There are many forms of community based organizations in Nepal. They are in the form of mere farmer groups to well organized structures such as federations, forums, networks, cooperatives, and so on.

2.2. Extension Planning Process

According to Kelsey and Hearne (1967) an Extension program is a statement of situation, objectives, problems and solution. It is relatively permanent but requires constant revision. It forms the basis of extension plans.

Extension planning is a process, which involves studying the past, and present in order to forecast the future and in the light of that forecast determining the goals to be achieved and what must be done to achieve them. Program planning is a decision making process involving critical analysis of the existing situation and the problems, evaluation of the various alternatives to solve these problems and the selection of the relevant ones, giving necessary priorities based upon local needs and resources by the cooperative efforts of the people both official and non-official with a view to facilitate the individual and community growth and development.

Problem Identification Process

With in the DOA and DOLS Participatory Bottom-Up Planning (PBUP) process of agricultural extension program planning is followed in planning process. Based on national agriculture policy and priority the planning is done. For this, Central Program Directorate and Offices of DOA and DOLS prepare technical guidelines in their respective areas. The departments compile technical guidelines along with the guidelines provided by the National Planning Commission (NPC) and MOAC. Thus prepared guidelines and directives are made available to DADOs and DLSOs through RD. The DADO and DLSO Chief inform their SMSs and Incharges of ASC/ASSC and other technicians about central guidelines and directives and guidelines receive from DDC. The guidelines and directives should reach ASC/ASSC before the PBUP at the ASC/ASSC level starts.

Levels of planning

- 1. ASC/ASSC level planning can be divided into; planning for pocket area and planning for non pocket areas.
- 2. District level planning

- 3. Regional level planning workshop
- 4. Central level program reconciliation and approval

2.2.1. ASC/ASSC level planning (Planning for pocket areas)

Agricultural production pockets are geographical locations that are agro-climatologically suitable for the production of particular commodity or for other agricultural productions. For the intervention of agricultural extension, pockets bearing potentialities of commercial production and with access of irrigation, road, market, electricity and agro-based industries are selected. Agricultural production pockets may cover certain areas of a word or tit may spread in more than one VDC and even areas of more than one ASC/ASSC.

Planning in the pocket area is done by using participatory planning tools mainly PC/PS. PC/PS can be supplemented by one or more PRA tools to get necessary information about eh pocket area. Detailed aspects of PC/PS approach will be discussed in the following section

Outcomes of the PC/PS exercise will be the activities related to one or more elements of production packages that include small irrigation, inputs management, agricultural land, agricultural roads, rural electrification, production technology, agro-processing and market management etc. These packages are provided in the pocket area to fully exploit the production potential of the particular commodity; that what we call is Pocket Package Program (PPP). These activities related to elements of production package are combined to give a form of time bound project with specific objectives, activities to be carried out, resources required, roles and responsibilities of major actors. Thus prepared projects, in crude form, are later translated by the ASC/ASSC in to the standard Project Formulation Format (PPF) circulated by DOA.

2.2.2. District Level Planning

DADO is the converging point for the adjustment in the district agricultural need and priorities and central directives, guidelines and resources (budget ceiling). Programs/ projects generated in ASC/ASSCs provided the basis for DADO annual program. In addition to that, it compiles analyses and updates the data coming form the ASC/ASSCs.

DADO itself prepares programs that are implemented directly from the DADO headquarter. These programs are to support the programs/ activities, but beyond the capacity to run, of ASC/ASSCs themselves. These programs include district and regional in-service and farmers training, district level workshop, feasibility study, impact studies, agricultural business and market promotion, coordination and management of inter5nal external resources, monitoring and evaluation etc. All these activities should necessarily be the activities of different projects. Projects thus formed are discussed in the District Agricultural Development Committee (DADC).

In line with concept of promotion partnership and pluralism in extension, DADO can offer some of its selected activities of NOGs/CBOs, farmers' groups and private sectors to implement in partnership or contract-out on competitive basis according to the guidelines provided by the MOAC.

Finally DADO will prepare a comprehensive scenario of agricultural development of the district that also include annual program to be launched in the district, their objectives,

responsibilities of personnel and organization, resources required, calendar of operations etc. Program thus prepared by the DADO are discussed in detail in DADC and are submitted in District Assembly (DA) thorough Agriculture Forest and Environment Committee and District Level Planning Coordination Committee of DDC for approval.

2.2.3. Regional level planning workshop

DADO presents program approved by DA in the regional program budget workshop to be organized by the concerned RDA. In regional workshop mainly technical aspects of district programs are discussed and resource matching is done. Besides DADOs, other participants are central program directorates, regional offices of line agencies, government farms and resource centers, laboratories. Line agencies are invited into the workshop to ensure better coordination in program implementation. There may be amendments in the district programs only from technical point of view.

2.2.4. Central level program reconciliation and approval

DOA reconciles the district programs on the basis of guidelines and directives provided by it, technical aspects of the program and budget ceiling in the presence of central level program directors. After that it forwards the programs to MOAC. Several round of discussions are held at MOAC, National Planning Commission (NPC) and Ministry of Finance and programs are approved with or with out trimming them. DOA receives that approved budget and programs that it sends to each DADO to implement.

2.2.5. Projectization of Agricultural Extension Activities

DOA has started to adopt projectization approach for district extension programs. District extension activities have now converted into project format. Any extension activity is now a component of a defined project with clear title, purpose, objectives, indicators, and institutional arrangements of managing implementation and monitoring and evaluation.

2.2.5.1. Projectization Process

- 1. Farmers' problems are identified and prioritized using PC/PS process in the pocket area with the involvement skateholders. PC/PS process clearly identifies project purpose and logic.
- 2. Prioritized problems and solutions lead clearly to project components. Project components are fited together into a project design format.

A good project design/document, in a simple way, makes clear:

- Why the project is proposed, and exactly what the project sets out to accomplish
- Who will benefit
- Why and how the project is expected to accomplish its purpose and objectives- its strategy and set of activities
- How those involved will know when they have accomplished what they set out do
- The timeframe, resources, polices, and implementation arrangements for doing so
- 3. Projects are then fitted into a prevailing program-budget formulating formats. DADO forwards the annual programs for the approval of related authorities.

2.2.5.2. Implementation of Projects

After the approval of annual programs, DADO implements projects through the Project Management Committee (PMC). The PMC comprises:

Chief, DADO Coordinator

Agricultural Extension

Office (AEO)/Assistant AEO (AAEO)

Assistant Planning Officer

Accountant

Member

Member

Concerned SMS Member-secretary

Terms of Reference (TOR) of Project Management Committee (PMC)

- The concerned SMS should prepare calendar of operation and communicate it to the chief and APO.
- At the project level, if necessary, a Project Implementation Committee should be formed and that should take care of implementation issues.
- The SMS should coordinate with line agencies and other stakeholders.
- Given the workload of SMS in the district, responsibility may be entrusted to other SMCs as well. The decision may be made by the PMC.
- PMC should meet a day prior to DADO staff meeting.
- Financial administration of the project will depend upon the recommendation of the SMS or the designated staff associated with the project. Accounts will be made transparent and the APO will maintain project-wise expenses as well.

2.2.6. Recent Interventions in Reforming Extension Planning Services

- Participatory project planning process is developed, and accordingly, extension
 activities of all districts (75) are projectized from FY 2001/02. The projects are
 based on local priorities identified through a participatory bottom -up planning
 process institutionalized throughout the organizations in DOA. Projects such as
 AREP (HMGN/WB), TLDP (HMGN/ADB), HARP (HMGN/DFID) etc have
 established participatory planning tools such as PCPS, SLA, PRA, VLW etc.
- With projectization, it has now become possible to identify components based on local priorities directly benefiting the users, linking measurable outputs to objectives for a given timeframe and designing activities/inputs to produce the desired outputs and impacts. The process could establish a system, within the organization from national to grassroots level, of standard project management, staff utilization and monitoring. Project profiles are documented at each level of the organization (national planning commission, ministry, department, region and district).
- In preparation for implementation of projectization process, extension staffs in field are oriented in mass followed by a refresher training to prepare a cadre of at least one master trainer in each district, regional and central program unit. The projectization process enhanced the need of linking central program units to districts for technical back up in project identification, project formulation and monitoring. Visits of senior subject matter specialists from these units to district project sites become more frequent.

- With projects' initiative, the government introduced policy reform to promote public private partnership, partnership with beneficiary groups and community organizations.
- Agencies within the organization began to be oriented to change the mindset to promote such collaboration and partnerships. Policy of contracting out extension programs is emphatically introduced.
- The newly introduced reforms in national extension strategy initiated under the projects created heavy need for staff orientation across the organization to reorient the extension agents associated with GOs and NGOs, PSOs and CBOs and also policy makers affiliated to local bodies. The key contents of this mass training are the changed role of public sector as a *facilitator* rather than a *service provider*, commercial outlook to service delivery, social mobilization and participatory development tools.
- Sustainability of these initiatives is ensured from the fact that DOA/DLS reformed national training strategy commencing implementation from the beginning of the tenth five-year plan (2002-07). New training modules for areas such as project planning, project monitoring and evaluation, marketing, commercial farming, mainstreaming gender in agriculture and agricultural resource management needed to improve human resource capability are prepared.
- Available socio-economic studies and district database analysis indicates that farm level productivity and income during various projects' period has significantly increased. However, this gain is realized in limited resourceful areas and among resourceful farmers, making the national benefit at large very nominal and far behind the national requirement.
- For feedback to national extension system, the impact studies, case studies and special technical studies are initiated. These studies validate the impacts of priority national programs or, in more cases, the impacts of micro-level projects at beneficiary level.
- Joint research-extension-farmer—nongovernmental research provider planning, implementing and monitoring systems are established.

2.3. Coordination Mechanism

Agriculture development program aims at improving the quality of life of rural people. Agriculture development implies the shift from traditional method to new methods of production that include the use of better and improved seed, fertilizers, tools, pesticides, even new farming system, etc.

Extension component is essential in the agricultural development process but it is, by no means, the only factor in the process. Equally important components are the development support systems such as research unit, various service and supply agencies, government bodies, etc. Each unit in its own way shares responsibility of agricultural development. In theory the extension system, beside its educational communication function, is expected to help farmers learn about new technological alternatives and the way to gain access to inputs, credit and marketing services so that farm output and incomes can be increased. The extension also intends to inform farmers about the si9tuation of inputs, credit, market problems, etc. So there is a dire need of having close relationship and linkage among the various agencies involved ion agricultural development programs.

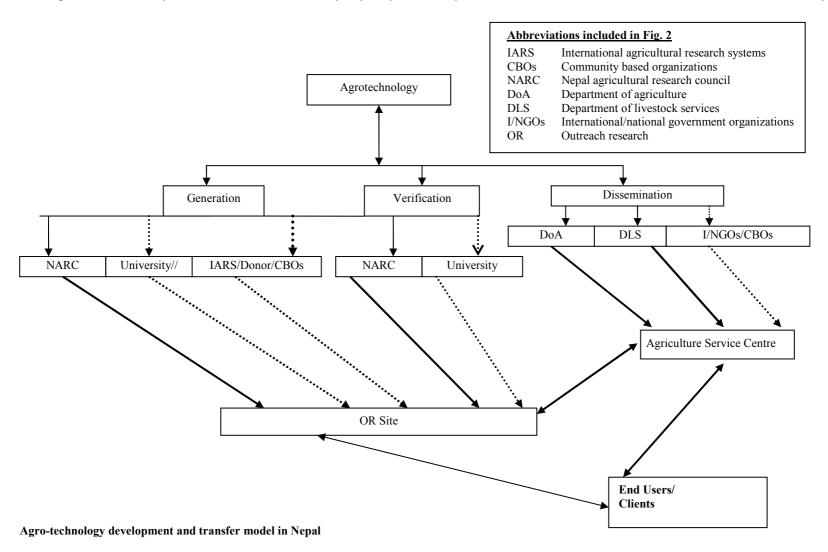
District Coordination Committee is of the mechanisms to establish coordination of regular program activities of the districts. The project activities are decided jointly by project personnel and extension workers. The planned activities are coordinated by Agriculture section of the project.

Under the decentralization policy of the HMG/N, District Development Committee is responsible to build and approved programs in different fields in consultation with all concerned agencies (DADO, AIC, LSC, ADB/N, Cooperatives, Research farmers, etc.) and the representatives from different users' group. It is also a mechanism to established coordination of regular program activities of the District.

AIC with necessary farm inputs chanalizes its activities through the Cooperatives, sales depots, private dealers, etc. in various parts of the country and works in close contact with extension for what, when and how much inputs to be supplied. On the other side, ADB makes available loans/credits either through Cooperatives or directly to the needy farmers in consultation with the District Agricultural Offices. It is, therefore, necessary that for the success of a program the function of these agencies must be integrated with one another.

2.3.1. Coordination and Linkage Model of Agro-Technology Transfer

A model of agro-technology development and dissemination has been outlined (Paudel and Thakur, 2008) in Nepal (Fig, 2). This model depicts how agro-technology is generated, verified and disseminated to the end users/clienteles. The model is based on participatory concept involving public-private-partnership where international, national, regional, and local stakeholders are linked to agriculture research and development (R&D). The limit of research is up to outreach research (OR) site where extension agencies are supposed to take fine tuned technologies for wider dissemination. In Nepal, Nepal Agricultural Research Council (NARC) is responsible for technology development while Department of Agriculture (DoA), Department of Livestock Services (DLS) and Community Based Organizations (CBOs) are the partners of technology dissemination. International/National Government Organizations (I/NGOs) are involved into research and development according to their priority and target set as well. Institutions which have strong linkage at OR site and which have poor linkage serve their function to deliver technologies to the clienteles with strong commitments and weak commitment, respectively, which is clearly indicated in the following fig.



2.3.2. Different Extension Organizations and their Coordination at Grassroots Level

An efficient extension organization needs to develop the capability of responding to changes in relation to its environment. Extension organizations have to cope with changes within and outside the organization, such as changes in farm technology, communication methods, needs of farmers, rural situations, export and import of farm produce, and market economy. Organizational development allows for planned changes in the organization's tasks, techniques, structure, and people. Attitudes, values, and practices of the organization are changed so that it can cope with changing situations. The employees also gain greater skills to deal with new problems.

Extension, though controlled and regulated by the central level organization, is in practical sense carried out by the grass-root level organizations. Extension institutions at grass-root level are of public (government) organizations, international or national non-governmental organizations, community based organizations and private organizations.

Government Organizations

Government organization at grass-root level are the Agricultural Service Centers (ASC) and their sub-centers located at particular locations to serve assigned number of VDCs. Earlier Junior Technicians (JT) and Junior Technical Assistants (JTA) were supposed to provide mobile extension services in the villages. With the growing demand of the farmers and their limited number they could not cater their services efficiently. Then the government changed its policy to station these JT/JTAs in the ASCs and provide extension service to Farmers' Groups (FG) through these stations. They have to go to the villages of farmers' field to advise whenever there is a group meeting or problem *en mass*.

The number of ASC in each district is 4 for high hills, 6 for mid-hills and 4 for terai. The number of sub-centers is not fixed and is being assigned as per need by DADO. It mostly depends upon the availability of field staff and office building to station them. The number of ASCs and field level staff has been drastically cut off after the organizational restructuring of Department of Agriculture (DOA) in FY 2060/61. Earlier ASCs were established and operative in almost all ilakas of the district. The government policy was to establish all developmental and administrative service centers in each ilaka. The number of , nine in each district during Panchayat regime, however varied district wise. Foreign aided projects like Integrated Rural Development Projects (IRDP), Agricultural Extension and Research Project(AERP), Upper Sagarmatha Agricultural Development Project(USADP), Hill Fruit Development Project(HFDP), Hill Agriculture Development Project (HADP) and others supported to construct ASCs in different *ilakas* of the project districts. Now these structures exceeding the number of ASCs are being used as sub-centers.JT/JTAs stationed in ASCs provide extension service to the farmers, collect information for management and policy formulation and also play regulatory role. In the changed context they work as agriculture development workers rather than agricultural extension workers.

2.4. Decentralization of Extension Delivery System

2.4.1. Decentralization: Concept and Issues

Decentralization is the transfer of authority and responsibility to lower level of government, quasi-government or private sector organizations for the public functions otherwise

implemented by the central government. However, this term should be interpreted with caution since decentralization differs, in forms and combinations, from country to country given the specific situation of its own. Decentralization comes by desire of the central government, demand from below or compulsion of the central authority because of government constraints to provide effective services. Following the pace of development, fulfilling farmers' demands at the local level in such a varied agro ecological zones and often-rugged terrain in Nepal by the central government has become a challenge for agricultural extension services.

The reasons why the central governments prefer to decentralize stems from the facts of:

- Need to address complex situations at the local level
- Central level funding may not be enough to finance agricultural extension services demanded by the farmers
- The grassroots farmer's participation may be better solicited through devolution

In our situation, the Agriculture Service Centers (ASCs) have to serve a large area often diverse in agro-ecological make up, natural resource endowments, category of farmers, and socioeconomic circumstances. Further, the political boundary of the ASC at the sub district (Ilaka) level and of the District Agriculture Development Office (DADO) at the district do not match with agro-ecological domain. This renders agricultural extension service provision even more difficult to fulfill farmers' demand for relevant, responsive and sustainable agriculture. There is a difference between the extension service and the advisory services—the former is to teach what the extension agent knows and is to accomplish the given task by their boss as targets and the latter is to respond to farmers' demand for specific problem solving.

Because the location specific problems/needs are as diverse as the locations themselves, demand for services are innumerable and require a large sum of extension budget as well as the knowledge and skill on the part of extension worker. This has implication for competently qualified manpower, program budget, and so forth. The central government in any country may not be in a position to fulfill this demand of the lower tier local government. This is very true in Nepal as well. Both the DADO and Farmers Group (FG) request for annual plan budget that far exceeds the actually available at the end. This has been insoluble as has been experienced in the past. Hence, the central government feels it necessary to decentralize in the excuse that local level agricultural extension funding is raised locally on top of central grants. Thus, in recent years decentralization has been the "excuse for escape" to avoid criticism from the local governments. Nepal is no exception. Agricultural extension has been always the subject of criticism at the district level, both from farmers and local leaders, and at the parliament alike for not serving the clients to affect vibrant agriculture in Nepal.

Linkage has been one of the talked about areas even in the centralized agricultural extension function. After decentralization, linkage is still another very important area in the context of limited research centers rested with Nepal Agricultural Research Council (NARC), more so because of the numerous microclimates interwoven in the complex production subsystems in Nepal. Expanding research base would mean added burden on budgetary resources from the central government.

Decentralization may bring the decision makers closer to the farmers, but there is no guarantee that farmers will be heard responsively. If the extension personnel have no different orientation, attitude and improved skill and knowledge, there will be no positive change towards improving the farming community livelihoods and reduction of poverty which is the overarching objective of the Tenth Plan.

Different forms of financing extension comprise users' contribution to extension programs. For this the farmers must be organized as farmers groups (FGs) and raise funds on their own initiative. Then the agricultural extension service can be sustainable. Mutual trust is all the more overriding for FGs to invest, and or share cost, in agriculture based on the advice of extension agents, and participatory decision making in management of extension prevails.

2.4.2. Types of Decentralization

Broadly, decentralization can be categorized into:

- Political decentralization
- Administrative decentralization
- Fiscal decentralization
- Economic or market decentralization

Political decentralization

The first type of decentralization, aims to encourage the participation of citizens or their representatives in public decision-making. The assumption behind this decentralization is that through local electoral jurisdictions the elected representatives know better the needs and aspirations of the voters/citizens who elected them and the policies thus formulated would be more geared towards meeting their needs. In so doing, the initiatives of the central government orient towards strengthening the local institutions through the enactment of legal measures like the Local Self Governance Act (LSGA), 2055 BS and Regulation 2056 BS and the associated Guidelines in Nepal.

Administrative decentralization

This takes the form of redistributing responsibility, authority and financial resources from the center to plan, to fund and to manage central level public functions by lower tier government agencies, corporations, semiautonomous bodies, or functional authorities. Not all functions of the central government are decentralized. The 3Ds of administrative decentralization are: deconcentration, delegation and devolution.

Fiscal decentralization

This is the vital component in the decentralization initiative, for: one, that the local institutions or the private organizations must have adequate revenues for financing the decentralized functions; two, that these local institutions must have authority to make decisions on their own.

In the beginning, central grants form substantial component of the revenues and the rest is raised locally. Fiscal decentralization can be of different types in combination, such as:

- 1. total grant from the centre, and central and local combined,
- 2. fee-for extension charging the farmers for services,

- 3. partnership and/or collaboration with farmers groups in the form of cash or kind,
- 4. raising funds from direct or indirect taxes.

In developing countries like Nepal, extension funding from the local government is generally difficult and there is a resistance for this type of decentralization from below. The central grant or subsidies becomes an obvious source for finance.

Market decentralization

In the liberalized economy, this form of decentralization is possible since privatization and deregulation policies become evident and functional. Therefore, it is said to be the most complete form of decentralization. With this, private business houses, NGOs, local community organizations, voluntary groups, cooperatives, etc run the extension functions which, otherwise, were carried out by the government entities. Contracting out of extension services is one type that has been introduced in Nepal. Public-private partnership arrangement could be another type of extension decentralization based on market forces. Deregulation policies will encourage the participation by the private sector and thus promote competition among service providers.

2.4.3. Historical Perspective of Decentralization in Nepal

There have been attempts for decentralization in the past by assigning lead roles to Chief District Officer (CDO) under the District Administration Plan 2032 BS or to the then District Panchayat (now the DDC). In the former decentralization, the CDO who was previously responsible for law and order situation in the district was also given the responsibility of development works signifying the development oriented administration. Nothing changed significantly except that the chief of DADO was put directly under CDO's limited administrative control for permission to leave the district and to take the approval for the leave of absence which previously fell under the Regional Director of Agriculture. Similarly, in the later the Local Development Officer (LDO) was the focal point and things did not change significantly from the former except the official pad and the sign board. Business was done as usual. At certain occasions, the JTAs (Junior Technical Assistants) were put under Pradhan Pancha (village chief) of the then Village Panchayat for administrative control, and programs and budget remained with the DADO as before. Things did not seem to improve because mutual relation between the JTAs and the Pradhan deceived the DADO in most occasions and vice versa. An account of the decentralization initiatives is given in the annex.

2.4.4. Description of the Reform Measures: Devolution

The Constitution of the Nepal 2047 BS had made a provision for the decentralization. This time, some seven years have passed in attempting to institutionalize devolution in Nepal.

The legal framework comprises of three basic acts and regulations this devolution stems from:

- (a) Local Self-Governance Act, 2055 BS
- (b) Local Self -Governance Regulation, 2056 BS and
- (c) Local Body (Financial Administration) Regulation, 2056 BS.

To oversee the implementation status of devolution according to LSGA and to monitor, Decentralization Implementation and Monitoring Committee (DIMC) have been formed under the chairpersonship of the Right Honorable Prime Minister and the working committee under the minister of local development (DIMWC). The Tenth Plan has also envisaged the decentralized functions based on basic principles of people's participation and empowerment.

The devolved structure comprise of three main aspects as (Mahesh Dahal, 2005):

- 1. Function: duty, authority and responsibility
- 2. Functionaries: staff, office space, equipment, liability, monitoring and evaluation
- 3. Funds: tax and non-tax revenues and grants

The twenty one-point program of the last government aims to effect decentralization on political, financial, social, administrative and semi-judicial authorities to the village level. As Ministry of Local Development (MLD) is the focal ministry charged with the responsibility of devolution, its action plan includes the study to find ways to make capable the local bodies. In so doing, the appropriate institutional structure, number and provisions with the concept of inclusive democracy for a viable unit will be sought for. The sectors of agricultural extension, livestock services, primary education, primary health and local infrastructure development will be fully devolved and internalized within the DDC in fiscal year 2062/63. While this is aimed at,

Decentralization Implementation Program 2058 will also be reviewed for any new changes to be adjusted for smooth devolution. The full devolution considered includes such aspects as disciplinary areas (in this case the agricultural extension), funds, offices and physical facilities, personnel, capacity building of local bodies to discharge devolved functions, monitoring and evaluation. Interactive consultations with concerned central ministries are underway by MLD and a Task Force is working to formulate Devolution Guidelines and Procedures. The Budget Speech has already earmarked 14 districts, one from each zone, as pilot districts for full devolution this fiscal year. The indicators used for the identification of these districts include: geography (i.e., one from each zone), accessibility, resource base, institutional capability, level of conflict, and level of infrastructure development. The districts thus identified are: Jhapa, Morang, Saptari, Dhanusha, Chitwan, Bhaktapur, Kaski, Rupandehi, Parbat, Dang, Banke, Jumla, Kailali and Kanchanpur. Under MoAC, District Agricultural Development Offices and Agriculture Service Centers, District Livestock Service Offices and Service Centers, and Cooperative Division Offices will fall under the devolved institutions. But closely related research and irrigation institutions are not covered which may imply some coordination issues during implementation.

Staffing

One very sensitive issue is with the staff in the present central civil service cadre; these staffs are to be deputed as and where they are basis until the time local service act is in force and reconciliatory solution is worked out. These positions have to be treated as central reserve pool under the same service and faculty and all the remuneration, career development and salaries according to the prevailing civil service act continued. As situations arise, the recommendation of local authorities may be entertained where applicable and thought appropriate.

Funding

The fund flow is very direct from the Ministry of Finance (MOF) to the District Development Fund (DDF) of the DDC.

Institutional arrangements

National Planning Commission will act as coordinating body with the participation of concerned ministries. A facilitation committee is proposed with the secretary of MLD as a chairperson. At the local level, DDC is to facilitate implementation. Again, to assess an appropriately structured viable unit of the local body, a high level commission will work on it and determine therein.

2.4.5. Proposed program for devolution in the agriculture sector

- Local level periodic and annual program formulation, approval, implementation and M&E
- Agriculture and livestock extension services
- Quality inputs production and distribution, improved livestock and poultry breeds, fingerlings
- Agriculture, livestock and cooperatives basic training and human resources development
- Animal health preventive and curative services, treatment of animals and veterinary drug management
- Agriculture market development, agriculture fair and exhibitions
- Statistics collection, analysis, documentation and updating
- Regulatory and M&E functions
- Quality control of agricultural inputs
- Technical services to farmers and awareness raising programs
- Income generation through fruit and vegetable cultivation, floriculture, apiculture, sericulture
- Registration, approval, regulation and monitoring of cooperatives
- Production, marketing and promotion of milk and milk products
- Modern slaughter house construction, management, regulation and monitoring
- Quality control and regulation of food, beverages and meat products
- Observing food health standards in hotels, restaurants and canteens
- Promotion of organic manures and organic farming
- Extension and promotion of IPM
- Any other activities determined as other than central functions

2.4.6. Lessons Learnt

- 1. One limiting factor working with devolution may be imposed by the lack of agricultural legislation in the country. This legislation as a guiding and umbrella principle for the agriculture sector should also be compatible with LSGA.
- 2. The present day agriculture should integrate the Nepalese youth in the wake of modernization and commercialization. The future agriculturists of the country are very poorly attracted to this enterprise, more so given the insurgency situation. The educated

youth would be an asset for new initiatives towards globalization as they are more tuned to recent information through internet, which is a limiting factor for the old and illiterate farmers, and take more risk. Thus the unemployed agricultural graduates and young entrepreneurs should be attracted to agricultural business like undertakings. In fact, the earlier 4-H youth program should be revived with refinement to suit to the present day need.

- 3. The knowledge base of extension is very weak. As there is a need of closer working relation between farmers (producers, entrepreneurs), research and extension, the demand for agricultural information has become more pressing than ever before (e.g., web search).
- 4. In the attempt for extension reform, many developed as well as developing world agriculture have resorted to strategies suitable for each country. Of course, there is no such model as a panacea but experiences are abounding in different continents. Good practices should be tried based on the lessons learnt from them. One strong consideration is of the incentive mechanism built in the extension system. The extensionists should be tied with producers challenging them to deliver the services demanded by the enterprise on performance basis entered into agreement with the producers. To begin with manpower quality in high priority areas should be developed and or managed accordingly.
- 5. In the wake of devolution, earlier attempts may demand at least as much funding as was supported by the central government previously, if not more. The assumption that devolution reduces budget burden as it is financed by the local government also may not hold true in many cases because preparatory works to devolution itself may be costly to train manpower, upgrade institutional set up and implement devolution through monitoring support. Otherwise, the task of devolution becomes one of frustration to local bodies, extensionists and farmers. This gives the impression that "earlier system was better than the devolved one" and the whole task of devolution carries a negative message and to begin with extension staff tend to choose the central service commission in favor of the local one

3. Governance

3.1. Institutional Reform

Institutional reform and organizational development are cross-cutting issues that impact on all areas of development. Building a strong, accountable and responsive bureaucracy is essential to providing a stable environment for private sector development; economic growth; sustainable resource management; livelihoods; and service provision (e.g. agriculture, education and health). Therefore many program with a technical theme focus on strengthening the target organizations. Key aspects of these programs include:

- restructuring and capacity building:
- conflict management;
- financial management systems;
- personnel management systems;
- information systems; and
- monitoring and evaluation systems.

Ministry of Agriculture and Cooperatives' (MOAC) Agriculture Perspective Plan Support Program (APPSP) was designed to deliver appropriate agricultural support services to the rural poor through improved policy and institutional arrangements. This project provided technical advisory support and fund management implementation for the APPSP. The program was focused on two levels of government:

- i. At the district level, where a fund for agricultural service delivery (District Agriculture Development Fund DADF) was established in twenty districts. The DADF was managed by the District Development Committees, and the program built the capacity of these committees to plan for and manage the DADF, ensuring that the poor and excluded beneficiary groups were targeted by the fund.
- ii. At the central level, where the Ministry of Agriculture and Cooperatives (MOAC) and other Agriculture Perspective Plan implementers were assisted with organizational and policy support.

In order ensure opportunities and lessons learned from the program are incorporated into future government initiatives, good practice and other key lessons that emerged from the APPSP were captured and disseminated within the MOAC and more broadly to the 75 districts of Nepal.

3.2. Public-private-NGO partnership

3.2.1. Introduction

Agriculture extension activities of the public and private sector for technology transfer have largely been undertaken separately in Nepal and South Asia over the years. The search for more effective ways to deliver public services dates back to the early 1980s when several agricultural extension models were tested. The private sector has worked to promote extension activities in the marketing of agricultural inputs and outputs largely in isolation from public sector activities.

The lessons of 1980s and 1990s have shown that neither the public nor the private sector alone can be effective in delivering services. There is a strong need for different types of public private partnerships in agricultural extension and development programs.

There is fine line dividing partnership and collaboration. Without entering into a debate on semantic differences this paper treats these two concepts grossly as one. Partnership/collaboration may be conceived as mutually beneficial and well defined relationships entered into by two or more organizations to achieve results they are more likely to achieve together (Winer and Ray). In general partnership/collaboration involves:

- A minimum of two organizations,
- An agreement about roles and responsibilities.
- Common objectives and activities aimed at the delivery of services, and
- The sharing of risks, benefits, and resources-both tangible and intangible.

Rosenbeth Moss Kantor (1990) described productive partnership as those which evolve, continue to yield benefits, create value, work through interpersonal connections and internal infrastructures that enhance learning. She identifies eight characteristics of best partnerships:

- Each partner contributes something of value,
- The strategic objectives of all partners are addressed,

- Partners have complementary skills and assets,
- Each partner makes an investment in the other,
- Communication is reasonably open,
- Mechanisms for smooth working together are in place,
- Each partner becomes both teacher and learner, and
- There is integrity and mutual trust.

The practice of partnership and collaboration logically leads us to acknowledge pluralism in agriculture extension and in reality there are a broad variety of institutions providing agricultural extension services. There has been a realization that farmers are best served by the broadest possible array of information sources and structures. The complexity of rural development demands a plurality of technological solutions and service structures. Farmers need access to many services such as input supply, credit, and even emergency responses to disease/pest infestations.

The emergence of the value-chain approach to address agricultural development also points to the comparative advantages of public and private partners in the delivery of extension services and in creating an enabling environment for agricultural development. The value-chain approach as applied to agriculture seeks to identify services that are missing or weak in a sector and develop the capacity of private and public service providers to address weaknesses. There are a variety of services where market failures occur. Government has a key role in providing public goods including market and productive infrastructure, research, the provision of basic knowledge, and the role of setting the policies and rules by which economic actors interact.

Experience has shown that the private sector is most efficient at providing inputs, embedded information with the sale of specific inputs, marketing channels, and the promotion of products/markets. The NGO sector has shown greater flexibility and efficiencies in introducing and supporting farmers to adopt new technologies, conducting planning and analysis activities, working with the business community and civil society to lobby for reforms, and to act as a facilitator of public private partnerships.

In the case of many agricultural export markets important public infrastructure, testing facilities and policies must be developed to enable the private sector to take advantage of market opportunities. Export facilities, laboratories, phyto-sanitary certifications, tax policies, and sector policies need to be developed in close public-private partnership to be successful.

Partnership is not a model administered or implemented by the state, but rather, it is a process how government agencies, development oriented NGOs, business and farmer organizations, private sector firms and others can support development. The purpose of entering into partnership is to take into consideration the presence of ongoing activities and, rather than trying to gain control over them, to instead choose niches and to identify common concerns where different approaches may lead to synergy.

In the recent past public extension has come under scrutiny for its limited accountability, inefficiency, and lack of responsiveness to changing farming conditions. Scarcities of financial resources for extension, changing ideology emphasizing efficiency over welfare, and heightened competitive interests from the private sector has led to acknowledge the private sector and NGOs as an important partner in the delivery of extension services.

3.2.2. Emerging trends of Partnership and Collaboration: A Journey towards Pluralism

The emergence of new extension arrangements offered by private sector, NGOs, and voluntary organizations has created a platform where delivery of services is undertaken independently or through various forms of partnership arrangements. The list of organizations providing extension services is growing. Various organizations providing services can be put into the following typology:

- Government organizations: line ministries
- Local government bodies: DDCs, VDCs
- Project organizations- These are created to oversee implementation of project activities for certain period and are generally publicly funded
- Private for profit organizations- these include private agribusiness, consulting firms, agri input dealers, traders/processors. It also includes such mechanism as contract farming with inputs, extension services, and markets are provided by agribusiness and the provision of embedded services with the sale of inputs or purchase of outputs.*
- NGOs (non-profit) that may be funded by government, or private sector sources
- * An example of embedded service is when an agro input supplier provides detailed information on the use of agricultural input, for example when seeds are sold the supplier provides details on planting dates, production techniques, and potential markets. This use of embedded service increases the demand for the input and effectively provides farmers with needed information.
 - Community-based organizations (CBOs), these are membership organizations based at village levels. They could be self-initiated, self-evolved, NGO initiated, government initiated, and project initiated.
 - These organizations deliver services in a variety of ways. However, there is realization that there is a comparative advantage with each organization, and that a single organization cannot meet the varied needs of the target group. This has invoked a need for entering into partnership resulting into synergy. Entering into partnership may entail a renewal of traditional roles for higher efficiency, effectiveness and sustainability. Partnership can take place at various levels; these can be classified broadly into three types:
 - Informational: In such arrangements organizations with similar interest get together to share information. Such exchange of information can take place through forums, networks, in specific themes like, food security, organic farming, IPM, or rural roads.
 - Institutional: Institutional arrangement to forge partnership among various agencies is provisioned through legislation, directives or by-laws or understandings. Development Boards, project steering/coordination committees, are some example of institutional partnership where representatives of various organizations work together for common goal.
 - This can be termed as representational partnership.
 - Programmatic: Partnership is reflected at various stages of program implementation.
 - Partnership could be at the planning stage where planning is done jointly and implementation is done separately. Programmatic partnership can further be delineated into two sub-types:
 - mutual: unifying comparative advantage by cost sharing
 - contractual: providing services through competitive bidding

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Partnership arrangements can take the following forms:

- Public- Public
- Public- NGOs
- Public- Private
- Local bodies- NGOs/private
- Projects- public/local bodies/NGOs/private
- Multi-partner (Public—Public-local bodies- NGO- Private)

It is apparent that agriculture extension service providers, government, NGOs, agribusiness, have perceptual differences in extension issues resulting in differences in their focus.

A study (Ojha, 2000) on partnership in agriculture extension in Chitawan, Nepal has shown that among partnerships, Public + Private and Public + NGO are more effective than other forms of partnership. The same study concluded that partnership is and effective strategy but is specific to circumstances and should not be generalized in all situations.

In this context it is worthwhile to review the strengths and weakness of organizations in agriculture extension.

NGO strengths include

- The majority of NGOs are capable of responding flexibly and rapidly to client's needs and changing circumstances as they are small and horizontally structured with short lines of communication.
- NGOs' concern with the rural poor means that they often maintain a field presence in remote locations, where it is difficult to keep government staff in post. This is well demonstrated in Nepal due to the conflict situation.
- A main concern of NGOs' is to identify the needs of the rural poor in sustainable agricultural development. For this they have therefore pioneered a wide range of participatory methods for diagnosis and program implementation.
- One of the strengths of NGOs has been their work in group formation and mobilization.
- As result of working in participatory approaches and close communication with rural communities NGOs have been effective in lobbying for agricultural reform and policies to benefit small producers

NGO weaknesses include

- NGOs' small size means that their projects rarely address structural factors that underlie rural poverty.
- Some fashionable areas have become densely populated by a diversity of NGOs that problems have arisen for competition for the same clientele.
- NGOs have limited capabilities for agricultural technology development.
- Some NGOs are accountable to external funding agencies than to clientele they
 claim to serve. Donor pressure to achieve short-term impacts, combined with a lack
 of cross learning, has led in some cases to the promotion of inappropriate
 technology.

Public sector strengths

- Wide network of staff covering all geographical areas.
- Better access to technology and resources.

- Well trained personnel.
- Continuous presence thus ensuring sustainability of services.
- Should be accountable to farmers and political structures.

Public sector weakness

- Supply driven rather than demand driven,
- Commercialization of agriculture gave rise to specialized clients and demand for location specific extension service which are not catered to by public systems,
- Extension provided are general in nature rather than specific and intensive,
- Insufficient face to face contact between extension agent and farmers possible,
- Inadequate technical qualification of technicians,
- Public extension is target oriented and less participatory,
- Extension treated as policy administration rather than change process,
- Professional and timely monitoring at all levels is lacking,
- Not effectively reaching poor and disadvantaged segments,

Involvement of NGOs and the private sector in agriculture extension has been experimented in various forms around the world. The following examples illustrate some experiences in private sector involvement in agriculture extension:

3.2.3. Reflections on Public Private Partnership Experiences in Nepal

In Nepal as else ware extension has long been grounded in the diffusion model of agricultural development. It is only recently beginning in the 1990s that emphasis and efforts towards involvement of the private sector in agriculture development have begun. Still efforts to involve and link to the private sector remain nascent. Donors have begun to promote programs for more private sector involvement. In Nepal partnership between government agencies existed since early days of agriculture extension. For instance, Tribhuwan Village Development Program was an example of partnership between government agencies (Department of Rural Development and Department of Agriculture). During 70s and 80s the theme of linkage and coordination received prominence as coordination among research, extension, input and credit related agencies was considered important in agriculture development. Through research – extension linkages in practice have been weak.

An important partnership program with private agencies began with the World Bank funded *Agriculture Research and Extension Project (AERP)* during mid 90s when the project contracted out extension functions to consulting firms and NGOs.

Agricultural policy, 2061 of HMG/N has laid a policy framework to attract private and NGO sector specifically in the areas of food and nutrition, agriculture production, collection, grading, storage, processing, packaging etc by providing tax incentives and institutionalizing competitive biding.

ADB Crop Diversification Project (CDP). The CDP has initiated two modalities of contracting agriculture extension activities:

 Contracting out extension activities to private extension service providers (NGOs/CBOs) to mobilize farmers in production pockets; Nepal Nepal

• Mobilizing farmers group by the social mobilizers recruited by DADO. In this strategy, both DADO and social mobilizers work on their strength such as group formation, mobilization and management to be done by Field Teams (social mobilizers) and technical backstopping by DADO staff.

CDP has three types of production pocket areas a) production pocket areas completely contracted to private extension service providers' b) production pocket areas with field teams; and, c) regular DADO pocket areas;

A mid term assessment of CDP (CDP 2005) has shown that technical staff have not owned and internalized the field teams as their supporting partners and that NGO partners are not providing enough technical backstopping, training and physical support to the field teams. As FTs have limited technical knowledge, their primary job is to convey the farmers' problems to their supervisors and consequently to technical staff. But due to the poor presence and inefficiency of supervisors and technical staff, farmers' problems are not properly addressed. The same report indicates that there has been significant increment in the social mobilization aspects after the involvement of FT.

DFID has given grant assistance for a period of five years effective from March 2003 for the APPSP. The program is aimed to orient agricultural services to reach target groups including the disadvantaged, marginal, poor women farmers, dalits, and ethnic minorities. Establishment and operation of District Agriculture Development Fund

(DADF) forms the basis for the implementation of APPSP in the districts. It attempts to devolve agriculture extension services as well the promotion of public-private partnership.

APPSP has been implemented in 20 districts. As of July 2005, 217 projects have been funded through District Extension Sub-fund (DEF). DEF is a competitive fund established for service providers to strengthen and decentralize extension service. A total of 1, 287 projects are funded through the Local Initiative Sub-fund (LIF). LIF is a competitive fund established for farmers' groups. The purpose of LIF is to address the needs and demands of poor farmers, particularly marginalized, women, disadvantaged groups and those living in remote area and support their initiatives. There is wide range of projects funded by DEF but most of the projects fall in the category of goat raising, marketing, vegetable production, and, seed production. The program has been broadly successful but has been challenged to receive strong proposals from local potential service providers.

Third Livestock Development Project (TLDP), Paincho (loan –in- kind) program on goat in TLDP is an excellent example of partnership between government and NGOs. Under this program, partner NGOs assume responsibility of farmer mobilization, help in establishing private vet services, and provide micro-credit to farmer group members while government agencies provides funds, supplies goats, veterinary services and funding for establishing agro vet shops along with other support services like training to NGOs and monitoring and evaluation. This program is implemented in 19 districts in partnership with 77 NGO partners (Sherchan, L)

National Agriculture Research and Development Fund (NARDF) was established in accordance with the principles of competitive grant system in 2002 under the Working Fund Act 1986. The fund targets government, non-government, educational, private sector and civil society organizations involved in agriculture research and development. It aims to

encourage these organizations to compete in partnership or collaboration for partial or complete funding. So far 23 projects are under operation.

The Nepal Tea and Coffee Global Development Alliance Experience

Starting from 2002 USAID has supported Winrock International to facilitate two public private partnership alliance programs, for specialty tea and coffee development for international export markets. Under the Global Development Alliance approach Winrock worked to identify stakeholders, including government agencies, private sector industry associations, farmer/producer organizations, and development partners including NGOs, INGOs, and donors. Each alliance has a formal written constitution, common objectives, a workplan, and a monitoring / reporting function. The alliances meet regularly and have proved highly successful:

- The coffee alliance has established Nepal as a specialty coffee exporting country shifting processing from nearly 100% low quality dry processed to over 60% washed/semi washed for international export markets. And has facilitated a tremendous increase in economic opportunities for poor smallholders
- The tea alliance has played a major role in establishing international market linkages and a branded identity of Nepal tea. In the past Nepal tea was being sold to India as an unbranded product. The alliance has facilitated Nepal tea entry into the USA market and branded Nepal tea in the major German market. The alliance has also facilitated the industry to adopt a code of conduct for social and environmental responsibility that is a strong marketing tool.

The alliance program is now in its final phase and is working to strengthen the capacity of the Tea and Coffee Development Board to continue the coordinating role and success of the alliance approach.

Smallholder Irrigation Market Initiative (SIMI)

The Nepal SIMI project supported by USAID and implemented by Winrock International, and partners International Development Enterprises, CEAPRED, SAPPROS, and AEC represents a model program for developing district and local level public private partnership. SIMI promotes micro irrigation (primarily drip and the treadle pump) for vegetable production by smallholders. SIMI takes a value chain approach building the linkages and capacity of agro input manufacturers, input suppliers (agrovets), equipment dealers, micro irrigation installers, and traders/ processors. The SIMI program has closely facilitated partnership with government agencies including MoAC, DOA, DOI, MLD, WDD, MOF, NARC and government projects APPSP, CDP, MGEP, PAF, and others. Government in the partnership has taken a lead role in developing marketing infrastructure, developing multi use piped water systems, providing market information through radio broadcast, providing basic extension services, adaptive research, providing resources to assist the poorest to adopt micro irrigation, and creating an enabling policy environment. SIMI has facilitated a wide range of partnership types include GO-NGO partnership, GO-Private Sector, and GO-NGO-Private Sector. Examples of GO-Private partnership facilitated by SIMI include the provision of marketing infrastructure that is utilized and managed by the private sector in partnership with government. Overall SIMI public private partnership activities are facilitated by a government advisory body and by participating on district and local level agriculture

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development committee meetings and close coordination with government line agencies Development Boards. Development boards can be conceived as an institutional mechanism for fostering public private partnership. Composition and autonomy are key factors affecting the functioning of development boards.

3.3. Accountability Hierarchy

Ministry of Agriculture and Cooperative (MoAC) is the central apex body of the Government of Nepal to look after the agriculture and allied fields in the country, and is responsible for overall development of agriculture (crops, livestock, food and nutrition and fishery) and co-operative sector. It is headed by the Minister, with complementary support from the Minister of State for overall policy matters and affairs of the ministry. The secretary is the administrative head and chief adviser to the Minister on policy, planning and administration. The ministry consists of five divisions, namely Agri-Business Promotion and Statistical Division; Planning Division, Monitoring and Evaluation Division, Gender Equality and Environment; and Administration Division and two centers they are Agriculture Information and Communication Centre and Seed Quality Control Centre. Besides, there are two autonomous councils: Nepal Agriculture Research Council (NARC), and Nepal Veterinary Council; and three National Boards related to Dairy Development, Co-operative Development, and Tea and Coffee Development. Similarly, there are four departments responsible for development of their specific subsectors: Agriculture, Livestock Services; Food Technology and Quality Control; and Co-operative, There are also three corporations / company, and five different committees constituted in different areas of operations. The Agriculture Research and Development Fund (NARDEF) is responsible for research and development activities.

Under the Ministry of Agriculture and Co-operative, the Department of Agriculture is mainly responsible for development of agricultural crops and fisheries. The Department is headed by the Director General (DG). Under the DG, there is a provision of three Deputy Director Generals (DDGs) to provide assistance in three major areas: Planning and Human Resources Development; Monitoring, Evaluation and Administration; and Technologies Transfer and Co-ordination. For providing technical support and backstopping to the agricultural development program, there are 12 program Directorates related to: Fruit Development; Vegetable Development; Fisheries Development; Crops Development, Agricultural Training; Agri- Business Promotion and Marketing Development; Agri. Extension; Plant Protection; Industrial Entomology; Post- Harvest Management; Soil Management; and Agricultural Engineering. Under each of the Directorates there are, as per relevance, different sections, resource centers and development programs.

Directly under the DoA, there are five Regional Directorates, one each in the five Development Regions of the country. The Regional Directorates are headed by the Regional Directors. The main responsibility of the Regional Directorates is to supervise the agricultural development programs in their respective regions. To implement the agriculture development programs at the districts level, there are District Agricultural Development Offices (DADOs) one each in the 75 districts. Each of the District Agriculture Development offices is headed by Senior Agriculture Development Officer (Gazetted 2nd class) and administratively, they are responsible to the respective Regional Directorates. In order to provide technical backstopping to various aspects of the agriculture development programs of the districts, there are Subject Matter Specialists (SMSs). Similarly, there are provisions

of Agricultural Services Centre/ Sub-centers staffed by JT/ JTAs to provide extension services at the sub-district levels, to the farmers. To assist on various aspects of the agriculture development programs, there are Laboratories and Training Centers at the regional level. For the implementation / management of the development projects, there are provisions of a separate Project Implementation/ Coordination Office for each of the projects. The Co-coordinator is appointed as the chief of such projects. The project co-coordinators are directly responsible to the Director General.

The beginning of the institutional development in agriculture is as old as 1978, when for the first time, the "Krishi Adda" was established. The MoAC, with a vision to improve the standard of living of people through sustainable agricultural growth by transforming the subsistence farming system to a competitive and commercialized one, has the following main defined objectives:

- To reduce poverty through increased agricultural production and productivity;
- To make Nepalese agricultural products competitive in the regional and world markets by developing the foundation of commercial and competitive agricultural systems; and
- To conserve the natural resources, environment and ecological diversity and utilize them for sustainable agricultural development.

In order to realize the above objective the Ministry is mandated with the following main functions:

- Formulation and implementation of agricultural and cooperative development policies and plans;
- Implementation of development activities to develop cereal crops, cash crops, industrial crops, horticultural crops and industrial entomology;
- Livestock development activities, such as farming, breeding, feed as well as pasture development;
- Operating agriculture farms and centers.
- Agriculture research and survey on cereal crops, horticulture crops, oilseed crops, industrial crops, livestock, veterinary services, agri-engineering, fishery, food technology, industrial entomology, cooperatives and dairy development;
- Training to farmers on different agriculture:
- Transfer of modern technologies aspects of related to agriculture, to farmers; and
- Carrying out the activities to develop youth and women farmers.

In order to provide impetus to the development of agriculture sector through conceiving a development framework in a long term perspective, and identify the key areas of development priorities and necessary interventions in a cohesive and integrated manner, the Government adopted the Agriculture Perspective Plan (APP), prepared in the perspective of 20 yrs covering the period from 1995 to 2015. The implementation of APP commenced from 1997. Under the Agriculture Perspective Plan support programmers there are seven projects being implemented mainly in the fields of Crop Diversification, Community Livestock Development, Commercial Agriculture, Soil Management and Agriculture Extension and Training. The APP is one of the documents that have received consensus of the major political parties and key stakeholders. The document provides long term vision and strategies for agriculture growth and poverty reduction. The Ninth 5- years Plan well recognized the central role of agriculture in the overall economic development of the country and adopted,

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by and large, the strategies, and priorities defined by the APP. The Tenth 5-year Plan recognized as the Poverty Reduction Strategy Paper (PRSP), provided continuity to the efforts and initiatives started under the 9th Plan.

The investments in the development of the agriculture sector have not been adequately matching with its potentials for actual needs and its contribution to the overall economy. Furthermore, the results expected even from the present level of investment cannot be said satisfactory. There are some inherent weaknesses in sound planning and effective implementation of the programs in agriculture sector, along with the weak monitoring and evaluation system, resulting into non-realization of the expected level of results. Being cognizant of this reality, while formulating the 10th Plan some basic elements of Managing for Development Results (MfDR) was incorporated to improve the quality of planning and monitoring and evaluation The development of agriculture sector plan, along with those of other sectors, was based on the Policy and Result Matrices and the focus of the proposed strategies and working policies, and proposed programs was on the achievement of desired results. The same approach was followed in formulating the Three-year Interim Plan (TYIP). However, there appears a strong need to improve further the whole range of planning, implementation and monitoring and evaluation system through operationalizing the MfDR approaches at the macro meso and micro levels.

The Asian Development Bank is providing technical assistance to five ministries and some selected agencies to improve their management efficiency through operationalizing/internalizing the MfDR approaches, to help realize the desired results in terms of outputs, outcomes and impacts. The present TA (ADB TA 7158-NEP), among others, covers MoAC with main focus on the Department of Agriculture under it. Accordingly, MoAC and DoA is being supported based on the experiences of previous ADB TA projects by undertaking status assessment regarding their preparedness for operationalizing the MfDR; developing their results frameworks and results indicators; and preparing business plans to be main streamed into planning, budgeting and monitoring systems. Based on the preliminary assessment of the factors responsible for low performance of the agriculture sector, the following main areas have been identified needing special attention for improvement of the performance of the agriculture sector:

- Integrating the farmer's crops production calendar with the supply of irrigation water from the DOI irrigation projects.
- Critical assessment of the supply situation of the key production inputs, such as
 fertilizers, foundation and commercial seeds, fruit saplings of known progeny and of
 specified standards, and fingerlings, and taking necessary measures to improve the
 situation in this regard.
- Generating reliable baseline data on area and production of various agricommodities for the assessment of actual realization of the intended results.
- Need for improving the quality of monitoring data.
- Making use of the feed-back information by different levels of the management hierarchy, for improvement of efficiencies and effectiveness of the programs.
- Introducing motivation and accountability measures along the management chain
- Ensuring an effective mechanism for co-ordination among the various agencies responsible for supporting various aspects of the on- farm production system, as a whole.

- Assessing the appropriateness and effectiveness of extension tools applied to motivate the farmers for adoption of improved practices related to production and post-harvest operations.
- Improving the situation regarding timely technical back- stopping to the production programs at the farmer's level.
- Improving further the research and extension linkages.
- Adopting appropriate policy on providing subsidy and protection to the agricultural products to enhance their competitiveness vis-a- vis the products of the neighboring countries.
- Raising the level of investments in the agriculture sector in conformity with its
 present and the potentials for contribution to the overall economic development of
 the country.

The status of MfDR implementation in MoAC is as follows:

- Readiness analysis of MoAC is completed and sectoral performance gap analysis of the agriculture and food security sector is under progress.
- Further activities including preparation of business plan for MoAC awaits budget discussion for FY 2010/11.

3.4. Management Information System

Realizing the growing importance of information in agricultural development in Nepal, the Agriculture Information Section (AIS) became operational in 1965 as a separate unit in the Department of Agriculture (DOA). This section was renamed as Agriculture Communication Division (ACD) in 1990. In course of restructuring of the Ministry of Agriculture and Cooperatives in 2000, it was given its current name of Agricultural Information and Communication Center (AICC) and was attached to the Ministry as one of its central units with greater role and responsibility. AICC is a professional wing of the Ministry of Agriculture and Cooperatives entrusted to produce agricultural information relevant to farmers, traders, entrepreneurs and professionals and to communicate the information through different media. The Center also bears the additional responsibility and challenge of managing and using digital information generated recently by the growing application of personal computer, internet and mobile telephone in modernizing agricultural development in the country.

The vision of the government is building an organization driven by information and communication technology (ICT) capable of ensuring timely, faster and relevant access to information to facilitate agricultural stakeholders and practitioners for building knowledge based farm communities.

3.4.1. Program activities

a. Farm radio program

Radio has been the most effective means of mass communication since its establishment in 1951 in Nepal. Its broadcasts in short wave are received all over the country while 83 per cent of the population can receive medium wave broadcast. It is estimated that there are more than 3.0 million radio sets in the country. AICC has been running its farm radio program since December 10, 1966. It produces seven programs a week each of 15- minutes duration in its own studio and aired on Radio Nepal at the evening time (6.40 to 6.55) daily.

Table 1. Radio Program Activity (6.40-6.55 evening)

• Sunday - Agricultural news

Monday - farmers' questions and expert's answers
 Tuesday - Food and Nutrition, Cooperatives etc.
 Wednesday - Interview with farmer and specialist
 Thursday - Livestock farming radio magazine
 Friday - Dialogue between JTA and old woman

• Saturday - Commercial Agriculture

Regional stations of Radio Nepal are also running agricultural programs produced by Regional Communication Unit of the government and some private FM radios have also been broadcasting farm programs produced locally by District Agriculture Development Offices or by the FM Stations themselves. There are altogether 205 licensed FM radio stations across the country of which only 69 are in operation. Recently, role of radio has become important in making farmers aware of the prices of agricultural commodities at different locations of the country. FM stations are playing effective roles in informing local market prices of agricultural commodities. Besides this, they are also useful media for the farmers to get first hand information about agricultural practices and also in knowing important events in agriculture.

b. Agriculture television program

Nepal Television (NTV), which started its service in 1984, has 3 studios and 15 broadcasting centers telecasting to about 50 percent of land coverage and 65 percent of population coverage in Nepal. NTV is using geo-satellite to broadcast its programs and capable of live cast with its Digital Satellite News Gathering (DSNG) equipment from any part of the country. Its second channel the metro NTV2 is also running in the recent years while 8 of 14 licensed private television companies are providing services at this time. There have been 482 licensed cable TV operators, of which 365 cable TV companies are operating in different parts across the country. AICC has been telecasting 15 minutes program since 1996 from NTV daily at the evening time (Table 2). From the mid July 2006, the telecasting duration has been extended to 20 minutes.

Table 2. Television program activity (6:30-6:50 evening)

• Sunday - Discussion on Agricultural Issues

Monday - Success Story

• Tuesday - Farmers' Problems and Technicians' Reply

• Wednesday - Agriculture Technology

Thursday - Agriculture in Foreign Country/farmers' useful technology

Friday - Agricultural ActivitiesSaturday - Agricultural Tele serial

AICC produces a number of documentaries on various aspects of farming and broadcast through NTV agricultural program. From October 2004, *Agricultural News* has been broadcasting on Friday of each week. From last year there is daily agriculture news with national news at prime time. AICC in collaboration with NTV has recently restructured its program format to introduce value-added services reflecting the changed needs of the users. Different I (NGOs) and donor agencies involved in agriculture sector also produce project

related agricultural information material and telecast through public and private television channels.

c. Publication and print media

AICC has been publishing *Krishi*, a vernacular bi-monthly agriculture magazine for over 40 years. It has been updated and reformed in its look and style recently. The center's other publications are agriculture diary, booklets, leaflets, and calendars. Among these publications booklet and folder are distributed free of cost to the farmers, agriculture technicians and other concerned persons.

Bi-monthly magazine and calendar are provided to the central as well district level offices of the Ministry of Agriculture and Cooperatives on a quota basis. In case of Bimonthly magazine, there is provision of subscription as annual and life memberships to the persons and organizations.

Publication and print remains number one media in agricultural technology dissemination. These media are operational from grass root to national level, from community based organizations (CBOs) to INGOs and from government level to private level. A national daily like 'The Kantipur Daily' has its permanent page on agriculture each Sunday. Other dailies publish agriculture information (news articles, technologies, announcements, interviews etc.) periodically. Similarly weekly, fortnightly and monthly newspapers and magazines also publish agricultural articles and information periodically. Among these magazines, the Himal and The Nepal fortnightly very often publish agriculture related news articles and technology packages. Agro based industries, private farms, NGOs and INGOs working in the field of agriculture also publish agricultural information and technologies as per need of the projects handled by them. Federation of Nepal Chamber of Commerce and Industries (FNCCI), Agro Enterprise Center (AEC) and Rural Urban Partnership Program (RUPP) are involved in providing price information of agricultural commodities by publishing price bulletins. Such institutions also publish technology packages for commercial production of crops. A very good example of such publications can be cited to an article on Off-season Vegetables, September 2006 by AEC/ FNCCI. Local news papers also publish relevant agricultural news and information valued at district level.

Many national and international agencies in Nepal are involved in projects like poverty reduction, income generation, rural employment generation and the like which are obviously directed towards agricultural development. These agencies also publish agricultural information and technical packages for the farmers. The leading agencies in this sector are USAID, JICA, DIFID, CIDA, Helvitas, IRRI, CYMMIT, SNV, SIMI-Nepal and CEAPRED. Similarly, Institute of Agriculture and Animal Sciences (IAAS), Himalayan College of Agricultural Science and Technology (HICAST) Nepal Agricultural Extension Association (NAEA) also publish agricultural articles in journals and also provide information to other media. Regular agricultural bulletins are published by regional and district offices of Department of Agriculture.

d. Computer application and internet use

Computer, email and Internet have become increasingly popular since the introduction of computers in Nepal by the government in 1971. With access to low cost personal computers in recent years and the growing involvement of private sector in computer business, the

availability of internet became possible only towards 1993-94 but in limited scale. The rate of computerization and automation in public sector remained still low as most computers are used for word processing purpose. AICC possesses about a dozen of computers with radio link broad band connectivity installed at the Center. This has given a way to reform governance making the organization more efficient, transparent and effective in the exchange of information within and between organizations. To be of use AICC has created its web portal www.aicc.gov.np in which general agricultural statistics of Nepal and introduction of organizations, departments, centers, boards and committees under the ministry are placed. As an electronic journal the bimonthly agriculture-Krishi has also been put in the website as pdf file which can easily be downloaded and read. The National Agriculture Policy 2004, Agriculture Business Policy 2004, and a number of booklets on various aspects of agricultural technologies are also kept in the website. As these materials are in vernacular Nepali, any citizen and literate farmer can read and get benefited from the information. The portal is also a gateway to all government ministries and relevant organizations as they are linked to the website. Some important websites linked to this URL are www.moac.gov.np. www.nardf.org.np, and www.narc nepal.org

e. Recent initiatives and achievements

- Daily Agricultural News Broadcasting in Radio Nepal and Nepal Television,
- Establishment of Information and Documentation Unit at the center
- Agriculture Television program made more attractive with inclusion of teleserial, agriculture talks program and lessons from agriculture of foreign countries
- Website Construction and Online Magazine, Statistics, and Booklets hosting,
- Radio Link High Speed Internet Connection at the AICC Premises,
- Improvement in the Structure and Look of the Bimonthly Magazine, *Krishi*,
- Agriculture Technology Book (Nepali), a hand book made for the lower level technicians and farmers, Published and Distribution in Progress.

f. ICT guidelines and directives

ICT has been recognized as one of the most important infrastructures for spurring agricultural development. Many of the existing conventional methods and technologies have become obsolete or ineffective with the advent of global IT revolution. It is therefore imperative for us to reap the fruit of IT revolution in bringing farm communities into the chain of ICT to build a sustainable and knowledge based farming system. The challenge that lays ahead us is how to utilize ICT effectively for the benefit of the masses of the farmers at the grass root level. To address such a question and to bring ICT at farmers' doorsteps in playing a greater role in farm technology diffusion, rural market integration and to diversify productive capacity of rural people, the Government of Nepal, Ministry of Agriculture and Cooperatives, on the initiation of AICC, has made the following decisions on the application of ICT in agricultural development in the country.

3.4.2. Central level

- Establishment of Agricultural Information and Documentation Unit (AIDU) at AICC to collect agricultural information, processing and distribution
- Management and making available of new technologies to technicians, farm communities and concern agencies through CD-ROM library, CD and emails,

- Gradual computer networking of central, regional and district agencies under the Ministry of Agriculture and Cooperatives to the central agricultural information and documentation system.
- Agricultural programs on radio and television will be made more informative and attractive to the audience and collaborative works will be launched with the local FM radios.
- AICC will focus its attention to publish materials related to common problem of technology, market development and policy matters on agricultural development.
- Monitoring and coordination of agricultural information and communication programs implemented by the regional and district offices.
- Formulation of working procedures for the establishment of rural agricultural information center (RAIC) in the districts.
- To include the above-mentioned agenda, program formulation will be done based on the priority and within the approved budget ceilings.

3.4.3. Regional level

- To strengthen the regional agriculture communication unit one of the agriculture extension officers at the Regional Directorate of Agriculture is given responsibility of the unit. Agriculture communication unit should implement the agriculture information and communication programs in coordination with the Regional Directorate of Livestock Services and other allied agencies.
- Carry out the role of coordination and monitoring for the farm radio programs implemented by the district offices. Coordinate district agencies and private broadcasters to formulate more effective and region specific regional radio program.
- Formulation of program to establish regional agricultural information and documentation unit.
- Organize at least one workshop a year for an interaction among local press, representatives of national media, agricultural technicians, local bodies and NGOs to make them aware of the regional agricultural information and communication and other activities.

3.4.4. District level

- Agriculture extension officer (AEO) of DADO is made responsible to formulate and implement agricultural information and communication program in coordination with other related agencies at the district.
- Formulate programs to establish agricultural information and documentation unit (AIDU) at DADO.
- Adopt print and publication program based on the local needs and feasibility.
- In view of the local needs and feasibility initiate the launching of farm radio program from the local FM station.
- Formulate programs to motivate local cooperatives and/ or farmer's groups to create Rural Agricultural Information Center (RAIC) through the identification and with collaboration of communities, local cooperative societies, VDCs, DDCs and local NGOs.
- Plan for an E-extension to be implemented as pilot project through RAIC or active groups of farmers in the district.

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3.4.5. Agricultural information resources

AICC is serving as a full-fledged center founded on ICT culture to motivate communities to adopt knowledge-based agricultural systems by fostering greater organizational efficiency and interrelationships among farmers, extension workers, researchers and entrepreneurs. The primary source of agricultural information for AICC is National Agricultural Research Center (NARC) from where agricultural technologies are generated. Other sources of agricultural information are

- Ministry of Agriculture and cooperatives for policy related information
- IAAS and HICAST for technology
- Government farms for technology and practices
- NGOs/INGOs working in agriculture sector (e.g. CEAPRED, Li-bird, Nepal SIMI) for technology and good practices
- Private farms for good practices
- Progressive farmers for good practices.
- Different websites related to agriculture

Public media and private media also serve as information sources for the farming communities. They usually transmit/publish/telecast

- success stories,
- government policies,
- price information
- good agricultural practices
- agricultural news etc.

4. Human resource development and capacity building

4.1. Central Agricultural Training Centre

Central Agricultural Training Centre (CATC) has been reorganized and renamed as Directorate of Agricultural Training (DAT) under the Department of Agriculture (DOA) as per Government decision of 20 November 2003. The CATC was established on December 10, 1987 along with ten Regional Agriculture Training Centres (RATCs) two each in the five development regions. The RATC were strategically created in the key locations for hills and terai in each development regions. Later in 1992 CATC was reorganized and ten RATCs were reduced and consolidated into five RATCs thus having one RATC in each development region. Prior to this establishment training programs were handled and managed by the then Agriculture Extension and Training Division of the Department of Agriculture. Following the inception of CATC, agricultural training programs scattered across the country were streamlined and made to link with the prioritized production programs. DAT has been organizing various types' in-service training courses for the gazetted officers working under the Department of Agriculture. The directorate, at present administers about a dozens of training courses annually, in which about 250 DOA officers are trained in various commodity specific fields, training related skills and in institutional capacity building. During the Ninth Five Year Plan (1996/97-2001/02) a total of 1027 officers have been trained through 49 training programs.

Vision

DAT as a government owned comprehensive agricultural training institute, under the DOA, Ministry of Agriculture and Cooperatives, a center for professionalism dedicated to service and training excellence.

Mission

DAT shall contribute to develop competent human resources in support to the food security and poverty reduction through agricultural modernization.

Mandate

- Conduct advanced level short training course for the technical officers and professionals of Nepal Agriculture Service of Government of Nepal.
- Ensure the extension of farm technology to the end users through organizing multilevel training programs and developing human resources
- Design and implement training related research and study programs
- Support and backstop Regional Agricultural Training Centers and District Training Units in planning, implementing and quality upgrading of training programs.

The courses offered by DAT are among the high standards in the kingdom as they are designed by highly qualified resource persons together with the dedicated team of management. Training courses, thus aim to improve the capability of trainees to activity lead, participate and collaborate in planning and implementing agricultural extension activities so as to give impetus to agricultural development endeavors.

DAT training courses are tailored to meet the needs of the professional subject matter specialist, planners, managers and extension workers who are serving the government at the center, regional and district level. The minimum duration of training course is one week and maximum duration is seven weeks.

4.1.1 Publications

DAT in collaboration with Manpower Development Agriculture Project (MDAP/GTZ) has published 32 different types of training manuals on various technical fields. DAT newsletter, a four-monthly publication is also a regular publication of this directorate. DAT has started publishing a Journal of Agriculture Development from fiscal year2003-04. Progress report, training effectiveness studies, brochure etc are directorate other publications.

4.1.2 DAT Network

DAT has network of five RATCs located in different development regions of the country and entrusted to run training programs for support staffs and farmers. Recently, RATCs are reoriented to offer more specialized training courses to the varying needs of farmers and support staffs tailored according to their background, interest and aptitude. RATCs usually give training to around 1000 JT/JTAs and over 3000 farmers on wide range of subjects annually.

Regional Agricultural Training Centre

Eastern Development Region, Jhumka, Sunsari Central Development Region, Naktajhij, Dhanusha Western Development Region, Lumle, Kaski Mid- western Development Region, Khajura, Banke Far-western Development Region, Sundarpur, Kailali

4.2. Agricultural University

The Institute of Agriculture and Animal Science (IAAS) - Nepal, began as a School of Agriculture under the Ministry of Agriculture in 1957 to train Junior Technical Assistants (JTAs) in agriculture. In 1968, the school was upgraded to College of Agriculture and a twoyear Intermediate of Agricultural Science (I.Sc.Ag.) program was started. In 1972, the College of Agriculture was given the status of the Institute of Agriculture and Animal Science under Tribhuvan University. Until this time, the institute did not have its own buildings and facilities and was operated at "Jagdamba Bhawan" at Pulchok in Kathmandu. In 1974, the institute was relocated from Kathmandu to its present site at Rampur in Chitwan District where 110 hectares of land, buildings and facilities of then Panchayat Training Center were endowed to the institute. Later in 1978, 125 hectares of livestock farm under Ministry of Agriculture was handed over to IAAS for teaching. At present the institute has its central campus at Rampur and two branch campuses. The Lamjung Campus, located at Sundar Bazar in Lamjung District was established in 1975 and The Paklihawa Campus located at Bhairahawa in Rupandehi District was established in 1978. Started with a few permanent faculty positions in 1972, the IAAS now implements teaching, research and extension programs through a core of over 150 trained and dedicated faculty members at its central and the branch campuses.

4.2.1. Academic

At present, the institute offers B.Sc. Agriculture (Bachelor of Science in Agriculture), B.V.Sc. & A.H. (Bachelor of Veterinary Science and Animal Husbandry), M.Sc. Agriculture, M.Sc. Animal Science, M.V.Sc., M.Sc. Aquaculture and Doctor of Philosophy (Ph.D.) programs at Rampur. The two branch campuses at Lamjung and Paklihawa also offer initial two years of B. Sc. Agriculture course.

4.2.2. Research

Research is an integral part of the IAAS system. Besides the course work, the faculty members and students are actively engaged in research activities. Although, IAAS do not get regular budget for research from the university, the institute strongly encourages faculties and students towards research activity and supports a number of research projects annually by mobilizing internal resources. The research projects are managed by the <u>Directorate of Research and Publication</u> wing of the Dean Office. The institute adopts highly flexible and transparent research project administration policy to facilitate researchers so that the scientific objectives can be achieved effectively and efficiently. Usually IAAS incurs 10% of the total project budget as overhead cost to cover the project management expenses.

Within its limited resources, IAAS annually invests over 600,000 (NRs.) to support faculty and students research projects, mainly postgraduate thesis research work. Depending upon

the availability of funds, undergraduate student's research projects are also supported. The financial support for such projects is awarded on meritorious basis.

IAAS faculties have been highly successful in competitive research grant application. Currently, over 20 faculty research projects covering a wide rage of topics of crop science, horticultural science, fishery, animal husbandry and veterinary science are on-going. The total budget of these projects amounts over 40 million Nepalese Rupees. The major incountry funding agency is the National Agriculture Research and Development Fund (NARDF) and among the international agencies DFID, FAO, USAID, UNDP, IFS, Eiselen Foundation, TUFT, IRRI/IFAD, CIMMYT AquaFish/CRSP, EU and WWF are the major ones.

4.2.3. Extension

The Directorate of Extension (DOE) was established on January, 2000 (2055-10-7) to strengthen the extension service delivery system of the IAAS.

The mission is to provide services to farmers by using more innovative, participatory and methodological approaches in the areas of developing human resource as well as farm resources on a continuous basis.

The major objectives are:

- Exposure of the faculty and students to of real farm conditions and agricultural production systems and their integration in the academic programs, research and innovative extension approaches and
- Establishment of relationship with community and sharpening its image as the active contributor and partner of the national agricultural development.

Following are the areas where the DOE has the opportunity and conducts its regular programs:

- 1. Developing and providing short term trainings based on clients' needs inclusive of all stakeholders.
- 2. Provide technical and diagnostic services to farmers as soil testing insect-pest and diseases of plants, and veterinary services on campus and also in the form of mobile animal health clinic to rural area farmers.
- 3. Conduct farm and home visits to specialized groups of farmers in specific crops, vegetables and fruits
- 4. Establish linkage with and co-work with the extension programs of District Agriculture Development Office and District Livestock Service of the home district.
- 5. Arrange workshop, seminar and interaction meeting for all types and levels of stakeholders of agriculture development and ultimately the farm families.

4.3. Nepal Agriculture Research Council

NARC is an apex body for agricultural research in the country with the ultimate goal of poverty alleviation with sustainable growth of agriculture production through the development of appropriate technologies in different aspect of agriculture.

Objectives

- To conduct qualitative studies and researches on different aspects of agriculture
- To identify the existing problems in agriculture and find out the solution.

 To assist government in formulation of agricultural policies and strategies Functions and Responsibilities

- Conduct qualitative agricultural research required for national agricultural policies,
- Prioritize studies and researches to be conducted,
- Provide research and consultancy services to the clients,
- Coordinate, monitor and evaluate the agricultural research activities in Nepal,

4.4. Training of extension workers and farmers through public, NGO and private initiatives

There are more than 5000 NGOs and dozens of INGOs and some technical and vocational institutes working in the country for the development of agriculture sector. These organizations provide different types of training to the farmers, traders and local leaders. The trainings includes awareness program to skill development program related with agriculture, livestock, food security, nutrition and health, cooperatives and other related field of agriculture.

5. Linkages among Extension, Research, Education, Farmers and Other Stakeholders

5.1. Linkage

In the beginning, there were no problems of coordination and linkage problems because of less number of stakeholders, organizations and comparatively low level of transactions of the farmers. Over the years, the growth occurred in terms of organizations, stakeholders and transactions of the farmers that created the problems in linkages and coordination. As a result, special mechanisms were developed gradually.

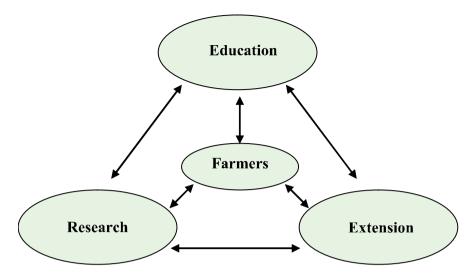
a) Traditional Linear Linkage



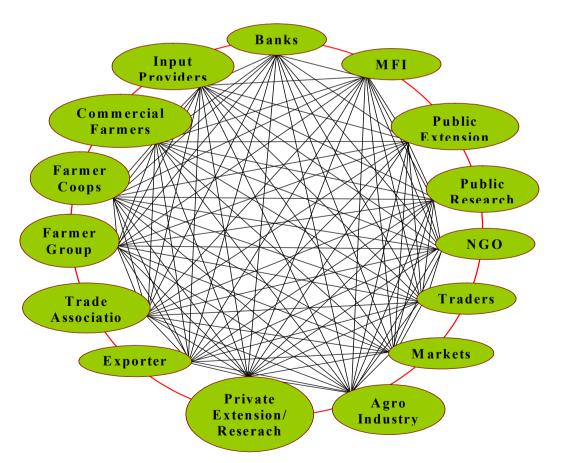
In this traditional system, farmers' problems were collected by extension agents and these problems were brought to research for solution. The solutions provided by research system would come to extension and ultimately to farmers through extension. Both research and extension used to be public base. Extension used to remain in touch with farmers and therefore considered as a bridge between research and farmers.

b) Farmers at the Center of Knowledge Triangle

The research, extension and education are considered the three pillars of the agricultural knowledge system (AKS). It is also called the "agricultural knowledge triangle" which places farmer at the center. The AKS integrates farmers, researchers, extensionists and agricultural educators, enabling them to harness knowledge and information from various sources to improve farming and livelihoods.



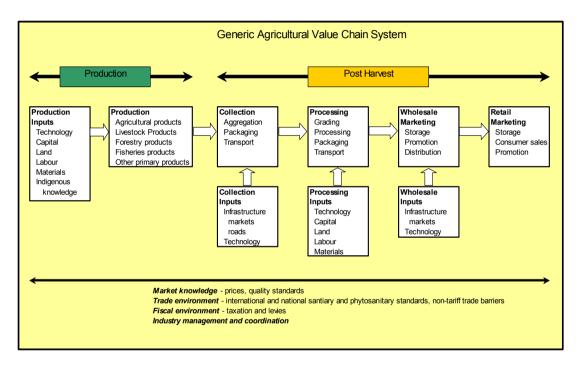
c) Multi-sectoral net work of stakeholders



The concerned agencies are functionally connected in many ways. For all the stakeholders focal point becomes the farmer. They are interlinked in terms of their services to end-users.

d) Value-chain approach

As agricultural gets commercialized, it involves the production of crops and commodities for sale rather than on-farm consumption and the use of sale proceeds to buy family and farm requirements. To maximize benefits (or value added) from the business activity and be sustainable, each participant in the delivery chain from producer to consumer must operate efficiently, profitably and in collaboration with other participants in the chain. To be efficient each link in the chain should be operating with the most appropriate technology, in full knowledge of market requirements, and within a business environment where a fair and transparent tax regime applies, trade impediments are minimized and acceptable quality controls are in place. This is the concept of the Value Chain. A generic value chain system for agricultural products is illustrated below.



The primary mechanisms for enhancing value chain performance are by (i) reducing costs at any point along the value chain, (ii) differentiating products by making them uniquely attractive to the consumer, and (iii) introducing appropriate technology at any point in the value chain system (iv) improving the performance and collaboration between stakeholder organizations involved in the value chain. In doing so, research, extension and other stakeholders in this chain should have strong linkages and play specific roles.

5.2. Linkage and Coordination Mechanism Between R&D

Agricultural technology plays vital role in increasing agricultural productivity. Transformation of subsistence agriculture into commercial one depends, to a large extent on the modern farming technologies are available to the farmers and they adopt them. Research centers are responsible to generate clientele oriented technology. Extension workers on the other hands are responsible to disseminate the proven technologies developed by research

stations to the farming communities and bring back the problems and needs of the farmers to the research centers.

A close working relationship between research and extension is in vital in maintaining this ideal linkage between r& e and hence in providing high quality agricultural services to farmers.

5.3. Key components of the system for R & E Linkages in Nepal

5.3.1. At the Central Level

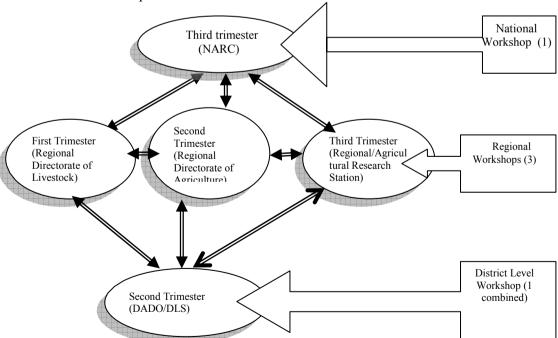
- Tripartite meeting
- Technical panel meeting
- National Agriculture Technical Working Group (NATWG)
- Seasonal crop and other technical workshops

5.3.2. At the regional level

- Outreach Research Program (ORP)
- Outreach Research Planning and Coordination Meeting (ORPCM)
- Regional Agriculture Technical Working Group (RATWG)

5.3.3. At the district and grass root level

- District Agriculture Development Committee (DADC)
- District Agriculture Development Program Implementation Committee (DADPIC)
- Village Level Planning and Review Workshop
- Farmers Acceptance Test



Model of linkage and coordination between R&D in Nepal

Linkage and coordination between R&D institutions in Nepal is tailored in such a way that there is a frequent interaction between different layers of intuitions to get two way feedbacks for agriculture research and development. Linkage mechanism is targeted for different hierarchy comprising from central to district level where frequent interactions among institution is a mandatory business so that coordination mechanism has been tied up in their annual targets. NARC is technology generator while DoA and DLS are technology promoter. This linkage and coordination mechanism has given a sense of responsibility to institutions assigned to their respective job of technology development and technology dissemination

6. Monitoring and Evaluation

Monitoring and evaluation are essential management functions that are interactive and mutually supportive. M & E are of critical importance for realizing the objectives of development programs and project, particularly for agriculture and rural development projects because of their poverty alleviation and multidimensional nature. M & E must be continuously strengthened to enable any development agency to respond to demands for:

- Adjustment of ongoing activities,
- Greater accountability in the use of resources,
- A clear basis for transparent decision making and
- More practical lessons from experience to guide future development interventions.
- M & E must be result oriented and provides assessments of the relevance, performance and success of development interventions.

6.1. Monitoring mechanisms of agricultural extension programs

A variety of means are available for use by extension program and project managers and other stakeholders in monitoring a program or project.

6.1.1. Work plans

Program or project managers must prepare annual work plans in operational terms. The work plan should describe in detail the delivery of inputs, the activities to be conducted (which one and how) and expected results. They should clearly indicate schedules and persons and/or institution responsible for providing the inputs producing results. The work plan should be used as the basis for monitoring the progress of program or project implementation. To keep higher government authorities and even donor informed of the progress of programs or project, managers should also provides them with work plan which simply indicate critical milestones in implementation with the corresponding time table and responsible actors.

6.1.2. Field visit

Program or project managers must make field visit at regular intervals and adequate budgetary resource should be allocated for this purpose. In addition to inspecting the sites, physical output and services of the program or project, the visit must focus on interaction with target groups to obtain their views on how the program or project is affecting them (directly or indirectly, positively or negatively) and their proposed solutions to perceived problems. Person under taking the field visit must prepare their reports either at the site or immediately after the visit, focusing on relevance and performance, including early signs of potential problem or success areas.

6.1.3. Stakeholder meetings

The objective of stakeholder meeting is to involve the major stakeholders in addressing issues that pertain to the programs or project, there by creating a sense of ownership. Besides the executing and implementing agencies and other development partner, it is essential that target groups expected to be affected by the programs or projects, be included in the discussion of issues relevant to them.

6.1.4. Systematic Reporting during Implementation

Program or project management must prepare monitoring reports more frequently (eg monthly, quarterly and /or semi annually) to serve its internal management requirements and also to submit to the higher authorities. The executing agency must also submit an annual report to the reporting agencies on the relevance, performance and likelihood of success of the program or project.

6.1.5. Terminal reports

Upon completion of a program or project, the executing agency must prepare a terminal report that focuses on the relevance and performance of the project, the likelihood of its ultimate success, and the initial lessons learned in term of best and worst practices. The report should also contain recommendations for follow-up action by appropriate institutions where necessary.

6.2. Existing M & E Arrangements in the Department of Agriculture and Livestock

6.2.1. At service center/ sub center level

Field observation Meeting with farmers group Progress reporting Documentation

Reporting formats and time of reporting

Monthly progress report, every month Quarterly progress report, every four month Basic statistical form, annually Bimonthly problem report, every two month

6.2.2. At the district level

Field observation from time to time Monthly staff meeting

- Review of last months progress
- Decisions on the next month's program

- Problems encountered and action taken for solution
- Input supply situation
- Standing crop condition

Organizing coordination meeting with line agencies compilation and reporting of progress report and publication of agriculture information

Media publication

Participation and presentation of progress at regional directorate and district council Updating district database

Reporting formats and time of reporting

Monthly progress report, every month Quarterly progress report, every four month Achievement evaluation form, every quarter Basic statistical form, annually Bimonthly problem report, every two month Project status report, every quarter Performance evaluation form, every quarter

6.2.3. At the Regional Directorate level

Field observation/supervision from time to time and monitoring of on going programs
Organizing quarterly progress review of program implemented under the region
Compilation and reporting of progress reports
Media publication
Organizing coordination meeting with line agencies
Periodic reviewing of the regional crop/livestock situation

Reporting formats and time of reporting

Monthly progress report, every month Quarterly progress report, every four month Achievement evaluation form, every quarter Basic statistical form, annually Bimonthly problem report, every two month Project status report, every quarter Performance evaluation form, every quarter

6.2.4. At the departmental level

Compilation and reporting of progress reports/publication of progress report
Organizing department level progress review meeting
Coordination among line agencies at the department level
Periodic field observations
Coordinating all program directorates to overcome technical problems faced by the districts

Coordinating all program directorates to overcome technical problems faced by the districts Decision over the solution on problems encountered by the districts Participation in regional as well as ministry level program review workshop

Reporting formats and time of reporting

Monthly progress report, every month Quarterly progress report, every four month Achievement evaluation form, every quarter Basic statistical form, annually Bimonthly problem report, every two month Project status report, every quarter Performance evaluation form, every quarter

6.2.5. At the ministry level

Periodic field observations
Organizing ministry level review meeting
Decision to overcome the problems for effective implementation of the programs
Compilation, reporting and publication of progress reports

7. Conclusion and recommendations

7.1. Conclusion

Presently, business environment for agricultural extension is changing fast, particularly due to increasing globalization of farm sector. This calls for change in the attitude of public sector organizations and also of other stakeholders and the need to reorient their capacity of delivering services. Broader extension agenda is emerging. Shift in paradigm of extension is taking place to cater the emerging needs of the farmer for diversified technologies, marketing and agribusiness, natural resource management, farm mechanization, etc. Extension service providers are diversifying. Recently, a large number of outside government organizations, particularly I/NGOs, CBOs, PSOs etc have emerged in the scene and have become more competitive and cost effective. Studies have proven this and have proposed alternative institutional models for delivery of research and extension services. Role of public sector extension is changing. Public sector has to play the role as "service provisioner" rather than as "service provider" demanding more sectoral support for quality assurance, monitoring and regulatory services. Country needs to respond to changes such as decentralization of extension services, privatization and downsizing and increasing efficiency. This calls for the need to reorient vision for extension, which should be based on the considerations of farmers, input suppliers, private and civil society extension service providers, local governmental bodies, central and regional governmental institutions, and the diversifying extension agents. With projects' initiative, the government introduced policy reform to promote public-private partnership, partnership with beneficiary groups and community organizations. Agencies within the organization began to be oriented to change the mindset to promote such collaboration and partnerships. Policy of contracting out extension programs is emphatically introduced. Implementation of extension programs in line with Local Governance Act of 1998 has been initiated; implementation strategy is to be institutionalized.

7.2. Recommendations for improvements

Despite criticisms regarding service delivery in agriculture extension, there is scope for improvements in the service delivery. Based on above discussions, following recommendations can be made to improve in future.

i) Assess the existing extension organization against farmers' needs and determine whether to strengthen or restructure it

- ii) Decentralize extension but not before capacity-building of the staff and orientation of relevant elected officials
- iii) Broaden the technical mandate of extension to aim at broader development of rural human resources
- iv) Promote pluralism in extension by involving public, private and civil society institutions
- v) Privatize extension partially or fully only where it is socially and economically feasible
- vi) Develop original, location-specific, participatory, gender-sensitive and inexpensive extension methodologies and materials instead of applying those methodologies which are promoted as universally suitable
- vii) Encourage the extension services to empower farmers through organizing them into legal associations to constitute a strong lobby for themselves and for extension
- viii) Encourage bottom-up, grassroots extension program planning by farmers in order to make extension demand-driven, but also exercise supply-driven, top-down modality for promoting common public good practices such as conservation of natural resources and environment protection.
- ix) If the extension function is to be performed with relatively small number of extension staff, follow appropriate strategies for getting maximum output
- x) Ensure effective operational linkages between extension and research and other key relevant institutions
- xi) Agriculture extension program should be based on demand of the clients. The program should be planned and implemented based on demand of the farmers rather than supply based.
- xii) Clear cut job responsibility in a new context is must. The extension staff should not be utilized for engaging in programs and activities that require specific professional background. The extension staff should not be utilized in the detail engineering works in implementation of small irrigation program for which they lack professional experiences. The job definition of the different extension works at different level needs defined and implemented accordingly.
- xiii) Advertise and advocate the services offered.
- xiv) Implement programs with the local bodies. Complete devolution with full responsibility.
- xv) There is need of comprehensive policy regarding agriculture extension service delivery and support system in Nepal that provide the foundation for commercialized agriculture responsive to need of client. The specific areas that need to be defined may be:
 - a. Agriculture extension
 - b. Agriculture input supply
 - c. Agriculture technical support
 - d. Postproduction management
 - e. Market development and management
 - f. Rural and agricultural credit
 - g. Law enforcements.
- xvi) The physical condition of the ASC should be improved and they should be equipped with minimum equipments supplemented by appropriate teaching materials.

- xvii) The command area of the ASC should be well defined based on the availability of human resources, geographic location and area to be served. The present structure can not be effective in providing services. The concept of CASC which has been put forward should be effectively implemented. The concept of CASC can be very effective in increasing the access of farmers through greater social participation. The experience of community forestry, community school management should be internalized in designing the CASC approach. Firstly, the existing ASC should be given priority to be converted into CASC and this opportunity can be provided to intended VDCs and farmers of the concerned pocket area. The concern of CASC should be on utilization of local resource centres and resource persons, greater access of farmers' organization for extension services and commercialization of agriculture.
- xviii) The institutionalization of the farmer's organizations such as farmers groups, farmer's cooperatives, Farmers Groups Coordination Committee (FGCC) as in Crop Diversification Project (CDP), Agriculture Development Comittee (ADC) as in JICA funded Agriculture Training and Extension Improvement Project (ATEIP), Farmers Alliances as in Commercial Agriculture Development Project (CADP) should be well capitalized in the extension service. Empowerment of these farmer based organization should be the major strategy for greater efficiency in the service delivery mechanism.
- six) Service delivery effectiveness is largely influenced by both demand and supply side strategy. So, there is need for improved strategies on both sides. On demand side, improving farmers' ability to demand better services and on supply side improving the capacity and efficiency of the delivery institution is a must. Empowering farmers based organization and political decentralization foster demand side strategy where as administrative decentralization and public sector reform along with civil service reform may promote supply side strategy.
- xx) The model service centre should be able to demonstrate cost effective and efficient service
- xxi) The motivation package, inclusive of capacity enhancement opportunity as well as monetary and non-monetary incentives, must be insured for the field level staff.
- xxii) The job responsibility and Terms of References (ToR) for different extension personnel should be redesigned with their shifting roles in the present context. The need for service of overseer/sub overseer has emerged with inclusion of small irrigation program in DADOs. Creation of such posts in DADOs is necessary if this program is to succeed.
- xxiii) The technical capability of the extension staff should improve. Moreover, the extension worker should be well trained regarding good governance and new emerging issues in agriculture extension.
- xxiv) Monitoring and evaluation should be made objective. The monitoring should be done at micro level and on basis of team approach. Participatory monitoring evaluation should be internalized in the system.
- xxv) The need for different services has been recognized by new agriculture extension strategy. The strategy has spelt out the need for action plan for implementation of extension services. Hence, the action plan should be developed regarding the internalization and application of already developed extension services that provide

bases for the extension need and services for different categories of clients and entrepreneurs.

- The practice of devolution in line with Local Self Governance Act has mixed result. It has eased in the planning and approval of program, improved accountability towards local government and greater access of local government bodies over program. Still, there is ambiguity regarding extension function, role clarity among DADO/DLSO and DDC, HRD, chain of command, fund contribution to agriculture extension, technical backstopping and ownership towards program. The devolved extension should internalize the experiences learned so far and a clear cut working guidelines needs to develop in line with LSGA for improved service delivery.
- xxvii) View extension within a wider rural development agenda: Emerging view of extension is not that of service or system but of a knowledge and information needs of rural people. The knowledge and information needs of rural people are so diverse that there is a benefit of having a range of providers to deliver advice, technology, innovations and services.
- xxviii) Define an extension policy for a pluralistic system: Extension strategies need to identify the overall objectives for public sector involvement in extension and define the roles and responsibilities of other service providers and of public funding.
- xxix) Develop a stakeholder coordinating mechanism: Some type of coordinating mechanism is needed for the various stakeholders in extension in order to provide a common framework.
- Putting information technology in service of extension: The revolution in information technology must benefit extension. The benefits could take many forms. Interactive electronic linkages may be established between extension and relevant institutions. The efforts to apply information technology should be started at locations which have necessary infrastructure and pre-requisites. The information technology should not be considered as a replacement of human effort in extension, but just as a supporting tool.
- xxxi) Build capacity of public sector and service providers: The funding should be increased for capacity building and institutional strengthening to widen the pool of qualified service providers.
- xxxii) Introduce some cost recovery: Reforms should encourage valuing information and knowledge services. This will encourage a market for knowledge services.
- xxxiii) The technical mandate should be broadened to educate farmers in interrelationship between agriculture production, food security, population and environment. It should engage in developing human capacities in farmers, which go beyond technology.
- xxxiv) Recognize rural men, women and youths as extension clientele.
- xxxv) Empower farmers to organize them in groups, cooperatives and larger organizations. Ensuring their legal status through formal registration should follow this. The next action should be to provide them with training needed to make plans and make decisions.
- xxxvi) Farmer to Farmer extension should be encouraged for utilizing indigenous knowledge and skills. For this, Farmers Organizations should be institutionalized, made active and efficient.
- xxxvii) Time has come that there should be gradual initiation of fee charging extension services with the commercial and competitive farmer.

- xxxviii) Multi sectoral coordination and linkages in terms of resource sharing and functions should be promoted to meet current complexities in agriculture sector.
- xxxix) Contracting—out is conceived as shifting responsibility while responsibility. It is the observation of the authors that many NGO implemented programs on technology dissemination and poverty alleviation have been highly successful but that efforts by the government to contract out extension services have had challenges, particularly efforts to privatize extension for whole districts;
- xl) The private sector is able to directly provide extension services mostly for high-value and export oriented crops. Mechanisms of private extension include:
 - Embedded services provided by the sellers of inputs and buyers of outputs
 - Contract farming relationships
- xli) A key recommendation of this paper is for government to develop, formalize, and implement mechanism to foster public private partnership and private sector linkage with provision of extension services. Such mechanisms should include:
 - **Project Advisory Bodies.** To link government services and public goods to the efforts of donor funded agriculture development programs multi agency project advisory bodies can play a key role, as exemplified by the SIMI advisory body. Such projects can also play a key role in fostering local level public private partnership in activities such as marketing infrastructure.
 - Development Alliances. When initiating major sectoral development and when substantial private sector partners are involved the use of development alliances that include government agencies, producers' organizations, processors/trader organizations, and the development community are highly efficient. The Nepal Tea and Coffee Development Alliances are successful models of this approach
 - **Development Boards**. As development alliances mature the development and/or strengthening of development boards is a key tool to bring together national level stakeholders.
 - Embedded Services. The local level private sector agricultural community also needs to be served and included in training and capacity building programs. Agro input suppliers and traders have the ability to reach large numbers of households with new technologies efficiently. But currently the private sector lacks access to latest technologies and often has limited capacity. Agriculture education should also be geared to develop technicians build private sector.

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National Agricultural Extension Systems in Pakistan

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Executive Summary

The agricultural extension system in Pakistan has a unique charter of serving people in the countryside to improve the quality of their life. It is an agency for change, a catalyst for individual and group action with a history of half-a-century of public service. Agricultural extension system is a vast partnership made up of several disciplines and organizations involved in promoting farm sector in Pakistan.

Extension's primary motive is education. The system transmits practical information produced by research centers and universities to the public. Its aim is to help farm people identify and solve problems through the use of new technology.

Extension programs are designed to help fulfill local and provincial needs with a flexibility to encompass national objectives. Extension offices established nationwide at district, subdistrict, and union council levels and the outreach activities of the universities and private sector and civil society organizations form an information network. Extension mission is better farming, better farm communities, in the aggregate, a prosperous Pakistan.

Over the past decades, the Extension has been challenged to pay closer attention to the emerging issues such as increasing pest and virus infestation to important crops like cotton, rice, and sugarcane and water and soil quality deterioration. Likewise, Extension had to broaden its focus to work on high value agriculture.

This country study report is orchestrated on the guidelines delineated by SAC. It includes the brief history with chronological developments in Extension system of Pakistan. The report also highlights the role of various government, non-government, private sector agencies and parastatals involved in purveying the research-born information to the farm communities in tandem with agricultural extension.

The report also covers various home-grown as well as donor-assisted mega interventions instituted from time to time to support extension effort in the country. While the organizational structure, planning, monitoring, and coordination mechanism are discussed, the governance, capacity building, incentive structure and extension's linkages with research, education and farmers are part of this report.

Analyzing the manu of options that challenge the country's agriculture, the study suggests reform measures and realignment of the existing extension system. There is a need to have increased focus on small farmers deploying the participatory approach. Likewise, the extension collaboration with NGOs and private sector needs to be expanded so that the task of public sector extension is re-enforced. Apart from the food commodities, the extension personnel have to be prepared for promoting high value agriculture particularly in the emerging challenges of globalization and market liberalization. A rigorous monitoring and evaluation system and improved extension-education-research linkages mechanism required to be in place. Pre-service and in-service training of the extension staff needs substantial upgradation. Measures to improve the functioning of training institutes and addition of a service academy for extension officers have also been proposed.

1. Introduction

While the dissemination of relevant information and advice to farmers has a long history that goes back to 1800 B.C., the first agricultural extension service of a modern kind came into existence as a result of an outbreak of the potato farming (potato blight) and vine growers devastation caused by aphid infestation in the United Kingdom during 1845. Closer to the same period, in 1866 Orissa famine in the sub-continent triggered the need to establish a central department of agriculture by the British rulers. By 1905, on the recommendations of the Famine Commission, the then government of united India decided to set up department of agriculture to organize agricultural research and demonstration farms in every province. In 1947, at the time of partition, Pakistan inherited the provincially organized similar agricultural infrastructure. Since then, agriculture in Pakistan has undergone a tremendous change.

Agricultural extension in Pakistan did not have a separate structure till 1962 when an independent department of agricultural extension was created within the provincial agricultural set up. During the fifties and early sixties, agricultural extension activities were carried out as a component of the integrated agricultural development approach whereby the Professor of Agriculture in Agriculture Colleges, also used to act as Deputy Director Agriculture and was responsible for agricultural research, teaching and extension. However, in 1962, the teaching was separated from research and extension with the establishment of West Pakistan Agriculture University Lyallpur (presently known as University of Agriculture, Faisalabad). Since then, the agricultural extension work is planned and carried out following a structure headed by Provincial Secretary of Agriculture who also heads the Department of agricultural research and several other related departments.

The Director General of Agricultural Extension (DGE) is the overall administrator of the public sector organization in the province who is responsible to the Secretary of Agriculture. Agricultural extension is one of the means available to help alleviate poverty and improve food security. It promotes the transfer and exchange of information that can be converted into functional knowledge, which is instrumental in helping to develop enterprises that promote productivity and generate income in the present climate of change. In addition to technology transfer, agricultural extension is a unique service in that it provides access to small farmers and the rural poor living far from the urban centers in acquiring nonformal education and information services.

of functioning any organization calls for necessary improvements in line with the changes in the working environment within which an organization functions. Without such reforms, the organization will either collapse or will keep working inefficiently and eventually becomes obsolete. The changes or the forces of change in the working environment vary in nature and scope. They could be political, technical, economic, or social. They could be location specific, regional, national, or global. The effects of these forces of change may be immediate, medium-or long-term and they may be direct or indirect. In response, the organization may make adjustments internally, externally, or both. National agricultural extension systems are no exception and they too are also directly or indirectly affected by such changes and are required to make internal and external adjustments in order to keep functioning at the same or higher level of efficiency. Before delving into explanation of reforms instituted or required in agricultural extension system of Pakistan, it will be in order to have an overview of the evolution of agricultural extension in Pakistan.

1.1 Evolution of Agricultural Extension Activities in Pakistan

Pakistan is a federation of four provinces where the provincial governments are primarily responsible for agricultural research and extension functions. Several extension approaches, designed primarily to improve the living standard of rural people through increased agricultural production and improved farm income, have been tried. During the last five decades, varying perspectives of agricultural extension have emerged. They include:

i. The Village Cooperative Movement

This movement started in the early 50s under the aegis of the Cooperative Department. It proposes that all farmers in every village be united under the umbrella of the village cooperative societies, choose their own management committees, and find the means of their development on a cooperative basis. The primary thrust of this movement is to educate member farmers about new technologies and to arrange farm-input delivery on soft-term credit. However, the experience suggests that the cooperative movement has not been able to achieve a consistent success. Some places where local leadership and cooperative department staff have been sincere and effective, it has achieved good results. It has proven a good source of farm input supply and technology transfer to the small farmers at village level.

ii. The Village Agricultural and Industrial Development Program (Village-AID)

The Village-AID program began in Pakistan in 1952, a little after independence, with substantial help from USAID and Ford Foundation. This program sought to bring about all-round development of the villages through organizing village councils, building roads, digging wells, constructing schools, and disseminating improved agricultural technology. This program achieved a good deal of success in the beginning but became a victim of departmental jealousies and political change in the country. With the abolition of the Village-AID program in 1961, rural development became a part of the Basic Democracies System (BDS).

iii. The Basic Democracies System (BDS)

Phased in 1959, this system was designed to bring together both the elements of community development and political development, especially at the local level. The government administrative and development tiers were organized into five levels where the union council, a group of 3-5 villages, was the lowest tier. The councils undertook a variety of social and economic development work in their respective areas. The problems union councils tried to solve were in the realm of education, infrastructure, agriculture, and sanitation. The BDS went a long way in developing awareness and building local leadership among the rural masses. The BDS also met the same fate as its predecessor program. The change in the government in 1970 saw the abolition of the BDS and introduction of a new rural development approach the 'Integrated Rural Development Program' (IRDP).

iv. Agricultural Development Corporation (ADC)

For supply of seed, fertilizer and farm machinery, the ADCs were established in 1960 at the provincial level in West and East Pakistan (Bangladesh). In 1970, the ADC was renamed as Pakistan Agricultural Development and Supply Corporation (PAD&SC) which was

primarily responsible to promote cooperatives, disseminate farm information, produce, procure and distribute improved seed, fertilizer through a well established input supply network all over the country. Other important functions performed by ADC included development of new lands, establishing seed farms and rendering farm equipments and machinery to the growers. Subsequently, the government decided to disengage itself from farm input supply functions, and the ADC was wound up.

v. Integrated Rural Development Program (IRDP)

In early 1970, once again due to the change of political scenario and the problems with the previous development strategies, the government decided to try a new development approach - - the IRDP. Development of agriculture was the central force behind this program. Moreover, the IRDP was created as a subsidiary of the Agriculture Department, its leadership was heavily drawn form the agricultural department, and all frontline workers recruited to run this program were agricultural graduates. On the other hand, Local Government Department controlled rural development funds. This dichotomy in modus operandi not only resulted ample tension between the two agencies, but also created frustration among the workers of this newly launched program. The IRDP staff, using their professional skills, started a campaign to enhance agricultural productivity, which had a tremendous impact on crop yields. Its one of the principal functions was to integrate the functioning of various line departments and facilitate farm service delivery to the farmers at one point. This coordinating role could not be accomplished successfully for hard departmental boundaries. Subsequently, in 1978, the IDRP was subsumed into the Local Government Department and turned into a routine bureaucratic agency.

vi. Training and Visit (T&V) System

Training and Visit (T & V) system of extension was introduced in 1978 in the first phase in the five districts of Punjab province with the financial and technical support from the Word Bank. In the second phase, it was extended all over the country in 1986-87 (Ahmad and Haq 1994, p.1). Under T &V system of agricultural extension, the functions of transfer of technology were clearly delineated and separated from supply functions such as provision of farm inputs. Technology transfer was kept with agriculture extension in public sector and the functions pertaining to supply of inputs and services were handed over to private sector or commercial corporations.

This system had three components: adaptive research, training, and an extension wing. The adaptive research component was responsible for the testing of the findings of applied research at adaptive research stations established at the regional level. The most promising innovations selected by the adaptive research scientists for the region were delivered to the farming community by the personnel of extension wing.

The Subject Matter Specialists (SMS) along with the personnel of the training wing, conducted regular fortnightly training meetings for the extension personnel to strengthen their professional competencies.

The main job of the extension wing was the transfer of the messages prepared by the SMSs and the training wing to the farm community through the contact farmers. The system was based on two-step flow of information, from the contact farmers to the whole farming community. The number of farm families that an extension worker (locally designated as Field Assistant) could cover varied considerably from place to place depending on

population density, roads, intensity and standard of cropping, and the types and diversity of crops grown. There was no fixed ratio of Field Assistants (FA) to farmers (Mullah, 1993, p.49). Generally speaking, the farm families on the jurisdiction of a FA were divided into 80 groups of about equal size. Then about 10 percent of each group were selected as contact farmers. Usually, on an average, the number of contact farmers in a group varied from eight to ten. FAs were supposed to visit the contact farmers according to a prefixed schedule known to the farmers as well as their supervisors (Ahmad, 1998, p.42-43). During a fortnight, the allocation of time of extension worker was eight days to contact farmers, two days each for training and extra visit/office work. The system did not yield the desired results as it strengthened the existing hierarchical tendencies with centralized management and top down planning several evaluations of the T&V concluded that it failed to bring about the desired changes in production practices, input use level and crop yields. Further it tends to marginalize the benefits of agricultural development to small farm holders, tenant farmers, and women.

The T & V system could not sustain when the World Bank assistance was withdrawn in 1994-95 and provincial governments failed to pitch in promised operational budget. The salary and operational budget ratio came down from 57:43 in 1993-94 to 93:7 in 2001-2002, severely hampering the operational activities of the extension system.

Thus the intensity of agricultural extension approach established under the T &V system has gradually diluted. The squeeze of financial support reduced the facilities for regular backup training to the staff and their mobility. Adaptive research farms discontinued and the morale of extension staff affected. The vacant positions of Agricultural Officers that come to several hundreds were never filled. Despite all such odds, the extension staff kept on maintaining limited contacts with farmers, organizing field days and field seminars. In some areas like train the trainer's programme and media extension, the private sector support such as pesticides and fertilizer companies was sought to keep the extension service in operation.

Because of certain compelling forces, at some places particularly cotton and rice belts of Punjab province, extension was organized differently. Both the commodities have exportled potential. The growers became very receptive of the improved production and protection practices. The traditional role of extension staff from person-to-person contact transformed to electronic means and print media. The growers were encouraged to visit commodity research institutes and acquire state-of-the-art knowledge and the best production practices. The training of extension staff was organized on regular basis employing modern training techniques. The monitoring and evaluation of the field staff by district and provincial extension managers was developed on mechanical and quantitative patterns. Use of fax machine helped sub-district and district extension officers to promptly feed the provincial government with the latest information about availability of seed, fertilizer, irrigation water, machinery, and other inputs besides crop stand, prevalence of any insect, pest, or disease, the anticipated yield production levels and marketing of the farmer produce.

1.2 Establishment of Agricultural Extension Institutions, Reformation and Development

Since independence, Pakistan inherited Punjab Agricultural College established in 1908 and agricultural research institute both located at then Lyallpur presently Faisalabad, in the Punjab province. Subsequently, the Punjab Agricultural College was upgraded to the level of

an independent agricultural university. Gradually, more agricultural colleges and research institutes in different parts of the country were established. Presently, there are five Agricultural and Veterinary Universities, five Agricultural and Veterinary Colleges and eight Agricultural and Livestock Training Institutes in the country. Several other general universities have independent faculties of Agriculture and Livestock, besides, there are fifteen research organizations at the federal level which are involved in conducting research relating to agriculture. Each province has a multidisciplinary and multi-commodity research institute with substations located in different ecologies. There are a number of commodity-specific institutes which operate as part of the main provincial research system. Research on crops is mainly conducted by the provincial Agriculture Department whereas research on livestock, poultry and fisheries is done by the Provincial Departments of Livestock and Dairy Development, Poultry and Fisheries.

The agricultural extension system's mission, which has been expanded several time since its founding in 1962, is to deliver information to the farmers through links among the above listed agricultural research institutes, academic institutions, and farm training organizations. When agricultural extension system was established, its focus was on food crops which gradually expanded to incorporate high value agricultural commodities, environment and food safety. Accordingly, several institutions were established to handle the emerging issues.

2. Organizations of National Agricultural Extension System (NAES)

Pakistan is federation of four provinces of Punjab, Sindh, Balochistan and Khyber Pukhtunkhwa, and four autonomous administrative units including Islamabad Capital Territory (ICT), Federally Administrative Tribal Areas (FATA), Gilgit-Baltistan (GB), and Azad Jammu and Kashmir (AJK). Accordingly, each province and administrative unit has developed agricultural extension system in line with the peculiar needs of their farming systems. Generally, Punjab acts as a role model in introducing innovative models and methodologies in agricultural research and extension.

2.1 Agencies involved in the extension system (GO and NGO)

A wide range of agencies including public, private, and civil society organizations have been engaged, at different level, in diffusion of information to the farmers of Pakistan. To reinforce the extension effort, time to time, several commodity-and area-specific initiatives were also undertaken. These include the followings:

A. National Agricultural Extension

- Public Sector Agricultural Extension System
 - Barani Area Development Programme
 - Crop Maximization Programs
 - Italian Crop Maximization Program
 - Cotton maximization program
 - Rice maximization program
 - Training and visit system
 - Banani Agricultural Research & Development Program (BARD)
 - Pak-Swiss Potato Program

- Agricultural Extension Services (AES) in ICT
- Technology transfer program of NARC
- ➤ Private Sector Extension
 - Fertilizer Producing and Marketing Firms.
 - Pesticide company, mostly involved in marketing their products.
 - Rafhan Maize Product/Sugar Mills.
- Civil Society/Non-Government Organizations-Driven Extension
- ➤ Universities-Supported Extension

• Public Sector Agricultural Extension System

Prior to the introduction of Training and Visit (T and V) system, traditional agricultural extension system had been in practice to disseminate the findings of research among the farming community. The following approaches, initiatives, and programs were introduced to the public sector extension system. were used under this system.

- a) The Service to Farmers Approach: This approach was based on the philosophy of establishing model farms with progressive farmers which would have a trickle down effect on other farmers and ultimately adoption by the fellow farmers of the area. In the diffusion process, extension was deploying the traditional means of communication and emphasis was on personal contacts involving individual and group meetings, home, and farm visit, etc. The diffusion process was relatively slow and extension was accessible to large farmers and village elites. This approach resulted widening the gap between large and small farmers in their access to information sources. Likewise, the spread of information as well as pace of diffusion was limited.
- b) The Inputs at Farmers' Door Step Approach: Under this approach, extension personnel were entrusted the responsibility of providing agriculture inputs, such as improved seed, fertilizers, pesticides, etc; near the door step of the farmers. Government subsidized these inputs to encourage their use. This approach helped in substantial increase in agricultural production but it turned the extension worker into a salesman for agricultural inputs (Government of Punjab N. D. p.6). In addition, not fully conversant with handling sale proceeds and financial bookkeeping, several extension workers landed in financial irregularities and faced disciplinary proceedings. However, both the above approaches were focused on production and productivity enhancement of food crops. In the meantime, T&V system was in the offing and in different phases it was introduced in most part of the country.

• Barani Area Development Programme (BADP)

This program was launched in 1978 for the rainfed areas by the Government of Punjab. Later on Agency for Barani Area Development (ABAD) took over the operational control of BADP. The programme was confined to the productivity enhancement of crops and livestock sectors in the rainfed regions of the Punjab province. The programme has undertaken several specific initiatives to develop farmers' interest groups and upgrade their quality of life. The farmers of the programme area had been given several incentives to upgrade the level of technology use. The prgramme is currently headed by a Project Director with the requisite infrastructure and professional staff.

> Crop Maximization Program

• Italian-Funded Crop Maximization Programmes

This programme was sponsored by Italian government primarily in support of Afghan refugees in early 1980s. PARC spearheaded this effort in providing professional staff and technological backup. The programme was focused in rainfed areas of Northern Punjab and KPK (NWFP) provinces which were the pressure areas of Afghan refugees. The programme covered maize, wheat, and rice crops. The program aimed at maximizing commodity production through an integrated approach. Under this programme the extension staff were organized around productivity enhancement of the specific commodities and farmers of the area were provided with technological package including the farm inputs. The extension professionals were also sent for overseas training to build up their technical capacity. It turned out to be successful and productive intervention which after closure of the Italian funding was internalized by the provincial governments and technology transfer program of NARC.

• Cotton Maximization Program

The cotton maximization project was implemented by the Punjab Agricultural Extension Department. The objectives of this project were (a) Intensifying availability of extension services to the farmers (b) Imparting necessary on-farm training to the growers about the cotton production technology (c) Arranging major inputs at the door step of the farmer and (d) Enhancing the availability and use of supervised institutional credit. The project had a positive impact on the yield of seed cotton.

• Rice Maximization

Pakistan Agricultural Research Council (PARC) took an initiative to enhance the rice production in the rice belts of Punjab, Sindh and Balochistan provinces. The extension staff in the respective areas took the lead while the PARC research system provided all the necessary technological and financial backup. The objectives of this program were (a) Demonstration of proven package of technology (b) Participation and coordination of all concerned nation building departments for the production of commodity (c) Provision of feedback to the researchers, etc; about the problems/constraints in the adoption of improved practices (d) Achievement of higher production within a short period. Besides the above objectives, PARC had been instrumental in providing planting material (seedlings), rice planting and harvesting machinery. The rice maximization program had a very bracing impact on the productivity of the rice growers in the respective zones and the improved farm practices were internalized by the rice growers.

• Barani Agriculture Research and Development Programme (BARD)

For improving dry land agriculture which represents one of the greatest technical limitations to accomplishing the production potential of barani rainfed lands, the (BARD) program with the technical and financial assistance of the Canadian Government was launched in 1981 under the umbrella of PARC. The objectives of the program were: (i) To introduce high yielding varieties and their production techniques suited to the socio-economic conditions and the varied climatic patterns and farming systems found across the rainfed areas; (ii) To demonstrate the findings of research programs at NARC through provincial operational research programs and to estimate the impact of research towards capturing some of the potential for increased food production in various barani areas; (iii) to disseminate proved packages of agronomic technology to

all institutions and agencies responsible for increasing agricultural production in the Barani areas. The program had been instrumental in introducing Canola crop which contributed tremendously in promoting use of canola oil in the country. Likewise, the project introduced improved varieties and production of peanut plantation. Subsequently, the programs activities were subsumed by PARC through its technology transfer efforts.

• Pak-Swiss Potato Program

The Pakistan-Swiss Potato Development Program started its activities in Kalam valley in 1984 under the agies of Pakistan Agricultural Research Council. The program effort concentrated mainly on the problems found at farmer level. The program covered diversified activities such as research and on-farm trials, development of extension scheme, identification of pest and diseases, management of seed, potato production through TPS, alternative crops and germplasm screening. Each of the activities have had a visible impact on improvement and productivity of potato in the valley. Thus special attention was given to the farmers' production system. The close relation with the farmers was very useful to identify limiting factors to potato productivity. The control of late blight had a visible impact on potato yield.

• Agricultural Extension Services (AES) in ICT

While carving the capital city Islamabad out of the Punjab province and granting it a status of the federal district with the authority of a provincial government in 1980 a new autonomous administrative unit was created as Islamabad Capital Territory (ICT). PARC assisted ICT administration in establishing agricultural extension services in the ICT. The AES in ICT is composed of five departments- - agricultural extension; livestock and dairy development; fisheries; soil conservation and cooperatives. The AES is responsible to provide scientific information and services related to the farm needs of the farmers living in 145 villages around the capital. The service operates under the Chief Commissioner who is the administrative hand of the Capital.

• Technology Transfer Program of NARC

In order to extend a full range of research backup to ICT growers through AES, PARC established the Technology Transfer Unit (TTU) in 1982 at its National Agricultural Research Centre (NARC) in Islamabad. The TTU subsequently was upgraded to a Technology Transfer Institute (TTI) and several more TTIs were set-up all over the country and housed at the heart of each provincial agricultural research institute. They are mandated to serve as a link between the scientists and farmers for disseminating modern technology among the farm communities and feed back to researchers the constraints and limitations of the farmers in application of a specific technology or scientific recommendation. Each of these institutes have a specific mandate that is accomplished through in collaboration with the farmers organizations, agricultural universities, colleges, commercial and public research institutes, NGO's and extension organizations located in the same ecological zone by undertaking the following initiatives: (i) Research in extension methodology; (ii) Training of extension agents; (iii) Exposure of progressive farmers to sophisticated or special technologies for large scale dissemination; and (iv) evolution and testing of innovative approaches to extension.

TTI initiative of PARC succeeded in initiating a process of establishing functional linkages among all stakeholders, undertaking extension methodological research,

conducting, evaluation/assessment studies, training of extension workers and farmers covering different areas of interest, establishing audio-visual units and documenting, printing and disseminating information.

> Private Sector Extension

Pakistan has a vast network of private sector organizations involved in manufacturing, marketing, and distributing the essential farm inputs and food products. During the sale promotional efforts of their products, some of them are deeply involved in purveying scientific information that is specific to their product and has a value-addition impact on the specific crop. In this process, a great deal of knowledge transfer and information diffusion take place at the farm level.

• Fertilizer Producing and Marketing Companies

Currently, seed, fertilizer, pesticide and farm machinery are in the private sector. National Fertilizer Corporation (NFC), Fauji Fertilizer Co. (FFC), Exxon Chemical Ltd. and Dawood Hercules Ltd. (DHL) to mention a few, are the producers and marketers of fertilizers in Pakistan. NFC and FFC have the most extensive extension programme. However, for the sake of developing an understanding the NFC and FFC extension program are briefly discussed here.

NFC extension aims at reaching all sort of farmers by employing simultaneously three extension approaches: Extension Agronomy, Zarai (farm) Service and Mass Media. Extension agronomy entails activities pertaining to advisory service through farmers' calls, farm visits, group discussion, farmers' meeting, demonstration and field days, crop/agriculture seminars, agricultural exhibitions, crop movies, and on-the-site soil testing.

Zarai service encompasses issuance of quarterly magazine in local language, letter service for literate farmers, posters containing crop production and protection recommendations, publication and dispersal of crop and product folders containing wide range of information on crops and products, mainly fertilizers and pesticides.

Mass Media includes NFC-sponsored radio agricultural programs, news paper and magazines, roadside hoarding bearing slogans on modern agriculture management practices and TV brand promotion programs which in part display production technology.

On the pattern of National Fertilizer Corporation (NFC), the Fauji Fertilizer Corporation (FFC) has started its extension efforts. However, this organization is also involved in training of the technical staff of sugar mills and providing training to the dealers. The dealers are imparted training about soil fertility and plant nutrient, time and methods of fertilizer application.

FFC also initiated an innovative approach of "Mobile Farm Extension Service" in 1987. Under this approach, a van fully equipped with soil testing laboratory moves at a pre planned and well-notified schedule in different villages. The van also has a provision of living facility for extension staff who camps in the rural areas for providing soil testing services and extending best site-specific farm services.

• Pesticide Companies

In the last decade when the cotton crop had a devastating attack of "cural leave virus", the use of pesticide surged un-proportionately. This gave tremendous boost to the pesticide business and companies dealing in pesticide emerged in hundreds, mostly based in the cotton belt. These companies are primarily involved in marketing the imported products. The pesticide giants in Pakistan are Syngenta, Bayer, Dow Chemicals, Nichemen, FMC, HELB, Agrevo, Ciba Giegy, Jaffar Brothers, ICI, Granulars Ltd while hundreds other local pesticide companies are aggressively involved in this business. Some of the extension functions performed by the pesticides companies are:

- Introducing new pesticides on to the market for providing efficient plant protection services to the farmers.
- Providing technical guidance to the progressive farmers at their door steps concerning the safe use of pesticides.
- Conducting free pesticide trials at the farmers' fields and to show video programs and documentaries, and organize field days to showcase the best practices of the pesticide use.

The prime mover of extension work by the pesticide companies has the inherited objective of promoting sales through popularizing their products among the farmers and ultimately earning more profit. The companies have developed their extension network to liaise with farmers all over the country. The firms also provide advisory and supervisory services to the dealers. They also organize dealers' and farmers' training programs and to take them to demonstration sites to impart first hand experience of best practices, besides establishing demonstration farms for farmers, and arranging film shows, and agricultural exhibitions. Other extension services including pest scouting and supervised spraying operation of chemicals through the trained and qualified staff are also undertaken by these companies.

• Rafhan Maize Company Extension

Rafhan is a group of commercial companies involved in processing corn for value addition. To have adequately raw material available, the company is instrumental in bringing more acreage under corn cultivation. The company has developed its own extension network that operates in the corn planting area. For establishing a buy-back arrangement, the firm enters into forward contracts with the farmers, provides them inputs such as hybrid seed, fertilizers, insecticides/pesticides, etc; on credit, and offers technical know how for the corn production and protection technology and purchases unshelled corn directly from the registered farmers at the guaranteed price at the mill gate and bears the transportation cost. Rafhan's closed-focused support to t he corn growers resulted in about 43 percent higher yield than ordinary growers.

• Sugar Industry Extension

There are 92 sugar mills in Pakistan. All of them have a varying degree of extension network for increasing the sugarcane plantation in their respective zones. Sugar industry hiers agricultural graduates to organize interest groups of sugarcane growers and impart them improved practices through arranging farmers' field training programs, providing them written material, visual aids, and taking to the model farms to show best agronomic

practices. The industry also supplies farm inputs at planting time and undertakes contracts for buying back the produce at the time of harvest. On the average, each sugar mill has a group 10-15 professional and para-professional staff on their payroll who carryout the sugarcane advisory services to growers operating in that particular zone.

• Solvent Industry Extension

There are about 30 solvent plants operating in the private sector and are involved in manufacturing edible oil in Pakistan. Sunflower, Saflower and Canola are the premier crops who provide raw material to the solvent industry. In order to keep their operations at maximum level, each solvent plant plans to get maximum number of oilseed growers on its contract. Employing the extension wing of their industry, they extend technical information and occasionally provides farm inputs on credit to the growers for enhancing the oilseed crop productivity enabling the solvent industry to operate at optimal level. They organize farmers' field days and distribute leaflets, handouts and show video programs for generating interest among farm communities to grow more edible crops. They also organize oilseed growers' competition and award prizes in the form of farm machinery equipments and tractors to the highest yield achievers.

> Non-Government Organizations and Civil Society Extension

A large number of non-government organizations are involved in the rural development effort where development of agriculture constitutes the core activity. Mega organizations like the Agha Khan Rural Support Programme (AKRSP), the National Rural Support Programme, Punjab Rural Support Programme, the Sarhad Rural Support Corporation, and Balochistan Rural support Programme and many medium and small range NGO's are actively involved in undertaking rural development initiatives using the principles of participatory development and the methodology demonstrated by AKRSP. They all place emphasis on the participatory approach designed to build on local leadership skills. Their extension programs aim at increasing the income of the farmers by: (i) imparting training to representatives of Village Based Organizations (VBOs) in agriculture and livestock management (ii) facilitating timely arrangement and supply of agricultural inputs (iii) introducing technological innovation such as inter-cropping, bee keeping, plantation of offseason vegetables, fruit processing, etc:. (iv) introducing improved farm machinery, and (v) demonstrating and experimenting high yielding varieties of crops, etc. Myriads international NGOs such as Oxfam, Plan, GTZ, etc; are in operation in Pakistan but after the devastating earthquake in 2005 following severe floods, their actions were intensified and hundred more NGOs moved their operations in Pakistan. After emergency relief, they all are involved in development of rural livelihood through promoting agriculture.

> Universities of Agriculture Extension

Agricultural Universities in the country make use of their extension departments to translate the research findings in simple and locally understandable language. The material published by the universities is widely distributed in the form of pamphlets, books, and through university journals. The universities also provide extension services to the farming community in the form of farm seminars, workshops, agricultural fairs and other continuing education activities. However, there is wide variation in the extension activities of the agricultural universities. For example, Sindh Agriculture University, Tandojam has established a Farmer Advisory Cell, which is responsible for coordination between farmers

who need technical help and the scientists of the university make field visits, meet farmers and listen to their technical problems for finding appropriate solutions. University of Agriculture, Faisalabad has established the Institute of Applied Research and Technology Transfer. This Institute provides extension services to the established community organizations and to the general farmers at two project sites in Faisalabad and Khushab districts. Khyber Pukhtunkhwa Agriculture University implemented the USAID-Funded TIPAN project. While TIPAN has strengthened the university in establishing various teaching departments and facilities, it had upgraded the research base of the university as well. Another unique element of this project was its "outreach program". This programme has provided the university faculty with the resources to reach out the farming communities in the rural areas and impart them the best farm practices. This was a very useful and rewarding experience for university faculty to work with farmers in real-life situation and to develop an understanding of the problems. On the basis of such experience, the faculty proposed useful interventions for enhancing the farm productivity in the outreach area of the university. Major cooperation between the extension and outreach programme of the Pukhtunkhwa Agriculture University is in the areas of Technology Development, the Integrated Village Demonstration Programme, Communication, Training and Continuing Education.

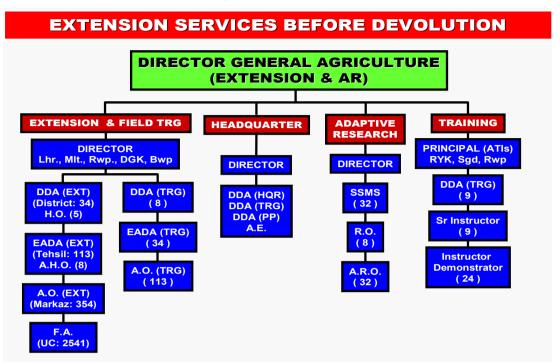
The departments of agricultural extension, extension education, and rural sociology of different Agricultural and Veterinary Universities have a special focus of their teaching effort wherein they take students who are in the process of specializing in such disciplines to the farmers fields where they live with the farm families for some time and share with them the knowledge and skills they acquire in the academic environment.

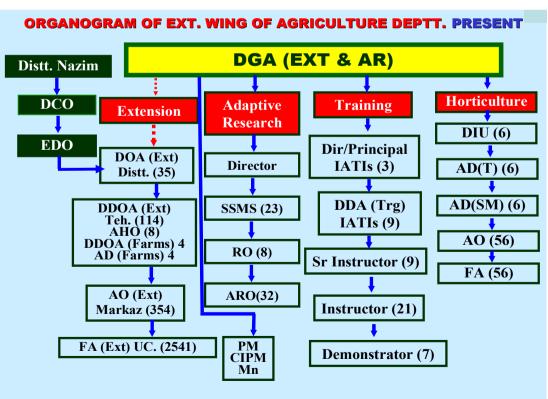
The variety of foregone extension activities by the academic institutions help the faculty get sensitized to the problem of the farm communities and propose the remedial measures in light of the scientific experience.

2.2 Organogram of Agricultural Extension with Major Activities

Agricultural extension in Pakistan is a hierarchically top-down system of administration where decisions are taken by the top administration without much involvement of other stakeholders, and implemented by the field staff which does not fit well into the present day requirements of more progressive, intensive and integrated agricultural. The Agriculture Extension Department is headed by a Director General at the provincial level and supported by Directors, Deputy Directors, Extra Assistant Directors, Agricultural officers and field assistants at the regional, district, tehsil, sub-tehsil (Markaz) and Union Council (a group of 5-8 villages) levels respectively. The extension officers at all levels are supported by other professional, technical and non-technical staff keeping in view their expected roles and responsibilities, and are planned to have horizontal and vertical linkages with other operators of agricultural education and research programs. However, as per Government's devolution plan, program planning and implementation responsibilities with appropriate authority except recruitment of personnel and allocation of funds have been decentralized to the district level. In other words, the district has become the focal point for all agricultural extension activities to be planned and carried out with the support of specialists in public sector agricultural research and education systems.

After Devolution, the following organogram and administrative set up in agricultural extension is being followed in all the provinces of Pakistan:





2.3 Extension Planning Process

While the Devolution intervention brought extension decision making closer to the farm communities, it resulted weakening the extension linkages with research and other institutions that have not been developed. Likewise, the communication and feedback mechanism of district extension to the provincial extension agency has become very remote.

2.3.1 Problem Identification Process

The extension programs are planned by the top management in the light of the priorities determined by the federal and provincial governments. However, the system has now slightly been decentralized in the sense that each district is to prepare seasonal (Rabi-Kharif) plans with given targets which are mostly aimed at increasing crop production. While preparing these district plans, agricultural extension personnel consult research scientists and other stakeholders through the established inter-agencies, intra-agency linkages but with very little input from small farmers. Primarily the identification of emerging problems and suggesting solution in response to the technological needs of the farmers is the responsibility of field officials of extension programs. With the implementation of Devolution Plan, the district is made a focal point for planning and implementation of extension programs.

There are very active and diverse interest groups and associations of specific commodity producers such as Cotton Farmers Associations, Mango Farmers Association, Sugarcane Growers Association and Chambers of Agriculture at various level who leave no stone unturned in articulating the impediments in production, processing, marketing and export of their commodities. These farmers associations are also represented at various policy and planning forums operating under the aegis of agriculture extension system. They play important role in lobbying for attainment of concessions in the planning process. Likewise, another small group of resource-rich farmers who are capable of articulating their concerns at the highest echelon have considerable influence in the extension planning process.

The other perspective in the planning process indicates that a majority (84%) of farmers in Pakistan are small farmers. This group of farmers is resource poor, with minimal access to inputs, credit and advice, thus lacks the power and organizational capacity to exert pressure on the research, extension and other public establishments to get their voices heard and provide feedback in the planning process and to have farmers' friendly policies with regard to inputs, services, marketing, and advisory services.

There exist the district-and provincial-level committees and boards of various commodities where the representatives of agricultural universities, colleges, institutes, some NGOs and private/corporate sector organizations, and different commodity-specific group of growers participate in the planning and implementation of agricultural extension program activities.

2.3.2 Priority Fixation of Extension Activities

The agricultural extension system had a top-down tendancy in its operation, therefore the decision making and prioritization of extension activities is greatly influenced by the federal and provincial governments. With the devolution of extension services from provincial governments to the district governments, extension priority fixation has been handed down to the district governments. Accordingly, the elected representatives of the district councils bring the feedback from their areas and extension priorities are set by the district agricultural committees which

have added benefit of better understanding of farmers problems. Given the great diversity in agro-ecology, commodity focus, and different farming systems in the country, the extension priorities are also set by the extension management at district, region and then provincial and federal level. However, the basic focus of most efforts is on enhancement of productivity and change in quality of life of the majority of farmers.

3. Governance

The terms governance refers to the functioning of the various branches of the government including executive, judiciary, bureaucracy and agencies involved in revenue collection. Therefore, the efficient performance of the government depends on the efficient performance of these state organs.

3.1 Institutional Reforms and Efficiency Enhancement

Extension operates in a dynamic environment where it is influenced by several other state systems. The shifting emphasis of Pakistan's agriculture towards diversification, commercialization, sustainability and efficiency has made it necessary for the extension system to critically examine the approaches and institute reforms for efficient performance of the system.

In order to bring efficiency and decentralize the decision making process, the Pakistan government made a decision in 2001 to devolve various subjects from the provincial to the district level under an institutional reform of devolution. The district governments were empowered with command and control decision making authority transferred from the province. All the decision making authority is with the hand head/Chairman District Council who is the elected public representative. To enhance efficiency in the public sector, Devolution was introduced with the following objectives;

- To decentralize powers and bring government system close to the people.
- > To improve efficiency of the government so as to facilitate quick disposal of its business for convenience of the people.
- To have close monitoring of the system and improve accountability.

In spite of the recently introduced administrative reforms under the devolution plan under which the district has been made a focal point for program planning and implementation, the devolution plan is still in its infancy and the people responsible at the district level for implementation of this plan are not yet fully conversant with the philosophy, rational and operational strategies of this system. As a result, the district instead of being a fully functional focal point for program planning, has become an isolated entity with no linkage with other districts and organizations even within the same province. Moreover, the feedback to research and planning has further reduced.

While the district council Chairman is the elected head who exercise full authority and control over the district, the District Coordination Officer (DCO) provides the bureaucratic support to the District Chairman. As is evident, from the organogram, the Executive District Officer Agriculture (EDOA) is the head of the devolved departments which include Agriculture, Animal Husbandry, Forestry, poultry, water management soil conservation, etc. All the departments are technical and their functions are of technical nature. The DOA is the front line

district officer who is responsible for Agricultural Extension work. He is supported by a number of Agricultural Officers and Field Assistants in the conduct of field operations.

3.2 Public-Private-NGO Partnership

To strengthen public-private partnership, government tried to introduce number of interventions. One of the successful efforts was the Farm Services Center introduced in the year 1995 in Khyber Pakhtunkhwa Agricultural Extension System with the objectives to provide one-window service to the farmers where agricultural machinery, fertilizers, seed, pesticides and credit are available at one point. These centers have representation of private sector who are involved in supply of farm inputs and NGOs that extend credit as well form farmers groups for providing technical information. This approach showed tremendous performance during the period 2001 to 2003 in many ways. At present, the "Farm Services Centers" are working at circle level. Inline with the Agriculture Policy, 2005 guidelines, the provincial government suggested to constitute a cluster of organizations of Farm Services Centers at district level with the name as, "Model Farm services Centers" (MFSC). The Model Farm Services Centers are equipped with the service delivery of the Agriculture Department including Agriculture Extension, Cooperatives, Water Management, Soil Conservation, Livestock and Dairy Development and Agricultural Research that would jointly be working under the one roof through their representatives. The main objectives of the FSC were as under.

- 1. Empowering of farming community through policy on introduction of participatory techniques (IPT) participatory technology development (PTD) and Farmers Field Schools (FFS).
- 2. Capacity building of extension staff in PTD & FFS.
- 3. Integrate effort by different agricultural sector departments.
- 4. The quality inputs such as seed, fertilizers, pesticides credits and fruit plants and advisory services are made available to farmers closer to their home.
- 5. The farmers are able to plan their activities through yearly action plan to be integrated with the District Action Plan.
- 6. Agriculture Statistics Officer based at Farm Services Centre helps in providing crops data and other farm statistics and also serve as Agriculture Information Manager for the Development of Statistics will be used for the formulation of various plans rationally.
- 7. The organizations like Agriculture University, Nuclear Institute for Food and Agriculture, Agriculture Research System, different developmental projects like Barani Area Development Project, Community Based Resource Management project (CBRM), Malakand Rural Development project, Zarai Taraqati Bank, Soil Conservation, Water Management, Agriculture Training Institute, Livestock Training Institute, Livestock and Dairy Development Department are also represented and provide inputs and technical services to the Farm Services Centre. Several public-private sector partnership MoUs have been signed for improved functioning of transmitting information to the farmers.

3.3 Accountability Hierarchy

Recently, the government has introduced a system of accountability in the public sector organizations. Like other departments in the public sector, the agriculture extension system has

also been challenged to pay closer attention to accountability. To implement this strategy on the pilot basis the extension system has developed and implemented an accountability system based on performance measurement. It developed three issue-oriented goals under accountability aspect: (i) an agricultural production system i.e. highly competitive in the national economy; (ii) a safe, secure, food and fiber system; (iii) greater harmony between agriculture extension and other related departments for enhancing economic opportunity and quality of life.

Accordingly, a strategy was devised to measure the performance-based management using indicators of inputs, outputs, outcomes, and processes. The indicators in context of extension system include work assignment for extension personal (input); an extension program programme's out-reach to a group of farmers (output); a change in behavior by extension and information receipants that resulted in an improvement in the their quality of life (outcome); and measure of the extent to which the views of the stakeholders were solicited in the planning and evaluation processes (process). In hierarchical accountability the field assistant is accountable to agriculture officer, agriculture officer accountable to district agriculture officer, district agriculture officer accountable to executive agriculture officer, executive agriculture officer accountable to district coordinating officer at the district level and director general agricultural extension accountable to secretary agriculture and livestock at provincial level.

3.4 Management Information System

The continuing rapid development of telecommunications and computer-based information technology (IT) is probably the biggest factor for change in extension, one which will facilitate and reinforce other changes. There are many possibilities for the potential applications of the technology in agricultural extension (FAO, 1993; Zijp, 1994). IT will bring new information services to rural areas over which farmers, as users, will have much greater control than over current information channels. Although the Agricultural Extension System (AES) is using the MIS, its fall potential has not been adequately realized. The district and below-level extension staff used to gear up to harness the full potential of this technology and preserving field information and employing it in diffusing information to farmers. Even if every farmer does not have a computer terminal, these could become readily available at local information resource centres. In some districts at pilot basis government has introduced the computer-based interactive extension-community communications on specific farm issues. On the basis of this experience, gradually, this effort will be expanded.

4. Human Resource Development and Capacity Building

The human resource development is an important component for an efficient extension system. Unless the extension personnel adequately trained in the latest technology transfer methodologies, the extension system cannot operate on efficient lines. Occasionally, the extension personnel get an opportunity to go back to the academic institutions to obtain higher academic degrees and there are several in-service training institutes where the extension professionals are sent to upgrade their knowledge and skills with the latest developments in the arena of agricultural extension. This is an ongoing process of human resource development and capacity building. It is a proven fact that without refurbishing the field functionaries with fresh knowledge and latest developments, they start getting into a state of inertia.

Seemingly, the human resource development aspect in extension system is neither regular not adequate. The Agricultural Training Institutes (ATIs) established in 1957, in-service training institutes need lot of improvement in teaching contents, methodology, environment and facilities.

The objectives of establishing the training institute was to get trained Field Assistants for Agriculture Department to serve as front-line workers in the rural areas as well as at the research stations. The ATI is headed by Principal who is the overall in-charge of the institute but his budget is controlled by D.G. extension. He is assisted by instructors. The mandate of the Institute includes the following functions:

- ➤ Pre-service training course of 2 years duration each for Field Assistants and for Stock Assistants.
- ➤ In-service short training courses for agricultural officers and field assistants of agriculture department.
- One-week training courses for farmers.
- Farmers exchange visits to other provinces.
- Special training courses for NGO's and different organizations.

There is a need to upgrade the degree-level curricular for extension graduate in the university. Similarly, the curricular of the ATIs need massive updating to include the new teaching areas enabling the extension trainees to comfortably handle the emerging field issues.

4.1. Involvement of Academic and Research Institution for HRD through Curriculum Development and Implementation Support

In order to keep abreast their professionals and field functionaries with latest developments in the field of agriculture, each provincial extension system organizes various short-term and long-term training programs in collaboration with academic and research institutions. The curricula for pre- and in-service education and training being used by different agricultural universities and training institutes are theoretical in nature with very marginal practical exposure. As a result, the graduates from these educational institutes lack skills required for a good extension worker who can interact with the farmers who in general are well experienced and aware of their needs and problems. Besides several other functions, the Higher Education Commission of Pakistan after every 5 years undertakes curricular revision exercise such as effort is useful in light of Curricular Revision Committee's (CRS) recommendations, the university-level curricula kept on updated. The CRC represents all stakeholders - - researchers, extensionists, and academia involved in extension and adaptive research.

4.1.1 Areas of Skill and Capacity Development

All extension staff needs to be made aware of participatory extension systems such as the farmer's field school approach. They must also be exposed to the successful experience as well as the limitations of NGO processes. Field Assistant level staff require training in interpersonal communication skills, utilization of audio-visual aids for training, methods of audience analysis, methods of group formation and facilitation of community planning. There close working with NGOs in development of village-based community organization will expose them to these skills.

Sound management of environment, including biological resources (trees, crops, livestock, fish, etc.) and natural resources (soil, water, etc.) ensure sustainable agricultural production systems. Thus, it is recognized that the potential use and limitations of these resources are intimately linked to the availability and advancement of knowledge and the growing needs for agricultural development. This would be attained only through integrating training-learning technology and knowledge generation, and rural institutions' formation in an holistic approach to available natural and human resources utilization and new methods for determining training needs, innovative forms of training programs including agricultural extension.

Adequate training of the extension personnel of all categories is essential in farm management techniques and business analysis for the sustainable and profitable development of agriculture in Pakistan. Pre-service training of field assistants is imparted at the agriculture training institutes. One of the main constraints in improving the standard of teaching of Agricultural Training Institute is the lack of adequately trained and experienced teaching staff who can give them exposure to the emerging issues such as international trade, food safety environmental degradation, etc.

4.2 Training of Extension workers and Farmers through Public, NGO and Private Initiatives

Trained manpower shortage both in quality and quantity is often a critical impediment to the successful programs of agricultural development, including transfer of technology to the farming community. Limited knowledge of farmers on appropriate utilization of land, soil, water and technology is a major problem faced in increasing farm productivity and the conservation of natural resources.

Sustainable agricultural and rural development requires the training and retraining of vast numbers of trainers, including professionals, field workers and farmers. The more extension workers and farmers are education and trained the more development becomes dynamic and evolutionary.

Given that the human resources are the most valuable asset of the agriculture extension, due considerations is given to the establishment/strengthening of agricultural extension institutes such as Agriculture Training Institutes to cater for such needs. The ATIs and Agricultural Research System also provide training to the agricultural extension agents, NGOs and farmers and also organize special courses for private sector professionals.

Likewise, the joint-short-training program are also organized by the extension system where representatives drawn from extension, NGOs, private sector, and farm communities are invited to participate.

5 Research-Education-Farmers present emerging trend linkages

Extension workers need new technological innovations to help the farming community to inject the innovations into the crop production skills of farmers their for enhanced productivity and improved quality products. Therefore, the institutional links between research and extension are critically vital. Such links between research and both sets of clients, extension and farmers are also complementary. One cannot substitute for the other. If these links between either of the partner are weak or missing the entire process get effected.

In Pakistan linkages between research, extension and education are quite loose. The university faculty and researchers in the research system are prone to writing of scientific papers or articles without considering the relevance or applicability of their research findings in the field. The researchers operate mostly isolation and therefore, their contact with other organizations is quite limited. They seldom take part or encouraged in extending their research findings in the farmers field. They seldom get opportunities to formally meet the extension workers particularly at below district level. Same is true for linkages between the extension and academic institutions.

Agricultural universities at present are also performing only a teaching role whereas the other two roles, namely research and extension have suffered a severe setback because of lack of funds and inappropriate linkages with research stations/centers and agriculture extension programs under the administrative control of agriculture departments and corporate sector.

Even the communication or interface within and among the research organizations is tenuous resulting in duplication of research efforts and uncoordinated research programs which are not aligned with the national needs and priorities. Such an environment points toward the poor communications between the farm research, extension, education and farmers. The linkage mechanism has further been exacerbated with the introduction of extension devolution plan in Pakistan as the district governments have emphasis on physical infrastructure and are least concerned with agricultural developments. Thus, the extension staff are not encouraged for out-of-district communications.

While effective linkage mechanism is vital for successful technology development and its efficient delivery. It allows two-way flow of information and keeps the technology generation organization's focus aligned to the needs of end –users there is no single formula for instituting effective links between all the entities involved in the process of agricultural knowledge generation, diffusion, and utilization. To establish effective and sustainable linkages among them, there is a need for a careful analysis of the constraints and opportunities present in their particular situation and providing ample funds required in institution-effective linkages and promoting technical meetings and reciprocal visits by all stakeholders to each others' institutions and field sites.

6. Incentive Structure

Rewards and reprimands act as motivational force in human behavior. If a person in a system gets a reasonable compensation package, his urge for better performance keeps on increasing and becomes an asset for the organization.

6.1 Incentive Structure: Present and Future Outlook

Generally, there exists no system of incentives and career advancement for good extension workers. The field assistant, who is the front line worker, is recruited at a low level of pay scale with two-year practical training course at an Agricultural Training Institute, after high school certificate and generally retires in the same grade. Similarly, the chances of promotion for agricultural officers who posses Masters' Degree in Agriculture are also limited. They generally get promotion one step above the initial scale of recruitment.

6.2 Career Advancement Scheme

While looking at the entire spectrum of problems faced by the agriculture extension system which adversely affects its performance, inadequate financial support and low morale of the functionaries figure significantly which are attributable to:

- Inadequate opportunities for skills and qualification up-gradation through in-service training in country and abroad.
- ➤ Insufficient chances and lack of criteria for regular promotion based on merit and output.
- ➤ Poor working conditions which includes lack of residences, office accommodation, transport and health insurance.
- > Seriously low funding level for extension field operations.

6.3 Performance Based Promotion System (PBPS)

The existing service structure is based on seniority system and is vacancy oriented. The staff often wait for their turn of promotion till their retirement. There are many cases where a staff member retired in the same grade in which he was recruited. This has resulted in frustration, low morale and ultimately, brain drain from the system. A proposal is under consideration to introduce performance-based promotion for extension professionals on the pattern of PARC.

An incentive system needs to be worked out where those who performed better than the majority of extension staff, may be granted extra incentives.

7. Monitoring and Evaluation

While there exist weak linkages mechanism in agricultural extension in Pakistan, rigorous, robust, and scientifically conceived monitoring, evaluation and impact assessment mechanism also needs to be in place.

7.1 Monitoring and Evaluation Committees

According to section 37 of devolution plan, the monitoring committees are elected by the District Council. The composition of District Council includes Chairman, Deputy Chairman district council peasant and women representatives and representatives of minority. Most of the members of such dispositions are neither qualified nor competent enough to undertake such a technical task. Therefore, it becomes very difficult for the members of the district councils to monitor and evaluate the performance the technical staff. Therefore, the evaluation by such committees mostly does not occur and in some cases it turns out to be unfair and biased. Such evaluation also has a political bend.

Under section 138, there is a special mention of a few committees which have been empowered to conduct monitoring of functionaries of the whole range of district government including agricultural extension. This again will involve staff performance. The committees are supposed to prepare evaluation report of the staff of each office on a prescribed proforma in relation to the following:

- ➤ Achievements of its target.
- Responsiveness to citizen difficulties.

- > Efficiency in the delivery services and
- > Transparent function.

While evaluation is a constant and ongoing specialized activity which is difficult to be undertaken by inexperienced and non-technical peoples. Although the province of Punjab is still struggling to establish the standards of evaluation of all the line-departments of district governments, the district governments in Kyber Pakhtunkhwa province have not started any activity in this regard.

Before devolution the district extension organizations were fully accountable to the DG, Extension and the directorate of Monitoring and Evaluation was responsible to conduct this activity on regular basis. Monitoring and evaluation committees composed of staff from the research organizations and planning and development departments were conducting evaluation of extension personnel at end of each crop season and their recommendations would become part of next crop cycles guidelines.

8. Conclusion and Recommendations

The reform measures described in this country report are based on a menu of options that challenge the country's agriculture.

Present agricultural extension service is placing emphasis on the major crops grown in the various farming systems. These include wheat, rice, cotton, sugarcane, maize, gram, and oilseeds. Very little emphasis is placed on fruits, vegetables and fodders. Extension staff needs to be apprized of the value addition aspects of farm products. They also need to be made aware of the impact of globalization and market liberalization on national agriculture.

It is widely acknowledged that the government extension system is limited by lack of technical competence and should be strengthened. It is also acknowledged that where private sector organizations or NGOs are willing to extend their services to farmers, those non-governmental initiatives should be encouraged and public sector extension system should extend full cooperation. Rather extension staff be trained through NGOs in participatory methods and village organization building skills

Monitoring and evaluation is very important to keep aptly aligned the focus of extension efforts. It is noticed that this aspect is weak. Besides, having a rigorous monitoring system, there is also a deficiency in capacity to evaluate, it is therefore recommended to phase in a strong monitoring and evaluation component manned by the professional evaluators each district government.

Farmer organizations are critical to coordinating the complex elements of farming systems at the farm level. Such organizations are essential for credit delivery, diagnosing and meeting specific needs of the production system, meeting increasingly high quantity and quality requirements, and many other rapidly changing needs. Thus, community organization is a major component that serves as an extension arm of extension system. It is proposed to build upon the sizeable institutional capacity already in place.

The private sector is central to effective extension system and is instrumental in provision of the key public goods to farmers. Public sector extension needs to capitalize on this opportunity and vigorously pursue public-private-sector partnerships in dissemination of scientific knowledge in a coordinated and re-enforcing mode.

Extension also needs to put in place an incentive structure that would encourage the private sector to enter into contractual arrangements with farmer organizations and link delivery of public services to marketing and agribusiness development. This initiative will facilitate and speed up transfer of farm information and level of adoption.

Farmers are the dominant private sector operatives in agriculture, but they are served by myriad private sector institutions ranging from an ordinary middleman who sells the farm inputs on credit and buy-back their produce to a large-scale mega integrated commodity processing plants/industry. Therefore, the improvement of services to small-scale entities is recommended so they can expand their operations and increase their productivity. The large-scale private sector institutions will have an important role in developing new approaches in support of small farm operators.

In order to coordinate the wide range of activities at the village level, it is recommended to strengthen the capacity of civil society institutions particularly the NRSP and the PRSP - - two institutions with a long history and successful record in organizing the farm groups and mobilizing rural resources for productivity enhancement and improved quality of life.

Because of the location specificity of farm practices, strengthening of national extension system is necessary to raise capacity to handle such situations. The emphasis needs to be placed on strengthening the linkages mechanism between research, education, extension, and farmers to fasten up the application of research knowledge at the farm level. The extension systems' focus needs to be shifted from traditional means of communication and from traditional crops to the modern means of communication and on high value crops and commodities.

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National Agricultural Extension Systems in Sri Lanka

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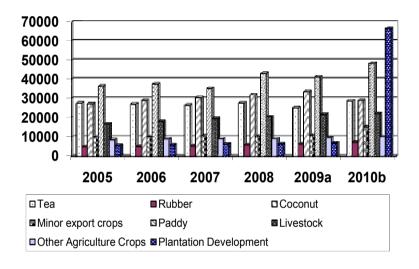
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Sri Lanka is a small island in the Indian Ocean, situated to the south-east of India. It has total land area of sixty four thousand square kilometers and a population of 19.5 million people (Annual report of the Central Bank of Sri Lanka, 2010)

Sri Lanka has traditionally been an agricultural country, as such its economic situation depends heavily on the trends and the growth in the agriculture sector. Of the total cultivable land (2.9 mn ha), 65%(1.9 mn ha) is cultivated with agricultural crops. Paddy the staple, occupies 40%, coconut 20%, tea 12%, rubber 7% and the remainder 21% is accounted for all other crops (other field crops, horticultural crops and other export crops).

Table 01: Gross National Product by Origin at constant (2002) Prices of Major Economic Activities 2005-2010



Source: Report of Central Bank of Sri Lanka (2010)

Agriculture continues to be an important sector of the Sri Lankan economy in terms of contribution to GDP, employment and income. Presently agriculture contributes 12 % to the country's GDP. 33% of the work force is employed in agriculture sector. In the Sri Lankan rural sector 60% of its population depends on agriculture for their livelihood. The production of food crops like paddy the staple diet, the other field crops has been extremely important in terms of both employment and income of the rural population. The export oriented plantation crops tea, coconut and rubber are the other important crops in the country's economy. Spices, sugarcane, cashew and floriculture at present play a significant role and have been recognized as crops of great future potential. Animal husbandry and livestock production and inland fisheries are two important sectors in agriculture of Sri Lanka. Mahaweli river development programme commenced in 1976 contributed to the expansion of cultivated land extent.(Annual report of the Central Bank of Sri Lanka, 2010, Sri Lanka State of the Economy 2011, Institute of Policy Studies of Sri Lanka, September 2011)

Organizational Structure

The extension activities of each unit is presented in detail in the annexure. Although extension units are established in different ministries, there is uniformity in the organizational structure of the units. Each structure is headed by a Director General. There are directors within the structure (technical and non technical). Each director is supported by deputy directors and assistant directors handling different technical subject matter. Based on the requirement of the profession some managerial level personnel are stationed in different geographical locations. They monitor the extension activities of each location and responsible for the mother organization. There exist one or more layers of officials at ground level under one command of guidance. In all the extension units ground level technical staff is directly linked with the farming communities in implementing extension activities. They also bridge the farming community with the mother organization. Each mother organization maintains formal and informal linkages and networks with relevant stakeholders to strengthen their services to the targeted audience. It is an area to be further strengthened to expand sustainable partnerships locally and globally.

Each structure has its own monitoring and evaluation mechanism in its unique way based on the expected output of the organization. Monitoring and evaluation mechanisms are another area to be well defined and focused for each stratum. Establishment of a transparent, systematic, proportionate, rewarding system for each stratum of the organizational structure specially for those who work at grass root level was a vision of many as an annual evaluation mechanism.

Method of recruitment of the staff and the educational qualifications required for recruitment are inline with the national policies. Direct recruitment for managerial level positions command a recognized university degree and the middle level technical officers require a two year diploma in the identified fields by the mother organization. Applicants who fulfill the basic educational qualifications are to sit for a written examination conducted by an independent body, the department of examination of Sri Lanka. The successful candidates are to face an interview. Within each mother organization promotion schemes are been regularised with timely adjustments approved by the government of Sri Lanka.

Common features of Extension Approaches

Sri Lanka's current development efforts initiated by the state towards agriculture sector to solve the food security problem is a positive sign. All the stakeholders who contribute to production of food is proposed to work as a team to this newly introduced national programme of making the homestead an economic unit. The present drive to improve rural road network although not a direct input to agriculture, national level home garden programme, promotion of animal husbandary at cottage level and assistance to commence home based enterprises hold a significant potential to promote rural agricultural growth. Agricultural research and extension which were ignored for sometime have to be revived with the dual objectives of enhancing domestic food production (to substitute food imports and attain self sufficiency) and developing an export-oriented agriculture sector. (Sri Lanka, The emerging wonder of Asia, Ministry of Finance and Planning, 2011, Institute of Policy Studies, September, 2011)

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Farmer group approach is widely used as the most effective tool of extension at present. Mother organizations develop constitutions to register farmer groups who fulfill the constitutional requirements within their organizations. In this approach many strategies are adopted to obtain expected results by each extension unit. The fertilizers are given at a subsidized rate for all the crops. The highest subsidy rate is given, for paddy the staple. The plantation crop (tea, coconut and rubber) sector, cashew and spices implement subsidy schemes to expand the production and improve productivity. These subsidy schemes are revised and readjusted by the relevant mother organisations (Please see the annexed reports)

Conclusion

The agricultural extensionists are not merely transferring technology to the farming community but on behalf of their clientele they coordinate with multiple, diversed groups of stakeholders who have their own agendas but are involved in agricultural development.

In Sri Lankan context the agricultural extension worker is challenged by the increasing population (1.1% annual growth) who demands for food and nutrition security, the state policies on food imports and exports and frequently changing agricultural technologies and markets. Therefore the vision of the extensionist has to be in line with the global scenario in agriculture to meet the present and the future challenges successfully.

The following are recognized as prime constraints in Sri Lankan extension.

- 1. The absence of a national policy on agricultural extension is a constraint to make this service duly recognized.
- 2. The extensionists have to communicate effectively and efficiently with a wide spectrum of audience in his/her carrier. Therefore a school to train agricultural extensionists (induction and in-service) seems to be a prime necessity.
- 3. This school also should be used to conduct research on agricultural extension continuously for the sustainability of this service.
- 4. At present in Sri Lanka all the prime state development programmes are focused on the family unit or homestead to make it an economic unit. Therefore it is a worthy cause to annalyse to obtain true hard data to be convinced whether building of one extension department excluding the plantation and sugar cane sectors is the most beneficial to the farming community of Sri Lanka, assuming that linking with one extension worker at grass root level for multitude of crops and services could be easier and simple for the farmer

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1. Introduction

(i) Historical background with chronological development of agricultural extension activities in the country

History reveals the presence of well managed irrigation schemes and flourishing peasant agriculture in Sri Lanka during the periods of ancient Kings. ⁸ The King Parackramabahu around the period of 1150s was the first to emphasize the productivity improvement per unit of water and land which were the limited resources for agriculture at that time. A vey recent revelation suggests that King Mahasen contributed significantly to Sri Lankan agriculture even during the third century.⁹

Agricultural extension is reported to have started in Sri Lanka during the colonial regime of the Dutch in the 17th Century. Extension started with Cinnamon crop for export. During the 18th and 19th Century, the British colonial rulers developed the system further.

With the breakdown of vibrant agricultural economy, after series of foreign invasions starting from 1640 to 1812, the earliest attempt to build up the peasant agriculture commenced after 1880s by the British.¹¹

Historical records reveal that from about 1880, agricultural instructors with two year training in agriculture were posted to work on agriculture under the government agents who were responsible for agricultural extension. In 1904 the Ceylon Agricultural Society (CAS) was established by the wealthier planters, land owners and agriculturists with the objective of helping the native farmers. It was a private organization. The extension work was carried out by the CAS in collaboration with the heads of districts.

The British introduced the Botanical Gardens in Paradeniya and Gampaha with aim of spreading out Tea, Coffee and Rubber cultivation. This eventually developed into the Department of Agriculture (DOA) in 1912, mainly to cater the plantation sector. In early 1920s the agricultural extension service was developed as a part of the DOA.¹²

In 1919, based on the 9 provinces of the country, 9 agricultural divisions were formed and agricultural officers were appointed to each province. In 1921 the staff of Ceylon Agricultural Society (CAS) was absorbed into DOA. In 1922 the functions of DOA was defined as research, extension and education when the country faced severe food shortage as an aftermath of the First World War.

During this period the agriculture officers were in charge of divisions while Agriculture Instructors (AIs) were in charge of ranges delivering the services of research,

¹⁰ Hathurusinghe, L.K. 2010 Loc. cit.

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⁹ The Daily Star, May, 2013.

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experimentation, management of agricultural farms, animal husbandry development and veterinary services, and also advisory services to the planters and farmers.

In 1932 the Director of Agriculture stated in the administration report that the main task of his extension staff was to have full contact with the village farmers, to link research to draw and deliver new information and technology, and to supply seeds and planting materials to the farming community. Also in 1932 a propaganda unit was established in DOA with cinema vans. In 1939, there were 09 agricultural divisions headed by agricultural officers (DAO) and 37 agricultural instructors (AI), as mentioned above, served as the field level extension workers who came in direct contact with farmers.

Research institutes were developed for Tea, Rubber and Coconut. The research institutes conducted research and impart the research findings to the planters or plantation companies. At a later stage, Sugarcane and Cashew were included in the programmes. In order to cater for the requirements of farmers, extension arms such as Tea Smallholding Authority, Rubber Controllers Department, Coconut Cultivation Board, Coconut Development Authority were added.

Post Independence Period (After 1948)

After the independence in 1948, greater attention was paid by the government on the production of rice¹³. More and more irrigation schemes were renovated, peasant farmers were settled in colonization schemes and more pressure were exerted to the DOA for technology improvement and transferring to farmers. Apart from the small increase in the number of AIs, 70 field demonstrators were appointed in mid 1950s to assist AIs in organizing field days, cinema shows but they were not utilized for advisory work with farmers. In 1952 a few female demonstrators were appointed to work with farm women on food preparation, food preservation, needle work and handicrafts. The farm women extension work terminated in 1964 and re-established in 1970 with the assistance of Food and Agriculture Organization (FAO). In 1952 Department of Food Production (DFP) was created in the Ministry of Agriculture as food production was considered a high priority. The DFP was responsible for coordinating the activities of all departments connected with production of food thereby weakening the extension and advisory efforts of DOA in increasing food production.

The AI continued to have direct contact with farmers for extension activities. Divisional Agriculture Officers were involved in planning and execution of extension activities such as popularization of pure line seed paddy, introduction of practices like row seeding and row planting, and sporadic drive to expand the cultivation of subsidiary crops like chilies and onions. Extension system was still weak and characterized by lack of national level planning and coordination, a small number of AIs and weak contact with farmers, weak research-extension linkages, lack of training to extension workers and heavy load of non-extension activities.

The Department of Food Production was dissolved in 1957 and about 500 food production overseers came to the DOA. They were later changed to Krusikarma Vyapthi Sevaka (Grassroots level agricultural extension worker). Subsequently more KVSs were recruited

Mahaliyanaarachchi, R.P.2002. Agriculture Extension Service in Sri Lanka. BeraterInnen.News 2/2002. http://go.microsoft.com/fwlink/?LinkId=69157

from those with one year training in practical farm schools. With these KVSs, a new cadre below the AI was created for extension activities.

In 1951 Young Farmers Club (concept of 4H clubs in America) was brought to the country and one club was started in a school and in 1958 it was extended to villages as voluntary organizations. In 1955 a few changes occurred in the field of extension such as introduction of more objectively designed results and method demonstrations and farmer group discussions, building up research—extension linkages and conducting experiments in the farmer's fields. In 1957 a new approach to rice production was established with the introduction of yaya (tract) scheme for seed paddy production which was earlier implemented in scattered farmer's fields.

In 1957 the Divisional Agricultural officer cadre was abolished and their functions were taken over by newly appointed 22 District Agriculture Extension Officers (DAEO). They continued to manage smaller farms, tractor units and farm schools in addition to extension programmes until 1963. The Plant Protection Service was also formed in 1957 to combat the epidemic outbreaks of pests and diseases.

Establishment of Technical Divisions

Only in 1963 the post of separate Deputy Directors were created to coordinate the extension work in rice and subsidiary food crops and horticulture. In 1969 the concept of testing varieties (varietal adoptability trials – VAT) and other technologies (field extension trials – FET) in farmer's fields were implemented by the extension staff. In late '60s the Agriculture Extension Centers were established with the objective of providing latest information and publications, and inputs required for cultivations such as seeds, fertilizer and agrochemicals. In 1970 these centers were further strengthened by establishing the Agrarian Service Centers (ASC) and housing all related agencies under one roof. There are about 550 such centers established in all agro-ecological regions of the country. The first In-Service Training Institute was established in 1967 to train extension officers of the DOA and other departments on crops and related disciplines. In 1965, annual national planning of the agricultural extension and production program was initiated. The administrative head of each district was appointed to coordinate the district agricultural committees with the preparation of district agricultural extension programmes which formed the basis for annual national agricultural implementation programme.

Because of the importance of conservation of forests, the Department of Forest and Wildlife was established during the British era. The department was later bifurcated into Department of Forest and Department of Wildlife Protection.

The Department of Fisheries and Aquatic Resources holds the responsibility of extension activities in the fisheries sector. National Aquatic Research Authority (NARA) and National Aquatic Development Authority (NADA) also support research and extension in the fisheries sector.

Another important development was the Mahawal Development Authority of Sri Lanka (MASL) in the 1970s under the Mahawal River Development Scheme. All agricultural activities, including extension, of the Mahawal Development Area came under the jurisdiction of MASL.

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In the early parts of the 20th Century the Department of Agriculture (DOA) was responsible for research and extension in both the crops and the livestock sector. Later a separate department, Animal Production and Health, was established as also the Department of Export Agriculture, for crops including spices and beverage crops. The DOA currently deals with rice, pulses, grains, yams, fruits and vegetables.

(ii) Establishment of Extension Institutes¹⁴

In addition to the Department of Agriculture (DOA), the Department of Forest and Wildlife (DOFW), the Department of Animal Production and Health, the Royal Botanical Gardens were established by the British rulers, the last especially for floriculture. Presently these Departments continue research and extension for crops and livestock. In addition, the extension institutes of plantation crops (Tea, Coconut, Rubber, Cashew and also sugarcane), each of which occupies a special place in Sri Lankan Agriculture, were established:

Tea Research and Extension

Tea Research Institute (TRI) founded in 1925 as a private outfit to cater to the demand created by the tea industry, became a government institution in 1957 and faced many changes over the years. It is mandated to research into tea production and manufacture and to disseminate information. Advisory and Extension Division of the TRI is responsible for the dissemination of current scientific ideas, findings and innovations to tea plantations managed by Regional Plantation Companies (RPCs), state owned tea estates and privately owned estates. Such information is provided to tea smallholders through the Tea Small Holding Development Authority (TSHDA).

The Advisory and Extension Division, housed at the TRI Talawakelle was established in 1959 and other six Regional Centers at Passara (1963), Rathnapura (1964), Hantana (1966), Kottawa (1980) Deniyaya (1984) and Kalutara (2010), to handle growers' requests for advisory matters. The extension activities of the TRI could be broadly categorized into individual extension, problem solving, information dissemination, education and training, public and mass media extension, extension and social research, production and distribution of teaching materials and coordinating the supply of planting materials.

The extension approach of the institute mainly remains as the commodity-based extension approach. The advisory and extension works were mainly confined to on-call problems solving estate visits with the involvement of scientists as subject-matter specialists, when required. The Para Extension Approach (PEA) was introduced recently to bridge the knowledge gap in the supervisory and worker level employees of corporate sector tea estates

Institute has a strong feedback mechanism which helps for decision making on research and extension activities.

Coconut Research and Extension

Coconut cultivation in this country as a plantation crop commenced in the middle of the 19th century. The Coconut Research Institute (CRI) established in 1929 was responsible for the

Hathurusinghe, L.K. 2010. Agriculture Extension in Sri Lanka, A paper presented at the Workshop on Rural Development for High Level Officers of AFACI Member Countries., Suwon, Korea, 7-14 Auguat 2010. http://www.moaf.gov.bt/moaf/?wpfb_dl=455

development of the coconut sector. The development of technologies through research in various disciplines and extension activities in the sector were the major activities of the Institute. With the establishment of a new organization, the Coconut Cultivation Board (CCB) in 1971 to implement the subsidy program introduced by the government to rehabilitate the coconut sector, research and extension activities came under two separate organizations. The sequential processes of research and extension interface in sustainable technology development and transfer should be realized by both organizations. Due to a lack of coordination and cooperation among the activities of these organizations, it has become difficult to achieve the major roles in the generation, development and transfer of sustainable technologies in the sector. The CRI is responsible to provide a two way channel to disseminate coconut cultivation and processing technologies and information, to extension personnel and stakeholders and acquire information about technology needs and production problems. The CRI is also responsible to evaluate the relevance, effectiveness, impact and affordability of technologies disseminated. Strengthening of functional linkages among the institutions and sub sectors are vital for enhancing the overall improvement of the sector.

Rubber Research and Extension

The rubber tree (*Hevea brasiliensis*) provides nature rubber (NR), an essential commodity in the international market. The NR sector is important in the Sri Lankan economy in terms of export earnings and employment generation. The NR plantation sector comprises of public and private sectors. Nearly 57% is occupied by the private sector comprises of small and medium estates, while the rest is owned by the private sector large estates, The Rubber Research Institute of Sri Lanka (RRISL) is the nodal agency in Sri Lanka for research and development on all aspects of rubber cultivation and processing for the benefit of rubber industry. The institute is committed toward technology transfer activities and training of extension offices and stakeholders. Increasing the productivity and income levels of rubber growers through transfer of technologies by extension and advisory services were undertaken at national and regional level to achieve the objectives of the ASD. Four major activities, i.e. exhibitions, farmer training programmes, seminars on current challenges and skill development training classes were conducted at several locations under the theme of "Isurubara Hetak Sandaha Asrimath Gsak Samaga" (For a Prosperous Future from a Prosperous Tree) to mark the centennial calibrations of Rubber Research institute. Advisory and extension support services were provided to rehabilitate 426 substandard rubber holding. Forty awareness programmes were conducted successfully to educate nearly two thousand rubber small holders on recommended agronomic and recommended agronomic and processing practices.

Cashew

Sri Lanka Cashew Corporation (SLCC) was established in 1973 under the State Agricultural Corporation Act No 11 of 1972. Since the establishment, the corporation is functioning as a Public Enterprise, mainly providing services to the industry while implementing commercial activities at a profitable level.

The activities of SLCC are to implement a well planned programme of actions to achieve it's objectives to enhance the income of growers and processors, to expand the cashew growing area using superior quality new varieties, to enhance the efficiency and increase the profitability of commercial activities, while preventing environmental degradations.

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Cashew is cultivated in almost all districts in Sri Lanka the extents are substantial in the high potential dry zone districts specially in Puttalam, Kurunagala. Monaragala, Anuradhapura, Polonnaruwa, Mathale, Hambantota, Ampara, Batticaloa, Vauniya, Kilinochchi, and Trincomalee. Statistics show a slow and steady increase in production over the last few years.

The extension arm plays a vital role in achieving the objectives of SLCC. The extension activities are coordinated by 09 regional offices of Sri Lanka. The cashew development officers (CDO) who are two year agriculture diploma holders, attached to the regional offices, conduct the extension activities with the guidance and supervision of the respective regional managers.

Individual visits, training workshop sand printed matter are employed in extension activities to impart the knowledge and skill to cashew growers. The training (technical know how) is given by the CDO based on the needs of their clients. Farmer societies are established by the CDO. The cashew farmer societies are registered with the SLCC based on a constitution developed by the SLCC. At present there are seventy four (74) cashew farmer societies in the country.

Sugarcane

The extension service of the sugar sector was initiated with the establishment of the Sri Lanka Sugar Corporation (SLSC) under the State Corporation Act No 37 of 1957. Later SLSC developed its organized extension service using an approach similar to the commodity development.

The research needs are met by the Sugarcane Research Institute (SRI) while the extension activities and input service provision are carried out by the extension staffs of sugar industries. After privatization of sugar industries in 1990s, extension staffs were gradually confined to activities such as monitoring farmer performance, managing input service and purchasing cane. This narrow extension perspective within the industry weakened relationship between extension officers and the farming community. This demands focus on skills development and incentives schemes for extension staffs using a joint private-public sector approach. Currently farmers and the industries operate with marginal profitability. There is the need to find solutions to pressing economical and technical problems affecting the industry and the sugarcane farmers. It is important to empower the farmer with entrepreneurial assistance.

(iii) Reforms and Development⁸

In Sri Lanka four major agricultural extension reforms were undertaken in the peasant agricultural sector since independence of the country in 1948. In 1957, District Agricultural Extension Officers and village level extension offices (KVSs) were appointed. This is the first significant attempt taken to widen the accessibility of the extension services to the peasant farming community.

The second major reform was the introduction of T&V system in 1979. This system became a failure due to number of reasons such as financial scarcity, lack of research linkage, social problems and administrative difficulties.

⁸ Mahaliyanaarachchi, R.P.2002. Agriculture Extension Service in Sri Lanka. BeraterInnen. News 2/2002.

The third reform was absorbing of the village level agricultural extension offices (KVSs) from agricultural service to administrative service as village offices in 1989. However, village officers are the grass roots level administrative officers of the state service have nothing to do with agriculture. This political decision taken to abolish the field level extension layer has given long-term negative consequences to the development of the agricultural sector in the country.

The forth one was the implementation of Integrated Agricultural Extension Service in 1993. The main objectives of the programme were to strengthen the different agricultural extension services in the country by integrating their functions. Currently extension service of DOA is accused for not doing enough. This should be considered seriously by the policy makers while the majority of the farmers are small holders and economically vulnerable. They are not economically strong enough to pay for extension yet.

As mentioned earlier, there are several commodity specialized extension services provided in tea, rubber, coconut and cashew sectors.

The public sector (Government and semi government) extension services are mainly targeted on small and resource less farmers. These services are free of charge.

There are few NGOs and private sector companies who provide agricultural extension services to the limited number of farmers. Public sector dominates extension services still. But due to different factors such as a failure to adopt a demand driven approach, a lack of appropriate technology, increasing cost of production, decreasing soil fertility, the uneconomic size of small holdings due to the continued fragmentation of the land, and financial and marketing constraints, they are unable to improve the productivity and profitability of farming since 20 years.

Presently, extension approaches being followed are top-down and commodity driven with little involvement of farmers in program planning. The number of farmers to be covered by each Agriculture Instructor varies from 1,000 to 7,000 depending on the geographical location. With hardly any physical facilities and low salaries, the extension staff finds it more tempting to serve the government-subsidized estate crops growers rather than the majority of small farmers, livestock owners and in-land fishermen.

Following the tsunami disaster and after the end of a lengthy civil war in the country, many bi-lateral and multi-lateral (World Bank, Asian Development Bank, IFAD, UNDP, Japan, Russia, AusAid, CIDA, China, Iran and The Netherlands have been active in providing various types of support¹⁵.

(iv) Establishment of NAES

Conventional extension approach

The DAEO was responsible for administration of district extension staff and, implementation, supervision and monitoring and evaluation of the extension programs for both crops and livestock under the conventional agricultural extension approach prevailed till late 1970s.

http://www.g-fras.org/en/knowledge/world-wide-extension-study/92-world-wide-extension-study/asia/southern-asia/319-sri-lanka (viewed on 11 June 2013).

Each DAEO had 6-17 AIs, 20 to 138 KVSs depending on the size and agricultural importance of the district. There were 22 districts and 202 AI ranges in the country. In each AI range, there were about 3000 ha of paddy lands and 3000 to 6000 farm families. Each AI range was subdivided to 4-12 KVS ranges thus KVS had about 1000-1500—farm families to serve and there were a total of 1090 KVSs in the field.

Although the extension system was progressively strengthened, the conventional extension system had more weaknesses such as lack of technical guidance, heavy load of non-extension activities, thin coverage by extension officers, lack of mobility facilities of field extension staff and poor research-extension linkage.

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Training and visit system of extension

As a remedy for these weaknesses, new and systematic extension approach, Training and Visit (T&V) system of agricultural extension, was introduced with the assistance from the World Bank and implemented form 1979 to 1987. This extension system created a unified extension system covering all food crops with a single line of command from the national to field level. It provided regular and fortnightly training to extension staff, scheduled visit to farmers with relevant information important to that fortnight and conducting Regional Technical Working Group meeting for preparation of regional extension and research plan and for bridging the research-extension linkage. Non-extension activities that had been carried out by the extension workers such as sale of inputs, production of seeds were relived from extension officers. Eight regional research stations were established in different agroclimatic zones of the country. Four special research stations and 18 sub (adaptive) research stations were functional during this period. Eight In-Service Training Institutes were also established and became operational by 1983 to provide the required training for extension staff.

The extension division of the DOA employed extension officers at district, segments, ranges and field levels. By that time there were 24 administrative districts and the designation of DAEO was changed to Assistant Director of Agriculture. A new post of segment agriculture officer was created and posted to guide and supervise 20-30 field extension personnel. Farm families and ranges served by KVS (750 on an average) were divided into six clusters and 6 contact farmers were identified in each cluster. Each contact farmer was visited regularly fortnightly and it was expected that contact farmer delivered the messages to the other farmers. This system of extension could not be continued due to drastic administrative changes and removal of KVSs from agriculture extension in 1987.

Second Agricultural Extension Project (SAEP)

As an alternative strategy to fulfill the vacuum created due to elimination of T &V system, the Second Agricultural Extension Project (SAEP) was implemented in 1993 with the financial assistance from the World Bank. This project made some attempt to establish farmer participatory and integrated extension approach for food crops, minor export crops, livestock and coconut sectors in Sri Lanka and the project came to an end in 1998, with little results. However, lack of successful integration among line agencies and lack of effective coordination between the project and provincial councils in particular were major hindrance to achieve expected results. Project evaluation report revealed that, due to weaknesses observed in implementation of Integrated Agricultural Extension System, the achievement of objectives of increasing farm incomes and agricultural production was partial and not very satisfactory.

Problems experienced

There was a drastic administrative structural change in 1987 with the devolution of powers to the provincial councils. The unified extension system was dismantled and extension staff was assigned to eight provincial councils creating 8 independent extension agencies. The field level extension services (KVSs) were removed from the DOA and were attached as village level administrative officers (GSN). Six inter-provincial areas under the central government control were established in accordance with the section II and 9th paragraph of the 8th schedule of the 13th amendment to the Constitution of the Democratic Republic of Sri Lanka. The linkage with the national extension and research system was left only to informal avenues, destroying all formal linkages. During the period starting from 1983, especially the north and eastern provinces and adjoining areas were severely affected with the civil war and agricultural extension activities in those areas were disrupted and limited only to a few safe areas.

After 1988 there were 10 agencies managing extension of food crops in the state sector, namely 8 provincial councils, central government extension in 6 inter-provincial areas, and extension systems in irrigations and colonization schemes in Mahaweli Authority of Sri Lanka. Up to 1993 the DOA was headed by Director of Agriculture and had 7 divisions namely, Research, Education and Training, Seeds and Farms, Socio-Economic and Planning, Botanic Gardens, Engineering, Finance, and Administration and each division was headed by a Deputy Director.

In 1993 the Department underwent an organizational restructuring process and Director General Post was created for the Head and 11 Director Posts were created. Three crop research and development Institutes were formed for rice system created a unified extension system covering all food crops with a single line of command from the national to field level. It provided regular and fortnightly training to extension staff, scheduled visit to farmers with relevant information important to that fortnight and conducting Regional Technical Working Group Meeting for preparation of regional extension and research plan and for bridging the research-extension linkage.

This system of extension could not be continued due to drastic administrative changes and removal of KVSs from agriculture extension.

2. Organization of National Agricultural Extension Systems (NAES)¹⁶

In Sri Lanka agricultural extension services are provided mainly by the government sector organizations. The major state sector institutions involved in agricultural extension are Department of Agriculture, Department of Animal Production and Health, Department of Export Agriculture, Coconut Cultivation Board, Tea Smallholdings Development Authority, Rubber Development Department, Tea Research Institute, Rubber Research Institute, Coconut Research Institute and Mahaweli Authority of Sri Lanka. Cashew Corporation, Silk and Allied Authority, Sugar Research Institute, Forest Department, Livestock Development Board and Department of Fisheries and Aquatic Resources also have their own extension services. There are a few Non Governmental Organizations (NGOs) and private sector input supplying companies who deliver extension services to the selected farming communities.

(i) Agencies involved in the extension system (GO¹⁷ and NGO) Department of Agriculture (DOA)¹⁸

The Department of Agriculture was established in 1912. It is the prime organization responsible for agricultural research and extension. The mandated crops of the DOA are paddy, other field crops such as pulses, oilseeds, condiments, roots and tubers, vegetables and fruits. The extension service of the DOA comes under two administrations: central government and provincial councils. There is a Director (Extension) in the central government authority. The provincial Deputy Directors (Extension) are responsible to the respective provincial authorities. Because of this dual structure, there are conflicts between extension service of the central government and provincial councils. There is no clear line of command. The designation of the Director (Extension) was changed at several occasions in Director (Technology Transfer) and Director (Communication).

The DOA has both staff grade extension officers and field level extension officers. Directors, Deputy Directors and Assistant Directors are considered as staff grade extension officers.

Agricultural Officers (AOs) and Agricultural Instructors (AIs) are the field level extension fficers. Before 1990, there was 2400 grassroots level extension workers named as "Krushi Viapthi Sevaka". But due to political reasons they were transferred to the Ministry of Public Administration as village officers (Grama Niladhari). So currently there is no grassroots level extension staff in DOA. The responsible authorities such as Ministry of Agriculture did not take any effective measure to fill this vacuum and the extension service of the DOA is not efficient as in early days.

Department of Animal Production and Health (DAPH)

The DAPH was a part of the DOA until 1972. In 1972 livestock production division including animal health was organized as the Department of Animal Production and Health. Unfortunately since 1977 up to 2002 DOA and DAPH were under different ministries. So there was no sufficient coordination between crop and livestock sectors, which is essential

¹⁷ Samuel, R. P. http://go.microsoft.com/fwlink/?LinkId=69157

¹⁶ Ibid

¹⁸ BeraterInnen News 2/2002 http://go.microsoft.com/fwlink/?LinkId=69157

for the development of the agriculture of the country. The field level extension officers of the livestock sector are Livestock Development Instructors (LDI).

Department of Export Agriculture (DEA)

The DEA was established in 1972. The crops mandated to this department are coffee, cocoa, cardamom, cinnamon, cloves, betel, areca nut, oil palm, vanilla, and lemon grass. All these crops are mainly export oriented ones. The DEA has its own extension service and the field level extension officer is called Extension Officer (EO). They are two years agricultural diploma holders.

Coconut Cultivation Board (CCB)

The CCB is a semi government institution, which involves in extension services to coconut small holders in the country. Coconut Development Officers (CDOs) are the field level extension officers in this institution.

Integrated Agricultural Extension Service (IAES)

The IAES is being implemented from 1993 with participation of the above described four institutions namely, DAO, DAPH, DEA and CCB. The major reasons to introduce this approach were cost effectiveness, disruption in the technical line of command, insufficiency of grassroots level extension workers and the need to practice farming system approach (Sivayoganathan, 1999).

The IAES is an integration of the extension efforts of four institutions. The extension programs for the area is planned and implemented at the field level by Field Extension Team (FET) comprising of the field extension officers of the four institutions. These officers are Agricultural Instructors (AIs) of the DOA, Livestock Development Instructors (LDIs) of the DAPH, Extension Officers (EOs) of the DEA, and Coconut Development Officers (CDOs) of the CCB. These officers serve as general practitioners in addressing farm problems, which are more general, and leaving community specialized ones to the respective line institutions. The FET members are guided and logistically assisted and supported by the Guide Extension Team (GET) at the District level and at the Provincial Extension Team (PET) at the provincial level (Sivayoganathan, 1999; Sivayoganathan and Kotagama, 1999).

Tea Small Holdings Development Authority (TSHDA)

The TSHDA is the organization responsible for providing extension services to the tea smallholdings sector. The field level extension officers of the TSHDA are Tea Inspector/Extension Officers (TI/ EOs). They are involved in providing extension service to the tea smallholders as well as in the supply of other agricultural support services. The extension service of the TSHDA is under the supervision of the Deputy General Manager (Extension) who is operating from Colombo.

Tea small holders are taxed indirectly for the extension services provided to them through the Tea Small Holdings Development Authority. Sixty percent of the island's tea production comes from the smallholder sector. Government takes 1.50 Sri Lanka Rupees from each and every exporting tea kilogram as an exporting tax. But this money is reinvested in the tea sector. All the tea sector institutions such as Tea Research Institute, Sri Lanka Tea Board,

and Tea Small Development Authority are funded by this money, not by the treasury funds (Mahaliyanaarachchi, 1996).

The Tea Small Holdings Development Authority is totally responsible for the extension delivery to the tea small holders in the country that is approximately two hundred and thirty thousand farmers. There is nearly 200 field level extension workers, and around 30 supervisory level extension officers. All these officers are paid by the tax money collected at the exporting end.

Here farmers pay indirectly for the extension services, which they obtain though they have no idea about it.

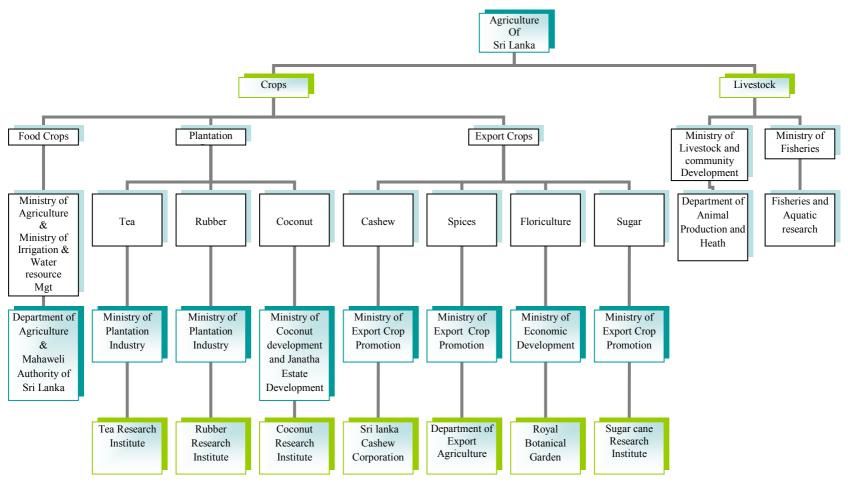
Rubber Development Department (RDD)

The RDD was established in 1994 by the amalgamation of the Rubber Control Department (which was totally responsible for disbursement of subsidies) and the Advisory Services Department (which was totally responsible for the extension service). Currently the RDD is responsible for providing extension service to the rubber small holders and disbursement of subsidies and other input facilities such as fertilizer, planting material, etc. The field level extension officers are designated as Rubber Development Officers (RDO). The extension activities in the RDD are decentralized, covering 12 districts of rubber growing areas under the supervision of the Assistant Directors.

Private Sector Extension Service

There is no highly specialized private sector extension service in Sri Lanka yet. There are some NGOs namely Care International, Red Bana, and Sarvodaya involved in agricultural extension work mostly as part of their overall community development programs. Also private sector input supplying companies such as Hechem, Ceylon Tobacco Company, Baurs Ltd, provide limited advisory services to their clients. These private sector companies recover their costs through the margin on the product they are either selling or buying. They do not make any direct charge to the extension services provided. It was found that there is a potential to privatize extension services especially in the horticultural sector, export agricultural crops, and livestock enterprises (Malkanthi and Mahaliyanaarachchi, 2001; Sivayoganathan, 1999).

(ii) Organogram of NAES with major roles of each position of the organogram



(iii) Extension planning process

For plantation crops there are respective research institutes/boards which are also carry out technology transfer activities. Apparently there is not much problems in planning and coordination.

However, in livestock sector, the government research and extension agencies are actively involved in farmer problems in production, processing, marketing and social problems. Therefore, three themes were considered in agriculture extension policy planning:

- a. Farming community participation in the planning process, assuring the sustainable development of the wellbeing of the farmers.
- b. Contribution and responsiveness of the private sector service institutions for farmer needs, and relieve the government from financial burden in servicing the farmers.
- c. The state role as to take the leadership standing as a focal point who would set policy, public resources allocation, rather than a as a provider of all services.

(Based mostly on livestock extension)

a. Problem identification process

Farmer need identification, for example in the livestock sector, is facilitated by self managed farmer societies which have been established. Strengths of these societies are at different levels. Dairy Villages, All Island Poultry Association, All Island Pig Association, Milco Farmer Societies and Mahaweli Farmer societies are some other livestock industrial stakeholder managed societies. These societies can be identified as sources of current problem identification. NGOs have a role in assisting them. Further, industrial developmental issues, animal breeding straggles, diseases prevention and control, feed resources development, production and processing, marketing, institutional and man power development issues are identified at various workshops, seminars and also at state officials progress review meetings.

b. Priority fixation of action activities

Technology transfer, facilitation for empowerment, and advisory are prioritized extension activities.

It would thus appear that some kind of bottom-up planning is already is at work in Sri lanka.

3. Governance

(i) Institutional reforms

Conducting of necessary training programs for farmers to update their knowledge and assist them to acquire required skills have been incorporated in most of the extension programmes.

(ii) Public-private-NGO partnership

Institutional set up has been established and public-private joint programs have been organized for training programs (for example in the livestock sector).

Commodity specialized approach is mainly used by private sector institutions for their forward contract programs, contract growing schemes, buy back operations and purchasing programs. For example, livestock extension needs of the most of the broiler farmers and considerable number of the layer farmers in the poultry sub sector are being looked after by these institutions through their service package consisting of delivering necessary external inputs, organizing and some times providing necessary services including livestock extension and buying back their productions from farm or field levels at a guaranteed or pre agreed price. Commodity approach is also in vogue in Tea, Rubber, Coconut and Cashew.

Projects funded by various governmental, non governmental and private sector institutions are in operation all over the country with varying capacities. Extension is a built in component of projects and they are specially tried to achieve pre-identified set of results in a selected area. The projects try to improve the delivery of necessary technical services, ensure livelihood opportunities, improve marketing facilities, and promote value addition activities etc by utilizing appropriate technologies at field level.

(iii) Accountability hierarchy

Director (Agriculture) ← Deputy Director (Extension) ← District Agricultural Extension Officer (DAEO) ← Agriculture Instructod (AI) ← Krushhi Viapthi Sevaka (KVS).

(iv) Leadership development

The necessity of empowering farmers socio-economically, technically and otherwise for their decision making has been recognized strongly. As a result various kinds of farmer organizations now play a significant role in production, marketing chain, for example, in the livestock sector.

The absolute necessity of active farmer involvement in decision making process of the entire marketing chain covering all aspects involved including policy making, allocating of scarce resources, planning, implementing, monitoring and evaluation of projects and programs has been emphasized in many of the programs. As a result various types of farmer organizations have emerged. For example half of the milk collected in the formal market of Sri Lanka is being handled by farmer organizations at present.

(v) Management information system

The use of electronic media in agricultural extension management has already made progress in Sri Lanka. The Department of Agriculture in Sri Lanka has started to use an IT application (CD-ROM) to disseminate agricultural innovations to farmers. A survey¹² revealed that websites were the fifth most used channel, together with written material (booklets, leaflets, pamphlets, posters), but behind the extension network, bulletins, technical manuals and software in agricultural innovation dissemination. Ninety-seven per cent of respondent websites indicated that they maintain an official website but farm businesses were not their

¹² Arumapperuma, S. 2008. The Role of Information Technology In Disseminating Innovations In Agribusiness: A Comparative Study of Australia And Sri Lanka. http://vuir.vu.edu.au/1416/1/arumapperuma.pdf

currently main target audience, because the majority of Sri Lankan farmers do not have access to computers.

Using information technology, such as websites, were effective and efficient means of diffusion. Sri Lankan survey respondents did not see websites as a low cost method, in terms of low overhead and establishment, employee training and maintenance. However, the importance of IT as a dissemination tool will increase with time in Sri Lanka. Except for farmers in the large plantation sector, the majority of Sri Lankan farmers need assistance (e.g. extension worker or telecentre worker) to use the IT facilities provided by the central government and NGOs.

Electronic mediated Animal Disease Information System and a Dairy Reproduction Information system has been established at the Head quarters of DAPH. A 24 hr serving hot line enables the clients clarify with professional guidance. The IT Centers have been established at the Veterinary Research Institute and at the Institute of Continuing Education (ICEAPH) at Gannoruwa.

4. Human Resources Development and Capacity Building

There are seven agricultural faculties and ten agricultural schools in the country. So around 500 agricultural graduates and 800 agricultural diploma holders come out from these institutes annually. This large work force could and should be used to enhance the quality of the extension service.

After nearly 30 years of the internal conflict in Sri Lanka, it came to an end in May 2009. Growing internal demand as well as the increase in foreign tourists is driving growth, resulting in a sustained high GDP rate at around eight percent. Sri Lanka aims to double its income and become an upper-middle income country by 2016, and taking the country's needs into account, the government is promoting private investment, and actively stimulating farming and fishing villages. (http://www.jica.go.jp/srilanka/english/index.html).

- (i) Involvement of academic and research institutes for HRD through curriculum de development and implementation support
- (ii) Training extension workers and farmers through public. GO and private initiatives

As stated earlier, Institutional set up has been established and public-private joint programs have been organized for training programs (for example in the livestock sector).

5. Research-Education-Extension-Farmer Linkages

One of the constraints at present in farmer- research-extension linkage is 'One Grower – Many Advisory Services' while there is the need for more ground level extension workers as well as stronger research-extension linkages.¹³

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¹³ Samuel, R.R. 2011.Country Profile: Sri Lanka National Agricultural Extension System. Presentation 'Country Profile: Sri Lanka National Agricultural Extension System. Workshop on' National Agricultural Research System – An Analysis of the System Diversity' organized by SAC, November 23-24, 2011, Thimpu, Bhutan.

(i) Present linkages¹⁴

The importance of strengthening the linkage between research and extension has been well recognized in the country. As a result several formal measures have been introduced.

• Provincial Technical Working Group (PTWG)

Originally introduced to support the T&V system in early 1980s, the forum paves the way for officers engaged in different disciplines to interact with each other and come to an agreement with regard to sharing responsibilities for production programmes to be implemented during the coming season. The provincial Director of Agriculture Extension and Deputy Director (Research) of the Regional Research Institute act as "Co-Chair" and the head of the Regional In-service Training Institute performs as the Secretary. The PTWGs meet before the commencement of each cultivation season and priorities for the on-coming seasons are agreed upon.

• Research-extension-training dialogues

The forums are organized during the season to analyze and discuss important fied problems and to observe to what extent certain technologies can be adopted under different situations. The sessions are normally organized as a scheduled field tours followed by technical discussion based on field observations. This strategy was also introduced by the T&V system to strengthen linkages between research and extension.

• Crop clinics

During the cropping season when farmers face multitude of problems related to dffeent disciplines, relevant researchers are to a pre-arranged location in the field by the extension autrhorities in the area to interact with farmersFarmers are expected to carry fresh specimens to enable researchers to make appropriate recommendations. Such sessions help to solve a large number of problems and extend the benefit of research-extension linkage to the farmer level. In order to [rovide better service during these clinics, arrangements are made to sell seeds, planting materials, technical publications and also video programmes are also shown to the public.

Field days

Although field days are organized as a normal extension function, researchers are invited to some filed days, when some noteworthy event occurs in the field. This gives them an opportunity to interact with farmers and understand different farming environments and share experiences with farmers and extensionists. Also field days organized by Research Institute to show new technologies. This provides an opportunity to develop dialogue between researchers and extensionists.

• Mass media activities

In order to strengthen programme of DOA the Audio Visual Centre of the the DOA has been equipped with resources to produce several technical television programmes per week for the

¹⁴ Mankotte, K.N. 2006. Agricuktural extenson in Sri Lana and different mechanisms available to strengthen research-extension linkages. Proc. Regional Workshop on Research-Extension Linkages for Effective Delivery of Agricultural Technologies in SAARC Countries.SAIC, 20-22 November 2006 held at NAARM, Hyderabad, India. SAIC,BARC Complex, Farmgate, Dhaka

National Television Service "Rupavahini". Also several radio programmes are broadcast weekly by Farm Broadcast Service in Colombo and its regional units. The printing press fulfills the need of producing technical print media materials for farmers. Opportunities are given to relevant researchers and extensionists to serve as resource persons in the production of both electronic and print media materials.

• Annual symposium of DOA

All senior technical officers of DOA are invited to the symposium and are given opportunities to present their findings of research outcomes, experiences gained in extension activities and socio-economic studies. The event has helped develop a better understanding among officers of different disciplines throughout the country.

• Toll free extension service

This is a recently introduced innovative ICT to reach the farmer. In order to support the present agricultural extension system which suffers from lack of sufficient extension officers in the field and the delay in getting messages to farmers, the Ministry of Agricultural Development has taken the initiative to provide a toll free extension service to the DOA. Any one can call the agricultural knowledge repository "call centre" through a telephone where agriculturists of DOA as well as any one from other departments are assigned to answer the calls. In cases where an extension officer is unable to provide a satisfactory answer, the caller is directed to relevant officers, including research officers.

• Agricultural technology parks

This concept of quick information dissemination mechanism was introduced recently and two such parks have been established in an aesthetically pleasant environment. This is a place to see live demonstration of some of the latest technical recommendations of food crops with self explanatory digital posters. For visitors who need further clarifications, agricultural instructors are assigned to each section of the park to assist them. Researchers assist in establishing demonstrations and in deciding the technical content of the posters. The technology serves as a "live agricultural university" for those interested. It also serves as a place for discovery learning for students and demonstration site for traditional agriculture in Sri Lanka. The Technology Park has become popular as a place for agro tourism. Its long term sustainability requires close working relationship between researchers and extensionists.

• Cyber agriculture extension

As an ICT initiative, Cyber agricultural extension has been implemented in Sri Lanka since 2004. This is an information exchange mechanism over cyber spaces. It utilizes the power of on-line networks computer communications and interactive multimedia to facilitate effective information exchange.

In view of the limitations of the original on-line cyber extension, digital extension mechanism (wireless cyber extension) was introduced in a pilot project. Up until December 2006, 45 cyber units were established as Agrarian Service Centre. The use of interactive CD ROMS is the key feature of the digital extension mechanism. Technical contents of these CD-ROMS are obtained from research institutes who extend their support during the production process as well. After continuous monitoring and evaluation over two years necessary steps have been taken to implement the on-line cyber extension since 2006.Code

Division Multiple Access (CDMA) facility and internal connection were provided by the cyber units.

The mechanism has improved the generation and collaborative use of agricultural knowledge. Two-way communications through e-mail and internet between Agrarian Service Centres, Research Stations, wextension agents and other private sector organization have been implemented. Researchers in national research stations and extension workers in rural villages can communicate with colleagues and experts with a click of the mouse. Farmers with the assistance from the agricultural instructor can communicate with agriculturists through e-mail. If farmers need to send visuals of their field problems, either they can use scanned image or digital still photograph. By using the web-camera and microphone, teleconference is also possible. Researchers and farmers will now be able to agricultural problems face —to face in the cyber space through internet. Similarly researchers can also discuss problems with other colleagues and also extensionists via e-mail to find out more information about a problem.

Researchers as trainers

It is common practice to get the assistance of researchers as resource persons in training programmes. This creates an opportunity for the extension officers to discuss their field experiences and give a feedback on the technical recommendation given by the researchers, enabling them to understand each other better.

• Adaptive research programme

Research officers often conduct adaptive trials in farmers' fields. Extension workers are expected to assist in site selection, establishing and maintaining such trials. Success of such a programme always depends on mutual understanding respect for each other.

• Disciplinary working group meetings

Research officers of a specific discipline of the country get together before the commencement of each season. They discuss problems and set priorities. Scientists from both Central and Provincial research institutes are invited to give them an opportunity to contribute towards deciding research priorities. Representatives from the extension service are also invited. This is also an opportunity to bring research and extension together.

• Crop zoning programme

In order to develop backward villages, the DOA has launched crop zoning programme Although the programme was initiated by the Research Division, officers involved in extension, seed and planting material production also support the programme peforming their respective roles.

Sri Lanks seem to have gathered the courage to challenge the weak linkage between research and extension, although further strengthening are possible. The level of success with rice production is taken as an example which would not have been possible without a strong linkage between research and extension. Similar examples can be cited for banana and pawpaw where research and extension have worked in "perfect harmony" 15

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Mankotte, K.N. 2006. Agricultural extension in Sri Lanka and different mechanisms available to strengthen research-extension linkages. Proc. Regional Workshop on Research-Extension Lib\nkages for Effective

• Institutional reforms for strengthening linkages

The importance of strengthening the linkage between research and extension has been well recognized in the country. As a result several formal measures have been introduced. These include:

- Provincial Technical Working Group (PTWG)
- Research-extension-training dialogues
- Crop clinics
- Field days
- Mass media activities
- Annual symposium of DOA
- Agricultural technology parks
- Cyber agriculture extension
- Researchers as trainers
- Adaptive research programme
- Disciplinary working group meetings
- Crop zoning programme

Sri Lanka appears to have gathered the courage to challenge the weak linkage between research and extension, although further strengthening are possible. 16

6. Incentive structure

- (i) Incentive structure: Present status and future outlook
- (ii) Career advancement scheme
- (iii) Prize and reward system
- (iv) HR management

7. Monitoring and evaluation

- (i) Institutional review and programme review
- (ii) Monitoring of extension programme

An effective monitoring and evaluation was identified with Participatory Technology Development Program in Sri Lanka.¹⁷

Step 1: First seasonal meeting of village interest group on upland farming: Village members and agricultural field staff analyze the situation in upland farming and discuss

Delivery of Agricultural Technologies in SAARC Countries. SAARC Agricultural Incformation Centre, Dhaka and National Academy Agricultural Research Management, Hyderabad.

Mankotte, K.N. 2006. Agricultural extension in Sri Lanka and different mechanisms available to strengthen research-extension linkages. Proc. Regional Workshop on Research-Extension Lib\nkages for Effective Delivery of Agricultural Technologies in SAARC Countries. SAARC Agricultural Incformation Centre, Dhaka and National Academy Agricultural Research Management, Hyderabad.

¹⁷ Wadduwage, P.2006. Enhancement of Extension Systems in Agriculture. Sri Lanka.

Report of the APO Seminar on Enhancement of Extension Systems in Agriculture

held in Pakistan, 15-20 December 2003 Edited by Dr. V.P. Sharma, Published by the Asian Productivity Organization 1-2-10 Hirakawacho, Chiyoda-ku, Tokyo 102-0093, Japan. http://www.apo-tokyo.org/publications/files/agr-16-ees.pdf

possible solutions. The members decide which innovation to test and establish a seasonal work plan for the activities agreed upon.

- **Step 2: Inter-village Visit:** Interest group members conduct a trip to another village, where similar problems have been identified and where farmers have started the testing of promising solutions.
- **Step 3: Second Meeting Of Village Interest Group:** The tests agreed upon in the first meeting are discussed in detail and a work plan for each test will be prepared.
- **Step 4:** Monitoring Visits: The interest group and the agricultural field officers meet regularly throughout the cultivation season; walking field to field they observe and discuss the tests implemented.
- **Step 5: Evaluation Meeting:** After the harvest, the interest group meets to analyze and evaluate the results of the season and to draw conclusions for the continuation of activities in the next meeting.

As an effective approach application of PTD in 500 project villages has shown very positive results. By conducting extension programs along in the field, it provided an opportunity for extension workers to concentrate their efforts towards a more sustainable rural development program. The project training component was very effective and training programs were conducted to improve extension workers' knowledge and skills on application of PRA tools in the field. It has further improved their skills on group facilitation, communication, planning, monitoring and evaluation of extension programs.

Special Papers from Bhutan on Agricultural Extension System

Agricultural Extension Services in Bhutan Present Status and Suggested Reforms

Dr. Toyanath Acharya

Head, Technology Screening & Monitoring Division Council for RNR Research of Bhutan 416 Special Paper

Introduction

Owing to its location in the eastern Himalaya, and land elevation ranging from 100 masl in the south to over 7,500 masl in the north, Bhutan's physical features are characterized by high mountains, steep slopes, narrow plateau & valleys, crisscrossed by fast flowing rivers. The terrain is therefore difficult for farming as well as for the development of associated infrastructure.

With a geographic area of 38,394 km² the country is almost entirely mountainous. The flatty spaces are therefore limited to valleys alongside rivers and basins. It is sparsely populated and more than 70% live in rural areas. A substantial population is still lives below poverty line, which is a rural phenomenon in Bhutan.

Agriculture (referred as Renewable Natural Resources [RNR], encompasses agriculture, livestock and forestry sectors) is the mainstay of the rural populace and therefore of the country's economy, with GDP contribution of more than 18%. The farm sizes are very small often making it difficult for any meaningful commercial operation. The farming system is therefore mixed with small scale operation of cereal, horticulture, livestock and agro forestry at every household.

The extension services and skills required are therefore complex and resource demanding.

Formal introduction of extension system

Although extension service in Bhutan started with implementation of the very first development plan in 1961, organized service provision seems to have started from the 5th plan [1981-87]. The concept and development of service provision have grown in tandem with technology generation from research systems, govt farms and associated central programs. However, the present day extension has evolved after going through the rigour of transition from centrally directed system to the current decentralized Dzongkhag (District) and Geog (block) operated one.

Policy & Organizational structure of extension system

The agriculture extension system has been totally decentralized, with technical departments [Departments of agriculture, forest & park services, livestock and agricultural marketing & cooperatives] under the Ministry of agriculture having only technical control. The central programs under the departments provide inputs and required technical guidance to the extension officials in the districts.

There are over 500 extension staffs engaged in livestock, agriculture, forestry and marketing related extension work in the 20 dzongkhags and 205 geogs. Typically each RNR extension centre [EC] is manned by a livestock, agriculture and forestry extension staff. Each sector has a district officer, to supervise them from the district. The livestock sector has additional staff manning veterinary hospital, artificial insemination and fishery activities as the case may be.

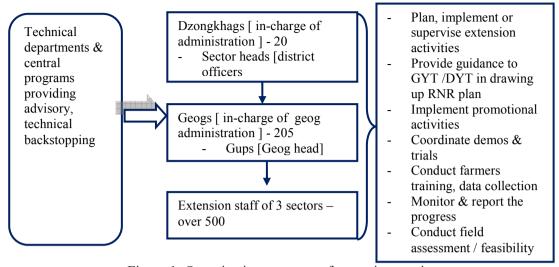


Figure 1: Organization structure of extension service

Field observation:

- So much material or knowledge is available with the MoAF, research stations or at central program. Somehow there is no percolation effect. Things are not getting to the ground.
- Our extension system is manned by lowly qualified staff. It began by recruiting class VIII or X passed candidates trained them for 6 months in Bhur Farm, Vet laboratories /livestock farms and Bhutan Forest Institute. Later, extension staff were trained at Royal Vet Institute (RVI), National Agriculture Training Institute (NATI), Ugyen Wangchuk Institute of Conservation & Environment (UWICE) and National Resources Training Institute (NRTI). Now the CNR [the erstwhile NRTI] has started degree level courses and the extension staffs in the field are going to be a mix of diploma and degree.
- The Ministry of Agriculture [and its technical departments] do not have direct
 control over the extension staff. Often the technical advice or the directive has to
 travel a long route to reach to them. The extension services are fully decentralized,
 with all key decision-making including financial aspects carried out at district or
 geog level.
- No specialized agency for extension so many organizations controlling. So many bosses: The district administrator and Directors of the ministry. Departments do not have direct authority. So many miscellaneous works.
- There is an inter-disciplinary committee, the Extension Coordination Committee
 [ECC] at the national level, which is responsible for overall coordination, policy
 advice, and monitoring and evaluation of extension activities. However decisions are
 often diluted or changed before reaching the field. Often the mechanism to deliver
 the decision is not working.

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• The country does have a guideline or handbook on extension. However there are many adhoc activities, mostly coming from central departments, which hinder the implementation of regular activities. The copies have not reached the remote geog.

- Basics of extension is basically imparting education [or continuing education] to farmers, with or without formal education, but with years of practical experience in decision-making in their daily life. Most of our extension centres do not have adequate extension equipment / material [audio visuals / brochures] which are the ingredients or pre-requisites to impart training. However, because of low or no adoption of technology, poor farmers are wrongly blamed as change-resistant. We have the overarching policy of MAP [marketing, accessibility & production]. However there is no extension staff assigned for market related works. It is expected of the extension staff in the field to do this work as well. However, extension cannot be effectively productive if it works alone, in isolation from the *farm-to-market-chain-links* (FMCL) actors and institutions.
- Because of the very complex physiographic condition and diverse faming system, Bhutan's extension system has to evolve suitable organizational structures, human expertise, strategies, approaches and methodologies; which should be location specific.
- Extension service seem to benefit influential / big farmers
- Formal Job descriptions vs actual field situation / function
- Terrain & coverage area: Because of the vey sparse population it is very difficult for one extension staff to cover the entire geog.
- HRD: districts hardly have any comprehensive HRD plan for extension staff. The support is therefore at the mercy and behest of the centrally operated projects to them.
- Very minimal Financial support

Likely reform in extension services

- There should be a reformation of the policy, which should encourage non-public institutions, NGOs, the private sector and farmers' organizations to become involved in the delivery of extension services, in addition to those delivered by the government department of extension.
- The earlier reward system should be revived, based on the performance of extension staff.
- The extension professional staff must enjoy the same level of benefits, career development [in-country / overseas studies and training] like that of staff placed in central or headquarters There should be adequate provision of operational budget and physical facilities such as proper housing, availability of transport, etc. as enjoyed by the professional staff of other disciplines, notably of researchers.

- The pre-service academic programmes in agricultural extension should be reviewed timely, in order to incorporate latest trends like poverty, food security, climate change.
- Monitoring, evaluation and impact assessment of extension programmes should be carried out on a regular basis.
- Training & Visit system or Farmer Field School may be introduced suiting different micro-climate zones of the country
- The extension services must apply modern information technology
- Globalization and market liberalization

The communities, must be educated and prepared to modify their agricultural operations within the context of globalization, a responsibility which, by and large, the national agricultural extension systems will have to bear, and they must prepare themselves in time to meet the challenge.

Privatization

Many services that were managed in the past by governments are now being managed and delivered by the private sector, especially in developed countries. Many developing countries are following the suit. The underlying reason is dwindling budgets of public institutions, which makes them relatively inefficient and less productive, causing not only financial loss to the government but also creating discontent among people. The private sector, on the other hand, has generally more resources, innovative ideas, and a motive for profit and is thus keen to offer efficient and better services to its clientele.

Pluralism

The modality of using more than one organization, whether public or non-public, for delivering extension services to farming communities, is gaining popularity. The obvious rationale is the pooling of all available resources in order to alleviate pressure from low budgets and staff in the ministries of agriculture, as well as to let the farmers benefit from a variety of sources

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The OGTP Model-An Approach to Agriculture Growth in Bhutan Badrinath (BN) Bhattarai¹

Summary

A suitable extension methodology is a code to the increased awareness on sustainable farming practices leading to improved rural livelihoods. The transformation of extension methodology is to the change desired by the communities and policy decision. The changing needs and aspirations of rural masses call for revisit and adjust working modalities in much needed extension service delivery.

The One Gewog Three Products (OGTP) model therefore was conceptualized and pioneered by Dr. Pema Gyamtsho, Honorable Minister for Agriculture & Forests, Bhutan, during Bhutan's 10th FYP. The objective of the OGTP was to make best use of available resources and existing expertise for development of potential commodities and products in accordance to agro-ecological domain and priorities of the farmers. This very model was planned and implemented in almost 205 Gewogs (Local administrative unit) in 20 Dzongkhags (Districts) to transform potency of extension service through appropriate technical interventions with focus to market oriented productions and value additions. The OGTP based approach strengthened the common platform for extensionists, farmers and researchers to provide a holistic support for products development and production increase leading to marketable surpluses and commercialization of selected agriculture produce in Bhutan. The implementation of OGTP at real field situation therefore was necessary to match with emerging rural development needs within the socio-economic paradigm and resources endowment.

The OGTP extension approach is a simple but holistic tool for dynamic pro-farming extension service. The approach directs more towards technical aspects on the commodity per se on priority basis in collaboration with, and participation of all relevant stakeholders and institutions within technical and materials resources base. The initial major challenge of the OGTP has been lack of strategy for implementation and prerequisite technical data for interventions of prioritized crops/products development besides technical know-how and additional requirement of resources. This emerging OGTP approach centred to market oriented production and products development in accordance to technical and agroecological potentials against various other implementation constraints of numerous commodities and products in cultivation or development under difficult terrains encompassed with varied agro-ecologies and remoteness, being mandated to one extension officer who generally looks after 150-450 h/holds.

The OGTP based Extension has now been becoming a model for Bhutanese agricultural development despite of the challenges being faced for implementation. The adoption of OGTP as a model is to harness location specific potentials and address productions constraints to augment households' income and food security through effective extension methodology and services delivery. Invariably, periodical review of development approaches, policies and strategies are indispensable in keeping with shifting agro-ecological stadium and social wants for increased crops productions and product diversifications within

¹ Principal Extension Officer/Head Extension & Information Management (EIM), Department of Agriculture, MOAF, Thimphu

sustainable development framework. This presentation will concisely discuss on OGTP approach and its relevance in Bhutanese extension system for agriculture development.

The OGTP model-an approach for agriculture growth in Bhutan

The Commodity based development was advocated in the Bhutanese extension system to excel production of crops during Bhutan's 9th FYP (2002-2007). The key to the progression of the commodity based development was required to understand agro-ecology, potentials and constraints of the commodities planned for development. The most suitable agro-ecological production pockets in this context were being identified and technically mapped for planning and implementation. The technical interventions within the extension quorum however have been focused for production of crops with limited emphasis on post harvest and product development. Further, the commodity priority for development were numerous with extension interventions by and large continued unbothered despite of strategic change in the plan development and expected outputs. The prescribed geographical boundary and the households within it included the activity areas and the extension approach linked to coverage and physical target achievement.

The OGTP extension was therefore an attempt to improve delivery of need based extension services and brings-in differences of better livelihoods of the farmers. The OGTP has been conceptualized during the 10th FYP by Dr. Pema Gyamtsho, Honourable Minister of the MoAF, Bhutan, that the commodity per se must be assessed and analyse for its potentials at each locations. The commodity having no technical potentials must not be wasted with efforts and resources but at the same time it should not be ignored or discouraged for development. The OGTP has been holistic in approach for driving extension services more professionally having a definite goal with focus on the activities that are technically potential for upward movement. It is to address agriculture development issues at the grassroots focused principally on potential crops and products for development.

This paper is expected to serve as an OGTP framework to support subsistence farming and to promote commercial agriculture. The theme of OGTP extension is achieved through assessment of field data on production potentials & constraints: soil fertility, aspects, sunshine slopes, crop variety, inputs, agronomy, farmers' preference and marketing opportunities. The OGTP is a situation-based farming right of way targeted to cater to derive economic benefits and happiness to both producers and consumers through investment into the most potential commodities and product development in all potential production aspects for increased production and access to markets.

The role of the extension personnel is to plan appropriate activities in collaboration with relevant partners that have direct bearing of socio-economic benefits to the farmers that leads to sustainable production system. The extension personnel facilitate and coordinate with all relevant stakeholders to address issues in the course of planning & implementation. The implementation of OGTP activities require combination of information devising production potentials and applying selective technical intervention based on priority in respect to use of judicious resources resulting maximization of food production and products for home consumption and sale.

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OGTP-development objectives

- 1. Income enhanced through surplus production and product development
- 2. Safeguard national & h/holds food security
- 3. Improve nutritional standards
- 4. Generate on-farm employment
- 5. Promote labor saving technologies
- 6. Support sustainable land use system

Outputs

- 1. Increased surplus production & products
- 2. Increased yield per unit area
- 3. Increased area under cultivation
- 4. Enhanced farmers professional capacities (farmers as resource persons for farmers)
- 5. Farmers organized for improved farming practices
- 6. Addressed farm labor shortage

Strategies-approaches

Potential products/commodities align with agro-ecologies and local priorities are the guiding principle in the design and applications of OGTP approach. The key to the approach is to emphasize packaging of modern ideas with the indigenous knowledge and inculcating voluntary participation of stakeholders. Thus the important considerations are:

- 1. Identification/mapping of potential production pockets based on commodity priority
- 2. Assess & analyze potentials & constraints
- 3. Resources, inputs availability/affordability
- 4. Plan development for intervention strategies
- 5. Assess & develop capacity of the extension personnel
- 6. Expansion of production areas (potential fallow lands under cultivation)
- 7. Explore crop diversification based on agro-ecological potentials
- 8. Development of ownership, partnership & voluntary participation of stakeholders

Recommendations

- 1. Lead Agency (Geogs and Dzongkhags) should initiate OGTP planning and management in collaboration with the local communities & relevant experts
- 2. Develop and maintain location specific data-base on production areas, crops and products
- 3. Extension personnel's understanding on OGTP should be built-in
- 4. Required resources should be supported with subsidy on essential inputs & equipments
- 5. Extension interventions must be directed to address potentials and constraints
- 6. Formation of farmers groups on OGTP should be encouraged
- 7. All non-OGTP farming activities & communities should be supported at promotional and advisory level

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National Agricultural Extension Systems

An Analysis of the System Diversity

Thimphu, Bhutan

23-24 November 2011

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