

Agricultural Extension Services Delivery System in Nepal



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Acronyms

ADB	Asian Development Bank
ADBL	Agricultural Development Bank Limited
ADB/N	Agricultural Development Bank/Nepal
AEC	Agro-Enterprise Centre
AIC	Agriculture Inputs Corporation
AICC	Agriculture Information and Communication Center
AICL	Agriculture Inputs Company Limited
APP	Agriculture Perspective Plan
APROSC	Agricultural Projects Services Center
ASC	Agriculture Service Center
BPP	Block Production Program
CALSC	Community Agriculture and Livestock Service Center
CBO	Community Based Organization
CBS	Central Bureau of Statistics
CDP	Crop Diversification Project
CLDP	Community Livestock Development Project
CTEVT	Council of Technical Education and Vocational Training
DADO	District Agriculture Development Office
DAE	Directorate of Agricultural Extension
DCCI	District Chambers of Commerce and Industries
DAT	Directorate of Agricultural Training
DDC	District Development Committee
DFID	Department for International Development
DFTQC	Department of Food Technology and Quality Control
DISSPRO	District Seed Self-Sufficiency Program
DLS	Department of Livestock Services
DLSO	District Livestock Services Office
DLSTE	Directorate of Livestock Services Training and Extension
DOA	Department of Agriculture
DOAE	Directorate of Agricultural Extension
DOC	Department of Cooperatives
DOLIDAR	Department of Local Infrastructure Development and Agricultural Roads
ECA	Extension Command Area
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FG	Farmers' Group
FNCCI	Federation of Nepalese Chambers of Commerce and Industries
FSRE	Farming System Research and Extension
GDP	Gross Domestic Product
GON	Government of Nepal
GTZ	German Technical Cooperation
HICAST	Himalayan College of Agricultural Sciences and Technology
HRD	Human Resource Development
IAAS	Institute of Agriculture and Animal Sciences
ICP	Integrated Cereals Project
IDE	International Development Enterprise

IFAD	International Fund for Agricultural Development
IHDP	Integrated Hill Development Project
IOM	International Organization for Migration
IPM	Integrated Pest Management
(I)NGO	(International) Non-Government Organization
IRDP	Integrated Rural Development Project
JICA	Japan International Cooperation Agency
JMA	John Mellor Associates
JT	Junior Technician
JTA	Junior Technical Assistant
LAC	Lumle Agriculture Center
LSGA	Local Self-Governance Act
LS(S)C	Livestock Service (Sub) Center
MLD	Ministry of Local Development
MOAC	Ministry of Agriculture and Cooperatives
MOE	Ministry of Education
MOF	Ministry of Finance
MOLTM	Ministry of Labour and Transport Management
NAES	Nepal Agricultural Extension Strategy
NAP	National Agricultural Policy
NARC	Nepal Agriculture Research Council
NARDF	National Agricultural Research and Development Fund
NDRI	Nepal Development Research Institute
NMTPF	National Medium-Term Priority Framework
NPC	National Planning Commission
NRB	Nepal Rastra Bank
NSCL	National Seed Company Limited
NTFP	Non-Timber Forest Product
OPEC	Organization of Petroleum Exporting Countries
OVOP	One Village One Product
PAC	Pakhribas Agriculture Center
PSP	Private Service Provider
RATC	Regional Agriculture Training Center
SAARC	South Asian Association for Regional Cooperation
SDC	Swiss Development Corporation
SEAN	Seed Entrepreneurs Association Nepal
SLC	School Leaving Certificate
SNV	Netherlands Development Organisation
SWOT	Strength-Weakness-Opportunity-Threat
T&V	Training & Visit Extension System
TU	Tribhuvan University
TYIP	Three-Year Interim Plan
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VAHW	Village Animal Health Worker
VDC	Village Development Committee
VLAA	Village Level Agriculture Assistant
WB	The World Bank
WFP	World Food Programme

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Tek Bahadur Thapa

Agricultural Extension Services Delivery System in Nepal¹

1 Background

1.1 Purpose of the Study

At the request of the Government of Nepal (GON), Ministry of Agriculture and Cooperatives (MOAC), the Food and Agriculture Organization of the United Nations (FAO) is formulating the National Medium-Term Priority Framework (NMTPF) for FAO's assistance to support objectives related to food security and agriculture development. In so doing, FAO is supporting sector studies to bridge the gap of knowledge in some areas as identified in the Stakeholders Workshop jointly organized by the Government—the National Planning Commission (NPC) and MOAC—and the FAO in August, 2009. Agricultural extension services delivery system is one of the areas for such a study.

This study is expected to contribute to the formulation of the NMTPF for Nepal. The main objective of the study is to identify the major issues and challenges facing the agricultural development sector from the perspective of technology transfer to the clientele. The strengths and weaknesses of the existing agricultural extension services will be analysed and recommendations will be put forth to address the identified gaps. Thus, the findings of the study will be helpful in the situation analysis and the preparation of the programme framework for the NMTPF.

1.2 Study Methodology

The consultant had earlier been engaged in the situation analysis exercise of the NMTPF formulation and presented the findings on issues and challenges facing the agriculture sector in the country during the joint Stakeholders Workshop described above. Further, to identify the gaps confronting the agricultural extension system and to suggest interventions by FAO and the Government to achieve development objectives in the agriculture sector, following study methodology was adopted.

- a. Review of literature. There is a dearth of evaluation studies concerning agricultural extension system in Nepal. However, this has been complemented

¹ This report is prepared by Mr. Tek Bahadur Thapa, FAO Consultant for NMTPF Formulation Team.

by the analysis of historical changes in the system and its contribution to meet demands, priorities and needs of the agricultural producers. An insight from the experiences of implementing different agricultural extension systems, often supported by donor partners, has helped in assessing the suitability in the Nepalese context. The study of these pilot agricultural extension systems has helped to understand the impact on agricultural producers, cost effectiveness of the various systems and, finally, the sustainability of new system intervention. Review of documents highlighting extension reforms and experiences elsewhere was conducted. This was helpful as a reference for suggesting interventions in light of successes and failures observed in the Nepalese agricultural extension system.

- b. Strength-Weakness-Opportunity-Threat (SWOT) analysis. During the process of situation analysis for NMTPF formulation, the SWOT analyses were conducted in the Department of Agriculture (DOA) and the Department of Livestock Services (DLS) separately in June 2009. Under MOAC, these are the two departments responsible for public extension services delivery. The outputs of those SWOT analysis exercises have been used in this study.
- c. Focus group discussions. These discussions were held with private sector and public sector groups.
- d. National Workshop on Agricultural Extension. The author presented a paper and participated actively in this workshop organized by Directorate of Agricultural Extension (DOAE) of DOA in June, 2009. The workshop was participated in by farmers, farmer group members, input dealers, traders, processors, private service providers, (I) NGOs, agricultural researchers, extensionists and donor representatives. This workshop was very useful to gather opinions of the stakeholders regarding the state of agricultural extension services and suggestions for future reforms.

However, no mention of this workshop, the focus group discussions and SWOT analyses has been made in this report because of the differences in the duration of this assignment and occurrences of those events. But the information from those events has been drawn for the present analysis.

- e. Meetings. Key persons were visited to seek their opinion about the issues that demanded clarification and to solicit their suggestions for improving agricultural extension services delivery in the country.
- f. Collection of secondary data. Published data on extension programme funds, number of women extension workers and private extension service providers was not available. Organizations were visited personally and a research assistant was engaged to collect that information. It was apparent that after the devolution of agricultural extension services delivery to the local body (District Development Committee), communication of information, to the departments from the district

extension institutions and vice versa, has deteriorated. Analysis has been conducted based on the limited information available and, in some cases, qualitative information by informed authorities has been used to substantiate the findings.

2 Agricultural System in Nepal

Nepal is divided into three physiographic regions—mountains, hills and Terai—with elevation ranging from 60 m in the Terai flatland in the south to 8848 m Himalayas in the north (K.C., 2001). Climate also varies according to topography from alpine and tundra in the north to subtropical in the south. Precipitation ranges from 1500 mm and 60-80 percent is received from June to September. More than 70 percent of this monsoon rain goes waste and, at times, causes heavy loss of lives and assets. Owing to different topography and climate, Nepal is home for varieties of flora and fauna (Figure 1).

Figure1. Map of Nepal



The features of Nepalese agriculture are unique in the sense of its complex nature of farming systems that are intertwined among the multiplicity of enterprises of crops, livestock, poultry, vegetables, fruits, spices, fisheries, agro-forestry and non-timber forest products. To this day, majority of the farmers produce what they consume and consume what they produce. The average farm size is 0.8 ha with 47 percent landholdings of size less than 0.5 ha (Table 1). Rice, maize, wheat, finger millet and barley are the major cereals grown. Maize and millet are mostly grown in the non-irrigated uplands and rice-based cropping pattern is popular in the irrigated areas. Oilseeds, pulses, sugarcane and potato are the other important crops. Different fruits and vegetables are cultivated in summer and winter seasons in different physiographic regions. Aquaculture is popular in the southern Terai flat land and river systems originating mostly from the Himalayas harbor indigenous fish species. Nepalese land use pattern has been presented in Table 1.

Table 1. Selected indicators of agriculture in Nepal

Particulars	Area in '000 ha	Percent
A. Land use pattern:		
1. Agricultural land cultivated	3091	21.0
2. Agricultural land uncultivated	1030	7.0
3. Forest (including shrub)	5828	39.6
4. Grass land pasture	1766	12.0
5. Water	383	2.6
6. Others	2620	17.8
Total	14718	100.0
B. Number of holdings ('000)	3 364.1	100.0
1 Holdings with land ('000)	3 337.4	99.2
2 Holdings with no land ('000)	26.7	0.8
3 Holdings less than 0.5 ha ('000)	1 578.9	46.9
4 Holdings more than 0.5 ha and less than 2.0 ha ('000)	1 504.3	44.7
5 Holdings 2.0 ha and above ('000)	254.2	7.6
C. Average size of holding (ha)	0.8	NA
D. Average parcel per holding (number)	3.3	NA
E. Average parcel size (ha)	0.24	NA
F. Cropping intensity	1.8	NA

Sources: 1) MOAC.2008. Statistical information on Nepalese agriculture, Kathmandu
 2) Central Bureau of Statistics. 2004. National Sample Census of Agriculture, 2001/02, Government of Nepal, Kathmandu.

Important livestock include cattle, buffalo, goat, sheep and pig. Poultry keeping is increasingly popular as demand from urban areas is rising. About two-third of the milk

and meat produced in the country is contributed by buffalo alone.

2.1 Agricultural Research

The Nepal Agriculture Research Council (NARC) was established in 1992 by an Act of Parliament as an autonomous body to coordinate agricultural research in the country. It is headed by an Executive Director appointed by the government. Under NARC, there are 15 divisions, two national research institutes, 14 commodity programmes, four regional agriculture research centers and 18 agriculture research stations.

The main areas of responsibility of NARC are (NARC, 2002): 1) to promote, support, coordinate, and evaluate research activities related to agriculture, natural resources and rural development, 2) to ensure that the national research agenda and resource allocation reflect the needs and priorities of rural communities and agro-entrepreneurs, 3) to ensure that researches are conducted with full participation of stakeholders, particularly the resource poor farmers, small entrepreneurs, food insecure and remote areas, 4) to promote participation of potential research partners, including government departments, university system, non-governmental organizations (NGOs), private agencies and individuals, 5) to mobilize national and international resources for agriculture and natural resources research, 6) to coordinate and facilitate in defining research agenda, priority setting and resource allocation for core and competitive research programs, 7) to encourage pluralistic regional research and development capabilities, and 8) to develop mechanism to transfer technologies and to ensure coordination among research providers and technology delivering agencies in public, NGO and private sectors.

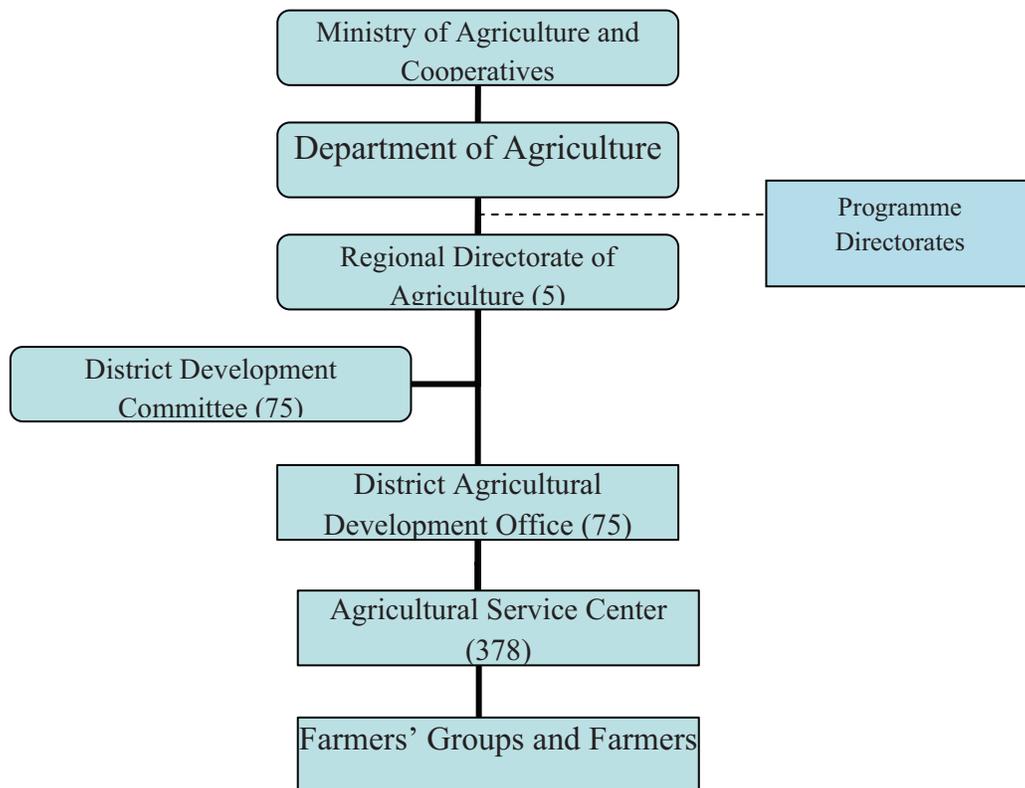
To date, agricultural research is more focused on food crops than on horticulture, livestock, non-timber forest products and fisheries. In general, funds for research on agriculture and natural resources are limiting factors but in horticulture, livestock and fisheries, dearth of human resources in both quality and quantity is also a binding constraint. New technologies in terms of varieties and practices are available on food crops for increased productivity but availability of modern inputs, credit facilities and market have constrained the full exploitation of technologies by the agricultural producers. Likewise, the focus of research is primarily on production aspects so the postharvest research is lagging behind. Since the private sector participation in agricultural research is almost non-existent, NARC is the single largest public body entrusted for the cause.

2.2 Agricultural Extension

Under the Ministry of Agriculture and Cooperatives (MOAC), the Department of Agriculture (DOA) and the Department of Livestock Services (DLS) are responsible for public sector extension services. The departments are headed by Directors-General and supported by Deputy Directors-General. At the central level, there are disciplinary Programme Directorates to help the departments in specific subject matters and to advise on matters related to policy, planning, monitoring and evaluation. These directorates supervise and provide technical guidance to agricultural farms and district level extension offices. Private sector linkage and coordination are also facilitated by these programme directorates. In essence, they function as technical hands of the departments.

The organizational structures under DOA and DLS are similar from the departments down to the grassroots level in the districts. A representative and simplified structure of agricultural extension system under DOA has been presented in Figure 2.

Figure 2. Simplified organizational structure of the agricultural extension system in Nepal



Under the DOA and DLS, there are five regional directorates—one in each developmental region—which primarily focus their functions in coordination with

agriculture related line agencies and private sector, monitoring and evaluation of district level extension services. There are District Agriculture Development Offices (DADOs) and District Livestock Services Offices (DLSOs) in all 75 districts of the country respectively for agriculture and livestock related extension services to the agricultural producers. These district offices are under the direct technical supervision of the respective regional directors but administrative control is somewhat ambiguous: after the devolution of agriculture and livestock extension to the District Development Committees (DDC) according to Local Self-Governance Act 1999, the DADOs and DLSOs fall under the administrative purview of the DDC. However, the regional directors of the departments of MOAC are exercising administrative authorities in practice. This conflict in the line of command creates confusion to district extension offices. This situation persists because of the absence of elected body in the DDC. The DDCs are presently headed by the Local Development Officers who are the cadres of the Ministry of Local Development (MLD).

The districts are subdivided into Agriculture Service Centers (ASCs) and Livestock Service Centers to provide extension services to the agricultural producers. The producers are organized into Farmers Groups to access government extension services.

The major objectives of the DOA and DLS are as follows:

- To increase agricultural production based on geographical specialization;
- To ensure food security through increased agricultural production and productivity in the country;
- To supply raw materials for the expansion of agrobased industries;
- To provide suitable markets for agroproducts and to promote competitive agriculture system for increased value addition in agricultural commodities;
- To promote agro-enterprises for increased off-farm employment;
- To support import substitution and export promotion of agricultural products;
- To help in reducing poverty of marginal, small and women farmers by creating productive employment opportunities;
- To verify technology through adaptive research; and
- To maintain balance between agricultural development and environmental protection, and conservation, promotion and utilization of genetic resources.

Strengths of Agricultural Extension (DOA)

- Well established organizational structure throughout the country, up to the

- subdistrict (service center) level;
- Availability of infrastructures and facilities like agricultural farms, laboratories (seed, soil and plant protection), agriculture training centers and plant quarantines to support extension service;
- Availability of human resources with specialization in different agricultural fields;
- Presence of different kinds of partners like (I)NGOs, private input suppliers (called agrovets), farmers groups and cooperatives; and
- Liberalized economic policy adopted in the country.

Weaknesses of Agricultural Extension (DOA)

- Weak motivation of technical staff;
- Frequent transfer of trained human resources, and placement not in accordance with “the right man in the right place”;
- Career opportunities not in line with performance and qualification;
- Inadequate technical expertise of professionals and low literacy of farmers;
- Blanket recommendation (one size fits all) of technologies, and lack of need based technology generation and transfer;
- Insufficient facilities and organizational set up at the grass roots (ASC) level;
- Lack of crop insurance policy;
- Weak coordination among related departments and ministries;
- Insufficient physical infrastructures like laboratories and ASC buildings;
- Minimum budget flow to the disadvantaged groups/ farmers;
- Lack of required training to human resources;
- Weak technology dissemination;
- Lack of appropriate programme planning;
- Weak marketing system; and
- Poor agricultural commercialization in hills and mountains.

Strengths of Livestock Extension (DLS)

- Organizational structure present down to the subdistrict level with 999 LSCs;
- DLS has 4050 human resources;
- Rich in animal genetic resources;
- Good land resources for forage and fodder development (feed resources);and
- Acts and bylaws are in place.

Weaknesses of Livestock Extension (DLS)

- High cost of production of milk, meat, egg, seeds, medicine;
- Indigenous knowledge and skills not transferred to new generation;
- Poor information flow, analysis and dissemination mechanism—poor communication;
- Inadequate skilled manpower in major technical fields like animal breeding, dairy technology, farm management, acts and regulation, safety and quality, laboratory analysis, trade, continuing education, policy analysis, human resources planning, harmonization with international standards, sanitary and phytosanitary standards;
- Inadequate human resources especially at medium technical level;
- Low staff motivation;
- Poor infrastructures and facilities at service centers;
- Inadequacy of appropriate technologies;
- Economically important diseases not prevented;
- Inadequate infrastructures and facilities for milk and meat marketing;
- Profitability analysis of enterprises not done;
- Inadequate linkage with stakeholders; and
- Weak planning, monitoring and evaluation.

3 Historical Perspective of Agricultural Extension Development

Changes in the agricultural extension services delivery system can be broadly classified into three distinct periods according to the emphasis put on the development of the agriculture sector in conjunction with the shift in the political economy of the country. They are: The period before 1951, the period between 1951 and 1990 and the period between 1991 to the present.

Before 1951

This period signified the autocratic rule by the Rana Regime until 1951. The ruling class was impressed by the new technologies used in countries they visited and thus introduced such new technologies and techniques as they considered appropriate and especially if considered useful to them. Imports of Jersey and Red Sindhi cattle, clover grass, tea, and other plant species are examples. The first ever Agriculture Office was established in Singha Durbar, Kathmandu in 1921, later upgraded to become the Department of Agriculture in 1925 to provide information on the modern agriculture practices to the farmers for producing more food in the Terai regions and as sources of

supply to the Kathmandu valley where they resided. Institutional growth resulted from the creation of an Agriculture Council as well as a vocational agricultural school in 1937. This marked the provision/emergence of agricultural extension workers for the country. Plant nurseries and orchards were also developed and a veterinary hospital established all of these located in the Kathmandu valley for the benefit of the then elites who were the ruling class. Later, agricultural farms were established, one each in Terai (Parwanipur) and the hills (Kakani) regions for experimentation on exotic crop varieties as to their adaptability in the Nepalese context. There existed, however, a problem of coordination and linkages between the Department of Agriculture and the Agriculture Council which necessitated a merger resulting in a new Agricultural Development Board that existed until the end of this era. The Department of Agriculture was reestablished in 1951 (K.C., 2001).

The period 1951 to 1990

The end of the 104 years long Rana Regime in 1951 led to the start of bilateral assistance from donor countries. The Agricultural Extension Service was formally constituted in 1953 with the Tribhuvan Village Development Programme which started in the mode of an integrated rural development initiative in which agriculture was one of the important components. However, the first planned agricultural development started with the launching of the First Five Year Plan in 1956. Increased production and employment were envisioned through the development of agriculture which gave emphasis to the transfer of agricultural technologies to farmers. However, the supply of modern agricultural inputs and the availability of extension workers were recognized as constraints to agricultural development.

A School of Agriculture was established under the Department of Agriculture in 1957. Later in 1959, an extension function was transferred to the Department of Agriculture and was placed under the new Agriculture Extension Section. A Rural Youth (4-H) Program and Home Science activities were also initiated. Earlier, extension agents were termed as Village Development Workers who were later renamed as Junior Technicians (JTs) and Junior Technical Assistants (JTAs) —the titles they still carry to date with roles relating to the discharge of their specialized tasks relating to either agronomy, livestock, horticulture, home science and agriculture engineering after the subject specific training that was imparted to them. District Agriculture Development Offices (DADOs) were gradually opened in all 75 districts to provide information on improved farming techniques through the use of various extension methods including demonstrations, trainings, farm visits, agriculture tours, competitions, leaflets and meetings. The use of these extension methods have not changed substantially to this day. Zonal Agriculture Development Offices were later abolished and the districts

became supervised by the Regional Agriculture Directorates.

Frequent organizational restructuring has been the state of affairs in the agriculture sector beginning in 1966 when the Department of Agriculture was dissolved to give way to five departments that include Research and Education, Horticulture, Livestock, Fisheries and Agricultural Extension under the Ministry. In 1968, the School of Agriculture was upgraded to collegiate status but was transferred in 1972 to the Tribhuvan University (TU) and became known as the Institute of Agriculture and Animal Sciences (IAAS).

The decades of the 1970s and 1980s witnessed the inflow of Integrated Rural Development Projects financed by bilateral and multilateral development partners covering the entire country, some with larger coverage of districts than the others. All of these had, by and large, agricultural extension components.

The Government's decision in 1990 had also made provision for the establishment of a Department of Horticulture which was later reviewed resulting in horticultural services being located under the DOA where it currently is located. Similarly, all research mandates were vested in the Nepal Agriculture Research Council (NARC) which was created by a separate Act of Parliament in 1992 formalizing it as an autonomous institution. Thus, the responsibilities for agriculture extension, research and education rest with three separate entities respectively of departments, council and institute spanning a distance difficult for coordination and linkage. At different times, a unified extension system to address the integrated agriculture-livestock based farming system was tried with the merger of the Agriculture and the Livestock Departments. After 1995, four departments—Agriculture, Livestock Services, Food Technology and Quality Control and Cooperatives—are operational under the Ministry of Agriculture and Cooperatives. The Departments of Agriculture and Livestock Services are the two major extension service providing institutions with district offices established in all 75 districts of the country.

The period 1991 to the present

The Peoples' Movement of 1990 displaced the erstwhile Panchayati System of governance to establish the Multi-Party Democracy. At this juncture, seven development plans had already been implemented and agricultural extension was primarily involved in the transfer of improved agricultural technologies to farmers for facilitating increased production and for raising their standards of living. New avenues were open in the international arena and Nepal could no longer be isolated from the rest

of the world in the need to embrace the advent of globalization.

The Eighth Plan (implemented between 1992 and 1997) was amidst the challenges of economic stagnation, increasing poverty, rapid population growth, structural anomalies and environmental degradation. In the beginning of the Plan, the agriculture sector alone contributed 61 percent to the Gross Domestic Product (GDP) and provided 80 per cent of the employment to the work force. Hence, priority was accorded to it for agricultural intensification and diversification to achieve food security and to create accelerated demands for labor in providing employment opportunities. The Plan marked the turning point for the economy, hence true for agriculture, by forging an open market policy in its operations.

The Eighth Plan also placed major emphasis on extension services delivery through grassroots Agriculture Service Centers² (ASCs) together with the mobilization of leader farmers from the farmers group to undertake extension functions for expansion of extension coverage while at the same time reducing government expenditure by the public supported extension system. As a cost reduction measure and for effective service delivery, all extension services were again organized through single administrative umbrella in 1992 but this only lasted for duration of just three years.

Privatization had been the order of the day in the plan and having a competitive agricultural system was taken on board in regards extension services, research, input distribution, agro-processing, and marketing. The role of the government was defined mainly in terms of management, quality control and monitoring. As a result, chemical fertilizer distribution was deregulated and opened to the private sector on equal footing with the government-owned Agriculture Inputs Corporation (AIC). The initial response by the private sector was encouraging but it did not last owing to policy differences imbedded in neighboring India which continued subsidies for chemical fertilizers even to this day. The border regions between India and Nepal enabled illegal inflow of subsidized fertilizers, often of inferior quality, into Nepal and the supply and use has never been smooth since deregulation.

Macro-policies were not reviewed to match with agriculture policies or vice versa for open market operations. Agriculture was viewed as entirely the private sector undertaking and there was a slump in the public sector investment. Indian agricultural policies supported heavy public sector investment along with subsidies on production inputs. But in Nepal, along with the chemical fertilizers, subsidy on shallow tubewell

² ASCs are public extension offices located at subdistrict levels. Throughout the country the ASCs are 378 under DOA and LS(S) Cs are 999 under DLS.

irrigation development was also withdrawn which slowed down the pace of irrigation infrastructure development in the Terai that was advocated for increasing food production under the Agriculture Perspective Plan (APP) (1995-2015). Withdrawal of subsidies in Nepal put Nepalese farmers in a difficult situation to compete with Indian farmers who are enjoying subsidies on different production inputs.

Government agricultural farms which had been established in different agro-ecozones at different times also had limited extension functions in their command areas in the name of outreach programme in the field of specialization of each farm in agronomy, horticulture, fisheries and/or livestock. These farms were basically charged with the responsibility of producing improved seeds/breeds, saplings, fingerlings, and poultry chicks for distribution to the farmers. Training for farmers and the maintenance of mother stocks for further multiplication and breeding were also functions of the farms. While some specialized farms had significant impact on improving farmers' enterprises, linkage with the extension system was weak owing to duplication of efforts and confusion in the roles played.

Public extension was seen as having poor partnership and linkages even with government partners. The Departments of Agriculture and Livestock Services are primarily responsible for advisory services for farmers and NARC has outreach research sites in some locations that facilitate or enable interaction among extensionists, farmers and researchers. The national research organization (NARC), extension services (DOA and DLS) and education (IAAS/TU) are functioning under different umbrellas, making coordination and linkage functions difficult to enable the provision of unified extension services to farmers. The IAAS does not have any such venues for interaction among the stakeholders.

Extension services about home science, food quality and regulation, marketing and agribusiness development are extremely limited to the level of constraining the pace of agricultural commercialization and the growth in international trade. The role of cooperatives in technical services, input distribution, marketing, and credit facilities are also found limited due to organizational, financial, and human resources constraints. Cooperative members lack technical and management knowledge and skills. As well, there is dearth of capital, infrastructures and facilities to run on sound business principles. About 40 percent of Nepalese cooperatives are limited to saving and credit functions. There were 11 454 cooperatives in the country by mid-March 2008; primary cooperatives constituted 98.7 percent (11 302) and saving and credit occupied 39 percent (4 432) out of the total numbers.

Under the Ninth and the Tenth Development Plans, there was faced a slump in public

funds earmarked for the agriculture sector as priorities shifted to education, health and infrastructure development. Agriculture in general was regarded as a private sector venture, while at the same time, the country was experiencing the decade-long armed conflict beginning in 1996. After the Peoples' Movement II in 2006, the country entered into the era of federal democratic republic for which a new constitution is now in the making and the system of agricultural extension services delivery is bound to have a new structure following promulgation of the constitution. The Three-Year Interim Plan (2007-2010) was prepared amidst the peoples' rising expectations, and the challenges related to agriculture and rural sector were seen as ensuring food security and alleviating poverty.

4 Nepal's Experiences with Different Agricultural Extension Systems and Their Impacts

During the last six decades of agriculture development endeavors, various initiatives had been publicly financed with the support of international development partners. Several experiments were also conducted with different approaches specific to the donor-assisted projects that were implemented throughout the country. These projects varied in terms of geographical coverage of districts, the size of funding and the number of project components. However, they also had commonalities such that all projects had agriculture and natural resources components, they tested the approaches for services delivery, implemented income generating activities through knowledge and skills development, had external advisors with varying experience levels, were implemented for a time-bound period, developed local infrastructures, and were aimed at raising the standards of living of the beneficiaries.

4.1 The Conventional Extension System

The Nepalese agricultural extension system is characterized by the public services delivery dominated by conventional approaches to advise agricultural producers and the stakeholders. After several experiments with different approaches, Government of Nepal (GON) has resorted to the conventional one, working through Farmers' Groups (FGs), since 1988 and thus deserves an elaborate treatment in this report. Features of such a conventional system include the following:

- a. Organizational structure and manpower.** The public sector, under the GON, is the major extension service provider in Nepal. Under the MOAC, the Departments of Agriculture and that of Livestock Services are the responsible institutions for extension services provision. In all 75 districts of the country,

District Agriculture Development Offices (DADOs) and District Livestock Services Offices (DLSOs) are respectively designated for agriculture and livestock extension services. The strength of the manpower varies between those located in mountains, hills and Terai districts. In the agriculture subsector, the number of Agriculture Service Centers (ASCs) located at the subdistrict level are fixed—4 each in Terai and mountains, and six in the mid-hill districts—irrespective of the number of farm households, scale of commercialization, agricultural area covered, the types of crops grown, the level of poverty faced, access to information and connectivity, existence of rural infrastructures, and so forth. Farmers can visit the ASCs to seek advice, and extension workers do not have to make regular schedule to visit them, except for a definite purpose of their own. The total number of ASCs is 378 throughout the country while in the livestock subsector, there are 999 Livestock Service (Sub-) Centers (LS(S) Cs) varying in number from one district to another.

Earlier the number of service centers was in correspondence with the number of *Ilaka*³ in the district, but this number has changed from time to time. The service centers are headed by JTs (Junior Technicians) or JTAs (Junior Technical Assistants). Farmers visit agriculture and livestock service centers, often located in different places, separately to seek advice they require. The attempt to provide a unified service from the same center failed as merger of DOA and DLS did not last long.

- b. Farmers' group approach.** GON has adopted the farmers' group approach of extension service delivery for reasons of cost effectiveness, group learning and joint decision making. To access government services, farmers are required to be organized into such groups having persons of similar interest in enterprise types. Agriculture and livestock farmers' groups are generally in separate groupings. They are advised by extension workers to conduct regular monthly meetings and to raise welfare funds. The JT/JTA contact FGs to select candidates from among farmers to make use of available external trainings, to conduct demonstrations, to participate in agricultural tours and in other activities offered under government funding. These groups ultimately graduate into cooperatives as formal institutions and get operated following business-like operations and for purposes of accessing benefits provided to cooperatives from the government.

³ *Ilakas* are the subdistrict headquarters meant for government service delivery contact points.

c. Leadership and capacity. District, region and department levels are headed not by extensionist but by any of the officials of the DOA because the leadership post is of the facultyless⁴ nature. Some of the appointees happen to be recent recruits and thus of limited experience in agricultural extension. In the district, other subject matter specialists are also posted. They represent various technical areas/fields including horticulture, agronomy, plant protection, agricultural economics, fisheries and agricultural extension. The required entry level is a graduate in agriculture related sciences or by promotion from JT level. The extension advice, even today, is related primarily to new technologies for higher productivity without much regard to aspects such as profitability, sustainability of production, post harvest operations, grading, packaging and marketing.

There exists also a lack of information on quality standards and marketing management due to the lack of expertise among the extension workers themselves. The front line extension workers are mainly the JTAs and JTs in the ASCs who hold respectively mainly high school (some with JTA training) and intermediate level qualifications from the vocational school and agricultural colleges. The needs, priorities and demands of the farmers for improved farming thus remain unmet by the available extension work force in the country.

There are only two specializations —livestock and veterinary services—under the livestock subsector while the rest of the leadership and staff capacity scenario is similar to agriculture extension services described above. In essence, there is a narrow focus of the extension service and the technical capacity of the extension system is inadequate to meet farmers' demands for agribusiness development, commercialization, diversification and natural resources management.

d. Partnership and funding. At the local level, funding for extension support is very limited that the staff find no resources for their full time engagement without forging partnerships with the Village Development Committees (VDCs), or the District Development Committees (DDCs), (I) NGOs, farmers groups, Community Based Organizations (CBOs), and other government and private sector stakeholders. Local priorities funded from DDC sources (which

⁴ There are various subject matter faculties in MOAC including agronomy, horticulture, fisheries, livestock and dairy, veterinary, extension, plant protection, agri-engineering, agri-economy, food technology and soils. These Subject Matter Specialists (SMSs) are responsible for advice to farmers in line with the relevant disciplines they come from.

are mostly from Central Government grants) are not, however, earmarked for agriculture purposes but are meant to be used for infrastructures (roads, drinking water, telephones, etc) and for the social sector (such as for education and health services). There is generally difficulty in finding partners having the resources to address in needs in agriculture. In the absence of having elected local bodies, JTs/JTAs have the added responsibility to represent as members of the VDCs pursuant to the Government decision.

- e. **Personnel management and incentive mechanisms.** There exist 11 technical specialties (called the faculties) that make up the agriculture service of MOAC. Entry levels, promotion and transfers have to be managed within the specific technical area to which an individual belongs. Poor remuneration packages, frequent transfers and limited opportunities for higher level studies for career development are problems facing extension staff. The Civil Service Act is one that is applicable to all types of government employees, excepting the health personnel.

There exists token field allowances available for the field staff such as the JTs and JTAs, but these are insufficient to motivate them. As well, frequent transfers do not relate to the earlier experiences and individual capacity. There is also the absence of clear job descriptions for the employees as well as career development paths that are transparent and based on a scientific performance evaluation system.

- f. **Thinly spread public resources.** To satisfy political demands equally among parties, extension programs tend to focus coverage over the entire districts of the country. This approach distributes the limited public funds available to all ASCs rendering gamut of extension packages of inputs, trainings, marketing, etc ineffective in isolation. DADO finds no better alternative than to allocate at least some activities to each ASC as target for engaging JT/JTA.
- g. **Program planning, monitoring, evaluation, and experience sharing.** Extension workers have been trained in some of the tools and techniques useful in extension work which includes those such as participatory rural appraisal, problem census/problem solving, projectization, project concept note preparation, logframing, proposal writing, bottom-up planning, participatory monitoring and evaluation, etc. Needs assessment is normally carried out at the Farmers' Group (FG) level one year in advance for use in planning during the following year but there is no assurance that planned activities are carried out and funds committed for implementing these from the

Central Government. There is also no flexibility to articulate programmes and funds based on farmers' priorities and needs. The Central Government provides the ceiling for funds allocated each year and the district council approves an annual extension programme based on the availability of funds according to the devolution principles. The extension programmes are then translated into activities which form the targets for each ASC annually. Monthly reports are submitted to the district by the ASC and districts forward them to the region, and the region to the department with limited feedback from the supervisors. Joint planning and priority setting between and with research, education, and client groups is generally absent within the extension system. Client surveys, diagnostic studies, program evaluation and impact assessments are also not built into the system. As well, indigenous knowledge of the producers is not well understood (and not considered) by research and extension.

On the positive side, the NARC does organize summer and winter crop oriented workshops where research and extension can interact. Outreach research sites of the NARC also provide useful venues for local level information sharing. There is, however, no joint projects/programmes participated in by research, extension and education arms of the agricultural system leading to their acting as independent and separate entities. Therefore, extension has not been able to adequately address the needs, priorities and demands of the agricultural producers. Programme areas are scattered and geographical coverage is large for successful monitoring of extension activities. The situation is also aggravated by the shortage of vehicles for mobility.

- h. Logistic support and extension materials.** ASCs are ill-equipped with required mobility by field vehicles, teaching aids and extension materials. In many places the ASCs operate from rented premises or share facilities with VDCs and others. Extension messages are not often accompanied by critical support services of inputs, credit and marketing. There are neither means nor capacities of the extension workers to put up a trial to solve local problems at the farmers' fields.
- i. Knowledge and information management.** The system does not embrace regular experimentation, reflection and learning for the improvement in the service delivery system. There are several good practices visible with farmers groups which are published and broadcast through radio and television programmes but are seldom internalized and replicated. Technical advices

passed on to farmers are based mainly on recommendations from NARC but the extension workers do not have capacity to adapt them for area-specific problems and needs.

- j. Changing needs of farmers.** Commercial farmers' demands are more specialized than input-based demands of subsistence farmers. The former demand for enterprise management, dairy animal production and supply of quality semen (CLDP, 2008). Donor-assisted projects tend to push through agreed activities which farmers generally have no or little need for or consider as low priority to them. In Community Livestock Development Project (CLDP) districts where the milk market is well developed, farmers prefer milk production as opposed to meat production which the CLDP is promoting according to what the focus is in the project design. Thus, there is a mismatch between farmer's real needs and interests and project focus.
- k. Services to the disadvantaged.** The extension system works with a generalized approach to delivering the services without regards to the types of clientele existing in the farming community. These different types of service recipients include: small/marginal and big farmers; agricultural producers devoid of communication infrastructures in the remote areas; and different indigenous and ethnic communities, *Madhesis and Dalits* who historically had poor access to all services provided by the state. So the extension system should design different mechanisms and related service inputs to address the needs and priorities of these different clienteles prevailing in the agriculture sector in the country.
- l. Women farmers.** Widely recognized, Nepalese women farmers work longer hours and contribute more in farming than their male counterparts. But extension service coverage for women farmers is less than that for male farmers. The reasons for this are: very few or no frontline female extension workers in the districts; male extension workers not well oriented towards gender sensitive service delivery skills; cultural values in some societies prohibit free movement of women out of their homes; lack of women-friendly technologies to reduce their drudgery (for example, food processing); additional responsibilities of child care and household core borne by women compared to the males; and lower literacy rate of women farmers than the male farmers.

One important extension method to reach women farmers, however, is noteworthy; the organization of on-the-spot training in the farming community

has helped in the technological empowerment of women. But such events are very limited in number and the duration for such one-day-trainings happen to be for just few hours.

- m. Migration of youth.** A study conducted jointly by the World Food Programme (WFP) and the Nepal Development Research Institute (NDRI) in the Mid-and Far-Western part of the country concluded that the average age of the surveyed migrants was about 30 years, almost 75 percent of the migrants were between 19 and 44 years of age and almost all migrants were male. Though migration is also viewed as a coping strategy against shocks and crises, Nepalese youth from all parts of the country tend to migrate abroad because: 1) normal life was disrupted during the Maoists' armed conflict between 1996 and 2006, and many were displaced from their communities, 2) both on-farm and off-farm livelihood opportunities were limited in the country, and 3) the growing demand for labour abroad was conducive for supporting the economy from migrant remittances. This scenario resulted into the agricultural activities in the hands of elderly people, women and children. During the same period, agriculture sector received low priority in policies and programmes, and resources allocation by the government.
- n.** With the changing context of the peace process, Nepalese youth should be brought into the mainstream of commercialization and diversification of the agriculture sector for it to contribute significantly to the economy with the involvement of the youth, the active labour force.

The Nepalese agricultural extension system is still conventional characterized by the notion and practice of research generating the technologies which extension passes on and the farmers hopefully adopting these technologies. Experiences in Nepal have shown that the present system is old-fashioned and not suited to farmers' current needs, priorities and demands. As a result, the present day objectives of food security, poverty reduction, commercialization, competitiveness, inclusive services, and natural resources management for sustainable livelihoods improvement are difficult to achieve.

4.2 The Training and Visit Extension System

The World Bank assisted the GON for the introduction of the Training and Visit or T and V Extension System first in the Bara and Parsa districts in 1975, and later extended it to all 19 districts in the Terai and in four districts in the mid-hills. The approach was well accepted in the beginning as a means to expand extension coverage, to train farmers and extension workers and to pass on technical recommendations in a time-bound

schedule of visits to contact farmers. This approach was implemented from 1975 up until 1989 (Basnyat, 1990). As implementation progressed, the extension service developed fatigue with this system due to the following reasons:

- The T and V system could not be replicated in other districts where the donor finance was not available as it was costly to sustain in terms of both financial and human resources.
- The main emphasis was put on technical recommendations which farmers and extension workers found uninteresting when the same messages were repeated.
- The system emphasized more on the production aspects, and in the absence of corresponding post harvest and agribusiness activities for value addition, farmers, extension workers and entrepreneurs experienced disincentives to raise production and productivity. The support services for inputs, credit and marketing were weak compared to farmers' demand due to weak partnership and linkage between extension and the various stakeholders.
- Extension workers lacked motivation, and regular supervision especially of the front line Village Level Agriculture Assistants (VLAAs), was hampered. VLAAs were not motivated given the meager honorariums paid to them and eventually sought to discontinue making regular visits to contact farmers.
- The system could not be replicated in the hilly areas owing to poor communication infrastructure given the difficult terrain where households are more scattered.

4.3 The Block Production Programme

The Block Production Programme (BPP) is an approach of extension services which has its roots from the concept of Green Revolution technology development in that production and productivity can be increased when complete packages of production practices are integrated and concentrated in a particular commodity in the contiguous agricultural area called the "block". In 1982, the approach was tested in the two Terai districts of Chitwan and Parsa under a USAID supported Integrated Cereals Project (ICP). Later it was expanded to the entire Terai and to some hill districts with the government funding. Originally, the block consisted of 1 000 hectares of contiguous plots but was later changed to 100-hectares sub-blocks when the pre-requisites were not available for larger size "blocks". In the hills regions, the sub-blocks were often of much smaller size, some of just 20 hectares per block. The success of BPP rests on the integrated use of seeds, fertilizer, irrigation and management practices. These inputs

were to impact on raising productivity through large scale demonstration effect to the farmers, and to support self-reliance in the food security needs of the country. Agronomists (not the regular extension workers) from research were deputed to the blocks supported by JTs/JTAs, thus there was a higher ratio of extension workers to farmers compared to normal extension support found elsewhere, which, although positive, proved to be unsustainable for large scale replication throughout the country and was thus finally discontinued. Originally, the 1 000 ha blocks was to be supervised by one agronomist, 2 JTs and 10 agriculture assistants but this was later relaxed in line with manpower availability. The BPPs covered 1 10 000 ha consisting of about 78,000 farm households in 28 districts (Basnyat, 1990).

The BPP relied heavily on public sector support for inputs, credit, irrigation, technical recommendations, and marketing. The private sector's participation was grossly neglected. As the programme expanded, networks and linkages among stakeholders (such as input and credit suppliers, etc) was found to be weak since they did not have the organizational resources to match with the required extension coverage. It may be argued that the BPP approach was bias towards large and resource-rich farmers who had large farm sizes with irrigation facilities and afforded purchased inputs. The BPP was even highly criticized by neighboring farmers who were devoid of services because they lacked the prerequisites of resources to participate in the programme. Overall, the BPP approach was costly in terms of financial and human resources compared to the nationwide conventional approach.

4.4 The Tuki Extension System

Under a Swiss-assisted Integrated Hill Development Project (IHDP), the Tuki⁵ system of agriculture extension was introduced in the Dolakha and Sindhupalchowk hill districts in 1977. The main features of the system are the following:

This system did not generate new technologies for use by the farmers but relied on technologies developed by commodity research programmes in the country and screened them through the conduct of adaptive trials in the three agricultural farms by the researchers in the project districts. A package of seeds and fertilizers was also distributed to test their suitability in the local condition. Then the researchers met with the extension staff to relay the results of the trials conducted (Dongol, 2004). Farmers trainings were conducted at quarterly basis with the involvement of researchers.

⁵ The word "Tuki" refers to a kerosene lamp that is commonly used by villagers in the remote areas where the modern amenities of electricity are not available.

The Tuki System's activities were not limited to technical subjects alone. The extension worker under this system had to: fulfill the needs with respect to improved agricultural inputs; disseminate information and train his neighbours; demonstrate new technology to his neighbours; and understand his own capacity and those of the agencies helping the farmers.

The system was implemented with the recruitment of volunteers (the Tukis) to the VDC after an intensive 15-days long progressive farmers training. They received four trainings in a year before the agriculture seasons. These volunteers called "Tukis" were those who had high respect within the community, with willingness to help their farmer neighbors in modern technologies, who maintained their own model farms, and distributed agricultural inputs to farmers and who were also interested to interact with neighbors regarding modern farming issues. As honorarium, Tukis received from the project 20 percent commission on the sale of inputs (seeds, seedlings, saplings, chicks, goats, tools, etc) and allowances at Nepalese Rupees⁶ (NRs) 0.50 per km travelled for the deliveries of such inputs. As well, Tukis also received interest-free credit, up to NRs 500 (US\$ 6.84) worth of inputs for three months. Later the commission on input sales was replaced by the provision to them of a seed multiplication programme in which the Tukis as well could participate.

Research and extension linkages were established between the DADO and agriculture farms through meetings held at the project headquarter located in Sindhupalchowk district. The DADO continued to operate following the conventional extension approach, the only addition being that the Tukis functioned to provide inputs which was often a missing component in the formers' work. Thus the two systems were complementary to each other. In Dolakha district for instance, one JT/JTA, the Tukis' supervisor, had to cover 960 households or 747 ha cultivated area (Basnyat, 1990).

The Tuki system, however, did not expand beyond the two project districts, and the operation, since it was basically the conventional approach described earlier, after IHDP was phased out in 1990. Under 1988/89 prices, the operation of the Tuki system required about NRs 4,00,000 (US\$ 5 469) per year (of which 20 percent went towards the payment of Tuki commissions and travel) which was equivalent to about 24 percent of the then annual budget of Dolakha district. Tukis later organized themselves into a Tuki Association and also sought alternative forms of employment given the paucity of business transactions.

⁶ 1 US\$ is equivalent to NRs 73.14 on March 23, 2010.

If linked to modern input suppliers, in partnership with DADO and research organizations, some of the Tukis could perform as private sector inputs providers with a successful enterprise to support effective extension services delivery.

4.5 Farming Systems Research and Extension Approach

Under a Department for International Development (DFID) assisted project, the Lumle Agriculture Center (LAC) and the Pakhribas Agriculture Center (PAC) located in the western and eastern hills respectively were assisted to integrate research and extension in the hill districts. It was initiated in a Farming Systems Research and Extension (FSRE) project under a single umbrella (and line of command) to generate technology in the research outreach sites with the participation of farmers to avail inputs locally and to expand the adoption of proven agricultural technologies within the Extension Command Area (ECA). There were only two divisions in the project namely, technical and administration. The integrated approach, however, confined itself within the project for inputs delivery and not much attention was paid to the existence of private stakeholders for future sustainability in marketing and enterprise development. At the later stage, the project extended partnership with the T and V System in the hills, in the western region, but the coordination and linkage was weak due to differences in management aspects in separate projects funded by different donors. Though the extension service under the project established good contact with farmers, the high extension cost could not be sustained by the government.

4.6 The Integrated Rural Development Project

All the administrative zones in the country were covered by the Integrated Rural Development Projects (IRDPs) in the 1970s and the 1980s. The mode of implementation recognized the existence of technology but what remained to be done was to boost agricultural production and productivity with improved supply of inputs, better extension services support and infrastructural development to uplift the rural standards of living. Thus the IRDPs emphasized strengthening the existing conventional extension system with additional temporary manpower, the supply of production inputs, construction of Agriculture Service Centers and additional fund for services. In sum, the IRDPs adopted the conventional extension system described earlier and focused on the intensity with which to implement the extension interventions. The projects in different locations varied in terms of project components, level of funding, coverage of geographical area from a single district to the entire zone, density of extension service, and so forth.

The Ministry of Local Development (MLD) was the central coordinating agency and the

Project Coordinator was deputed from there. Individual components were to be implemented by the respective ministries through their district level line agencies. Some of the earlier IRDPs provided project allowance to the manpower working under the project but this was later discontinued as it adopted a discriminatory policy compared to the staff doing similar jobs elsewhere outside the project. The task of integration was found difficult because of the varying rules and working guidelines adopted by different line ministries and the line of command was unclear due to the presence of many bosses that extension had to report to. The cost of extension services was moderate under the IRDPs. Grass roots level extension infrastructures like ASC buildings, market yards, trails, rural roads and small irrigation schemes proved to be of worth and some of them are still useful today. Research-extension linkage worked through strengthening existing agricultural farms within the project area while others relied heavily on the available technology and was promoted through the DADOs. At later stages, it was realized that technology was not available for all categories of farmers (e.g. irrigated/non-irrigated conditions) to adopt based on the assumption of green revolution technology applicable to all environments.

5 Policy Environment

The Agriculture Perspective Plan (APP) (1995-2015) has twin objectives of poverty reduction and sustainable agricultural growth with multiplier effect on non-agriculture sector. National Agricultural Policy 2004 lends from APP and National Agricultural Extension Strategy 2007 outlines implementation mechanism to achieve goals set by the foregoing policies. The Three-Year Interim Plan (2007-2010) encompasses objectives of ensuring food security with enhanced agricultural productivity, commercialization and competitiveness, inclusive extension service delivery, conservation of agro-biodiversity and sustainable environment.

5.1 National Agricultural Policy 2004

Despite the priority accorded to agriculture under the various Nepalese Developmental Plans, the National Agricultural Policy was only formulated in 2004. This policy envisions the sustainability in agricultural production, and transformation into a commercial and competitive system from the existing subsistence farming system. Food security and poverty alleviation are the current challenges while at the same time agriculture is vital for the sustained economic growth of the country. There are three major objectives outlined for the agriculture sector under the policy (NAP, 2004). They include:

- a. Increasing production and productivity to ensure food security and alleviate poverty,
- b. Making agriculture competitive in the regional and world markets with the development of prerequisites for agricultural commercialization and diversification, and
- c. Conserving and managing natural resources for environmental sustainability.

These policy objectives are, however, difficult to achieve because associated policies do not follow corresponding reforms to complement the agricultural policies. Agricultural research focuses on varietal development with higher production potential, resistance to pests and diseases, and early maturity traits. Higher productivity does not ensure higher returns to farmers owing to low product prices and high cost of production inputs. Supply of livestock breeds, veterinary drugs and raw materials for feeds has to depend largely on imports from India. Indian policies on agricultural outputs and inputs have a large bearing on the profitability of farming in Nepal. Subsidy and price supports in India are still continuing while the Nepalese government deregulated inputs (especially chemical fertilizer and shallow tubewells) distribution, and minimum support price was withdrawn.

Agro-processing and products marketing have not received due priority. Quality standards and certification system development is lagging behind which constrains participation in the domestic and export markets. Thus competitiveness in regional markets is weak. These facts slowed down the pace of commercialization as well. Natural resources management is a multi-sector endeavor, not related to the agriculture sector alone. Agricultural practices continued to pollute the soils, water and the environment as ecofriendly practices were not put to use to minimize the untoward effects of agrochemicals, veterinary drugs and hormones. Integrated Pest Management (IPM) was popularized only for a few crops but with limited geographical coverage.

Reasonable inclusion of women, small and marginal farmers, indigenous and ethnic groups, and disadvantaged producers in remote areas could not be materialized from the change in policy as the conventional extension system continued with the traditional work procedures. Cooperatives suffered from reduced level of public services as the organization was down-sized in coverage of districts. The private sector did not find it encouraging participating in agricultural research and developmental works under the existing policy provisions.

5.2 Nepal Agricultural Extension Strategy 2007

Nepal Agricultural Extension Strategy (NAES) primarily outlines the mechanism to expedite the implementation envisioned by the Agriculture Perspective Plan (1995-

2015) and emphasizes efficient and effective services to agricultural producers through a participatory process by enabling learning among them. The Strategy focuses primarily on institutional pluralism, privatization and decentralization of extension services. Since the services were devolved pursuant to the Local Self-Governance Act (LSGA) 1999, it was necessary to define roles and responsibilities of the central government and the District Development Committee (DDC). Coordination and linkages among value-chain stakeholders are weak at all levels—from district to the center. Monitoring of extension programmes by MOAC institutions is weak and there is a lack of elected local body in the district for about a decade now.

The district and village governments are run by teams of bureaucrats –who have their respective agency roles—relating to that of the central government. Under the current practice, manpower and conditional grants are provided by the central government and programme planning, budgeting, implementation, monitoring and evaluation rest with the local government. The agricultural development fund to be managed by DDC has been conceptualized in the NAES with the contributions from donors as well as from the private and public sectors. The DDC grants from the central government are seldom prioritized for the extension programmes; budget ceilings provided to DADO and DLSO are the major sources of funding extension programmes.

The public sector extension has been mandated to address the poor, small and marginal farmers, socially excluded groups, women, and areas where the private sector does not find a comparative advantage to work in targeted programmes. For agricultural commercialization, the public sector has to change its role from being a service provider to that of service management in working with agro-entrepreneurs and to provide support through the roles of facilitation, monitoring, standardization and quality control. Collaborative and partnership roles of public and private agencies are highlighted in the Strategy for efficiency and effectiveness. (I) NGO's role has been best described as being for social mobilization aspects for organizing farmers into groups and later to be federated into cooperatives.

The use of lead farmers with the provision of training for them for capacity building to disseminate information and to act as local resource persons has practical application in IPM technologies and recognizes farmer-to-farmer extension as a cost effective and relevant mechanism. Information and communication technologies has substantial role to play in disseminating information but the application in agriculture is yet to be popularized. The Strategy encourages the use of electronic media through Farmers' Call Centers in rural areas that have telephone facilities. Thus far a toll-free number has been established at the Agriculture Information and Communication Center (AICC) in Kathmandu for interaction between the agricultural technicians and the farmers.

Identification of national and district priority commodities, division of districts in clusters, and targeting of special projects for poverty reduction are envisioned in the Strategy. Coordination among the stakeholders is expected through a district based committee (e.g. the District Agriculture Development Committee) participated in by all the public and private stakeholders.

The overall impact of the Strategy is expected to contribute to improved food security, increased income, environmental balance, inclusive agricultural development, commercialization, sustainable livelihoods, value addition and quality control of agricultural products.

5.3 Three-Year Interim Plan (2007-2010)

The overall goal of the agriculture sector in the Three-Year Interim Plan (TYIP) of the Government is to achieve broad-based, inclusive and sustainable agricultural growth. In so doing, the objectives put forth under the plan are: increased productivity, food security, competitive agriculture, inclusive development and environmental balance. Nepal's Agriculture Extension Strategy is to be implemented for efficient and effective services delivery. On technology generation and services, the Plan encompasses decentralized approach to establish sovereignty of farmers in the decision making process in areas of agricultural research planning, implementation and evaluation. The integrated role of research, extension and education is recognized for improved delivery and information service provision through internet and website networks development in accessible areas. The interagency coordination through partnership and complementary roles among government, NGOs, cooperatives, community organizations and local bodies is visualized.

At the Village Development Committee⁷ (VDC) level, demand based Community Agriculture and Livestock Service Centers (CALSCs) establishment is geared towards gradual self-sustenance. Devolved extension services will receive backup support for soil testing, seed testing, plant protection, fertilizer quality test, different trainings, artificial insemination, veterinary care, and quarantine services. As inputs delivery for agricultural modernization are imperative, community resource centers will be established for agriculture and livestock development purposes (TYIP, 2007).

⁷ The Village Development Committee is the lowest body of the local government comprising of about 5 800 inhabitants on the average.

6 Extension Support Services

The most important but limiting factors for modernizing agriculture in Nepal comprise of the services of production inputs, agricultural credit, marketing of inputs and outputs, and rural infrastructures. The relevance, efficiency and effectiveness of the agriculture extension system are also contingent upon these factors.

6.1 Production Inputs

Extension messages are often not accompanied by the availability of physical inputs. This not only frustrates the farmers eager to adopt innovation but also demotivates extensionists in their job performance, and the reliability of services is also questioned. Agricultural innovations do not spread by just words-of-mouth. The government extension system has been criticized since long for not delivering the production inputs on time, to the places where they are needed, and in the right quantities and qualities.

The erstwhile government-owned Agriculture Inputs Corporation (AIC) was restructured into the Nepal Seed Company Limited (NSCL) and Agriculture Inputs Company Limited (AICL) which now mainly focus their transactions respectively in crop seeds and chemical fertilizers. The distribution of chemical fertilizers has been drastically reduced since restructuring while the sale of seeds has maintained the status quo. Sales by the NSCL, the major organized sector seed agency, amounted to 3 799 MT of improved seeds in 2007/08 (Table 2). This situation has prevailed for at least a decade in the past. The major part of the seeds sold by NSCL constitute of the three important food grains—paddy, maize and wheat—out of which wheat registered the highest use at 4.1 percent of the cultivated area in the country. At times, NSCL deals with meager amounts of oilseeds, pulse and vegetable seeds.

Table 2. Sale of improved seeds by NSCL in Nepal, 2007/08

Particulars	Unit	Paddy	Maize	Wheat
Area sown	Hectare	15,49,000	8,70,000	7,06,000
Improved seeds sold	MT	900	30	2869
Area covered by NSCL seed	Per cent	1.3	0.1	4.1

Source: GON/MOF, 2009. Economic Survey, Fiscal Year 2008/09.

The distribution of chemical fertilizers by AICL was drastically reduced after

deregulation in 1997. The private sector participation in import and sale of these fertilizers was encouraging in the initial years after deregulation but the high cost of initial investment in such bulky items ultimately discouraged the entrepreneurs. There is already a huge gap between the inputs demanded and the sale by these institutions. Both NSCL and AICL have their networks primarily in accessible areas in the Terai and mid-hills.

The government agricultural farms produce limited amounts of various crop seeds, forage seeds, fruit saplings, fingerlings, poultry chicks, calves, piglets, etc for distribution to farmers from their district extension agencies but the demand is far greater than can be produced. Extension programmes encourage the development of local resource centers, on private as well as farmers group initiatives, for the production of locally demanded inputs. These include livestock breeding, fruit and vegetable nurseries, district seed self-sufficiency programme, fish breeding farms and nurseries. In many cases the quality mother stock are limiting factors. In such a scenario, the concept of Community Agriculture and Livestock Service Center (CALSC) should be implemented with priority as a resource center for multiplying locally demanded production inputs, and as knowledge and information provider. This is one important area where government and international development partners should forge partnership to develop local level capacity of producers and other stakeholders.

Rural cooperatives can be instrumental in the supply of inputs and technical messages. State support in geographical coverage, institutional development, capacity building in managerial and business undertakings have been the limiting factors for their expected roles in agriculture development. Private sector input dealers, popularly known as agrovets, operate in more accessible areas (in Terai and mid-hills) and sell seeds, fertilizers, pesticides, micronutrients, veterinary drugs and small tools. They are also the service providers to producers but the quality of inputs and technical recommendations is questioned because there is no monitoring mechanism of such services. Other private companies deal in imported as well as locally produced seeds and other agro-inputs.

The issue of major crop seeds supply has been attempted through a District Seed Self-Sufficiency Programme (DISSPRO) with locally available technical manpower at the DADO from DOA but the availability of source seed for further multiplication, storage after harvest and marketing of the seeds produced have posed major problems.

About half of the national requirement of high value vegetable seeds is commercially handled, of which the private sector shares four-fifth of the transaction. There is immense potential for export to the SAARC countries, and vegetable seed industry has

been accorded the national priority industry by Industrial Enterprise Act of 1992. The Seed Entrepreneurs Association of Nepal (SEAN) has members from registered seed firms, farmers' seed producer groups and individual seed entrepreneurs and is engaged in production, processing, marketing and exporting of Nepali seeds. Much of the hybrid seeds (about 80 percent) requirement in Nepal is met through imports as the market is small for the private sector to invest in the business, nor are the foreign companies attracted to it. Similarities in the Terai with Indian climatic and production environments have benefitted farmers to access technology from across the border.

6.2 Agricultural Credit

In general, there is no easy access to agricultural credit in Nepal. The existing Agricultural Development Bank, Nepal (ADB/N) has been restructured as a limited company to perform on a commercial footing and there is no designated lending agency for agriculture now. No particular amount of agricultural credit is earmarked as against in the past when ADB/N performed the function for the institutional loan for agriculture with resources support from the government. In the absence of this, targeted programmes to reach specified vulnerable and disadvantaged group of peoples has been difficult. Interest rates for agriculture purposes with ADBL range from 10-12 percent and rural areas are devoid of formal sources of credit as it is difficult to find branches operating in the vicinity of farmers. The branch offices in rural areas were recalled during the decade-long arm conflict by the Maoists and have not been reinstated since.

To fill the credit gap, farmers raise their own group welfare funds and mobilize for agricultural and social purposes on terms decided by their members. These accumulated funds are growing bigger and extension should pay attention to utilizing them as participatory investments in demand-driven programmes. Savings and credit cooperatives constitute about 40 percent of the total cooperative organizations and are potential lending institutions. But their presence is more pronounced in urban than in rural areas.

Microfinance institutions operate at both retail and wholesale levels but the coverage in rural areas is limited. The rest of the credit needs is met from informal sources on varying interest rates which often happen to be exorbitantly high.

6.3 Agricultural Marketing

There is inherent inefficiency in the performance of the agriculture produce marketing in Nepal as wholesalers and middlemen significantly influence prices of agricultural

products. There should be a level playing field for all stakeholders to participate in the market to promote competition in efficient marketing. The contribution of the cooperatives in marketing is very low as marketing cooperatives are few in number. An Agricultural Marketing Act is in the making by the parliament and the current marketing operations are conducted according to the guidelines issued by the MOAC. The GON has assisted construction of collection centers, market centers and other market infrastructures in partnership with the producer groups, other stakeholders and the local government. Livestock and fisheries products markets are very few, follow the traditional unhygienic practices and the regulation of these markets has been challenging.

The GON lacks funds to facilitate construction of more physical infrastructures and develop efficient and competitive agricultural markets that would provide producers the incentive to invest in innovations for increased farm incomes. Demand-driven extension programmes motivate producers to invest in such local rural market development which raises their income earnings. Development Partners can play a crucial role to develop locally viable agricultural markets at least in areas served by feeder roads. This should be concomitantly supported with marketing extension services thus far neglected. Extension service advocates unilateral transfer of technology for increased productivity with new technologies. Services to market-oriented production planning (commercial farming) are grossly lacking with the government supported extension system.

Marketing of outputs suffer from inadequate capacity of storage, absence of grading and appropriate packaging, poor transport, quality control and marketing infrastructures. Marketing infrastructures can broadly be classified into collection centers, small wholesale and big wholesale markets according to Nepalese scale of operation. In the local *haat bazaars* that mostly operate on weekly basis, inputs and outputs are transacted freely without regards to quality and standards, a practice continuing since long. Milk marketing is handled by three organizations—milk cooperatives, Dairy Development Corporation (DDC) owned by the government and private sector dairies. DDC alone handles about 50% of the milk marketed in the country. Similarly, fruits and vegetable entrepreneurs operate for fresh products transactions in both government-constructed Agriculture Produce Market Centers (APMCs) and private premises. APMCs are managed by a committee of government, producers, traders and local body representatives.

Export markets are managed by organizations and individuals of the business community. Knowledge and information on quality control and certification system (e.g. organic products), sanitary and phytosanitary regulations, and grades and standards are becoming crucial for Nepalese producers to facilitate participation in regional and

global markets. These are specialized fields and the capacity of the extension system should be enhanced to provide such needed services for the various agricultural stakeholders.

The price information system works through both public and private service providers. Radio Nepal broadcasts wholesale agricultural prices daily, and regional radios twice a week in the eastern and mid-western regions. Agro-Enterprise Center of the Federation of Nepalese Chamber of Commerce and Industries (FNCCI) maintains website for price information. Efforts are underway by the government to broadcast price information at the local level through the privately owned FM radio stations. Overall, the information services relating to commodity prices should be strengthened to help producers improve their marketing efficiency.

6.4 Rural infrastructures

Agriculture roads are vital for movement of commercial products to the markets. Farm to market feeder roads construction as envisaged by APP has been constrained for want of funds. Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR) under Ministry of Local Development (MLD) is responsible for constructing agricultural roads. The development of cold storage facilities in rural areas is poor as power shortage is rampant. Physical infrastructures are most deficient in remote hill districts where food insecurity is acute. Regions inhabited by indigenous and ethnic minorities tend to have poor rural infrastructures.

7 Agriculture and Livestock Education and Training

Agricultural producers should be educated and trained on technical innovations and markets to empower them to demand for services. Education and training institutions should therefore be aligned accordingly to cater to the needs for ever changing technologies and markets. The Nepalese farming system is dominated by majority of small farms where commercial and competitive production is a challenge. Experiences have shown that small farm enterprises as well can produce commercial goods profitably. Women's contribution in Nepalese agriculture is more than that of men, suggesting their technical empowerment through inclusive education and training.

There is currently no agricultural university in the country. However, Tribhuvan University has institutes which provide undergraduate and higher level studies in agriculture, livestock, veterinary and food technology sciences. The Council of Technical Education and Vocational Training (CTEVT) under the Ministry of Education (MOE) also provides paratechnical courses for JT/JTA levels. In the private sector,

there are few training institutes for paratechnicians as well as academic courses at undergraduate levels and to a limited extent, those targeted at graduate level.

The main objective of agricultural training is to enhance the human resources capacity in technology transfer to farmers and entrepreneurs. DOA and DLS have central as well as regional institutions for staff, entrepreneurs and farmer trainings. The Directorate of Agricultural Training (DAT) coordinates agricultural training activities under DOA; DAT also prepares, updates and refines training curriculum, manuals, audiovisuals for use in the trainings at the regional training centers. Training is not treated as a specialized task as transfers of staff to and from these institutions are frequent. Of the 36 training officer posts in the agricultural training institutes, 15 were vacant in the FY 2008/09. Similarly, the Directorate of Livestock Services Training and Extension (DLSTE) runs and oversees livestock related trainings. This institution is also responsible for central level coordination of livestock extension functions.

There are also training institutes within the MOAC departments for the training of farmers, entrepreneurs, cooperative members and government employees. The DOA and DLS conduct various trainings at the community level and also at regional and central training institutes. The Department of Food Technology and Quality Control (DFTQC) conducts trainings in the departmental premises and 5 regional laboratories, and DOC at central and divisional/subdivisional levels following their organizational set ups.

In FY 2008/09, DAT provided trainings to 206 agriculture officers while the Regional Agriculture Training Centers (RATCs), together with the program directorates and agricultural farms, trained 350 JTs/JTAs and 662 leader farmers (Table 3).

Table 3. Trainings conducted under DOA and DLS in 2007/08

Particulars	DOA	DLS
Officer level training	206 officers	96 officers
Non-officer training	350 JTs/JTAs	218 JTs/JTAs
Farmer training	662 farmers	344 farmers and entrepreneurs

Sources: DAT (2009) and DLS (2009).

Trainings for agriculture officers covered the areas of planning and management, basic induction, training of trainers and technical subjects. The duration varied from a week, two weeks to over month-long courses. The JTs/JTAs also received more or less similar types of trainings but emphasis was on their capacity enhancement for front-line

extension service delivery. Farmer Leaders received training on subjects covering being successful resource farmers, group management and welfare fund mobilization, gender, agribusiness promotion and marketing, planning and other technical aspects of production, post harvest and marketing. Village Agricultural Workers training was for a total of 51 days focused on developing lead farmers, self employment and local resource persons for the neighbors. In 2009, of the total leader farmers trained about 23 percent were women and 21 percent of these represented the lower caste and various ethnic groups. The technological empowerment of women generates higher levels of income through agricultural enterprises development.

There exists partnership of the training centers with the private sector, donors and public organizations as well in the conduct of the trainings. The concept of community farmer training in partnership with farmers group has also begun to take shape at the local level. It is quite interesting to note the wide range of new and important areas covered in the trainings but the concern is the quality of the training imparted as against the low motivation of trainees to participate. Much emphasis is yet to be put on the selection of right kind of trainees. Curriculum design should also originate from the needs and priorities expressed by stakeholders through interactions, participatory processes and diagnostic studies. Resource persons to the trainings are drawn from public and private institutions, and from freelance individuals.

The DOA and DLS provide inservice trainings on planning and management to extension officers at the central institutes while commodity specific technical and management skills and knowledge are provided to JTs/ JTAs at the regional training centers. Training for lead farmers are also conducted at the regional level. Districts focus on season specific and problem-based trainings at ASCs and on-the-spot at the farming communities. Some mobile trainings are of short duration (usually one day long) and target specific problem areas, for example for women who cannot move outside their community or the problem that needs to be addressed in farmers fields. Training on home economics is, however, lacking and needs to be addressed.

The frontline extension workers possess various education and training backgrounds at recruitment. Entry to JTA level are school graduates usually holding School Leaving Certificates (SLCs) which constitute 10 years of schooling which is topped up with just one agriculture course, JTA training at IAAS or private institutes after SLC, or JTA training at trade schools of CTEVT, or through promotion from lower levels. Since their knowledge and skills differ greatly, management and supervision of extension function has been problematic.

Training the private sector stakeholders who handle input and output marketing is not

institutionalized in the training system. However, agrovets dealing with pesticides are given orientation before they start the business; so are the Village Animal Health Workers (VAHWs). Interactions among producers, input dealers, agrovets, extension workers and traders are organized infrequently by departmental agencies to discuss and share problems and opportunities. Such occasions have provided forums for business deals as well. IPM has been one such area where the trainers from (I) NGOs and private organizations were reasonably included and the impact is visible.

Identification of training needs and impact evaluation of trainings on job performance and on the change in livelihoods of the farming community are seldom carried out. DADO and DLSO staff put forth training demands to regional training centers and thus need for training is recognized for farmers and JTs/JTAs. Most of the trainings at the district and central levels are based on the best judgment of the training authorities with little or no consultation with the extension colleagues and value-chain stakeholders. Often the trainings have not been able to motivate extension workers for better performance but at times yield frustration owing to performance evaluation weaknesses inherent in the entire system.

8 Agriculture Information and Communication

The Agriculture Information and Communication Center (AICC) of the MOAC, uses mass media to provide information on new technologies through Radio Nepal and Nepal Television on daily basis. The central level broadcasting is of general nature to accommodate the needs of the farmers countrywide. Agriculture news has only recently been started in 2009 by these national level radio and television programmes. Print materials include magazines, leaflets, diaries, folders and calendars published each year for distribution through district extension agencies. Similarly, video documentaries are also produced annually usually for use by the extension system. Toll free telephone services, once a week, are of recent addition to the AICC's services for interaction between the farmers and the agricultural technicians. Some publications have been digitized and internet based information is yet to be popularized.

The AICC has regional units attached to each Regional Directorate of Agriculture with limited (usually one or two) staff entrusted for messages to the producers on new technologies, relaying success stories of agricultural entrepreneurs and related news services. At the regional level, there is a dearth of trained human resource on information and communication services as this task is carried out normally by JT/JTA with little guidance from the AICC in Kathmandu. The communication is generally in Nepali language as the JT/JTA is not versed in the local dialects which often happen to

be many even within the region.

9 Farmer Organizations

From 1988, the government promoted farmers group (FG) methods at the grassroots which was widely accepted by the producers as well as by the extension system as an approach to improve farming systems in a cost effective manner by reaching out to agricultural producers especially where there existed a limited number of extension workers stationed at the ASCs. Farmers, on their part, saw the benefit of working together for decision making and accessing public services from a definite location. In some cases, resolution was passed to penalize extension workers for his/her absence as extension workers were required to participate at monthly meetings of the FGs. This was accepted by the extension system which moved to popularize the approach. By 2008, there were 30 339 FGs (DOA with 17 074 and the DLS with 13265 FGs) having a membership of 5 03 668 members at the grassroots. Through such, the coverage of public extension reached a level of about 15 percent of the 3.4 million agricultural holdings in Nepal.

Under DOA, about 30 percent of the FGs are organized around the production of vegetables. Commercial pockets developed by 9 174 FGs covers 3 75 324 ha involving 4 93 561 agricultural households (DAE, n. d.). Of the total membership, women constitute 49 percent in the farmers groups.

Since smallholders find it particularly important to express their special needs and to negotiate with the extension system to cater to their demands, the producers when organized into FGs are advised to: 1) Hold meetings regularly, 2) Raise welfare funds to mobilize for agriculture as well as for the social needs on terms mutually agreed upon, 3) Demand for public support for the benefit of the group and the community, 4) Achieve efficiency in inputs procurement and output marketing, 5) Access services as formal institutions from government line agencies and others, 6) Act as pressure or lobby groups. Small farmers benefit from the group approach by producing commercial goods for distant markets and raise incomes which they were unable to as individuals.

FGs have raised about NRs 382 million (US\$ 5.22 million), from members' contributions since their establishments in various years. Under DOA, about 50 percent of the group welfare funds have been mobilized, of which 79 percent of loans from group funds have been invested for agricultural purposes (Table 4). About 50 percent (NRs 19 05 24 000) of the group funds raised is lying idle with the FGs suggesting that the fund is available for investment in need-based agricultural enterprises.

Table 4. Group Welfare Funds Utilization

Particulars	No. of FGs	FGs welfare fund (NRs '000)	Investment (NRs'000)			Unused FGs welfare fund (NRs '000)
			Agriculture	Non-agriculture	Total	
DOA	17,074	25,63,88	10, 05,32	2,70,83	12, 76,15	12,87,73
DLS	13,265	12,52,00		NA	6,34,49	6,17,51
Total	30,339	38,15,88		NA	19,10,64	19,05,24

Source: DOA/DOAE (n.d.) and DLS (2009).

Experience in Nepal confirms that farmers' organizations need to be developed for advancement of agriculture and rural development. As of now the producers' organizations have developed on their own product lines as cooperatives of milk producers, honey producers, coffee producers, or of other commodities. The district level organizations are still weak and awaiting developmental initiatives. DOA and DLS should emphasize the development of producers' organizations and enable them to demand for enterprises of their priority and to participate in extension services delivery. Farmers' forums were initiated by the National Agricultural Research and Development Fund (NARDF) as viable alternative for producers' empowerment and establishing them for their own cause. This initiative needs furtherance for the causes of strengthening the extension system.

10 Some Experiences in Nepal with Piloted Extension Systems

The experiences in the country in an attempt to reform extension system suggest that farmers are willing to pay for services to improve their economic efficiency for enhanced livelihoods (IDE/Nepal, 2004). The prevalence of free public extension service in limited scale has not been able to cater to the needs of about 3.4 million agricultural holdings in improving their livelihoods. Hence, alternative ways of financing extension service has been the call of the day.

10.1 Private Extension Service Providers

In 2004, the DOA reduced the number of ASCs in the districts from 932 to 378 so as to right-size the extension organization in the country. This would mean that farmers and farmer groups served earlier through the ASCs needed to find alternative ways of accessing the agricultural support services. To this end, the Crop Diversification Project (CDP) implemented with ADB assistance had employed partner NGOs as Private

Service Providers (PSPs) in the commercial production and marketing of high value crops with the “pocket area⁸ approach” working through farmer groups (FGs). These included a field team consisting of one male and one female social mobilizer from the local community in each pocket area. The public extension service (DADO) staff provided coordination and monitoring support to the PSP’s field team which also had a district team supervisor of its own. Social mobilization, formation of groups and empowering women and disadvantaged farmers with technical and managerial skills and knowledge, interaction with traders for mutual benefit and ultimate increased sale of products improved the living standards of the beneficiaries.

Farmers groups became federated into a coordination committee and some 25 percent graduated into farmers cooperatives by mobilizing resources from their group savings. The project developed collection and market centers, trained resource persons, prepared manuals and guidelines for DADO and NGO partners, organized demonstrations, conducted exposure visits to research farms, processing and marketing units.

The collaborative PSPs model of extension became fully financed by the Nepalese government but ceased functioning after the project ended as extension funding from the public source was limited and was not provided to sustain the system.

Since extension programmes should be supported by quality inputs availability, the concept of Community Agriculture and Livestock Service Centre (CALSC) should be promoted to complement extension advice by integrating production and distribution by local enterprises of crops and forage seeds, livestock breeds, horticulture/fodder plant nurseries, fingerlings, fertilizers, and veterinary drugs. Inputs marketing enterprises become sustainable with a ready market of materials available locally.

Village Animal Health Workers (VAHWs) and veterinarians can gainfully be self-employed in areas where livestock production has attained commercial scale. As the demand for livestock products has increased in urban areas and in neighboring countries, high-value livestock warrant care even in rural areas; thus demand for VAHWs has increased. GON is supporting programmes to privatize veterinary services.

⁸ Pocket area is an agricultural area with potential for marketable production covering up to 1 000 ha of food crops, 150 ha of fruit trees and 100 ha of vegetables in the Terai flat lands. For hills, the pocket area is up to 150 ha for food crops, 70 ha for fruit trees and 40 ha for vegetables.

10.2 Cofinancing for Extension Services

Extension programme planning is rigid and target-oriented with little room for addressing farmers' needs and priorities in a timely and flexible fashion. The notion of public responsibility for extension has to be changed from the minds and deeds of extension workers and farmers alike. The concept of cofinancing between the government and the stakeholders should be encouraged in the extension system, at least in part of the extension funding. The common form of cofinancing is found in commercial agricultural enterprises like vegetable cultivation and herbal farming. Cofinancing is best addressed when a commercially viable agricultural enterprise is jointly formulated and implemented in partnership with the clients group. Participatory funding in enterprise development will entail accountability among the partners involved. Different forms of partnership among the collaborating agencies are possible, as:

- a) Public-public partnership
- b) Public-private partnership
- c) Private-private partnership

There exists a dearth of evaluation studies on the various models of extension service delivery that have been practiced in the country. There should be a continuum of experimentation, reflection and learning in the extension science. The preoccupation that NARC alone is entitled for all agricultural researches in the country has to be revisited as part of the national agricultural technology system reform. NARC was predominantly occupied with crop science research, and recent initiatives include social science, but the research in extension service in collaboration with the departments has yet to be included in the agenda.

Under the "One Village One Product" (OVOP) mode of partnership between the GON and Federation of Nepalese Chamber of Commerce and Industries (FNCCI), there are clear set of responsibilities identified with financial and management roles defined for the development of certain products (like rainbow trout fish, sweet oranges, orchids, wood apple (*be/*), and Nepalese hog plum/mombin) from production, processing, quality control and ultimately their marketing.

10.3 Fee-for-Extension Services

Smallholders can produce commercial agricultural products to increase incomes through marketing high-value commodities in domestic and international markets (IDE/Nepal, 2004). Demand-driven micro-irrigation and agricultural technologies

integrated with market development in participation with the smallholders can reduce rural poverty. Producers pay for embedded services in purchasing inputs, service provision, processing and marketing of agricultural products. The constraint of access to economic opportunity by smallholders, women and disadvantaged groups can be overcome when equality in participation is ensured. They can as well mobilize local resources to provide matching funds with public investment.

Farmers will be prepared to pay for reliable advisory services that contribute to increased productivity and sustainability of production systems for improved livelihoods. The Nepalese extension system is characterized by public funding and public extension workers doing the routine work as fulfilling the targets set annually. This has resulted into low performance of the agriculture sector. A pluralistic network of institutions is preferred over a single public organization like in Nepal. Market-oriented production system arising from farmers' prioritized needs with sustainable extension funding can uplift the living standards of the farmers. In Chitwan, the poultry capital of Nepal, entrepreneurs have hired and paid for veterinary services on their own. There can be no universally accepted efficient and effective service delivery mechanism as the nature of enterprises, markets, innovations, production environments and technologies are different. But the bottom line is that the ownership of financing the service and the quality of service provision to satisfy the needs of the financier are closely correlated in the fee-for-extension service.

11 Recommended Reform Measures for Relevant, Effective and Efficient Agricultural Extension Services in Nepal

The extension system in Nepal includes a complex network of institutions and the reform process should be expedited for a more viable extension system. There can be no blue print for generalization in Nepal as the farming systems are diverse and micro-enterprises potentials are many. Therefore, the process to address needed reform in Nepal to ensure an efficient, effective and relevant extension system should give due consideration to the following:

- 1) Frequent change of governments has shifted policy priorities in Nepal. Long-term commitments in policy, strategy and funding are crucial for extension services performance.
- 2) Monopolistic supply of public extension service has been criticized since long by politicians and private sector alike. The capacity of the central level extension agencies has not been fully utilized in monitoring and support of

district field activities. Departmental programme directorates as disciplinary specialized agencies should monitor extension programmes, help in regulatory oversight of input suppliers, conduct diagnostic studies, and facilitate linkage and coordination among service providers.

- 3) Extension should resort to independent evaluation by a neutral agency to ascertain documented results of positive impacts, and weaknesses for future reforms. Extension reforms need to be continuously experimented, experiences learned and translated into action for improved delivery.
- 4) The traditional thinking of extension service as a state function has to change and mutually reinforcing roles of private and public services have to be emphasized. Private service providers should not be seen as competitors by the public extension system but as partners. But total privatization is not feasible in the Nepalese context as government responsibility for targeted inclusive agricultural extension to small and marginal farmers, women, caste/ethnic communities, disadvantaged groups and areas should largely rest with the public service. Furthermore, pro-poor services, food security and poverty alleviation should be the state responsibility.

Experiences show that private extension has comparative advantages in some areas; for example, social mobilization in Nepalese extension service. Initially, this will require MOAC initiatives and facilitation towards developing working relationships with the private sector in partnership fashion. For this, service delivery mechanisms and funding extension programmes through private and public extension should be worked out.

- 5) The development of farmers' organizations is limited to the formation of farmers' groups at the grassroots level and there is no central body to lobby on behalf of the farmers in general. Extension services with clients' participation will empower farmers' organizations to negotiate with service providing institutions and the Government by giving feed-back on the currently implemented programmes and expressing clients' needs, priorities and demands for future programmes intervention. This will help reform the policy and make the extension service efficient, effective and sustainable. Thus, demand-driven local level food security needs and commercialization can be addressed through participatory extension development. Participatory extension service should also emphasize value-chain development for achieving commercialization and competitiveness.

- 6) Public extension is free in Nepal but a reliable service is often not available to the masses. Experiences have shown that agricultural producers are willing to pay for commercial enterprises development services that increase their incomes (for example, agricultural and micro-irrigation technologies for market-oriented agricultural extension services experimented by IDE/Nepal). Hence, some element of fee-for-extension by producers or farmers' organizations should be implemented with embedded services.
- 7) An extension system suitable for Nepal to meet the needs of farmers and farming communities in the twenty-first century should be conceived in the broader sense, than it has been in the past of merely being a provider of technical advice through lip service or word-of-mouth. It should coordinate and facilitate networking among public and private stakeholder institutions for research, education, inputs, credit, processing and marketing. Joint planning, implementation monitoring, impact assessment, and sharing in a project mode should be emphasized. This should be incorporated in the extension policy and strategy by the policy making body, the GON and the MOAC.
- 8) District extension programmes are pre-occupied with input-output targets, and activities are translated into number of demonstrations and trainings conducted, farmers' tours organized, FGs formed and seed minikits distributed. If the program budget is increased, the number of activities tends to increase too. These do not support agricultural development policy of commercialization and competitiveness. Results-based extension programme planning should identify objective outcomes of socio-economic goals; for example, increasing dairy farmers' income by 10 percent in two years; reducing pesticide use in vegetables by 20 percent in 3 years, etc.
- 9) "Pocket production programmes" focused on investments for selected target areas having greatest potential for impacts should be considered. It is argued that the focus on high potential areas benefits the wealthier farmers and raises the concern over equity issues. Experiences in Nepal show that small and disadvantaged farmers can also participate in commercial production and, therefore, should be carefully attended by extension for inclusive development. Participatory district extension planning should minimize political pressure to spread thinly the extension programs that cannot show impacts.
- 10) Rural youth migration for foreign employment is happening at a pace jeopardizing agricultural development. This work force should be attracted for

gainful employment in agriculture and rural development through appropriate policies and programmes to modernize the agriculture sector.

- 11) Women farmers work longer hours and contribute more to agriculture than their male counterparts but the extension services provided to them are not commensurate with their actual involvement and contribution. The technological empowerment of women will improve the performance of the agriculture sector in general and increase household incomes of farmers in particular. Therefore, appropriate extension service delivery mechanism should be designed and implemented, including the recruitment of more women extensionists in the system.
- 12) The present extension service has reached more accessible areas and resource-rich farmers. The extension system should design appropriate mechanisms to cater to the needs and demands of resource-poor farmers, remote area farmers, different ethnic groups and *Dalits* (so called untouchables).
- 13) Extension service is primarily focused on increasing agricultural productivity, and marketing and profitability analysis of innovations, crucial for agricultural commercialization, are weak. The extension system is poorly equipped with innovations in natural resources management and climate change. Soil fertility management, water conservation technologies, agroforestry, quality control and certification, climate change adaptation and mitigation measures should form extension agenda in addition to agro-biodiversity conservation, promotion and use. Capacity of research, education and training, and extension should be enhanced pursuant to goals of agricultural development. For this, agricultural human resources development, both in private and public sector, should be urgently addressed.
- 14) Production inputs, agricultural credit and marketing are binding constraints for agricultural development in Nepal. Input suppliers are relatively more accessible in the Terai; hills and remote areas have paucity of input dealers. Where present, they complement extension with technical advices. The private input suppliers should be linked with research organisation (like Agricultural Research Center) and local extension agencies (like DADO and DLISO) to support effective extension services delivery.

Agricultural credit is not earmarked to support agriculture development objectives. Micro-finance intermediaries are few in the rural areas, fewer in

the remote places. Saving and credit cooperatives are mostly located in urban areas, and working capital is a limiting factor in the rural setting. Agriculture marketing is underdeveloped in Nepal. Rural markets provide opportunity for producers to earn cash incomes. Access to inputs and credit, and rural markets development are crucial for effective extension service delivery.

- 15) Government has considered agriculture as a private sector initiative and funding is not tuned to developmental goals. Due attention should be given in allocation of public investment to the prioritized agriculture sector.

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ANNEXES

TERMS OF REFERENCE

(Agricultural Extension Services Delivery System)

Under the overall supervision of the FAO Representative in Nepal, and the technical supervision of the concerned Policy Officer of the Policy Assistance Branch of the FAO Regional Office for Asia and the Pacific (FAO-RAPP), and in close consultation with the Senior Extension, Education and Communications Officer at FAO-RAPS as well as officials of the Government of Nepal and the National Team Leader (NTL) of National Medium-Term Priority Framework (NMTPF), the Consultant will be responsible for undertaking a study on **Agricultural Extension Services Delivery System**. This study will form a part of the formulation of the NMTPF for Nepal (which is a framework being prepared at the country level). The main objective of the study is to enable an understanding of the major issues and challenges facing the agriculture and rural development sectors from the perspective of technology transfer and support services delivery for these sectors.

The Consultant will analyze strengths and weaknesses of the existing agricultural policies and programmes and provide recommendations to address the gaps identified. The findings of the study will serve as input for the situation analysis and the preparation of the programme framework for the NMTPF. In undertaking this task, the Consultant will carry out, but not be limited to, the following tasks:

- Assess existing situation of agricultural extension and support services including agricultural communications/information (both public, private and others such as from civil society);
- Identify gaps to be filled for enhanced productivity of different agricultural sub-sector related activities;
- Assess existing capacities and limitations of the providers of agricultural extension support services;
- Examine possibilities of reducing the cost of extension support services for the benefit of smallholders including women and rural youth farmers;
- Review the contributions of agricultural extension related training programmes launched for farmers, field trainers, extension staff and private sector stakeholders involved in the supply of input and marketing of outputs;
- Examine possibilities for modernizing agriculture through the development of relevant and efficient delivery of extension services;
- Examine the roles and linkage systems and opportunities of the public and private sector

institutions supporting agricultural extension services;

- Examine ?roles and linkage systems and opportunities of farmer groups, associations and unions in disseminating agricultural extension services;
- Suggest policy measures for improved delivery of agricultural extension services;

Deliverables:

- Prepare and submit a draft report for comments;
- Submit 2-3 pages summary of the draft report covering major findings and recommendations;
- Present the report in a workshop organized for NMTPF; and
- Submit final report within 15 days incorporating comments and suggestions received on the draft report.

Qualifications: Post-graduate degree in Agriculture especially those related to agricultural extension, education, farming systems, economics or related fields, plus at least 15 years of experience in the field of agriculture. Fluency in written and spoken English and Nepali are also important requirements.

Input duration: Total input 1.5 months.

Duty station: Kathmandu, FAO country office; with limited field visit.

Suggested Generic Content Outline for the NMTPF Related Study Reports

In order to maintain consistency in the presentation of results of various sectoral / thematic studies related to the NMTPF, this guideline has been drawn. All consultants concerned with the studies are suggested to follow these guidelines during preparation of their respective reports:

- What major issues concerning the thematic / sectoral subject area of study appear from agriculture, rural development and food security perspectives?
- Which of these issues should be emphasized as near future priorities for greater attention?
- What are the recently completed, ongoing and pipeline activities related to the subject area covered by the study?
- What policies related to the topics covered under study are facilitating and constraining development of agriculture and food security situation in the country at present?
- What policies are further desirable for the development of the sector?
- What are the major gaps requiring government's immediate attention in relation to the topics covered under study from agriculture and food security perspectives?
- What are the areas of comparative advantage for FAO, where it could contribute with its technical assistance services?
- Which donors are likely to support collaboration with FAO for the identified subject area of technical assistance?
- What priority items should be selected for a programming framework of medium-term (3-5 years) in view of the possible technical assistance?

While seeking answers to the abovementioned questions potential reform areas representing changes in the operational strategies and practices should be explored. The technical / non-technical solutions relevant to the possible programme areas and priorities should be determined accordingly.

Annex Table 1. Issues, Priority Interventions and Potential Partnerships

Issues	Priority Interventions	Partnerships	
Inadequate capacity of extension workers to advise farmers	1.1 Develop Human Resource development plan for public and private sector to address niche areas.	GON agencies	Potential International Development Partners
	1.2 Establish University of Agriculture and Forestry	MOAC, NPC, FNCCI, MOE, TU/IAAS	GTZ, USAID, FAO, ADB
	1.3 Review curriculum involving stakeholders, and update	MOAC, CTEVT, TU/IAAS, FNCCI,	
	1.4 Institutionalize continuing education and establish regular contact with specialists	HICAST, MOE, private sector	
Weak linkages of extension with research and education and vice versa	2.1 Joint planning of research, extension and education with value chain stakeholders (producers, processors and traders)	MOAC, MOE, TU/IAAS, NARC	WB, ADB, USAID, IFAD, SDC
	2.2 Define accountability of respective organizations	GON, TU, NARC	
	2.3 Allocate funds for respectively identified functions and areas	MOAC, NPC, MOF, NARC, TU/IAAS	WB, ADB, USAID, IFAD, SDC
	2.4 Develop Monitoring and Evaluation mechanism	MOAC, NPC, MOF, NARC, TU/IAAS	
Limited coverage of the extension service	3.1 Develop Community Agriculture and Livestock Service Centers (CALSC) in public-private partnership mode	MOAC, FNCCI	GTZ, WB, ADB, DFID, JICA, SDC
	3.2 Institutionalize Private Service Providers (PSP) approach	GON, MOAC	
	3.3 Expand farmer-to-farmer extension, use local resource persons, expand IPM coverage	MOAC	FAO, Norway, SDC
Disadvantaged/marginalized farmers poorly served by the extension system	4.1 Implement targeted extension programs for disadvantaged (small, marginal, women, ethnic groups, Muslim, Madhesi, etc) farmers through CALSC	MOAC	WB, ADB, DFID, EU, FAO
	4.2 Develop rural infrastructures (e.g. feeder roads and markets) in areas inhabited by disadvantaged and ethnic groups	MOAC, DOLIDAR	WB, DFID, ADB, WFP
Slow pace of agricultural commercialization and weak competitiveness due to higher cost of production	5.1 Focus on few priority commodities in each geographical areas	MOAC	ADB, WB, IFAD
	5.2 Institute standardization and quality certification system on priority commodities and organic products (for example, tea, coffee, honey, cheese, etc) to enhance competitiveness in national and international markets	MOAC	ADB, WB, IFAD, SNV
	5.3 Conduct national and international market research	MOAC	
	5.4 Formulate Agriculture Price Policy, review policies of neighbors and harmonize.	MOAC, NPC, MOF	FAO

Weak extension support services	6.1 Encourage private sector in production and distribution of production inputs (seeds, breeds, saplings, feeds, fingerlings, fertilizers, pesticides, veterinary drugs, etc) with backup from the government for sufficient source materials and quality monitoring mechanism.	GON,MOAC	DFID, FAO, GTZ, WB, ADB
	6.2 Step up local resource centers, both public and private, for demand based supply of inputs	MOAC	DFID, FAO, GTZ, WB, ADB
	6.3 Designate nodal agency with allocated funds for agriculture credit, review interest rates and lending procedures	GON, MOF, NRB	
	6.4 Strengthen local agriculture price information system in partnership with local FM radios	MOAC	
	6.5 Focus on developing rural infrastructures for marketing efficiency in public-private partnership mode.	MOAC, DOLIDAR	ADB, WB, WFP
Weak Farmers' Organizations (FOs)	7.1 Strengthen FOs at district and national levels to solicit in need identification and prioritization of agricultural research, extension and education programs.	MOAC	
	7.2 Empower FOs and involve in partnership for program planning (priority setting) and implementation.		
Limited focus & participation of youth in agriculture	8.1 Design and implement youth-in-agriculture program for employment generation and minimize unfair trade in out-migration	MOAC, MOLTM	IOM
Weak devolution of extension service to local bodies	9.1 Federal states should take care of this by: -Establishment of extension cadre in collaboration with research and education.	GON, MOAC, MLD	
Cooperatives are too profit oriented rather than on cooperative principles.	10.1 Rural cooperatives should serve members for technical information, production inputs and marketing outputs.	MOAC	
	10.2 Enhance managerial and technical capacity of cooperatives	MOAC	FAO
	10.3 Expand institutional coverage of Department of Cooperatives in 75 districts	MOAC, GON	
National macro- policies and agriculture policies should be synchronized	11.1 Agriculture is considered a private sector business. Underdeveloped state of producers cannot compete with the industrial sector. Thus, incentive mechanisms, for inputs and outputs, should be based on different farmers' categories	GON. NPC, MOAC	

Inadequate funding for agriculture including for extension	12.1 Allocate program funds in relation to outputs expected and contribution to GDP	GON, MOAC, MOF, NPC	
	12.2 Provide matching grants to FGs funds in partnership mode	MOAC, MOF	
	12.3 Partnership with private sector on OVOP mode	MOAC, MOF, FNCCI/DCCI	
Lack of agricultural extension policies	13.1 Formulate comprehensive agricultural extension policy	MOAC	FAO

Annex Table 2. Completed, On-going and Pipeline Projects

S.No.	Project/Program	Focus Areas	Status(completed/on-going/pipeline)	Partnership
1	Agriculture Perspective Plan Support Program (APPSP)	APP implementation support, effective planning, implementation, monitoring and evaluation, decentralized extension services, mobilization of District Extension Fund (DEF) and Local Initiative Fund (LIF), integration of agriculture/livestock production and markets through local service providers, inclusive service provision, poverty alleviation, strengthening of WTO/SPS enquiry point, policy reforms	Completed,2009	DFID
2	Lease-hold Forestry and Livestock Project (LFLP)	Poverty alleviation, forest products and livestock enterprises	On-going, 2005/013	IFAD
3	Commercial Agriculture Development Project (CADP)	Infrastructure/non-infrastructure investment, inclusive development of stakeholders, market information, capacity enhancement, Marketing and processing of high-value crops,	On-going, 2007-2012	ADB, Japan
4	Crop Diversification Project (CDP)	Commercialization, diversification, extension service, private service provider, client-oriented research, marketing of secondary crops	Completed, 2001-2007	ADB
5	Project on Agricultural Commercialization and Trade (PACT)	Rural business development, sanitary and phytosanitary facilities and food quality management, market infrastructure development.	2009-2015	WB
6	Community Livestock Development Project (CLDP)	Poverty alleviation, gender equity, community development and capacity building, partnership in services, private service providers, micro-finance, Intensive Livestock Production, processing, commercialization, marketing, private entrepreneurs development, livelihoods in high altitudes	On-going, 2005/010	ADB
7	High Value Agriculture Project (HVAP) in Hills and Mountain Areas	Smallholders high-value crops commercialization, value-chain approach	Pipeline	IFAD

8	High Mountain Agribusiness and Livelihoods Improvement Project (HIMALI)	Integrated livestock, horticulture, NTFPs	Pipeline	ADB
9	Crop Diversification and Commercialization Project (CDCP)	Under preparation	Pipeline	ADB
10	Sustainable Soil Management Project (SSMP)	Soil fertility management, use of local and improved technologies, NGOs participation, organic fertilizer	On-going, 2007-2010	SDC
11	Community Managed Irrigated Agriculture Sector Project (CMIASP)	Empowerment of Water Users' committees, irrigation development, agricultural extension, inclusive development of ethnic and Dalit communities	On-going, 2006-2012	ADB, OPEC Fund
12	Irrigation and Water Resource Management Project (IWRMP)	Irrigation infrastructure development, irrigation management transfer, water management, institutional support for increasing agricultural productivity, small and non-conventional irrigation, community managed seed program, soil management	On-going, 2008-2013	WB
13	Agriculture Training and Extension Improvement Project (ATEIP)	Effective training and extension, capacity building, agriculture extension model farmer	Completed	JICA
14	Integrated Pest Management, Phase II	Integrated pest management	On-going, 2008-2013	Norway
15	Social Safety Net Project (SSNP)	Food/cash for work program, transport of seed and fertilizer to vulnerable	On-going, 2008-2010	WB

Annex Table 3. Coverage by agricultural extension service in Nepal, 2007/08

S. No.	Particulars	Unit	Extent of coverage by extension service
1	Rural population per Agriculture Service Center	Number	60,197
2	Total cultivated area per Agriculture Service Center (ASC)	Hectare	11,877
3	Village Development Committees (VDC) per ASC	Number	10.4
4	VDCs per JT/JTA working in the district	Number	2.5
5	Cultivated area per JT/JTA working in the district	Hectare	2,858

Source: 1) MOAC. 2008. Statistical information on Nepalese agriculture 2007/08, and 2) Computed from DOA data.

Annex Table 4. Coverage by livestock extension service in Nepal, 2007/08

S.No.	Particulars	Unit	Extent of coverage by livestock service
1	Rural population per Livestock Service (Sub) Center (LSC)	Number	22,777
2	Cattle population per LSC	Number	7,088
3	Buffalo population per LSC	Number	4,501
4	Goat population per LSC	Number	8,144
5	Milk production per LSC	MT	1,390
6	Meat production per LSC	MT	234
7	VDCs per LSC	Number	3.9
8	VDCs per livestock JT/JTA in the district	Number	2.7

Sources: 1) MOAC. 2008. Statistical information on Nepalese agriculture 2007/08, and 2) Computed from DLS data.

Annex Figure 1. Organizational chart of Ministry of Agriculture and Cooperatives

