

AGRICULTURE EXTENSION STRATEGY 2019-2028



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FOREWORD

Bhutan is an agrarian country with about 51.1 percent of its population deriving their livelihood directly from agriculture. Agriculture sector is the mainstay of livelihood, and economy to an extent, and will continue to play a central role for years to come.

Agriculture Extension in Bhutan is one of the means through which the Department of Agriculture seeks to help farmers develop and improve their livelihood. It includes a wide range of services like provision of production inputs, dissemination of improved production technologies, management practices, enhanced communication and networking services, and capacity building initiatives. In keeping with decentralization policy, agriculture extension also provides crucial support to local governments in facilitating development processes.

With time, it has become imperative to modernize extension support services to ensure quality service delivery. Dzongkhag and gewog-based extension professionals thus, have critical roles to play. Front line extension agents with up-to-date knowledge and upgraded practical skills are important assets for the department as well as the nation. It was long felt that a comprehensive strategy for better coordination and implementation of the extension services need to be put in place.

Agriculture Extension Strategy 2019-2028 strives to put forward strategic guidelines for effective delivery of extension services in response to addressing emerging issues (e.g. climate change adaptation, commercial farming, market access) in agriculture farming. It provides a basis for planning, budgeting, monitoring and evaluation of extension services to our field extension colleagues. The strategy also calls for capacity building of the extension personnel to keep up with new technologies and evolving challenges.

This strategy is amongst the many initiatives that the department has launched as part of our collective efforts in achieving a self-reliant and a sustainable agricultural economy. The strategy is a result of rigorous consultations and we commend the team for their concerted efforts. With the adoption of the strategy, the department calls on all agencies and stakeholders involved for their commitment in implementing and realizing its objectives.

Best wishes!



Kinlay Tshering (Ms)
DIRECTOR

ABBREVIATIONS & ACRONYMS

AED	: Agriculture Engineering Division
AKRA	: Agency Key Result Area
AMC	: Agriculture Machinery Centre
APA	: Annual Performance Agreement
APD	: Agriculture Production Division
ARCM	: Agriculture Research Coordination Meeting
ARDC	: Agriculture Research and Development Centre
ARED	: Agriculture Research and Extension Division
ASSR	: Agriculture Sales and Services Representatives
BAFRA	: Bhutan Agriculture and Food Regulatory Authority
BAIL	: Bhutan Agro Industries Limited
BCSR	: Bhutan Civil Service Rules and Regulations
CMU	: Central Machinery Unit
CNR	: College of Natural Resources
CoRE	: Council for Research and Extension
CoRRB	: Council for RNR Research of Bhutan
CP	: Central Programme
DAMC	: Department of Agriculture and Marketing Cooperatives
DAO	: Dzongkhag Agriculture Officer
DoA	: Department of Agriculture
DoL	: Department of Livestock
DRDS	: Department of Research and Development Services
DRPW	: Dzongkhag Review and Planning Workshop
DT	: Dzongkhag Tshodu
EA	: Extension Agent
FAO	: Food and Agriculture Organization
FCBL	: Food Cooperation of Bhutan Limited
FYP	: Five Year Plan
GEC	: Gewog Extension Centre
GPMS	: Government Performance Management System
GT	: Geowg Tshode
HRD	: Human Resource Development
ICT	: Information and Communication Technology
ICTD	: Information and Communication Technology Division
IWP	: Individual Work Planning
LG	: Local Government
MoAF	: Ministry of Agriculture and Forests
NBC	: National Biodiversity Centre
NGO	: Non-Government Organization
NMC	: National Mushroom Centre
NPHC	: National Post Harvest Centre

NPPC	: National Plant Protection Centre
NSC	: National Seed Centre
NSSC	: National Soil Services Centre
PCCM	: Programme Coordination Committee Meeting
PPD	: Policy and Planning Division
RAF	: Resource Allocation Framework
RCSC	: Royal Civil Services Commission
RDTC	: Rural Development Training Centre
REID	: Research Extension and Irrigation Division
RNR	: Renewable Natural Resources
ROP	: Outreach Programme
RRPW	: Regional Review and Planning Workshop
SKRA	: Sectoral Key Result Area
TAF	: Technical Field Attachment

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1. INTRODUCTION

1.1. Background

The Department of Agriculture was established on 1st October 1961. From the start of the first five-year plan (1961) until the end of fourth five-year plan (1981), extension services provided were top-down and dominated by input supply (e.g. seeds/seedlings, fertilisers, farm tools), farmers' trainings, demonstrations and field days. Coinciding with the decentralisation process of the government in the fifth five-year plan, the Department of Agriculture appointed dzongkhag agriculture officers and extension agents since 1982 in the dzongkhags and gewogs. The main agriculture extension activities were focussed on improving soil fertility, plant protection and farm mechanisation for enhancing crop production.

In line with the decentralization policy, the role of extension agents was recognized more as a change agent and communicators of knowledge and information on improved crop production. Extension agents were also tasked to sale of agricultural inputs and collects credits. However, involvement of agriculture extension agents in credit collection was stopped in 1987 following the incidences of oversights leading to misappropriation of cash. The sales and distribution of input supplies (e.g. seeds/seedlings, fertilisers, farm tools) were then taken over by the Agriculture Sales and Services Representatives (formerly Commission Agents) since the seventh five-year plan (1992-1996).

A review of the national research system in 1991 led to the integration of agricultural extension system. The integration exercise brought extension staff from the Departments of Agriculture and Animal Husbandry under the Research, Extension and Irrigation Division (REID) with its creation in 1993. REID was renamed as the Department of Research and Development Services (DRDS) in 1999. In early 2003 DRDS was bifurcated into DoA and Council for Research and Extension (CoRE). The extension system remained with DoA while the research system was placed under CoRE. Later CoRE was renamed as Council for RNR Research of Bhutan (CoRRB) in 2003. The restructuring exercise in 2009 realigned the RNR research system under the respective departments (Agriculture, Livestock, and Forestry). Subsequently this led to the dissolution of CoRRB on 16th March 2016. Currently both the agriculture research and extension mandates are with the Department of Agriculture.

1.2. Current agriculture extension system

The Department of Agriculture is the nodal agency for technical and human resources management - planning, appointment, transfer and capacity building. Broadly the agriculture extension system could be stratified into national, regional, dzongkhag and gewog levels. The national and regional level extension is represented by Department, Division, Central Programmes and regional ARDCs. Central programmes and ARDCs are mainly involved in supporting and providing technical advisory services to dzongkhag and gewogs. Dzongkhag and gewog extension are in the forefront of agricultural extension system working directly with farming community and agri-entrepreneurs. Dzongkhag and gewog extension system is administratively under local government and function fully on the technical guidance of the Department of Agriculture in translating national agricultural development priorities.

1.3. Situational analysis of agriculture extension system

This section focuses on the challenges and issues of the agriculture extension system so that appropriate strategies are formulated to make it effective and efficient. The analysis is based on secondary resources such as official documents.

1.3.1. Demand of extension services

Farming in Bhutan is largely small-scale, subsistence and integrated. While the integrated farming system approach (i.e. mixed farming of crops and livestock) has supported food and nutrition security and crop diversification, the use of extension services for improved crop production technologies has been not capitalized. Further, the low literacy rate in rural areas has not stimulated the rural populace in adopting emerging technologies or encouraged risk-taking. Educated family members migrate to urban areas for employment outside farming. Mostly the old and the infirm are left in the villages. This trend has serious consequences on agriculture and rural development programmes. As a result, crop productivity is low due to the use of traditional cultivation practices. However, the demand for extension services has increased following the recent transition from subsistence to commercial farming.

The law of inheritance that provides every individual member of the family equal rights to land is responsible for land fragmentation, loss of agricultural land to non-farm use (e.g. construction of houses) and farm labour shortage. Small and fragmented landholding limits the scope of agriculture extension to support commercialisation of agriculture and improve rural livelihood through value addition and marketing of farm produces and products.

1.3.2. Reach of extension services

The delivery of timely extension services to farmers is still constrained by remoteness, scattered settlements and rough mountain terrain despite the farm road connectivity. Poor rural accessibility during the peak monsoon which coincides with the major and important farming activities affects delivery of agriculture extension services. There are many isolated villages where it still takes hours or even days to provide extension services.

The existing norm of posting one agriculture extension agent per gewog exacerbates the challenges of extension service delivery and coverage. It is difficult for a single extension agent to cover all households in a gewog for service delivery. The frequency and coverage of extension service is dependent on the total number of households, ease of transport, and distance between the households/villages, cultivated areas, cropping intensity or diversity and the potential of the gewog for commercialisation. However, the existing norm of deploying one extension agent in each gewog needs to be reviewed. Moreover, agriculture extension agents are also extensively involved in non-extension activities.

1.3.3. Planning and implementation process

The long-term development vision of the Department of Agriculture for a self-reliant, productive, resilient and sustainable food system is often challenged by short-term impact-oriented plans and programmes.

Unlike in the past, the Department of Agriculture has limited engagement with the local governments in decision making for prioritising plans and programmes of national importance. The decentralisation policy of the government has empowered the local government to prioritise and implement plans and programmes. In the process, many of the intangible knowledge-based aspects of enhancing food and nutrition security receive low priority in their plans and programmes. Agriculture activities in the dzongkhags is dominated by infrastructure development such as farm road and irrigations while the core agriculture extension activities receive less attention and budgetary support.

1.3.4. Capacity of agriculture extension agents

In general, the extension agents in the gewogs hold diploma qualifications in agriculture or horticulture which are generalist in nature. In the absence of regular refresher courses on the improved agriculture technologies, agriculture extension agents often lack adequate knowledge and skills to disseminate agricultural technologies available in the country.

Microenvironment and different agro-ecological zones in Bhutan provide a wide range of opportunities and potentials for diverse crops and agriculture enterprise development. There is a need for a greater specialization on crop husbandry, commercialisation and product development at dzongkhag level.

1.4. Rationale for agriculture extension strategy

In spite of significant contributions by agriculture extension system to agriculture development in the country, the core agricultural extension programmes and their services including farm inputs have not been able to keep pace with agriculture development. At the institutional level, weak linkages between extension, research and central programmes has implication on the development of inappropriate technologies leading to poor adoption of technologies. To address the development needs and emerging issues (e.g. climate change adaptations, commercial farming, market access), the department needs enabling policies or strategic guidelines for effective delivery of extension services.

2. STRATEGIC OBJECTIVE

2.1. Vision

A dynamic, well-structured, coordinated and effective agriculture extension system for an inclusive economically viable and sustainable agriculture

2.2. Mission

1. Strengthen capacity and institutional coherence for effective and functional agriculture extension system.
2. Provide enabling environment for effective participation of stake-holders for economically viable and sustainable agriculture.
3. Enhance extension system to facilitate promotion of improved agriculture technologies and resource management

2.3. Objectives

1. Ensure policy coherence of agricultural extension service delivery are in line with national priorities and goals.
2. Establish a well-structured, coordinated and harmonized agriculture extension system.
3. Provide institutional framework and basis for formulation, operation and effective management of agriculture extension system.
4. Strengthen agriculture extension services that is responsive to emerging issues and challenges.
5. Provide a framework for building institutional capacity for effective and sustained delivery of agriculture extension services.
6. Empower farmers and other value chain actors to effectively participate in decision making and in availing agriculture extension services.
7. Enhance vibrant and dynamic linkage amongst all concerned stakeholders engaged in agriculture value chain.
8. Ensure gender, poverty, disaster, environment and climate change mainstreaming, approaches into extension service delivery.
9. Ensure effective extension services delivery to support food and nutrition security.
10. Promote a culture of learning, professionalism and knowledge management in agriculture extension system.
11. Ensure effective extension services for livelihood of rural farming communities.

2.4. Guiding principles

1. *Empowerment and Inclusive Participation*
To enable participation of farmers and stakeholders, at all stages of extension service delivery
2. *Need based and Market-oriented*
To ensure extension services are planned and delivered according to stakeholders' specific needs and prevailing economic opportunities
3. *Multi-stakeholder and Partnership*
To create new and enhance existing collaboration for effective and/or complementary extension services
4. *Multi-approach and Method*
To adopt diverse approaches and methods for effective extension service delivery.
5. *Competent Human Resource*
To ensure an adequate pool of competent, skilled and qualified extension professionals for quality services at all times
6. *Process and Result-oriented*
To ensure that extension service delivery approaches are target and result oriented.
7. *Cultural and Community Sensitivity*
To ensure that cultural, community and social sensitivities are duly accounted for and regarded whilst planning and delivering extension services
8. *Value Chain Extension*
To assure that extension services cover the entire value chain of commodities from input supplies, through production and processing to marketing
9. *Gender and Youth Mainstreaming*
To provide special attention and support to gender and youth-specific needs.
10. *Climate Resilient and Sustainable Agriculture*
To ensure that extension services promote economically viable, climate resilient and sustainable agriculture production systems
11. *Nutrition-sensitive Extension*
To incorporate and reinforce human nutrition in extension service delivery
12. *Responsibility & Accountability*
To reiterate responsibility and accountability in ensuring provision of effective extension services

3. KEY EXTENSION STRATEGIC AREAS

3.1. Extension services

Agriculture Extension Services are the services delivered by extension personnel to the farming communities and other clients for improvement of their livelihood. Broadly extension services include Advisory, Technology Transfer, Facilitation and Administrative Services.

Advisory Service(s) is a term commonly used as an alternate for “extension services”. Extension agents are expected to provide information on available technologies that can improve the income and welfare of farmers. Apart from providing knowledge and technologies to improve agricultural productivity, they are expected to fulfil a variety of new functions, such as linking farmers to domestic and export markets, promoting environmentally sustainable production techniques, adapting to climate change, mobilization of farmers’ group, etc.

Technology transfer services is the process of disseminating new technologies and practices that largely result from research and development efforts in different fields of agriculture.

Facilitation services in the context of extension services refers to helping farmers and other relevant stakeholders in achieving the expected outcomes.

Administrative services refer to services delivered by extension agents, in accordance with existing policies, rules and regulations, and guidelines. This contributes to effective and efficient public service delivery and hence, require to follow ‘Turn Around Time’ (TAT) and Service Delivery Standards.

The key strategic area for extension services include but not limited to:

3.1.1. Crop promotion

Crop promotional programmes are intended to promote released and indigenous (neglected, underutilized crop species) crop varieties in the farmers’ field to enhance productions and conservation.

The crop promotion shall be taken up with the following strategies:

- Sensitize farmers on released and available crop varieties.
- Identify farmers and promote crops as per crop promotional programme guidelines.
- Facilitate or support access to inputs.
- Conserve indigenous and high value crops.
- Develop effective and efficient Monitoring & Evaluation system.

3.1.2. Pest management

Pest (insects, diseases, weeds, vertebrates) management is one of the core components of extension services. Farmers rely on extension for effective pest management services.

- Regular monitoring of pest incidences and maintain surveillance record.

- Advise farmers on recommended pest management packages and prescribe plant protection products.
- Facilitate access to recommended plant protection products.
- Create awareness on safe handling of plant protection products.
- Create awareness on illegal import and use of non-notified plant protection products.

3.1.3. Land development

In order to increase land productivity and bring fallow and underutilized land under cultivation, land development programmes have to be initiated, facilitated and implemented by extension agents.

- Create awareness on land development guidelines, policies, and technologies;
- Initiate, facilitate and implement land development programme.
- Assess the feasibility and support land development programme.
- Provide support and help ensure utilization of developed land.
- Maintain record on land development.

3.1.4. Farm mechanization

Farm mechanization is aimed at enhancing production, reduce drudgery and addressing farm labour shortage.

- Create awareness on suitable farm mechanization technologies.
- Facilitate, identify and demonstrate appropriate farm machinery technologies.
- Maintain inventory of farm machineries in the *Dzongkhags/Gewogs*.
- Facilitate technical backstopping, access to farm machines, their maintenances and repair.
- Create awareness on safe handling of farm machines.

3.1.5. Irrigation water management

Provision of assured irrigation water is critical for enhancing crop productions.

- Plan and initiate irrigation development schemes.
- Identify and promote appropriate climate smart irrigation technologies.
- Facilitate formation of water users' groups (Irrigation).
- Collaborate in irrigation water source protection.
- Maintain inventory of irrigation schemes.

3.1.6. Nutrient management

Nutrient management is one of the important services for crop production.

- Develop efficient soil-plant nutrient management system.
- Ensure that the necessary soil information is made available to optimize the use of land suited for agriculture.
- Support researchers on soil fertility survey and assist in testing the soil fertility status.

3.1.7. Research outreach programme

Recently released and new technologies in pipeline are demonstrated to the farmers through research outreach programmes. These activities must be conducted according to the work plan developed by the ARDCs during the annual Regional Review and Planning Workshop. The Extension Agents shall:

- Plan and prioritize research-extension collaborative activities suitable for the area.
- Identify sites and mobilize farmers for the collaborative activity.
- Participate in the implementation of the collaborative activities.
- Support researchers on monitoring, data collection and analysis of outcomes.
- Share the outcomes of the research collaborative activities.

3.1.8. Market facilitation

Market facilitation becomes inevitable when extensions continuously motivate farmers to up-scale production.

- Facilitate linkages between individual farmer and/or groups and cooperatives with markets.
- Facilitate market information to farmers and relevant agencies.
- Certify origin of agricultural produce.
- Facilitate development of market and rural access infrastructures.

3.1.9. Farmers' groups and cooperatives

Farmers' groups and cooperatives are formed in order to enhance production scale and capacity, optimum resource utilization, value additions and effective marketing of agricultural products.

- Facilitate formation of farmers' groups and cooperatives.
- Facilitate registration of farmers' groups and cooperatives.
- Maintain information on farmers' groups and cooperatives.

3.1.10. Credit facilitation

Credit facilities are crucial in boosting crop production and agriculture enterprise development.

- Create awareness on the credit facilities and application procedures.
- Review and verify agriculture project proposal/application and provide recommendation
- Maintain information on the status of the credit facilities availed and progress of the project.

3.1.11. Enterprise development

Medium and small-scale enterprises are seen as one of the key drivers of economic development of the country with huge potential to create employment in agriculture. As of August, 2017, there were 41 licensed agri-based cottage and small enterprises employing 150 individuals. The department will support an individual or group of private entities to take the enterprise with equity investment for shared responsibility and ownership. Department will also provide continued technical assistance to ensuring success.

Extension Agents shall:

- Create awareness on enterprise development opportunities.
- Provide support in implementation of enterprise development.
- Undertake field monitoring and report implementation progress.
- Verify the financial and physical progress reports.
- Identify, facilitate and encourage enterprise development in collaboration with the Department of Agriculture and Marketing Cooperatives (DAMC) and other agencies.
- Review and recommend proposal/application for enterprise development.
- Provide technical and administrative guidance and support services.
- Facilitate linking entrepreneurs with producers in collaboration with DMAC and relevant agencies.
- Maintain inventories of enterprises.

3.1.12. Land services

The Land Act, 2007 prescribes involvement of representatives from the Ministry of Agriculture and Forests (MoAF) in providing land services at national, *dzongkhag* and *gewog* levels, mainly intended to verify implications to the farming sector.

- Preliminary assessment of land suitability for land exchange, land substitute, land conversion, and land lease.
- Joint verification of rural infrastructure development programmes.
- Verification of crop valuation for compensation during land acquisition, land damage and dispute settlement.
- Maintenance of inventory of cultivated and follow land.

3.1.13. Crop damage assessment

Crops are damaged by natural calamities, pest and disease, and wild animals, affecting agriculture production.

- Create awareness on the need for crop damage assessments.
- Assess extent of crop damage and submit report.
- Maintain records of crop damages.

3.1.14. Knowledge & information management

Knowledge management and information sharing in this context refers to maintaining consistent and reliable data of agricultural importance at all levels in the extension system. The data shared by extension are used by planners and researchers to formulate five year and annual plans for the farming sector and other stakeholders. Further, these data are referred to by relevant individuals and agencies at LG, national and international levels, and therefore, it is crucial that extensions maintain authentic and consistent data at all levels. In this line, extension agents shall:

- Conduct crop cut as per guidelines and maintain data at *Dzongkhag/Gewog* level.
- Conduct annual agriculture sample survey and agriculture census.
- Maintain records of annual crop production and acreage.
- Maintain household information and gewog profile.
- Maintain record of services provided to the farmers.
- Maintain inventory of agricultural infrastructures, farm machineries and equipment.
- Maintain any other data relevant to agriculture.
- Production and archiving of annual reports.
- Maintaining of extension materials.

3.2. Extension approaches

Extension approach is defined as the overall orientation of extension activity within a particular organization or geographical area. Broadly, eight different types of extension approaches are adopted by various organizations and institutions around the world: general agriculture extension, commodity specialized approach, training and visit approach, agriculture extension participatory approach, project approach, farming system approach, cost sharing approach, and educational institute approach.

In Bhutan following extension approaches are adopted.

3.2.1. Participatory extension approach

This approach will engage the farmers in identifying the problems, finding solutions, designing realistic plans and implementing them. The extension agent will play the role of a facilitator in implementing the participatory approach. Participatory extension approach focuses in involving farmers or farmers' groups with common interest in the following:

- Evaluation of crops and agriculture technologies.
- Planning and implementation of agriculture development programme.
- Formation of a group to enhance the production and marketing capacities.

3.2.2. Commodity approach

The commodity-based approach was started in Bhutan in 2003 with four commodities (citrus, apple, potato and vegetables) to identify opportunities and constraints at each stage of commodity development and to harmonize the research and extension programmes thereof.

Presently, there are 12 national commodity programmes of which six commodities (rice, maize, fruits & nuts, citrus, potato and vegetables) are prioritized for the 12th FYP while the other six commodities shall be implemented under normal planning and budgetary programme.

In order to implement the commodity programmes the following arrangements are put in place:

- Commodity focals are placed at the head quarter to lead the overall commodity programme coordination.
- Commodity coordinators are placed in the ARDCs to coordinate the technical aspects of research and development activities.
- Plans and programmes of ARDCs, central programmes, dzongkhag and gewog are aligned with the commodity programmes.
- Commodities coordinators shall coordinate and prioritize commodity development plans with extension through regional review and planning workshop
- Dzongkhags and gewogs shall implement the commodity plans
- Support preparations of dzongkhags/gewogs commodities plans
- Commodity coordinator shall facilitate technical backstopping to extension agents in collaboration with relevant agencies.

3.2.3. Training and visit approach

This approach is an effective way to enhance extension services delivery through face to face interactions between farmers and extension agents/subject matter specialists. This approach strengthens linkages among professionals, extensions agent and farmers.

- Prepare plans to visit farms and training programmes.
- Visit, interact and implement plans.
- Provide need-based trainings and advisory services.
- Regular visits and interactions with farmers.

3.2.4. Lead farmer approach

Lead farmer approach helps in bridging the technologies transfer gap by complementing the roles of research and extension. The lead farmer approach begins with a training programme of a packaged course in farming provided for a selected group of farmers with potentials to disseminate skills acquired from the training programme to others.

- Identify lead farmers based on their farming experiences, knowledge, skills, interest and willingness to transfer their skills to other farming communities.
- Give priority to groups, youth or women engaged in farming.
- ARDCs provide training and inputs for establishing demonstration agriculture farms.

- The lead farmers will assist DAOs and extension agents to increase and expand agriculture services and outreaches.
- ARDCs shall provide regular refreshers courses to the lead farmer.

3.2.5. Cost-sharing approach

The main objective of the cost-sharing approach is to contribute to the Department of Agriculture's goals and objectives such as increased food production, improving farmers' incomes and strengthening agriculture sector's contribution to the national economy.

- Cost sharing mechanism shall be implemented in line with the existing national cost-sharing mechanism.
- Promote crop and agriculture technologies that contributes to realizing the national priorities.
- Promote sharing of responsibilities and externalities among the agents.

3.3. Extension method

Agriculture extension methods are channels of communication between the farmers and the extension personnel with the aim of motivating and enabling them to find ways of solving their problems.

Effective means of communication is to be utilized to ensure the delivery of extension services includes:

3.3.1. Individual extension

It entails regular interactions with individual farmers for agriculture extension services.

- Farm and home visits,
- Telephone call/office call
- Informal contact
- Social media (message via We-chat, WhatsApp, etc)

3.3.2. Group extension

Group method is a common and cost-effective method still widely used. The different types of Group extension methods are:

a. Demonstrations and field days

Extension personnel takes active role in conducting demonstration to showcase technologies and advocate their adoption.

b. Group meetings and training

Group meetings and training are used for information sharing and building capacity of the farmers.

c. Field days

This method enables farmers to come together at a common site and exchange the ideas or experiences.

d. Field trips

The method is based on “seeing is believing” and is effective in bringing change in the farmers’ attitude for technology adoption. Farmers are taken to research centres, other regional centres, farmers’ fields and other relevant institutions to learn and acquaint with the new technologies.

e. Exhibition

Exhibition includes systematic display of information to garner interest of the farmers and also to promote agriculture technologies and farm produce.

Exhibitions are conducted at mass gathering, through display in RNR Centres, technology parks and other venues during major events

3.3.3. Mass extension

Mass media are communication channels through which information are conveyed to a large number of people at a time in different places. They include print media like poster, newsletters and leaflet, electronic media such as radio, TV, films and information and communication technology, which includes internet, phone and social media.

The common mass media are:

a. Print media

Print media such as newsletter, magazines, posters, leaflets, journals and report are used to disseminate information on agriculture technologies to clients. The print media shall be mostly used for general advocacy and awareness on agriculture technologies, development programmes and topical issues.

b. Radio

Radio communication, given its wider coverage and affordability, shall be used for dissemination of agriculture information. Community radio programmes can be initiated in rural areas for information dissemination and discussion on topical agriculture issues.

c. Television

With increasing popularity and accessibility of TV in the country, it can be used effectively to disseminate agriculture information, agro-met advisory services, and deliberate on relevant agriculture topical issues through TV short programme, TV spots, documentaries, panel discussion, including live prime time programmes.

d. Information and Communication Technology

Information and Communication Technology (ICT) offers tremendous opportunity to improve agriculture extension services. Technology includes computer, mobile phones, internet and social media.

ICT facilities shall be used to strengthen agriculture extension services to provide information on input and market prices, indention of agriculture inputs, delivery of agro-met services and dissemination of agriculture technologies. These facilities are also used for data collection and management.

3.4. Governance and institutional arrangement

3.4.1. Institutions and mandate

Since the start of the planned agricultural development in 1961, the extension system has gone through numerous changes and institutional restructuring and realignment. Considering the role of extension system, particularly at dzongkhag and gewog levels in enhancing rural livelihood, the Ministry of Agriculture and Forests has always placed high emphasis on strengthening the role of extension services at all levels.

Extension agents under the dzongkhag agriculture officer provide extension services to each of the 205 gewogs. The four Agriculture Research and Development Centres (ARDCs) in the region will continue to backstop their client dzongkhags and gewogs (Table 1) with technical assistance and need-based research to address field challenges and emerging issues.

Table 1: ARDCs and client dzongkhags

Sl#	ARDC	Sub-Centre	Client dzongkhag
1	ARDC, Wengkhari	Khangma and Lingmethang	Bumthang, Lhuentse, Mongar, Trashigang, Trashiyangtse and Pemagatshel
2	ARDC, Samtenling	Panbang	Samdrup Jongkhar, Trongsa, Zhemgang, Sarpang and Samtse
3	ARDC, Bajo	Menchhana	Gasa, Punakha, Wangdue Phodrang, Dagana and Tsirang
4	ARDC, Yusipang	Sampheling	Thimphu, Paro, Haa and Chukha

Further, seven central programmes viz. National Soil Service Centre (NSSC), National Seed Centre (NSC), Agriculture Machinery Centre (AMC), National Plant Protection Centre (NPPC), National Post Harvest Centre (NPHC), National Mushroom Centre (NMC) and Central Machinery Unit (CMU) shall continue to support dzongkhags and gewogs extension systems with their mandated services. Beside ARDCs and central programmes, commodity programmes (commodity focals based at the headquarter and commodity coordinators based at ARDCs), shall also provide support to dzongkhag and gewog extension system to plan and implement respective commodity programmes.

Broadly, extension system can be stratified into four levels viz. national, regional, dzongkhag and gewog.

i. National level

The Department of Agriculture has the overall mandate to guide and support agricultural development and improve livelihood of the farmers in line with the national vision and objectives. The department provides broad policy guidelines, strategies, institutional support and mobilizes resources for delivery of effective and need based extension services. The department also represent the extension system at the national level and work as a link with other departments and agencies within and outside the ministry. It is also responsible for human resource development and capacity building of extension personnel.

The three divisions - Agriculture Research and Extension Division (ARED), Agriculture Production Division (APD) and Agriculture Engineering Division (AED) oversee the extension plans and programmes.

Agriculture Research and Extension Division (ARED)

ARED is mainly responsible for framing and providing policy and strategic guidelines for enhancing effective delivery of extension services. The division also facilitates the promotion and transfer of new technologies generated/introduced by ARDCs and central programmes.

Therefore, to ensure effective delivery of extension service, the division shall:

- Lead the review and formulation of agriculture extension policies, strategies and guidelines including their sensitization.
- Lead and coordinate human resources planning, deployment and capacity development of extension personnel.
- Review the ToR for dzongkhag and gewog extension personnel.
- Coordinate agro-meteorology advisory services.
- Monitor and evaluate the extension service delivery.
- Facilitate and foster linkages or platform for resource mobilization and information exchange.
- Lead extension knowledge and information management.
- Maintain agriculture disaster related information.

Agriculture Production Division (APD)

APD has the overall mandate to coordinate, lead and facilitate the implementation and monitoring of all crop production and allied services. It is also mandated to lead and coordinate the implementation of commodity development programmes with support of coordinators placed in ARDCs, focal persons in the division and dzongkhag agriculture sector. Therefore, to ensure effective delivery of extension service, APD shall:

- Formulate commodity development and implementation strategies.
- Oversee and review agriculture development and implementation programmes.
- Institute and formalize annual dzongkhag planning and review workshop.

- Oversee and facilitate timely and adequate availability of production inputs.
- Validate agriculture production data and related information.
- Lead, formulate and streamline agriculture development support services.
- Review and provide technical clearance for agriculture development proposals.
- Provide technical assistance to agriculture enterprise development programmes and associated SOEs.
- Coordinate agriculture conference.

Agriculture Engineering Division (AED)

AED provides technical support for developing infrastructure such as irrigation, farm road, marketing infrastructure, and RNR centres etc., which facilitates enhanced crop production and marketing. Therefore, to ensure effective extension service delivery, AED shall:

- Lead the review and formulation of policies, strategies and guidelines on agriculture farm infrastructures and farm machineries.
- Lead planning and development of agricultural infrastructure and irrigation facilities.
- Facilitate farm mechanization and land development programmes.
- Coordinate capacity building of dzongkhag engineers and extension staff in agriculture infrastructure development.

ii. Regional level

The regional level extensions comprise four ARDCs and seven central programmes. They will facilitate and provide technical supports to the dzongkhags and gewogs level.

Agriculture Research and Development Centres (ARDCs): The four regional ARDCs are established to generate need-based technologies and provide technical support to dzongkhags for enhancing crop production. ARDCs shall:

- Demonstrate or showcase agriculture technologies on-station and through research out-research programme (RoP).
- Develop extension materials, provide information and create awareness on available technologies.
- Identify agriculture field issues and emerging challenges.
- Provide technical backstopping on crop production and management.
- Provide training to extension agents and lead farmers.
- Coordinate field attachment of new agriculture extension recruits.
- Compile, validate, submit and maintain regional level data.
- Coordinate annual RRPW for synchronization of dzongkhag and regional work plans with the department.

Central programmes

Under the Department of Agriculture there are seven central programmes, which are administratively linked to APD except AMC and CMU who report to AED. The Central Programmes maintain functional linkage with ARED and ARDCs for technology dissemination. These central programmes are directly responsible for providing technical support to the extension in dzongkhags and gewogs.

National Soil Services Centre (NSSC)

NSSC is the lead agency to provide extension support and advisory services related to land and soil nutrient management. NSSC shall provide the following services:

- Provide fertilizer and nutrient recommendation based on soil and plant analysis.
- Coordinate and support agriculture land development and management programmes.
- Coordinate the development of soil and nutrient management packages.
- Coordinate procurement and distribution of organic and bio-fertilizers.
- Conduct on-farm nutrient management trials and demonstrations in collaboration with dzongkhag and gewog extension.
- Capacity building of extension personnel and farmers on land and nutrient management aspects.

National Plant Protection Centre (NPPC)

NPPC provides all plant protection related services including capacity building of extension personnel and farmers. NPPC shall provide the following services:

- Provide diagnostic and advisory services on plant protection.
- Coordinate procurement and supply of plant protection inputs including bio-inputs.
- Coordinate the development of the plant protection packages.
- Conduct on-farm integrated plant protection trials and demonstrations in collaboration with dzongkhag and gewog extension.
- Lead, oversee the procurement and use of plant protection chemicals.
- Capacity building of gewog and dzongkhag extension personnel and farmers on integrated plant protection aspects.

National Seed Centre (NSC)

NSC is mandated to support the extension with the supply of seed and planting materials of released varieties and fertilizers to enhance crop production. To provide smooth and efficient service of input supply, Agriculture Sales and Service Representatives are appointed in the dzongkhags. Regional seed centres are established in the strategic locations (Bajo, Samtenling, Jachedphu and Chundudingkha) to enhance services of the National Seed Centre.

To ensure effective service delivery NSC shall provide following services:

- Lead and oversee national seed industry development.
- Supply seeds/seedlings of released and notified varieties.

- Coordinate procurement and supply of chemical fertilizers.
- Provide technical support to registered seed growers.
- Maintain adequate stock of agricultural inputs.
- Enhance access to seeds and fertilizers.
- Maintain inventory of agriculture/horticulture nurseries and seed enterprises.

National Post Harvest Centre (NPHC)

The NPHC is the lead agency to provide technical support related to agriculture crop handling, post-harvest, food processing, value addition/product development and diversification. NPHC works in close collaboration with ARDCs, dzongkhag and gewog extension to provide its services to farmers. To enhance the capacity and efficiency of the services delivery, post-harvest sub-centres are established in Dagapela, Goling, Shumar and Lingmethang. NPHC shall provide the following services:

- Lead and oversee post-harvest infrastructures and technology development.
- Generate and promote post-production technologies and infrastructure development.
- Capacity development of farmers, entrepreneurs and gewog extension agents on post-production technologies.
- Capacity development of Dzongkhag and Regional (ARDC) engineers on infrastructure development related to post-harvest and food processing.
- Facilitate procurement and supply of processing equipment and packaging materials.

Agriculture Machinery Centre (AMC)

AMC is mandated to promote gender friendly farm machineries and technologies to address agriculture farm labour shortage, enhance labour efficiency and reduce drudgery in farming. AMC has three regional centres located at Bajo, Khangma and Samtenling to support and ensure timely and effective extension service delivery.

AMC shall provide the following services:

- Lead and oversee farm mechanization programmes.
- Capacity development on farm machinery operations and maintenance.
- Standardize farm machineries and certification systems.
- Promotion of environmental and gender friendly machineries.
- Maintain inventory of farm machineries.
- Review and ensure effective farm machinery hiring services.

iii. Dzongkhag level

The dzongkhag agriculture sector working under the administrative supervision of respective dzongkhag administration and the technical supervision and guidance of the Department of Agriculture shall:

- Prepare FYPs and annual plans for agriculture development in consultation with LG and DoA.

- Sensitize DT and GT members on the agricultural development policies, plans and programmes.
- Coordinate and support agriculture input supply.
- Assist in identification and appointment of ASSRs and RSGs including their monitoring.
- Guide and supervise the planning and implementation of field programmes.
- Coordinate capacity development for extension agents and lead farmers.
- Compile, validate, submit and maintain data at dzongkhag level.
- Facilitate and assist ARDCs, central programmes and other agencies in implementing collaborative agriculture research and development activities.
- Facilitate and support establishment of agriculture-based enterprises.
- Conduct regular M&E and provide reports to the department.
- Conduct annual dzongkhag planning and review workshops.
- Coordinate and facilitate the development of agriculture infrastructures.
- Mobilize fund for dzongkhag agriculture extension activities.

iv. Gewog level

The success of the whole extension system hinges on the services delivered by gewog extension centres. All the 205 gewogs in the country shall have Agriculture Extension Centres (AEC) manned by the Extension Agent (EA).

Gewog AEC shall:

- Coordinate and facilitate the overall delivery of extension services to farmers.
- Engage in preparation of plan and programmes.
- Implement and monitor agriculture development programmes.
- Organize demonstration, field days and field visits.
- Conduct and provide farmers' training to enhance skills and knowledge.
- Organize campaign and advocacy on crop production, resource management and other agriculture associated programme.
- Facilitate and implement collaborative activities.
- Regularly collect and maintain gewog agriculture data and profile.
- Facilitate agriculture input supplies.
- Facilitate establishment of agro-based enterprises.
- Facilitate the development of agriculture infrastructures.
- Preparation and timely submission of progress reports.

3.4.2. Extension programme management and coordination

Agricultural development and extension service delivery is a complex process requiring effective coordination, planning and strong commitment from various stakeholders within and outside the Ministry. Therefore, to establish and maintain effective coordination and planning for agriculture development and extension service delivery, the following forums and committees shall be in place:

i. **Dzongkhag Review and Planning Workshop (DRPW)**

The dzongkhag agriculture sector shall coordinate DRPW in consultation with the dzongkhag administration. The meeting shall review the progress, prepare plans and discuss field issues and opportunities for agriculture sector development. This would be an annual event where all gewog agriculture extension agent and dzongkhag agriculture officials shall attend.

The meeting shall precede the Annual Regional Review and Planning Workshop organized by ARDCs.

The meeting agenda shall include:

- Annual planning, budgeting and progress review.
- Opportunities and issues from the field and GT/DT.
- Agricultural data and information management – crop area, production, land use, irrigation, electric fencing, input use, input dealers, land development, mechanization etc.
- Collaborative research activities for submission to Regional Review and Planning Workshop (RRPW).
- Sensitization on new policies/strategies/guidelines/programmes/technologies.

ii. **Regional Review and Planning Workshop (RRPW)**

This is one of the important forums, where research centre, central programmes, commodity programmes and dzongkhag extension come together once a year. The meeting shall review progress, prepare plans, discuss field issues, and share information on recently released technologies. It is also an important forum for identifying collaborative research and development activities amongst dzongkhag, ARDCs and central programmes.

The RRPW shall be coordinated by APD in collaboration with ARDCs. It shall be organized after the DRPW, but before the Agriculture Research Coordination Meeting.

The meeting agenda shall include:

- Harmonise national, regional and dzongkhag plans and programmes.
- Review and prepare collaborative research and development activities amongst dzongkhag, ARDCs and central programmes.
- Field implementation issues and constraints.
- Sensitization on new policies/strategies/guidelines/programmes/technologies.

The workshop shall be attended by:

- a) Chief of APD-Chair
- b) PD from concerned ARDC
- c) PDs from central programmes
- d) DAOs of the client dzongkhags along with one extension agent
- e) One representative from ARED
- f) Representative from NBC, FMCL, BAIL, BAFRA, DAMC and FCBL as required
- g) Commodity coordinators/focal(s)
- h) Research sector heads of concerned ARDC

iii. Agriculture Research Coordination Meeting (ARCM)

The agriculture research coordination meeting serves as a technical forum for planning, reviewing and endorsing annual research activities. This forum will provide a suitable and effective platform for coordination, critical peer review, planning and development of annual plans. This forum will also discuss cross cutting issues that arise from the RRPW.

The meeting agenda shall include:

- Plan, review and harmonize annual agriculture research work plans.
- Provide platform to present completed research results to highlight significant findings for endorsement, knowledge sharing, visibility, and for publication in peer reviewed journals.
- Identify emerging research needs and priorities.
- Finalize nationally coordinated trials and collaborative work plans.
- Discuss cross cutting issues of the regional review and planning workshops.
- Ensure compilation and publication of proceedings.

The meeting shall be attended by:

- a) Director, Department of Agriculture (Chairperson)
- b) Advisor to the Department, DoA
- c) Chief ARED, DoA
- d) Chief APD along with one officer
- e) Programme Director, ARDCs
- f) Programme Director, Central Programmes
- g) Representative of AED
- h) Representative from NBC, RUB, RDTC, on a need basis
- i) Commodity Coordinators
- j) Technical paper presenters

iv. Programme Coordination Committee Meeting (PCCM)

The Programme Coordination Committee Meeting is one of the highest forum and will be conducted yearly. PCCM serve as a forum to assess progress of the past fiscal year plans and understand the issues, constraints and lessons learnt. The meeting aimed at coming out with commodity strategies at the national level and its implementations. It will complement the Agriculture Conference whenever the conference is deferred due to unavoidable circumstance or budget constraints.

The PCCM shall have the following functions:

- Oversee implementation and coordination issues of different programmes.
- programmes Review and discuss administrative issues and HR allocation.
- Review and streamline the commodity programme strategies.
- Review and discuss programme resource mobilization and allocation.

The Meeting shall be attended by:

- a) Director, Department of Agriculture (Chairperson)
- b) Advisor to the Department, DoA
- c) Chief, APD, ARED, AED, DoA
- d) Programme Director, ARDCs and Central Programmes
- e) Commodity Focals
- f) Representative from Directorate Services and PPD

v. Agriculture Conference

Agriculture Conference is an important event organized by the Department of Agriculture biennially. The conference is the highest and the final event of the series of meetings and workshops held at different levels under the Department of Agriculture. During the conference, many thematic and cross cutting issues affecting agriculture sector growth, policies, research findings and field constraints are presented, deliberated and resolved. It is also the highest forum where alignment and priority setting of plans and programmes are discussed and agreed.

The meeting agenda shall include:

- Review of programme progress against FYP targets.
- Review of issues and challenges in the agriculture sector.
- Review priority setting and alignment of plans and programmes.
- Sensitization of new policies, strategies and programmes
- Presentation of new and important research findings

The conference shall be attended by:

- a. Director, Department of Agriculture (Chairperson)
- b. Director, Directorate services, MoAF
- c. Advisor to the Department, DoA
- d. Chief, PO, PPD
- e. Chief HRO, HRMD
- f. Chief, APD, ARED, AED of DoA
- g. Programme Director, ARDCs
- h. Programme Director, Central Programmes
- i. Commodity Coordinators and focals
- j. DAOs
- k. Representatives from CNR, RUB
- l. Representatives from RDTTC, BAFRA, DAMC, FCBL, FMCL, BAIL, NBC

3.4.3. Planning, budgeting, implementation

A. Planning process

The key objective of the extension programme is to bring together national policies and local initiatives to balance the national and local requirements. This entails a careful planning process with the engagement of farming communities, local government, technical expertise, entrepreneurs.

Programme planning for agriculture extension has to be considered at different levels;

Gewog level

The gewog extension centre shall be the key agency engaged in the planning process to bring together national policies and the needs of the local communities. At the time of planning, the interests of farmers and their motivation to increase agriculture production must be considered. Engagement of communities in the planning process will be important to reflect their needs and interest relating to changes expected on their farms.

The programme planning shall include;

- Promotion of newly released varieties and crop diversification.
- Conservation and promotion of traditional varieties.
- Farmer's capacity building on agriculture production management practices.
- Annual agriculture survey and data submission to dzongkhag agriculture sectors.
- Technology demonstration for households/groups.
- Infrastructure development monitoring.
- Collaborative activities with central programmes/NGOs.
- Extension programme monitoring and reporting.
- Gender mainstreaming in agriculture.

Dzongkhag level

The planning at dzongkhag level shall include the extension programmes that are beyond the technical and financial capacities of the gewog. Planning shall also include all the collaborative activities in consultation with ARDCs, central programmes and gewog extension. The dzongkhag shall avoid duplication of any programmes that are within the capacity of gewog extensions.

The activity planning shall include:

- Large scale crop promotional and area-wide management programmes.
- Capacity building of extension agents and lead farmers.
- Dzongkhag level data compilation, validation and management.
- Enterprise development programmes.
- Coordinate and facilitate interventions that are beyond the technical capacity of dzongkhag.
- Infrastructure development for the facilitation of extension programmes in the dzongkhag

- Dzongkhag Review and Planning Workshop.
- Collaborative implementation of regional and national programmes.
- Monitoring and evaluation of plans and programmes at dzongkhag level.

Regional level

The extension planning at the regional level shall emphasize mainly on the technical capacity building of dzongkhags/gewogs, and to undertake the activities that are beyond the technical capacity of the dzongkhags. The ARDCs and central programmes shall avoid the duplication of any programmes that are within the capacity of dzongkhag agriculture sectors.

The activity planning shall include:

- Demonstration of newly released and technologies in pipeline through Research Outreach Programmes (ROP)
- In-country capacity building of extensions.
- Technical backstopping of dzongkhag extension programme implementation.
- Field days and collaborative evaluation of technologies in farmers' field.
- Coordinate Regional Review and Planning workshops (RRPWs).
- Monitoring and evaluation of technologies and their adoption
- Regional data compilation, validation and management.
- Research and extension publications.
- Technical field attachment of new extension recruits.

National level

The planning at department level shall focus on fulfilling the national objectives by providing policy directives, and address technical and financial gaps in the regions and dzongkhags.

The department will also establish priorities in line with national policies. Accordingly, the national programmes will also mobilise funds and inputs to implement programmes initiated by the department.

The planning will include:

- Formulate policy, programme, rules and regulations, strategies, guidelines and standards.
- Programme evaluation, analysis and policy review.
- Human resources planning and deployment.
- Development of extension infrastructure.
- Institutional capacity building (short-term and long-term) programmes.
- National coordination workshops/conferences/meetings.
- Resource mobilization including technical expertise.
- Publication of annual reports – development highlights, survey reports.
- Nation-wide sensitization and advocacy programme.

B. Budgeting

In general, the availability of fund will depend on the existing resource allocation framework (RAF). The programme shall follow the following budgetary arrangements shall be followed:

Gewog level

The gewog extension shall propose and maintain the budget for the following activities that will be directly initiated and implemented under the supervision of the gewog administration.

- Seeds and seedlings for crop promotional programmes.
- Agri-technology promotion programmes.
- Farmers capacity building.
- Pests and nutrient management services.
- Small scale area-wide crop production management programme (eg. SLM, fruit fly, citrus canopy, etc.)
- Household/group level demonstration programmes.
- Agriculture infrastructure.

Dzongkhag level

The dzongkhag agriculture sector shall propose and maintain budget for the following extension programmes.

- Development of agriculture infrastructures and facilities.
- Dzongkhag level workshop/meetings.
- Annual agriculture surveys.
- Seeds and seedlings for large scale crop promotional programmes.
- Capacity building for extension and lead farmers.
- Establishment of demonstration fields.
- Sensitization and advocacy programmes.

Regional level

The ARDCs and central programmes shall propose and maintain budget for the following extension programmes.

- Establishment of Research Outreach Programmes (ROPs).
- Regional workshops and meetings.
- Capacity building of extension agents and lead farmers (in-country).
- Technical assistance for agriculture-based enterprises.
- Field days for new crop production technologies.
- Regional level campaigns and awareness programmes.
- Publication of manuals, guidelines and reports.
- Technical field attachment of new extension recruits (ARDCs).

National level

The department Programmes shall propose and maintain the budget for the following programmes.

- Development/formulation/ review of policy documents and guidelines.
- National coordination workshops/conferences /meetings.
- Institutional capacity building programmes.
- Professional services for capacity building and technology implementation.
- Publicity and advocacy programmes.
- Information and knowledge management.
- Orientation/field attachment programmes for new recruits.
- Publication of policy documents, guidelines, reports, etc.
- Programme monitoring and evaluation.

C. Implementation arrangements

All the extension programmes shall be implemented in line with extension manuals/guidelines/standard practices, and in accordance with existing rules and regulations.

The extension programme implementation shall adhere to the following arrangements and systems.

- i. The *Gewog Extension Centre* (GEC) shall be the key implementing agency for extension plans and programmes. The GEC must coordinate and lead the programmes and plans that are directly under their centres. The extension in the gewog must liaise with dzongkhag, regional centres and central programmes for implementing the collaborative plans and programmes. Extension in gewogs when faced with difficulties in implementing certain programmes and activities will seek expertise of the dzongkhags agriculture sector. Both the gewog administration and dzongkhag agriculture sector shall be informed on the implementation of any extension programmes in the gewog.
- ii. The *Dzongkhag Agriculture Sector* shall lead and coordinate the implementation of all the extension programmes directly under the sector. The sector will oversee and support the implementation of gewog extension programmes and will liaise with regional centre and national programmes. Implementation of any extension programmes including those that concerned other agencies (NGOs) shall be programmes routed through the dzongkhag administration.
- iii. The *ARDCs* and *CPs* shall lead and coordinate the implementation of the extension programmes planned under their centres. The ARDCs and CPs shall ensure that dzongkhag agriculture sectors and the gewog extension are involved in the implementation of regionally initiated extension programmes. The ARDCs/CPs shall keep track of all the extension programmes implemented in the region and update the department on a regular basis.

- iv. *The department* shall lead and coordinate the implementation of the extension programmes planned directly under the national programmes. Implementation of programmes in the field shall engage either regional centre or dzongkhag or both. programmes The DoA shall keep the MoAF informed on a regular basis, primarily on the implementation of extension programmes that are of national importance.

3.5. Extension human capital

The DoA is one of the largest departments under the MoAF with a total staff strength of more than 800 personnel of which 35% are deployed in the dzongkhags and gewogs. The department reaches out to clients through a network of dzongkhag and gewog extension, research centres and central programme offices established throughout the country. Therefore, the department shall continue to endeavor to manage, train, and place its extension officials in the right place to effectively fulfill the goals and objectives of the department.

The following plans and strategies shall help manage and strengthen the human capital in the department.

3.5.1. Induction programme

The new employees appointed by the Royal Civil Services Commission (RCSC) to department shall undergo the induction programme to orient new employees on policies, plans, mandates and goals. The induction programme includes two categories: i) Orientation programme at the DoA and dzongkhag headquarter and ii) Technical field attachments at the ARDCs.

i. Orientation programme

a. HQ-Department

Orientation programme provides an opportunity for new recruits to acquaint with the department and its structure, policies, and goals, thereby, ensuring new recruits a smooth transition into their workplace. Recruits shall be briefed on their responsibilities (ToR) before they are sent to their workplace. Orientation programme for a period of one week shall be organized by the department including familiarization visit to central programmes.

b. HQ- Dzongkhag

Following the orientation at the department-HQ the newly appointed recruits shall undergo a month-long administrative attachment with the dzongkhag-HQ.

This will help ensure that the recruits gain hands-on experience on office management, familiarise with dzongkhag plans and programmes, and LG administration. This orientation programme will precede the technical field attachment programmes.

ii. Technical field attachment

Technical Field Attachment (TFA) is a field-based practical experience programme that prepares the new extension employees for the tasks they are expected to face at their workplace. Technical field attachment will involve new recruits in the agriculture extension services being placed in respective ARDCs for a month immediately after completing the orientation programme at dzongkhag-HQ. Respective ARDCs shall maintain the budget for the technical field attachment programme.

The objectives of the field attachment are:

- To orient new employees on the mandates of agriculture research system and available agriculture technologies.
- To familiarize the new recruits with research priorities and planning process.
- To provide hands-on experiences and exposure on agriculture technical skills.
- To strengthen agriculture extension and research linkages.

3.5.2. Capacity development programme

Human Resource Development (HRD) is key to successful extension service delivery. With the shift in subsistence farming to semi-commercial and commercial farming, demand for the extension services is expected to increase. In order to provide efficient and quality services, extension personnel need to upgrade their knowledge and skills to cope with emerging issues.

i. In-country training programme

In-country training programmes act as an important platform for strengthening human capacity. It will not only help develop skills but also assist in enhancing interpersonal relationship as well as promote professional networking. Such forums create opportunities for sharing field issues and information that lead to productive discourses and way-forwards.

The in-country training programmes could be carried in collaboration with the department, ARDCs, central programme and dzongkhags based on the relevance. This will facilitate resource mobilization and post-training evaluation. Proper system on follow-up actions after training should be put in place, where the organizers shall pre-plan and then report on action-taken following any training initiatives.

The department, research centres and central programmes shall organize regular and need-based training programmes. The in-country training programme could include:

- Modern agriculture technologies (protected agriculture, e-agriculture, farm mechanization, micro-irrigation, GIS).
- Rural and community development approaches.
- Production system (Land management, organic agriculture, good agriculture practices, improved agriculture, climate resilient agriculture, and climate services).
- Commodity value chains and enterprises development.
- Data management.
- Technical paper writings.
- Extension tools, methods, crop productions, communication.

ii. Ex-country training programme

The ex-country training shall be led by the department. The training programme here would be specific to specialised courses that are otherwise beyond the scope and capacity of the in-country training programmes.

The department shall strive to put together a successive HR planning to enhance the capacity of the extension. The nomination of the staffs for the ex-country will be governed based on the existing rules and regulation, relevance, frequency and equity.

iii. Refresher courses

It is recommended to have these training programmes on a periodic basis so as to keep extension staff abreast of the new development in agriculture. Such training programmes shall also serve as an important driver in building their morale and boosting their confidence – which are integral to performance and quality services. Proposals for refresher courses shall be based on periodic review of the needs or priorities.

3.5.3. Staff deployment and transfer

The dzongkhag and gewog extension make up 35% of department's workforce and have been instrumental in successful delivery of services. Equitable distribution of gewog staff with knowledge and experiences are paramount to providing effective service delivery at the grass root level. Currently, the national average ratio of gewog extension to the farming population is 1: 238 (RNR census, 2019). The current deployment of one extension staff per gewog does not take into population size and agriculture area leading to inefficient service delivery. For example, Phongmed (Tashigang) and Soe Gewogs (Thimphu) with a farming population of 824 and 29 respectively are each served by a single extension agent. Therefore, there is a need to deploy gewog extension staff relative to the gewog's farming population and agriculture area.

Staff deployment

The deployment of the extension staff would be based on the following criteria:

- Deploy gewog extension staff in proportion to the farming population, agriculture area, and dispersion of farming households.
- Due consideration and priorities shall be given to the dzongkhag with agriculture commercialization programmes.
- Minimum of one extension agent shall be placed in each gewog.
- Encourage and ensure the placement of appropriate professionals.

Staff transfer

Staff transfers are undertaken with the objective to deliver successful and effective services. With a large number of staff preferring for placements in urban or adjoining districts, the MoAF has come up with “the Transfer Guideline 2018” to ensure fair and transparent transfer system. This guideline is in line with the staff transfer framework of the RCSC.

The department shall put in concerted effort to:

- Provide equal opportunities for all extension staff to serve in urban and remote gewogs alike.
- Follow BCSR 2018 and the ministry's transfer guideline and criteria in place.
- Encourage and ensure the placement of right professional in the right place.

3.6. Monitoring, evaluation, reporting

The existing monitoring, evaluation and reporting system as per the Government Performance Management System (GPMS) are National Key Result Area (NKRA) and Agency Key Result Area (AKRA) and Annual Performance Agreement (APA).

NKRA and AKRA defines national priorities and objectives for planning and resources allocation for the five-year plans. APA defines annual objectives and targets budget allocation and work plan in line with the priorities of NKRA and AKRA. As per APA objectives and targets, *Individual Work Plan (IWP)* is developed to implement, monitor and evaluate the plans and programmes. In order to carry out the real time monitoring and evaluation, the plans and programmes are monitored quarterly, mid-yearly and annually.

3.6.1. Monitoring

A simpler, relevant, reliable and functional monitoring system shall be followed to ensure that approaches are appropriate for all agencies involved in implementing extension programmes. Relevant stakeholders will be entrusted/ deployed/ engaged in monitoring efforts, based on the requirement and objectives. For an effective monitoring process, officials entrusted shall be from appropriate professional background. Monitoring shall be carried out following *regular extension programme implementation and specific programme evaluation* approaches.

Monitoring *regular extension programme implementation* ensures that field extension programmes are implemented on a regular basis in accordance with national policies, strategies and existing standards. Field activities shall be monitored by the extension agents on a regular basis (depending on the activities) and implementation of activities by extension agents shall be monitored by the dzongkhag agriculture sector. Extension activities that are in part research related shall be monitored by concerned agencies, and shall be assisted by extension agents in their respective gewogs.

The monitoring for *specific programme evaluation* entails systematic collection of data, following standard protocols Monitoring shall not be limited to data collection and analysis, but shall also involve problem diagnosis solution generation. Standard method shall be developed and adopted based on the objective and purpose of the evaluation required. Monitoring for evaluation will be emphasized, but not limited to:

- Production surveys.
- Technology adoption rates.
- Income and living standards.

Frequency of Monitoring

Monitoring of extension programme shall be taken up as an ongoing and continual exercise by the following agencies:

a) Gewog Extension Centre

- For the introduction of new varieties, inputs or production management practices/interventions, data collection should be undertaken twice in a cropping season: at the time of sowing (ref. earlier production data) to obtain benchmark information and again at the time of harvest.
- Crop cut survey will be conducted at the time of harvest using standard survey methods and guidelines provided to assist the estimation of annual crop production.
- Annual production survey will be conducted using the standard methods and guidelines provided by RNR Statistical Division of MoAF.
- Continual field observation and farmer interview at least once during cropping season and in the following year to monitor and assess technology adoption rates.

b) Dzongkhag Agriculture Sector

- Monthly monitoring of major extension programmes (implemented by dzongkhag) that are beyond the capacity and scope of gewog extension centres and to validate, guide and scrutinize the programmes implemented by the extension centres.
- At least once in a year, but will mostly rely on the gewog extension centre's monitoring reports, unless otherwise required for specific studies which shall then involve detail monitoring through field visits.

c) ARDCs and Central Programmes

- Quarterly monitoring of the collaborative activities and Research Outreach Programmes (ROPs).
- Quarterly monitoring of major extension activities implemented that are beyond the capacity of dzongkhag agriculture sector and gewog extension centres.
- Monitoring for adoption of technologies annually.

d) Department of Agriculture

- Monitoring at the department level shall focus on outcome and impact assessment in line with five-year plan and agriculture policies.
- Monitoring of the field programmes shall be conducted once in a year either through field visit depending on the nature and importance of the programme or through field reports.

3.6.2. Evaluation

Evaluation shall be conducted to assess the effectiveness of extension programmes, focusing on both outputs and outcomes based on annual, mid-term, terminal reports and other studies.

Impact assessment on the other hand shall be based on both the programme outcome of the FYP and implementation of the agriculture policies and programmes.

The key objectives of the evaluation of extension programme are to:

- Assess performance of extension programmes in relation to their objectives.

- Assess efficient utilization of public resources.
- Provide credibility to extension programmes for future investments.
- Collate lessons drawn from programme implementation for improvement wherever required.
- Assess the contribution of extension programme to household income and rural livelihood.

The extension programme shall be evaluated based on changes in production, technology adoption rate and income/living standards. The relative changes examined shall be associated with extension inputs and services delivered within the programme implementation period.

Evaluation shall be based on the monitoring report of gewogs, dzongkhags and regional/central programmes and shall involve collections of information that will facilitate comparison before and after extension interventions.

3.6.3. Reporting

Reporting is essential for efficient monitoring, evaluation and knowledge and information management. Different levels of reporting system shall be followed to ensure that extension programme progress are reported appropriately as below:

Gewog Extension Centre

The progress on extension programmes implemented in the gewog/community/locality shall be reported to the dzongkhag agriculture sector on a quarterly basis. The report shall consist of activities carried out in the last three months and plan of activities for the forthcoming quarters and shall be submitted following existing reporting procedures.

Dzongkhag Agriculture Sector

The dzongkhag agriculture sector will compile both the gewog and dzongkhag extension programme progress monitoring report and submit to the department on biannual basis. The report shall consist of activities carried out in the last 6 months and the plans for the remaining months and shall be submitted following existing procedures. In addition, dzongkhag agriculture sector will produce annual highlights and submit to the department.

Regional Centre/Central Programmes.

Regional centre/central programmes shall compile the report for extension programmes directly implemented or in collaboration with dzongkhags and submit to the line divisions on annual basis as part of their annual report.

Department of Agriculture

Reports in the form of annual highlights, FYP mid-term reports and terminal reports will be published and circulated to concerned agencies.

A gist of the outputs/outcomes of the extension programmes will be presented both during the RRPW and ARCM for review and feedbacks if required. Major issues and recommendation thereon will be presented and discussed during the Agriculture Conference.

4. LEGAL AND POLICY FRAME WORK

1. The National Extension Policy 1995
2. RNR Research Policy of Bhutan 2011
3. The Local Governments' Act of Bhutan 2007
4. Bhutan Civil Service Rules & Regulations 2018
5. Food and Nutrition Security Policy of the Kingdom of Bhutan 2014
6. RNR Marketing Policy of Bhutan 2017
7. Seeds Act of Bhutan 2000
8. Pesticides Act of Bhutan 2000
9. Bio-safety Act of Bhutan 2015
10. Plant Quarantine Act of Bhutan 1993
11. Bio-security Policy of the Kingdom of Bhutan 2010
12. National Food Security Reserve
13. Agriculture Research Strategy 2018-2028

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