AGRICULTURE EXTENSION GUIDELINE 2025

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DEPARTMENT OF AGRICULTURE

Ministry of Agriculture and Livestock

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1. Introduction

The agricultural extension services in the country were operated through a centralized, top-down approach initially. The core activities during the 1960s were primarily focused on input supply such as seeds, seedlings, fertilizers, farm tools alongside farmer training, on-farm demonstrations, and field days.

A significant paradigm shift in the extension system occurred during the 1990s, with the introduction of decentralized governance. In 1982, the DoA formally instituted the deployment of Dzongkhag Agriculture Officers and Extension Agents at both dzongkhag and gewog levels. These personnel were tasked with implementing targeted interventions aimed at improving soil fertility, enhancing plant protection measures, and promoting farm mechanization geared towards increasing crop productivity. Over time, the roles of extension agents evolved to encompass broader functions, including acting as change agents and facilitators in the transfer of knowledge, technologies, and best practices to farming communities.

Currently, Bhutan's agricultural extension system is structured across four strata: national, regional, dzongkhag, and gewog levels. At the national and regional levels, the system is represented by the Department of Agriculture, its Divisions, Central Programs, and the Regional Agriculture Research and Development Centers (ARDCs). The DoA functions as the nodal agency for technical and human resources management responsible for planning, appointment, transfer, and capacity development of agricultural personnel. The ARDCs and Central Programs primarily provide technical backstopping and advisory support to field-level extension offices.

At the dzongkhag and gewog levels, extension agents operate at the frontline, directly engaging with farming communities and agri-entrepreneurs to implement agricultural programs and disseminate innovations. While administratively under local governments, these extension services operate under the technical guidance and supervision of the Department of Agriculture, ensuring alignment with national agricultural priorities.

In light of this multi-tiered institutional framework and the evolving responsibilities of extension agents, it has become imperative to establish a comprehensive guideline that standardizes service delivery, enhances coordination, and strengthens the overall effectiveness of the agricultural extension system.

The primary objective of this guideline is to systematize and enhance the efficiency of agricultural extension services by providing a coherent framework for service delivery. It aims to promote the integration of innovative, climate-resilient technologies and approaches into extension practices. The guideline is aligned with the strategic objectives of the 13th Five Year Plan and is designed to address emerging sectoral challenges while responding to the dynamic needs of agricultural stakeholders across the country.

2. Current Situation and challenges of agriculture extension services in Bhutan

Despite substantial progress made in developing and institutionalizing Bhutan's agricultural extension system over the past several decades through capacity building, decentralization, and increased farmer outreach numerous persistent and emerging challenges continue to impede its overall effectiveness, efficiency, and responsiveness. These challenges span multiple dimensions as follows;

2.1. Reach of Extension Services in Bhutan: Geographical constraints characterized by Bhutan's rugged mountainous terrain, dispersed settlements, and remoteness of many rural communities pose significant limitations to the accessibility and efficiency of agricultural extension services. Although all gewogs are connected by farm roads, the challenging terrain and availability of transportation remain significant issues. Extension personnel often face logistical challenges in reaching isolated areas, as travel remains physically demanding and time-consuming. These factors collectively constrain the timely delivery of technical support and limit the frequency and coverage of extension interventions in remote farming communities.

2.2. Inadequate Number of Extension Workers: The agricultural extension system is currently challenged by a rising rate of attrition, which has led to a significant increase in the extension agent-to-household ratio, now estimated at 1:239. Consequently, extension agents are now required to go beyond their primary responsibilities, conventionally focused on managing the agricultural needs of a single Geog. Additionally, the evolving situation has compelled agents to assume additional administrative and cross-sectoral responsibilities, ultimately broadening the scope of their work and straining their capacity to provide specialized support.
Therefore, there is a need to develop a comprehensive Terms of Reference for the extensions to avoid diversion from their primary roles. Additionally, exploring the possibility of clustering extension services or prioritizing the deployment of extension agents based on the intensity of agricultural activities in each gewog is essential.

2.3. Vacant Households and Fallow Land: The increasing number of vacant households and fallow land, which stood at 63,770.99 acres as of 2019, poses a significant challenge to the effective delivery of agricultural extension services. Rural-to-urban migration has led to an increasing number of households becoming unoccupied, resulting in a decline in the active farming population. As a result, a large area of fertile land is left fallow, which could otherwise be used for productive agricultural activities. Extension agents face significant challenges in engaging the shrinking farming community and revitalizing fallow land for agricultural use. To address this, targeted strategies are needed to promote rural settlement and enhance the productive utilization of available land.

2.4. Climate Vulnerability: Climate vulnerability is a significant constraint within Bhutan's agricultural extension system, as the increasing frequency of climate-related events such as erratic rainfall, droughts, floods, and pest outbreaks threatens crop productivity and food security. The

extension system faces challenges in addressing these risks due to limited access to localized climate data, insufficient integration of climate-smart agricultural practices, and a lack of technical capacity among extension agents to guide farmers in climate adaptation. This underscores the need for strengthening the system's climate resilience through improved training, access to early warning systems, and the mainstreaming of climate-resilient agricultural practices.

2.5. Knowledge Gaps: For extension services to remain dynamic and responsive to the evolving needs of agricultural development, extension workers must be proficient in modern technologies to facilitate effective knowledge transfer to clients. However, lack of capacity-building programs and refresher courses has resulted in many extension agents falling behind in acquiring the technical expertise necessary to keep pace with rapid advancements. This knowledge gap, exacerbated by changing climate patterns and emerging technologies, significantly undermines the effectiveness of extension services in rural areas.

Therefore, it is crucial to invest in capacity building, provide real-time information access, and incorporate digital tools to keep extension agents informed. Furthermore, enhancing collaborations with research institutions and agricultural organizations will enhance knowledge exchange, while tailored strategies addressing regional needs will empower extension agents to offer timely and relevant support to farmers, helping them adapt and thrive.

2.4. Insufficient Funds for Extension Activities: With increased priority on enhancing food self-sufficiency, the Department of Agriculture is formulating an ambitious plan to transform the agri-food sector for economic growth and sustainable development. However, due to resource limitations, the budget allocation for agriculture is minimal. This disparity between the ambitious goals outlined in the plan and the limited financial resources available has created significant challenges for extension service providers in effectively implementing the proposed activities.

2.5. Poor Adoption of Technologies: Majority of farmers in Bhutan are illiterate subsistence farmers, which presents significant challenges in promoting new technologies. Smallholder farmers tend to be risk-averse and reluctant to adopt new practices, even when provided with training and guidance from various organizations.

2.6. Frequent Change in Guidelines: Inconsistent policy changes disrupt agricultural extension services, hindering effective planning and implementation. For instance, recent notifications on cost-sharing from the Ministry of Finance contradict the existing cost-sharing mechanism of the Department of Agriculture.

2.7. Ineffective Linkages Between Stakeholders: Over the years, coordination between extension services and other stakeholders has weakened, undermining efficient knowledge transfer, resource utilization, and program implementation. Additionally, weak collaboration has led to communication gaps, mismatched services, limited innovation, and diminished policy impact,

highlighting the urgent need to strengthen these coordination efforts for effective extension service delivery.

2.8. Poor Database System: The lack of a robust database system further complicates the delivery and monitoring of extension services.

2.9. Insufficient Motivational Support: Despite the performance rating of civil servants in the system, extension agents in the field often lack sufficient motivational support, undermining their effectiveness. Inadequate incentives, recognition, or professional growth opportunities affect their commitment and performance. Addressing these issues through better incentives and recognition is essential to improving the quality and consistency of extension services.

2.10. Limited Awareness of Credit Facilities and Accountability: Limited awareness of credit facilities and enforcement of accountability on extension agents significantly challenge agricultural extension services.

3. Roles and Responsibilities

Extension agents are the key implementers in delivering agricultural extension services, acting as the primary point of contact for rural communities and providing essential developmental support. They play a pivotal role in collecting accurate and timely data from grassroots levels, which is critical for informed planning and implementation at all agriculture extension stratum. Therefore, the roles, responsibilities, and terms of reference for extension agents must be clearly defined. This will ensure that agricultural development efforts are aligned with the objectives of the Five-Year Plans, and that extension agents fully understand their roles within the Dzongkhags and Gewogs.

3.1.Roles and Responsibilities of Dzongkhag Agriculture Officer

The Dzongkhag Agriculture Officer (DAO) and Agriculture Extension Supervisors are pivotal in executing the Department of Agriculture's strategies and policies within the Dzongkhag and Gewogs. The DAO represents the Department of Agriculture at the Dzongkhag level, while the extension supervisors operate directly within the Gewogs. Their defined roles and responsibilities are essential for ensuring the successful implementation of agricultural initiatives and support services within the communities.

Strategic Planner: As a planner, the DAO has to lead in the development of plans and securing funds to implement the activities in the Dzongkhag. Specific responsibilities include.

- Develop plans and budget for agricultural development in collaboration with the Department and local governments in the Dzongkhag.
- Guide and advise local governments on the formulation of agricultural plans and programs within the Dzongkhag/Gewogs.

- Prepare and submit funding proposals for agricultural development initiatives in the Dzongkhag.
- Coordinate and support the supply of agricultural inputs within the Dzongkhag.
- Conduct timely monitoring of agricultural development activities in the Dzongkhag/Gewogs.
- Advocate for local government engagement on agricultural policies, strategies, and plans.
- Participate actively in meetings of relevant committees within the Dzongkhag.
- Provide feedback on the effectiveness of agricultural policies and programs.

*Technical Expert***:** Agriculture Officers in the Dzongkhag will function as technical adviser to the local government, and their responsibilities will entail;

- Offer technical guidance and support to Gewog Agriculture Extension in executing activities.
- Manage and facilitate the exchange of knowledge and information.
- Participate in the development and revision of agricultural policies, regulations, and technologies for effective implementation.
- Collaborate on research and the development of new agricultural technologies.
- Provide agricultural data to relevant agencies as needed.
- Supervise, guide, and advise subordinates, entrepreneurs, and farmers on enhanced agricultural technologies and innovations to boost production.
- Coordinate and collaborate with technical agencies to access necessary expertise.

Production Facilitator

- Analyze and develop commodity-specific production strategies and plans
- Mobilize improved inputs for agriculture production
- Facilitate transfer and adoption of appropriate technologies in the field.
- Supervise, guide and advise sub-ordinates, entrepreneurs and farmers on improved agriculture technologies and innovations for enhancing production
- Facilitate farmers and entrepreneurs on improved agriculture production and technologies practices.
- Provide counseling and advisory services to farmers and entrepreneurs on production issues
- Function as the bridge between the Department of Agriculture/Ministry of Agriculture & Livestock and the Local Government

- Sensitize and advice local government on agriculture development policies, plans and programs
- Facilitate, foster and develop linkages with farming communities and relevant agencies
- Facilitate and implement on-farm research and development for sustainable agriculture production
- Manage and exchange knowledge and information
- Integrate ICT in agriculture production and development

3.2.Terms of Reference for Dzongkhag Agriculture Sector

- Ensure the distribution and implementation of RGoB policies and guidelines for cross-cutting agriculture extension and other topics
- Represent the Extension Support Division in different technical forums as and when required
- Coordinate the agriculture technology packaging, School Agriculture Program, LDI & Cooperatives, non-technical and cross cutting training for the client departments
- Monitor the performance of RECs in the RNR RCs on their work programs and guide and facilitate their role in technology packaging and technical backstopping to the Dzongkhag extension services
- Coordinate with projects and Central Programs within MoAL which are involved in extension or extension-related activities
- Carry out any other official work assigned by the supervisors

3.3.Roles and Responsibilities of Gewog Agriculture Extension

Gewog Agriculture Extension serves as the closest and the most accessible point of contact for farmers. Gewog Extension Centers are established to cater to the needs of farmers.

Technical

- Disseminate released new and innovative agriculture technologies
- Provide technical and advisory support and assistance to the farmers in crop production
- Partake in the development of agriculture development plans and programs for Dzongkhags/Gewogs
- Attend and actively participate in meetings of relevant committees in the Dzongkhag.
- Assist ARDCs in carrying out agriculture research and development activities including Research Outreach Program

- Crop performance monitoring and assessment Collect and maintain agriculture data for proper planning, reporting and decision making.
- Carry out assessment of crop damage by disasters

Production Partner

- Facilitate farm inputs based on prevailing rules and regulations (e.g., seed and seedlings, farm equipment, farm machinery, fertilizers, agrochemicals, etc.) for optimum agriculture production.
- Assist in agriculture infrastructure development
- Implement electric fencing, chain link fence construction)
- Verify/assist land-related services (wetland conversion, land exchange, land development, and land lease etc.,)
- Facilitate agriculture credit services and technical clearances

Monitoring and Reporting

- Represent department/ministry and sensitize and advise local government on agriculture policies, plans and programs
- Implement timely monitoring of agriculture plans and programs in the Gewog
- Collect, review and submit physical and financial progress report
- Support stakeholders in the implementation of development plans and programs

3.4.Terms of Reference for Gewog Agriculture Extension

- Ensure the distribution and implementation of RGoB policies and guidelines for cross-cutting RNR extension and other topics
- Represent the Extension Support Division in different technical forums as and when required
- Coordinate the RNR technology packaging, School Agriculture Programs, LDI & Cooperatives, non-technical and cross cutting training for the client departments
- Monitor the performance of RECs in the RNR RCs on their work programs and guide and facilitate their role in technology packaging and technical backstopping to the Dzongkhag extension services
- Coordinate with projects and Central Programs within MoAL which are involved in extension or extension-related activities
- Carry out any other official work assigned by the supervisors

4. Extension Approach

1. Commodity Approach
2. Extension Participatory
3. Lead Farmer Approach
4. Training and Visit Approach

4.1.Commodity Based Approach

The Commodity Based Approach strategically designs its interventions to address the specific challenges and leverage the unique opportunities associated with a particular commodity. Its primary objective is to strengthen the entire value chain of a given commodity, from production to post-harvest handling, processing, marketing, and export. Initiated in Bhutan in 2003, this approach originally targeted four key commodities: citrus, apple, potato, and vegetables to identify opportunities and constraints at each stage of commodity development and to harmonize the research and extension programs thereof.

To facilitate effective coordination, the commodity focals are placed at the headquarters to oversee the overall commodity program coordination and at the ARDCs to manage the technical coordination of research and development initiatives.

The 13th FYP prioritizes commodities such as rice, maize, potatoes, vegetables, and high-value crops like cardamom, ginger, and apples. Interventions under this approach align with these national priorities, focusing on enhancing productivity, quality, and marketability to contribute to food security, rural livelihoods, and export revenues. The Commodity Extension Approach is effectively used involving the following processes:

Steps in the Commodity Extension Approach

a) Selection of commodity

- Review National and Local Priorities: Refer the national agricultural policies, plans and target as well as the Dzongkhag/gewog plans. focus on crops that are already marked priorities (e.g., Rice, maize, cardamom)
- Assess agro-climatic suitability: Study the local climate, rainfall, temperature and altitude. Make sure the crop can grow well under those conditions.
- Analyze soil and water conditions: Test soil typo and Ph level. Czech if there is enough water for irrigation (or if the crop can grow in rainfed conditions).
- Evaluate market demand: Find out if there is local, nation or export market demand. See if farmers can get a good price and earn profit from the crop.
- engage local stakeholders: Talk to the farmers, extension officers, traders and cooperatives to learn from their experience, preferences and concerns.
- Check technical feasibility: Check if the crop is adaptable to the area, identify the input requirements such as seeds, fertilizers and pest control and the best farming practices and technologies available.

- Assess resource availability: Look at land size, water access, labor force, tools and infrastructures such as roads and storage.
- Evaluate economic viability: Estimate production costs and expected returns and see if the crop is profitable and sustainable for farmers.
- Pilot testing or demonstration plots: Conduct trials or demo plots to observe crop performance before promoting it. This shall be carried out in collaboration with ARDCs or Central Programs.

b) Consultative meeting

Engage Stakeholders: Organize meetings with farmers, cooperatives, processors, and market actors. This lets you gather insights on the challenges and opportunities for growing specific crops.

- Farmers' perspective: What crops are they already growing, and what are the challenges?
- Market actors: What is the demand for different commodities, and are there opportunities for value addition?
  Government & Non-Government Organizations: Understand available support systems and development programs.
- Share Information: Provide information on the commodity's potential, benefits, and possible challenges. This will help farmers make informed decisions.

Develop a commodity promotion plan

- Design strategies: Create clear methods for improving the production, processing, and marketing of the selected commodity.

Set Actionable Plans:

- For Production: Promote better farming practices, provide access to inputs like quality seeds, fertilizers, and equipment, and introduce new technologies.
- For Marketing: Develop market linkages, establish farmer cooperatives, and create direct market access for farmers.
- For Value Addition: Work on enhancing local processing capacities, including storage, processing facilities, and packaging.

c) Resources and Support: Identify resources (funding, training, technical assistance) required to implement the plan and coordinate with relevant agencies for support.

d) Implementation

Training Farmers

- Farmers' Field School (FFS): Organize participatory sessions where farmers learn by doing, such as hands-on pest identification and management in rice fields.
- Field Days: Field demonstrations on production technologies, integrated pest management in vegetable fields, etc. allowing farmers to observe the results firsthand.

- Mass Media: Disseminate information through radio or television programs, such as a series on post-harvest storage techniques for maize
- Social Media: Share training videos or infographics on Facebook or WhatsApp groups to reach farmers.

Provide Resources: Offer resources such as seed subsidies, extension services, and information on new technologies.

Facilitate Learning: Encourage knowledge sharing through farmer groups, demonstrations, and exchange visits to successful model farms.

- Farmer Groups: Create local farmer clusters to discuss common challenges and solutions, such as group discussions on pest control strategies for maize.
- Demonstrations: Conduct live demonstrations of compost preparation using locally available materials during a Field Day event.
- Exchange Visits: Organize visits to successful model farms, such as a trip to a Gewog known for its innovative crop rotation practices, enabling farmers to learn directly from peers

Using Commodity Extension Approach can effectively support farmers in the selected commodity's value chain. The approach focuses on improving production, processing, and marketing in a coordinated manner with the active involvement of all stakeholders. Your role as an extension staff is key in facilitating these activities, providing necessary training, and ensuring that farmers have the support they need to successfully adopt and benefit from the chosen commodity.

4.2. Agriculture Extension Participatory Approach (Transfer of Technology)

The Participatory Extension Approach (PEA) is one of the agriculture extensions approaches, characterized by active participation of farmers. The fundamentals of the participatory approach are active listening and learning from farmers. It ensures farmers' needs are taken care of and the development and transfer of technologies are directed towards addressing real challenges the farmers face. Unlike the conventional top-down approach, the PEA contributes to conserving and promoting indigenous technical knowledge. The participatory approach promotes co-creation and shared learning among the farmers which will positively affect technology adoption by the farmers. PEA can be followed in the following steps;

The Participatory Extension Approach here is explained in two categories; First when a particular agriculture technology is available at the research stations and needs to be disseminated to the farming communities, second when the problem needs to be identified with a solution based on the farmers' preference.

Step 1: Preliminary Planning

- Define aims and objectives (For example to introduce new crop varieties)
- Decide the appropriate location/time

- Ensure fair representation from diverse groups, including marginalized communities/gender
- Equip with tools for the meeting

Step 2: Identify and Engage Stakeholders

- Identify key players such as farmer groups, Local leaders (Gup), local cooperatives, women and youth groups, and the Ministry of Agriculture and Livestock.
- Community Meetings: Conduct community meetings in Dzongkhags (districts) to discuss agricultural challenges and opportunities, ensuring representation from diverse groups, including marginalized communities.
- Methods:
- Use Focus Group Discussions (FGDs) to capture diverse perspectives.
- Implement Community Mapping exercises to visualize local resources and needs.

Step 3: Conduct a Participatory Needs Assessment

- Participatory Rural Appraisal (PRA): Utilize PRA tools (annexure) like mapping and seasonal calendars to gather information directly from farmers about their practices, needs, and resources.
- Focus on Indigenous Knowledge: Consider local farming practices and indigenous knowledge as valuable assets that complement new technologies.
- Methods:
- Conduct Transect Walks with farmers to observe and discuss agricultural practices.
- Organize Surveys to collect quantitative data on farmer needs and challenges.

Step 4: Planning

- Develop a Joint Action Plan: Collaborate with stakeholders to create a detailed plan that outlines objectives, methodologies, timelines, roles, and responsibilities.
- Resource Assessment: Identify available resources (financial, human, and material) and gaps that need to be addressed in the planning phase.
- Methods:
- Facilitate Workshops for Planning that include diverse stakeholders to ensure all voices are heard.
- Use Problem Tree Analysis (Annexure) to identify root causes and plan interventions.

Step 5: Build Collaborative Networks

- Form Farmers' Groups or Cooperatives: Encourage forming local farmer groups to foster collaboration, knowledge-sharing, and access to resources.
- Create Advisory Forums: Establish forums amongst extension agents, researchers, relevant central agencies, and farmers to discuss challenges and explore solutions.
- Methods:

- Utilize Participatory Action Research (PAR) where farmers actively participate in the research process.
- Organize Networking Events to build connections among stakeholders.

Step 6: Select and Adapt Technologies

- Local Varieties and Techniques: Prioritize native crop varieties that are resilient to local conditions alongside sustainable practices like organic farming, good agriculture practices etc.
- Adaptation Workshops: Conduct workshops where farmers brainstorm ways to adapt technologies to their specific contexts.
- Methods:
- Implement Hands-On Workshops for skill-building in adaptation techniques.
- Use Demonstration Plots to showcase effective practices.

Step 7: Organize Capacity-Building Activities

- Hands-On Training Programs: Implement training focusing on organic farming, agroforestry, and post-harvest techniques.
- Peer Learning: Facilitate learning among farmers by promoting experienced farmers as trainers.
  Methods:
- Organize Farmer Field Schools (FFS) focused on experiential learning.
- Conduct Workshops addressing specific skills or technologies.

Step 8: Implement Pilot Projects

- Select Diverse Pilot Homes: Choose a range of farmers for pilot projects to evaluate technology effectiveness.
- Continuous Monitoring: Schedule regular field visits to these pilot farms for technical support and data collection.

Methods:

- Use Visual Demonstrations to show new techniques in action.
- Implement Collaborative Pilot Programs to allow collective learning.

Step 9: Gather Feedback and Evaluate Outcomes

- Participatory Monitoring and Evaluation (M&E): Engage farmers in evaluating the effectiveness of technologies.
- Documentation: Document findings and farmer testimonials to learn from successes and areas needing improvement.

Methods:

- Conduct Joint M&E Workshops for farmers to assess progress collectively.
- Establish Feedback Loops to incorporate insights into ongoing adaptations.

Step 10: Promote Results and Scale-Up

- Field Days and Exchange Visits: Organize events where farmers can learn from successful implementations and each other.
- Community Knowledge Sharing: Create platforms for ongoing sharing of information and success stories.

Methods:

- Host Agricultural Fairs to celebrate local practices and innovations.
- Use Digital Tools for sharing updates and resources.

Step 11: Ensure Sustainability and Resilience

- Empower Communities: Build leadership within farmer groups to lead initiatives for sustainability.
- Integrate Climate Resilience: Train farmers in climate-resilient practices like water conservation.

Methods:

- Promote Agroecological Approaches such as crop rotation and integrated pest management.
- Provide workshops focused on Natural Pest Management techniques.

Step 12: Collaborate with Policymakers and Institutions

- Advocacy for Supportive Policies: Work with local and national policymakers to align strategies that prioritize sustainability.
- Forge Partnerships with Research Institutions: Build alliances with institutions for ongoing research and technological development.

Methods:

- Organize Policy Dialogue Sessions to share findings and advocate for supportive measures.
- Create Advisory Committees involving extension workers and policymakers for continuous collaboration.

4.3. Lead Farmer Approach

In the agriculture extension system, the Dzongkhag and gewog extension offices are at the forefront working directly with farming communities and agri-entrepreneurs. However, with the increasing rate of attrition in the system, the ratio of extension agents to households has risen significantly to 1:239. Consequently, extension agents are unable to cater to all the extension services required in their respective gewogs. Moreover, difficult mountain terrain and scattered human settlements in some gewogs also pose challenges to providing responsive and prompt extension services. This isolation limits the dissemination of modern agricultural practices and

technologies. Therefore, the leader farmer approach can be one of the strategies to deliver extension services with broader outreach.

The Lead Farmer Extension Approach is a widely recognized method for enhancing agricultural practices by leveraging local farmers as trainers and role models. This approach enhances extension service delivery especially in situations of limited extension service providers. The approaches rely on the involvement of lead farmers, who are knowledgeable and influential in their communities, to spread agricultural innovations and best practices. This approach can be effectively implemented through three primary extension methods: individual, group, and mass communication.

a. **Lead Farmer Approach**

i**.** *Selection of Lead Farmers***:** The selection of Lead Farmers should be based on several key criteria:

- Experienced and progressive farmers capable of leading others by example. Avoid any favoritism.
- Willingness to share skills and develop a demonstration farm.
- Availability of land near their farmhouse for the demonstration farm.
- Preference may be given to youth or early school leavers or former student
- Encourage and ensure women participation.
- Selected candidates must complete all the training courses at ARDCs or Central Programs.
- Select the candidates that meet all or most of the criteria.

ii. Training of Lead Farmers

- Conduct intensive training sessions for lead farmers on new agricultural technologies, sustainable practices, and leadership skills.
- Provide hands-on training and demonstrations, ensuring the lead farmers fully understand the techniques they will be promoting.

iii. Knowledge Transfer:

- Each Lead Farmer is required to extend the knowledge and skills acquired from the training to the farmers in his/her community.

iv. Establishment of Model Farms:

- The lead farmers should establish model farms where they can showcase the new technologies and practices.
- Use these model farms as demonstration sites for other farmers to visit and learn from.

v. Farmer-to-Farmer Extension

- Lead farmers must organize field days and workshops to share their knowledge and experiences with other farmers.
- Facilitate farmer-to-farmer training sessions where lead farmers mentor and guide their peers.

b. Characteristics of the lead farmer's model

The Lead Farmer model is a holistic approach to disseminate farming technologies through structured season-based hands-on training and establishment of integrated model farms. Hence, some of the characteristics of this approach are as follows:

i. Lead Farmer:

- Lead Farmer (LF) is a self-motivated and trained individual who is willing to lead other farmers in his or her community by sharing knowledge and skills within the lead farmer expansion or Farmer-to-Farmer (F2F) extension program.
- The extension staff should visit the demonstration farms of all the lead farmers on the respective gewog to build strong linkages and reinforce the lead farmer model, initiating expansion of his or her services.

ii. Extended farmers:

- Extended farmers are individuals or groups within the community who are willing to learn from or take the services of the Lead Farmer.
- Selection of these farmers should be facilitated by extension staff.

iii. Training venue:

- The integrated farm developed for the Lead Farmer as a part of the lead farmer training should serve as the training venue to expand his or her services to others. This ensures maintenance of quality standards and benefits more farmers through replication of the model.

iv. Extension Officers:

- The local extension staff act as facilitators, supporting Lead Farmers in training or replicating their skills and services to other farmers under the Lead Farmer Expansion Program

v. The Curriculum:

- The curriculum should be oriented towards imparting adequate hands-on practice training in which the skills acquired by the lead farmers are disseminated to the farmers in both formal and informal training and visits.

- A structured curriculum based on the needs must be prepared by the extension staff to guide the conduct of the training.

vi. Training program:

- The gewog agriculture extension staff should plan out training programs preferably at different seasons and stages of a value chain approach with a training plan as well as a post training program.

vii. Training approach:

- The gewog agriculture staff and the resource person – Trained Lead Farmer should organize the training in one of more Lead Farmers' demonstration models..
- Expanded farmers may opt to reside for a few days on the lead farmer's farm. For instance, if the prioritized farming technology is "training and pruning of fruit trees" and "vegetable cultivation", the facilitator (herein referred to as Extension Officer) provides the required budget and inputs to the Lead Farmer concerned and the extended farmers undergo hands on training on the specified subject using his/her model farm as the training venue. However, the facilitator should provide required guidance whenever necessary.

viii. Learning materials and resources:

- The facilitator should assist the Lead Farmer concerned in developing required learning materials and resources.
- The lead farmer expansion should cover payment for services to the Lead Farmer resource person as well as plan out resources required for lead farmer expansion into other farmers who are getting trained or expanded with the services from the lead farmer. These materials will mostly be production inputs to replicate the demonstration model and basic tools required for replication.

c. Monitoring and reporting under the Leader farmer program

i. Dzongkhags/Gewog:

- Regularly monitor the progress of post-training plan implementation by the lead farmers and provide ongoing support and feedback.
- Keep record of the services extended by the lead farmers.
- Address any challenges or questions that arise during the implementation of new practices.
- Conduct periodic evaluations to assess the effectiveness of the lead farmer approach
- Gather feedback from both lead farmers and follower farmers to identify areas for improvement.

ii. ARDCs / Central Programs:

- Provide timely refresher courses / training based on feedback and emerging needs.

d. Sustainability and Scaling Up of lead farmer approach

- Support Lead Farmers in maintaining their farms and motivate them to expand their reach.
- Document success stories and lessons learned to replicate the model in other communities and share by mass media
- Encourage rewards for Lead Farmers through in-kind or agreed repayments, and provide technical assistance and coordinated inputs.

e. Challenges and risks

- Providing agricultural support to inactive and non-progressive Lead Farmers may result in inefficient use of resources.
- The quality of training provided by Lead Farmers may vary, affecting the consistency of knowledge transfer.
- Farmers may resist adopting new practices promoted by Lead Farmers due to ingrained traditional methods.
- Lead Farmers may not possess all the necessary knowledge to address diverse farming issues.
- Difficulty in tracking and evaluating the impact of the Lead Farmer Approach can limit the ability to make informed improvements.
- Sustaining the Lead Farmer model can be challenging if not well-integrated into institutional frameworks and if ongoing support is lacking.
- Limited availability of financial, technical, and material resources can hinder the effectiveness of the Lead Farmer Approach.

4.4. Training and Visit (T&V) Approach

This approach involves regular and systematic visits by extension workers to farm households to train farmers on agricultural practices, technologies, and innovations. The extension workers demonstrate improved practices, monitor the progress of farmers, and offer feedback. These visits are structured to ensure that farmers receive continuous support and guidance. **Example:** During the Green Revolution in India (1960s to 1980s), the T&V approach was adopted to train farmers on the use of high-yielding seeds, appropriate fertilizers, irrigation techniques, and pest management practices. Extension workers were sent to rural areas regularly to introduce farmers to these new agricultural technologies.

4.5. Cost sharing approach

The costs of inputs or technologies are shared between the government and the farmer. This approach encourages farmers to take greater responsibility for the adoption of new practices or

technologies by involving them financially. **Example:** In Bhutan, the Cost-Sharing Approach is applied to greenhouse projects, where the government covers 40% of the cost and farmers contribute 60%.

5. Extension Methods

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, Individual, group and mass extension methods.

5.1. 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)

5.2. 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 take active role in conducting demonstrations 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

5.2.1. Mass extension

Mass media are communication channels through which information is conveyed to many 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) offer tremendous opportunities to improve agriculture extension services. Technology includes computer, mobile phones, internet and social media.

ICT facilities will 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.

6. Implementation Plan

Timeline for the implementation of the guidelines.

Sl.	Activities	Procedure/steps for accessing services	Duration (days)	Start	Finish
1	Planning, budgeting and coordination meetings with stakeholders (local governments, cooperatives, NGOs, and farmers).	1. Develop a detailed work plan and schedule. 2. Secure funding and resources (tools, materials, training modules). 3. Identify target groups and villages	14	January to March	
2	New technology dissemination and as a technology implementer.	1. On Farm trial 2. Data collection and monitoring 3. Evaluation 4. Field day	14		
3	Information and data management and serve as a data manager and feed data till the national level.	1.Crop data collection 2. Crop cut 3. Annual crop production data	30	January to December	
4	Plant protection services ensures crop production.	1. Indent collection and submission 2. Cash collection and submission to concern Agency 3. PP Chemical distribution 4. Awareness on Pesticides usage	30	July to September	
5	Providing land services.	1.Preliminary assessment of land suitability for land exchange, land substitute, land conversion and land lease. 2. Joint verification of rural infrastructure development with Gewog administration 3.Maintain land records like cultivated, fallow and wetland dry land, and other land types.	7	January to December	
6	Agriculture Land Development	Create awareness on land development and use and keep abreast to guidelines, policies and technologies - Initiate, facilitate and implement land development programs- ALD - Provide support and ensure utilization of developed lands - Maintain records and submit reports.	14	November to April	
7	Soil fertility management	- Ensure soil plant nutrition management through technical support from related agencies – NSSC. - Link with researches in soil nutrient management and conduct soil fertility tests - Disseminate soil and nutrient information to farmers/community, and advice/train on soil fertility management.	14	January to December	
8	Infrastructure development	1. Planning/discussion/prioritizing with LG and community for Infrastructure development and renovations 2. Propose budget through LG or centre	7		

		3. Monitor with site engineer and community 4. Record and Report 5. Encourage and form Users group, and ensure its active roles play and participation.			
9	Irrigation Water management	- Plan and initiate irrigation management schemes - Facilitate formation of water users' group-WUA - Collaborate irrigation source protection and smart irrigation technologies - Maintain irrigation scheme inventory and report - Monitoring.	14		
10	Market Facilitation	-Facilitate market for farmers/products with related agencies and markets - Facilitate market information to farmers and related agencies - Development of rural market infrastructure and support essentials.	3		
11	Farmer's group mobilization/ enterprise development	-Facilitate formation of farmers group in irrigation, farm roads, crop production and marketing groups and co-operatives. - Create awareness on Credit facilities and application procedures - Enterprise field monitoring and report implementation process - Provide technical and administrative guidance support services	7		
12	Assessment of crop loss by natural disaster/wild animals	-Assess the loss in the field by filling up prescribed format and submit to DAO in both hard and soft copies for onward submission to MoAL	7		
13	Attend quarterly GT/DT	-Presentation of progress and budgeting	3		
14	Monitoring and feedback collection	-Visit farms to assess the adaption of new practices - Collect farmers' feedback through surveys or focus group - Adjust strategies based on observed outcome - Collections of need-based assessment	7		
15	Reporting and Knowledge Sharing	-Prepare and submit reports to government or funding agencies. - Host knowledge-sharing events or workshops.	3		

7. Monitoring and Evaluation

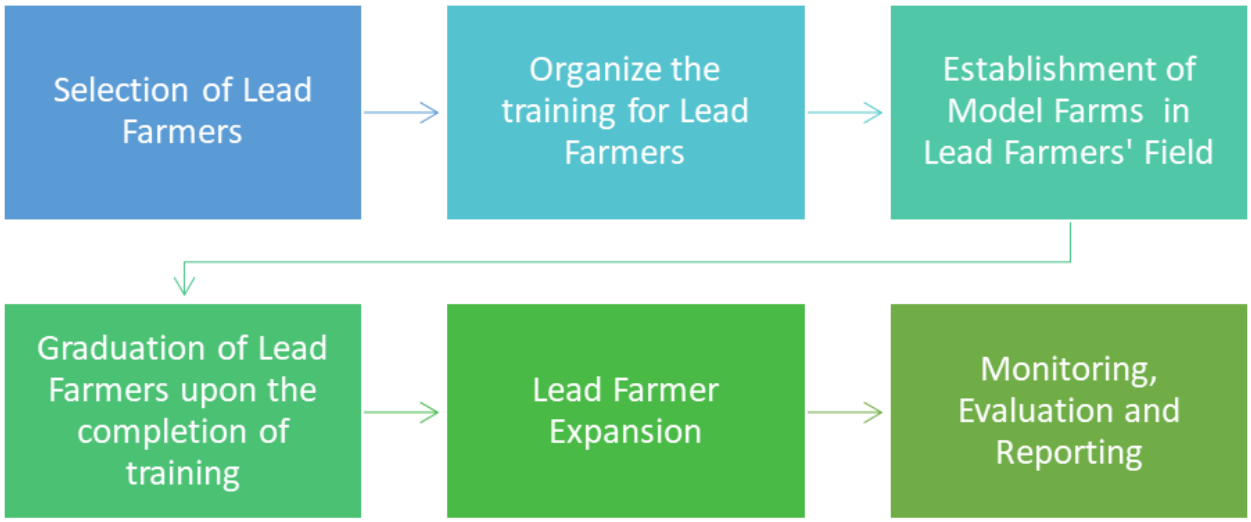
Monitoring and Evaluation of extension activities, outputs and impacts are key for success for extension programs. The extension services are provided in two ways; one as per the events of the annual work plan that has been planned in advance and other in response to day-to-today interaction with the farmers as follow up activities.

The effectiveness of agriculture extension programs is dependent on proper planning and monitoring and evaluation of extension activities, outputs, and resultant impacts. The extension services are provided either through systematically scheduled interventions outlined in the annual work plan or through adaptive, demand-driven support that emerges from day-to-day interactions with farmers and follow-up interactions with farming communities

Extension service delivery is operationalized through two principal mechanisms: first, through systematically scheduled interventions outlined in the annual work plan; and second, through adaptive, demand-driven support that emerges from continuous engagement and follow-up interactions with farming communities.

Annexures

Annexure 1. Flow chart for Lead Farmer Approach



Annexure 2. ***Training Calendar for the training of Lead Farmers***

Training Programs	Duration	When	Course content	Responsibility
Course 1: Awareness on farming technology options	3 days	September	Session 1: Available technologies in center.	*ARDC*
			Session 2: Available technologies on post-harvest technology	*NPHC*
			Session 3: Lead farmer approach	*ARDC*
			Session 4: Marketing opportunities	*RAMCO*
			Session 5: Climate smart agriculture technologies	*ARDC*
Course 2: Crop establishment and management practices	8 days	Dec - Jan	Session 1: Orchard establishment techniques	*ARDC (Horticulture)*
			1.1 Orchard layout, planting method	
			1.2 Pruning and Training	
			1.3 Plant propagation and nursery management	
			Session 2: Vegetable production	*ARDC (Horticulture)*
			2.1 Poly house technology	
			2.2 Vegetable seed production	

			2.3 Vegetable production technologies	
			Session 3: Value addition and product development of maize	*ARDC/NPHC/ RAMCO*
			Session 4: Mushroom production	*ARDC (Mushroom)/NMC*
			4.1 Oyster production	
			4.2 Shiitake production	
			Session 5: Farm record keeping	*RDTC*
Course 3: Crop management technologies	8 days	April - May	Session 1: Plant protection	*NPPC/NCOA*
			1.1 Conventional practices	
			1.2 Organic practices	
			Session 2: Soil fertility management	*NSSC*
			2.1 Conventional practices	*NCOA*
			2.2 Organic practices	
			Session 3: Water management technologies	*ARDC (Technical Support Service)*
			Session 4: Seed selection for maize	*ARDC (Field Crops)*
			Session 5: Fruit thinning	*ARDC (Horticulture)*
			Session 6: Nursery raising for rice	*ARDC (Field Crops)*
Course 4: Post – harvest and marketing	7 days	Aug – Sept	Session 1: Seed selection for rice	*ARDC (Field Crops)*
			Session 2: Value addition of fruits and vegetables	*NPHC*
			2.1 Fresh fruits and vegetables	
			2.2 Product development & processing	
			Session 3: Marketing	*RAMCO*
			Session 4: Farm record keeping	*RDTC*
			Session 5: Training closing	*ARDC*