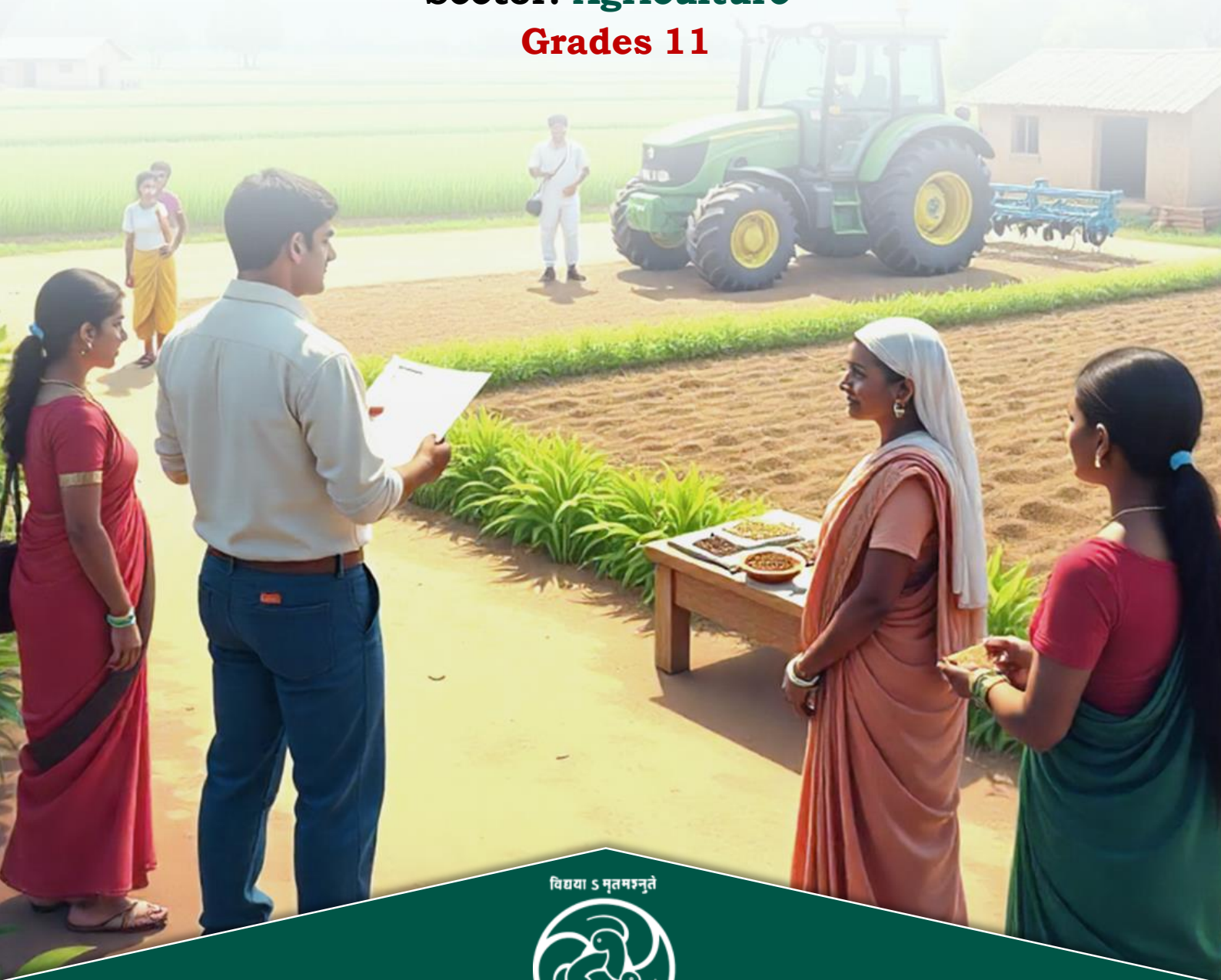
Draft Study Material

Agriculture Extension Service Provider

(Qualification Pack: Ref. Id. AGR/Q7601)

Sector: Agriculture

Grades 11



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Preface

Vocational Education is a dynamic and evolving field, and ensuring that every student has access to quality learning materials is of paramount importance. The journey of the PSS Central Institute of Vocational Education (PSSCIVE) toward producing comprehensive and inclusive study material is rigorous and time-consuming, requiring thorough research, expert consultation, and publication by the National Council of Educational Research and Training (NCERT). However, the absence of finalized study material should not impede the educational progress of our students. In response to this necessity, we present the draft study material, a provisional yet comprehensive guide, designed to bridge the gap between teaching and learning, until the official version of the study material is made available by the NCERT. The draft study material provides a structured and accessible set of materials for teachers and students to utilize in the interim period. The content is aligned with the prescribed curriculum to ensure that students remain on track with their learning objectives. The contents of the modules are curated to provide continuity in education and maintain the momentum of teaching-learning in vocational education. It encompasses essential concepts and skills aligned with the curriculum and educational standards. We extend our gratitude to the academicians, vocational educators, subject matter experts, industry experts, academic consultants, and all other people who contributed their expertise and insights to the creation of the draft study material. Teachers are encouraged to use the draft modules of the study material as a guide and supplement their teaching with additional resources and activities that cater to their students' unique learning styles and needs. Collaboration and feedback are vital; therefore, we welcome suggestions for improvement, especially by the teachers, in improving upon the content of the study material. This material is copyrighted and should not be printed without the permission of the NCERT-PSSCIVE.

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Date: 30 June 2025

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Module 1 Introduction to Agriculture Extension Service Provider

Module Overview

Agricultural extension is essential for empowering farmers with up-to-date knowledge and skills to improve productivity and sustainability. It helps them adopt new technologies, manage resources efficiently and make informed decisions. Extension services also connect farmers to markets, credit, and government schemes, enhancing their livelihoods. Agricultural Extension Service Providers (AESPs) play a crucial role in bridging the gap between research institutions and farming communities. They serve as vital agents of change, facilitating the dissemination of scientific knowledge, technologies, and best practices to farmers.

This module introduces students to the foundational principles of Agricultural Extension Services, emphasizing their crucial role in enhancing agricultural productivity and supporting rural development. In Session 1, students will explore the concept of an Agriculture Extension Service Provider, understanding their function as a bridge between research institutions and farmers. The session highlights the importance of transferring scientific knowledge, promoting improved farming practices, and facilitating access to agricultural innovations for sustainable development. Session 2 focuses on the various issues and challenges faced by Agriculture Extension Service Providers, including limited resources, communication barriers, and the need to engage with diverse farming communities.

Learning Outcomes

After completing this module, you will be able to:

- Describe the role and importance of Agriculture Extension Service Providers in facilitating knowledge transfer and improving farming practices.
- Analyze the common issues and challenges faced by Agriculture Extension Service Providers and propose strategies to address them effectively.

Module Structure

Session 1: Concept of Agriculture Extension Service Provider

Session 2: Issues and Challenges of Agriculture Extension Service Provider

Session 1: Concept of Agriculture Extension Service Provider

Definition of Extension

Extension is an education and its purpose is to change the attitude and practices of the people with whom work is done. Extension is a continuous process designed to make the rural people aware of their problem and indicating to them the ways and means by which they can solve them. It involves not only education of rural people in determining their problems and methods of solving but also inspiring them towards positive actions in achieving them.

Do you know?

The word extension is derived from the Latin root 'ex' meaning 'out' and tension meaning 'stretching'. So, Extension literally means "stretching out" or "expanding knowledge outward."

Extension or Agriculture extension is a method or a series of methods by which the technical know-how of science is carried to and included in the practices of the cultivators.

Extension is an out of school education which emphasized on voluntary participation. It starts with the existing level of people and aims to lead them to socio-economic development through co-operation and active participation.

Concept

The concept of extension has combined the concern for the overall development of man with methodology and efficiency of a systematically organised educational programme. It is largely non-formal in nature. It not for the sake of learning alone rather it is problem-oriented education for action.

Extension by nature is an educational practice but it has been used to disseminate information. Our extension workers are trained to teach and tell rather than to elicit views and ideas or encourage sharing of experiences among the community members (Tuazon, 1991). There is need to think about ways and means to make extension education more interactive and human focussed.

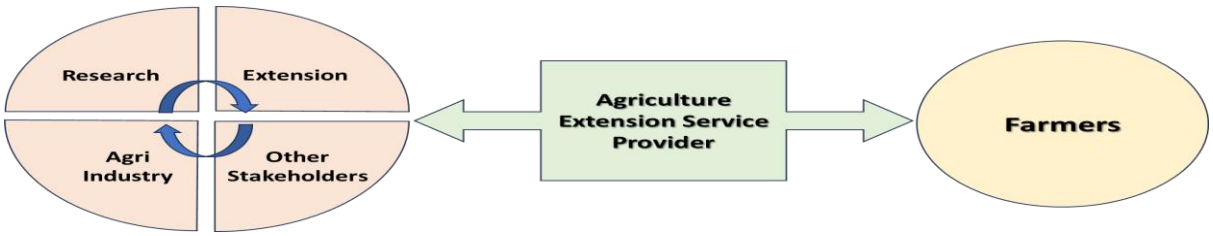

Fig 1.1: Role of AESPs

The need for extension arises out of the fact that the condition of the rural people in general and the farm people in particular, has got to be improved. There is a gap between what is the actual situation and what ought to be the desirable situation. This gap has to be narrowed down mainly by the application of science and technology in their enterprises and bringing appropriate changes in their behaviour.

Why Extension?

Scientists may develop better farming techniques, but farmers need help to understand and use them. Extension workers act as a link, teach farmers about new seeds, better irrigation, or pest control methods in a way that is easy to apply in the field. It's like having a guide who helps farmer learn and adopt new, beneficial practices for farming, animal husbandry or rural development.

Principles of extension

The principles of extension are relative and not necessarily fixed in importance or sequence. The principles discussed here are those which are either fundamental in nature or widely accepted in literature on the subject.

1. **Principles of interest and needs:** People's interests and people's needs are the starting points of extension work. To identify the real needs and interests of the people are challenging tasks. The extension agents should not pass on their own needs and interests as those of the people. Extension work shall be successful only when it is based on the interests and needs of the people as they see them.

2. **Grass-roots principle of organization:** Extension programme should start with local problems. Extension work should start with where people are and what they have. The establishment of the three-tier system namely, village panchayat, Block-samiti and Zila Parishad, followed by state legislatures and parliament satisfies the grass- roots principles of organization in the extension (Dhama and Bhatnagar, 1987).

3. **Principle of cultural difference:** In order to make extension programmes effective, the approach and procedures must be suited to the culture of the people who are to be taught different culture require different approaches. A blue print of plan of action designed for one region cannot be applied effectively to another region due to cultural difference.

4. **Principle of co-operation and participation:** Most members of the village community will willingly cooperate in carrying out a project which they helped to decide to undertake. It has been the experience of many

countries that people become dynamic if they are permitted to take decisions concerning their own affairs, exercise responsibility for and are helped to carry out projects in their own village.

5. **Principle of applied science and democratic approach:** Extension is an applied science; it is a two-way process. The problems of people/farmers are identified and taken to the concerned scientists, who on the basis of research and experimentation find out the solution best suited to their conditions. The extension worker then, with the various means disseminate these findings in such a way that the farm families can voluntarily adopt them to satisfy their own needs.

   However, it is democratic in a way that all possible solutions are placed before the participants and their merits are highlighted through mutual discussions. Ultimately the people are left free to decide their line of action, what method to be adopted in their local situations with their own resources and available government assistance.

6. **Principle of learning by doing:** "Farmers, like other people, hesitate to believe and set on theories; or even facts, until they see with their own eyes the proof of them in material form. We must in some way, bring this work to their personal attention. We must carry it home to them". However, learning by doing is most effective in changing people's behaviours. This develops confidence as it involves maximum number of sensory organs.

7. **Principle of trained specialists:** Trained specialist have to be provided, who keep themselves in touch with their respective research institutes on the one hand and extend to the extension worker, meaningful terms, the latest scientific developments, which have scope for adoption in particular areas.

8. **Principle of adaptability:** Extension work and extension teaching methods must be flexible and adopted to suit the local conditions. This is necessary because the people, their situation, their resources and constraints vary from place to place & time to time.

9. **Principle of leadership:** The involvement of leaders in extension programmes is the one single factor that determines the success or failure of those programmes. Local leaders are the guardians of local thought and action and can be trained and developed to best serve as interpreter of new ideas to the villagers.

10. **Whole family principle:** The family is the unit of any society the members of the family have to be developed equally by involving all them, because: -

    a. The extension programme affects all members of the family.

    b. Family members have great influence in decision making.

    c. It creates mutual understanding.

    d. It balances farm and family needs.

    e. It provides an activity outlet for all.

    f. It assures family services to the community and society.

11. **Principle of satisfaction:** The end product of extension work should produce satisfying results for the people. Satisfying results reinforce learning and motivate people to seek further improvement.

Orientation to Agriculture Extension Service Sectors

Agriculture extension services provide farmers with information and education on new technologies, best practices and other innovations that can help improve their crop yields and overall production. This can include information on new seed varieties, irrigation systems, pest and disease management and alternative farming techniques. By providing farmers with access to this information, extension services can help farmers make more informed decisions about which technologies to adopt and how to use them effectively.

Additionally, by providing training and technical assistance, extension services can help farmers better understand and manage the risks associated with using new technologies, which can reduce the likelihood of production losses due to mistakes or unexpected challenges.

Overview of agriculture extension system

Agricultural Extension System in India is multi-tiered institutional framework that supports farmers through research, training and advisory services. At the national level, the Ministry of Agriculture and Farmers Welfare oversees key organizations such as Department of Agricultural Research and Education - Indian Council of Agricultural Research (ICAR), Department of Agriculture & Farmers Welfare and Department of Animal Husbandry and Dairying which are responsible for agricultural research, animal husbandry and extension policies. Institutions like National Institute of Agricultural

Extension Management (MANAGE), National Institute of Agricultural Marketing (NIAM) and EEI support capacity building and market linkages, while National Dairy Development Broad (NDDB) and National Fisheries Development Board (NFDB) focus on dairy and fisheries development.

At the state, district and grassroots levels, the extension system includes 731 Krishi Vigyan Kendras (KVKs) under 11 Agricultural Technology Application Research Institutes (ATARI), three Central Agricultural Universities, 63 Sate Agricultural, Veterinary and Horticulture Universities, Agricultural Technology Management Agency (ATMA) and Zonal Agricultural Research Station (ZARS)/Regional Agricultural Research Station (RARS), which ensure localized agricultural research and farmer training. Organizations like State Agricultural Management and Extension Training Institute (SAMETI) and Block Technology Team (BTT) work on skill development and technology dissemination. The private sector, cooperatives and Non-Governmental Organizations (NGOs) also play a critical role in agricultural extension, supporting Primary Producers, Farmer Producer Organizations (FPOs) and Farmer-to-Farmer Extension at the village level. This well-integrated structure ensures the flow of knowledge, resources and technologies from research institutions to farmers, enhancing agricultural productivity and rural livelihoods.

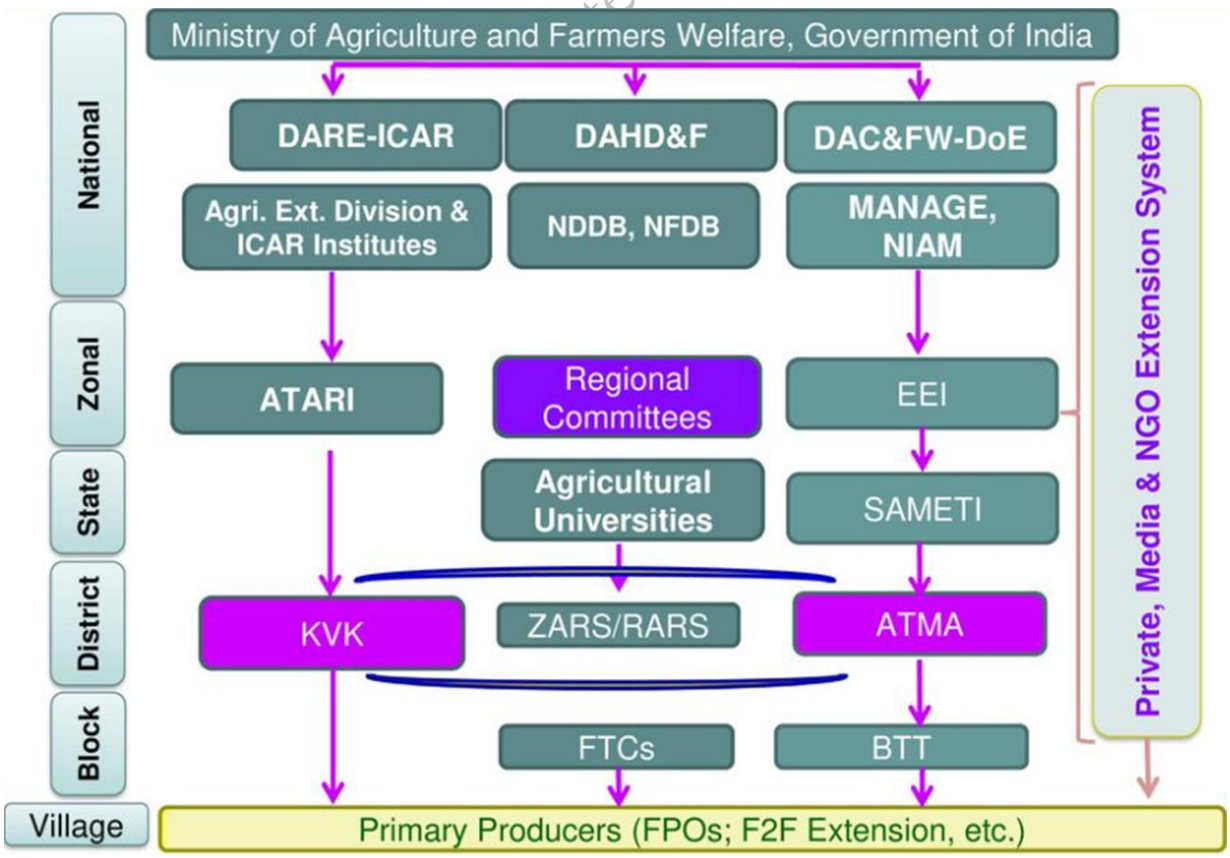

Fig 1.2: Agricultural extension system hierarchy (Source: Sontakki, 2016)

Multi-Agency Agricultural Extension System in India, highlighting both organized and unorganized sectors. The organized sector is divided into Public Extension and Private Extension. Under Public Extension, entities like State Development Departments (including Line Departments, Commodity Boards and Cooperatives) and Agricultural Universities & Research Institutes play a role. Additionally, Mass Media, including TV, radio, newspapers and IT applications, supports knowledge dissemination. The Private Extension sector consists of Private Companies (Input Dealers, Marketing Agents and Agri Input Companies), NGOs and Farmer Organizations that focus need-based activities and sector-driven initiatives. On the other hand, the Unorganized sector comprises Progressive Farmers, Agripreneurs and Para-Professionals, who contribute to agricultural extension in an informal manner. The diverse and multi-stakeholder approach of India's agricultural extension system ensures the widespread dissemination of agricultural knowledge and innovations among different categories of famers and stakeholders in diverse agroclimatic situation.

Size and Scope of the Agriculture Industry and Its Sub-Sectors

The agriculture industry is one of the largest and most significant economic sectors globally, contributing substantially to Gross Domestic Product (GDP), employment and food security. In India, agriculture plays a crucial role, employing nearly 42.3% of the total workforce and contributing approximately 18.2% to the national GDP (Economic Survey 2023-24). Given India's diverse agro-climatic conditions, the sector encompasses a wide range of activities, from traditional farming to modern agribusiness.

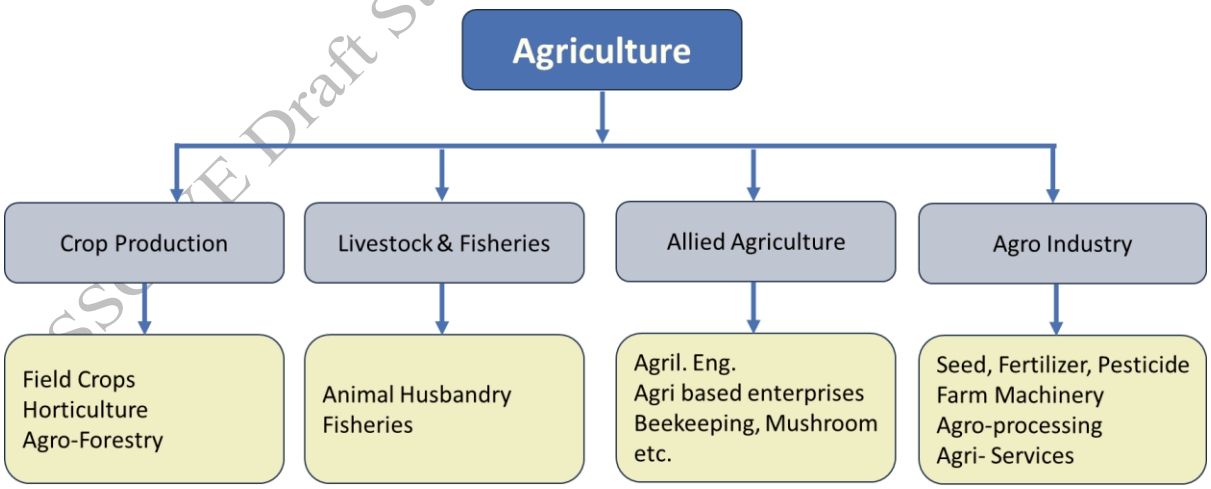

Fig 1.3: Sectors of Agriculture

The agriculture industry includes several sub-sectors, each contributing uniquely to the overall economy and employment landscape. Crop production is the backbone of Indian agriculture, with major staples including rice,

wheat, maize, pulses and oilseeds. Horticulture involves the cultivation of fruits, vegetables, flowers, spices and medicinal plants. India is the second-largest producer of fruits and vegetables globally, with key crops such as bananas, mangoes, potatoes and onions. The sector also supports significant export potential. Agroforestry, which integrates tree planting with farming, provides multiple benefits, including soil conservation, carbon sequestration and enhanced farmer income. Forestry contributes to sustainable resource management and raw materials for the paper and furniture industries.

Animal husbandry involves the rearing of livestock such as cattle, goats, sheep and poultry. India has the world's largest livestock population and is the leading producer of milk, with dairy farming being a major source of livelihood for rural populations. Poultry and meat production have also witnessed rapid growth due to rising demand for protein-rich diets. India is among the top fish-producing countries globally, with aquaculture contributing significantly to food production and exports. Coastal regions, rivers and artificial ponds support both marine and inland fisheries creating employment for millions of fish farmers and traders.

Agro-industry is auxiliary sector of agriculture. Seed industry providing high-yielding, pest-resistant and drought-tolerant seeds of crop. Fertilizer and pesticide industry providing input for farming. The agro-processing industry converts raw agricultural products into value-added goods such as packaged foods, dairy products and edible oils. This sector not only enhances food security but also generates employment in food processing, packaging and logistics. The integration of technology in farming through precision agriculture, drone technology, soil health monitoring and AI-based solutions is transforming Indian agriculture. Startups and agritech companies are offering digital solutions to improve productivity and market access.

Sector-wise Potential and Employment Opportunities in Agriculture

The digital transformation of India's agriculture sector is set to generate a wide range of employment opportunities, particularly in digital advisory services, supply chain management and precision farming technologies. With improved access to credit, farmers can invest in modern agricultural practices, potentially leading to the creation of around one million new jobs. Additionally, NABARD’s initiatives to support agri-based startups and rural enterprises are expected to further drive employment in rural areas.

The sector is also witnessing a rise in job opportunities across various domains. Agri-warehousing is expanding, creating demand for professionals such as warehouse managers, quality control inspectors, inventory managers and logistics coordinators to ensure efficient storage and distribution of

produce. The adoption of new agricultural technologies has opened avenues for careers in precision farming, including roles like drone operators, IoT device technicians, data analysts and agritech product developers. Horticulture is another growing sector, requiring skilled labour in greenhouse management, floriculture and organic farming, as well as marketing specialists for export-oriented produce. Animal husbandry and fisheries are seeing increased demand for livestock farm managers, dairy technologists and aquaculture managers. Additionally, agro-processing is expanding with opportunities in food packaging, quality control, machinery operation and supply chain logistics, adding value to raw agricultural products and enhancing job creation.

Another significant area of employment is the seed and input industry, agri cooperatives and FPOs, which plays a critical role in enhancing agricultural productivity. This sector requires skilled professionals formally educated or trained in agricultural skills. Furthermore, jobs in fertilizer, pesticide and farm equipment industries, including research scientists, production engineers, sales and marketing executives and extension officers are essential to supporting farmers with the latest inputs and technologies. As agriculture continues to evolve with digital and scientific advancements, it remains a key driver of employment and economic development in India.

- **Opportunities for Rural Youth and School Dropouts:** Rural youth can benefit from training in modern farming techniques, agribusiness management and farm mechanization. Government programmes like skill development initiatives offer vocational training, enabling young farmers to adopt sustainable and profitable agricultural practices. Skill development programmes and vocational training in farm mechanization, irrigation management and organic farming provide employment opportunities for school dropouts. Hands-on training in dairy farming, poultry management and rural agribusiness startups enables financial stability and self-employment. Custom Hiring Centers provide employment to rural youths and farmers enabling access to modern farm machinery to small and marginal farmers at affordable rental rates, increasing efficiency and reducing the cost of cultivation.

- **Opportunities for Women:** Women play a vital role in Indian agriculture, contributing significantly to farming, livestock rearing and agribusiness activities. Government schemes support women-led self-help groups (SHGs) in organic farming, dairy cooperatives and food processing units. Training in value addition, kitchen gardening and agro-based entrepreneurship provides financial independence to rural women. Namo Drone Didi Scheme promotes employment through the

use of drones in agriculture for spraying pesticides, fertilizers and monitoring crop health, enhancing productivity and avoiding manual labour shortage.

- **Opportunities for Educated Youth:** Educated youth can explore careers in agritech, research and agribusiness. Agri-Clinics and Agri-Business Centres (ACABC) scheme by NABARD aims to promote self-employment opportunities for agricultural graduates, diploma holders and other qualified individuals by encouraging them to establish agri-clinics and agri-business centers that provide professional extension services to farmers. Opportunities exist in precision farming, AI-driven agricultural analytics and digital platforms that connect farmers with markets. Positions in agricultural research institutions, extension services and start-up ecosystems encourage innovation in sustainable farming solutions.

- **Entrepreneurship in Agriculture:** Agricultural entrepreneurship is gaining momentum, with opportunities in organic farming, food processing, seed production and export businesses. Schemes like Attracting and Retaining Youth in Agriculture (ARYA) programme to encourage rural youth to engage in agriprenuship as a profitable and sustainable livelihood option. The scheme aims to reduce the migration of young people from rural to urban areas by creating gainful self-employment opportunities in agriculture and allied sectors. ARYA Enterprises opportunities in animal husbandry, fisheries and agro-processing industries provide additional income sources. Agripreneurs can leverage government incentives, loans and subsidies to establish startups in sustainable farming, farm-to-market supply chains and agro-based industries.

- **Agri-startups:** Agri-startups are emerging as a transformative force in India's agriculture sector, driving innovation, improving productivity and creating significant employment opportunities. With government support through schemes like RKVY-RAFTAAR, ACABC. These startups are modernizing traditional farming, enhancing value chains and addressing key challenges in agriculture. R-ABI plays a crucial role in job creation and rural economic development by fostering agri-startups that generate employment across various domains, including agribusiness, food processing, farm machinery, organic farming and agro-marketing.

Roles and Responsibilities of an Agricultural Extension Service Provider (AESP)

An Agricultural Extension Service Provider (AESP) is an individual that help farmers by providing useful information, advice and training. His/ Her main job is to teach farmers modern and improved farming methods to help them to improve the agriculture production and productivity.

Characteristics of a Good Agricultural Extension Service Provider (AESP)

Boonjing (2008) synthesize and categorize characteristics of agricultural extensionists based on the needs of the stakeholders, namely, farmers, agricultural extensionists, DOAE and the community and society. Five personal characteristics of agricultural extensionist were: knowledge, leadership, emotion, work skills and smartness.

1. Agricultural extensionist should have agricultural extension knowledge on agricultural technology, psychology, social context, policy management, agricultural extension system, agri-business management and systematic thinking **(Knowledge dimension).**

2. Agricultural extensionist should play a leading role to stimulate farmers' thinking and learning process; be ethical leader, be able do tackle farmers' problem in a creative way; be ready to work proactively and devotedly; work as a team; take a principal role on self-development, system development and farmers' network development **(Leadership dimension).**

3. Agricultural extensionist should understand themself and also could control their emotion, having high responsibility, be proud of and satisfaction with their lives including social relations **(Dimension of emotion).**

4. Agricultural extensionists should have capacity to work in the field, to work as a team and to cooperate in work that suitable to the conditions of the area **(Dimension of work skills).**

5. Agricultural extensionists should have good personality, trust worthy, sacrifice, dedication, leader's image, empowerment, discipline, honesty, transparency, intelligence, public mind and full of knowledge in agricultural extension **(Smartness Dimension).**

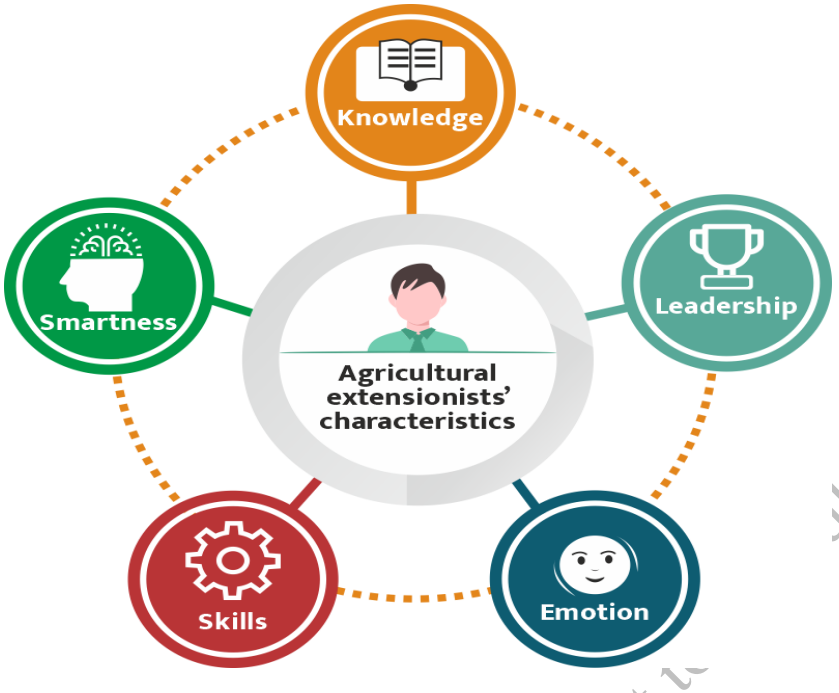

Fig. 1.4: KLESS model by Rujeepatchara Boonjing, 2008

Roles of an Agricultural Extension Service Provider (AESP)

Agricultural Extension Service Providers (AESPs) serve as a critical link between agricultural research and farmers. Their primary objective is to empower farmers by imparting practical knowledge, skills, and support that enhance agricultural productivity, sustainability, and profitability. AESPs facilitate the transfer of technology and innovations to the farming community, helping them adopt best practices and modern tools for improved farming outcomes. The following are the different roles of an Agricultural Extension Service Provider:

1. **Conducting Training and Demonstrations**: AESPs organize and conduct training sessions and on-field demonstrations to educate farmers about improved agricultural practices. They also provide hands-on guidance on the proper use, maintenance, and operation of agricultural machinery, tools, and implements.

2. **Dissemination of Agricultural Knowledge:** One of the key roles of an AESP is to disseminate relevant and updated information regarding crop production techniques, pest management, soil health, and sustainable farming practices. This helps farmers stay informed about new technologies and innovations.

3. **Planning and Implementation of Extension Services**: AESPs are responsible for systematically planning extension activities and implementing them effectively to ensure optimal outreach. This includes

scheduling training programs, selecting appropriate methods, and coordinating with stakeholders to maximize impact.

4. **Capacity Building of Farmers**: AESPs focus on enhancing the self-management and entrepreneurial abilities of farmers. Through training and continuous support, they help farmers develop skills necessary for managing their agricultural enterprises independently and sustainably.

5. **Effective Communication and Report Preparation**: Effective communication with farmers, agricultural stakeholders, and agencies is a vital role of AESPs. They also prepare detailed reports and presentations to document extension activities, share feedback, and guide future interventions.

6. **Promotion of Sustainable and Green Agricultural Practices**: AESPs advocate environmentally friendly and resource-efficient agricultural practices. They educate farmers about the importance of green skills, sustainable development, and conservation to ensure long-term agricultural productivity.

7. **Facilitation of Market Linkages**: AESPs assist farmers in establishing forward linkages with markets and backward linkages with input suppliers. This role is essential in improving farmers' access to quality inputs and fair prices for their produce, thereby enhancing their income.

8. **Formation and Strengthening of Farmer Groups**: Encouraging the formation and proper functioning of Self-Help Groups (SHGs), Farmer Interest Groups (FIGs), and Producer Groups (PGs) is an important role. These groups empower farmers through collective action and improved bargaining power.

9. **Awareness to Government Schemes**: AESPs educate farmers about various government schemes, subsidies, and support programs. They assist in the enrollment and effective utilization of these schemes to promote agricultural growth and welfare.

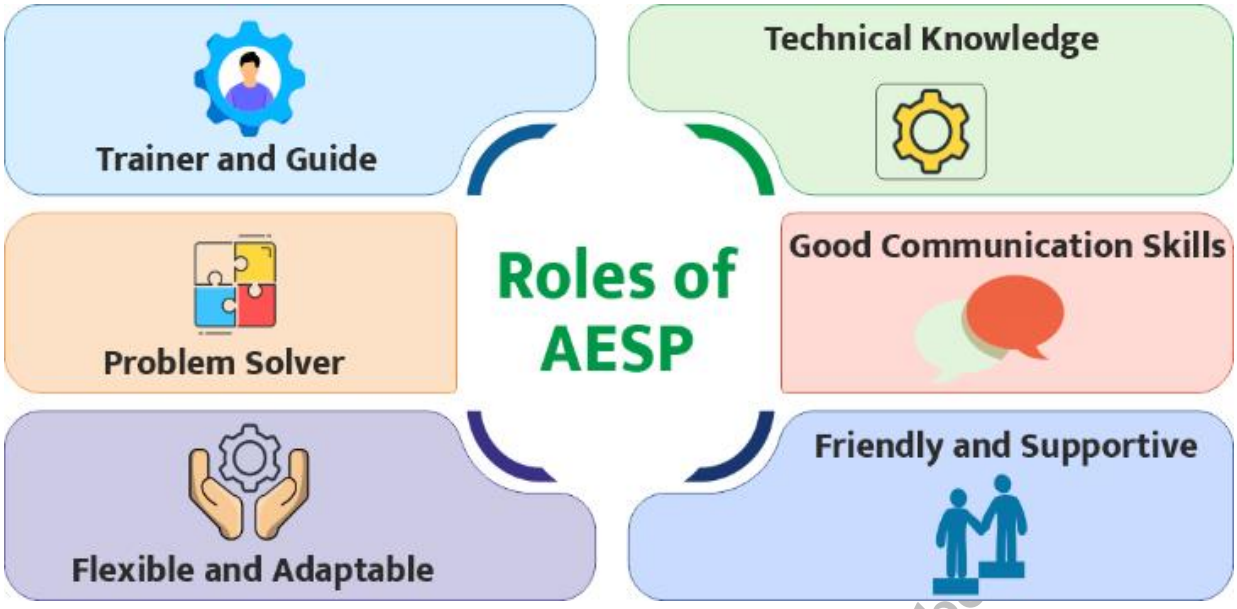

Fig. 1.5: Role of AESP

Perceived responsibilities of an Agriculture Extension Service Provider (AESP)

- Assists farmers in diagnosing problems related to crops, livestock and soil fertility etc.
- Disseminate knowledge about various scientific methods and technologies of agriculture production
- Develop network with local organizations, coordination of services and promote collaboration with development partners.
- Encourages the farmers to adopt progressive farming methods
- Informs farmers about government schemes, subsidies and support programmes
- Have basic knowledge of the geographical area under consideration
- Promote innovation platforms to facilitate knowledge management
- Connect farmers with scientists and agricultural specialists
- Connect farmers with financial institutions, cooperatives and market opportunities
- Conduct training sessions, field demonstrations and workshops on modern farming practices
- Implementing collaborative and pluralistic delivery of extension service
- Monitoring and documentation of the progress of extension initiatives

Practical Exercises

Activity

Visit nearby Krishi Vigyan Kendra or Farmers training centers (FTC) and interact with extension officials about various Agriculture Extension Service.

Materials required: Pen, pencil, notebook, etc.

Procedure:

- Visit a nearby Krishi Vigyan Kendra (KVK) or Farmers' Training Center (FTC).
- Interact with the extension officials and observe their activities.
- Note down the following information:
    - Types of agricultural extension services being offered
    - Types of training programs and demonstrations conducted
    - Method of communication and information dissemination
    - Target audience and farmer participation
    - Any innovative practices or technologies being promoted

Check Your Progress

Fill in the Blank

1. Extension is a _____-oriented education for action.
2. The principle of _____ and_____ is fundamental to successful extension work.
3. The concept of extension is largely _____ in nature.
4. Extension involves the application of _____ and technology to improve rural conditions.
5. The principle of _____ by doing helps change people's behaviour effectively.
6. The Ministry of Agriculture and Farmers Welfare oversees extension at the _____ level.

Multiple Choice Questions

1. Who defined extension as education aimed at changing people's attitudes and practices?

a. Dhama & Bhatnagar

b. Tuazon

c. Ensminger

d. Kumar & Hansra

2. Which principle highlights the importance of matching extension methods to local culture?

a. Principle of Leadership

b. Principle of Cultural Difference

c. Principle of Adaptability

d. Whole Family Principle

3. What is the primary goal of agricultural extension services?

a. To conduct farming

b. To educate only extension workers

c. To provide information and technical support to farmers

d. To replace traditional farming

4. The extension system in India includes how many Krishi Vigyan Kendras (KVKs)?

a. 731

b. 1021

c. 511

d. 623

5. Which principle suggests involving local leaders in extension programmes?

a. Principle of Satisfaction

b. Principle of Trained Specialists

c. Principle of Leadership

d. Principle of Applied Science

6. What type of education is agricultural extension primarily considered?

a. Formal education

b. Non-formal education

c. Distance education

d. Online education

7. Which agency supports capacity building in the Indian agricultural extension system?

   a. ICAR

   b. NABARD

   c. MANAGE

   d. KVK

8. Which sub-sector of agriculture involves fruits, vegetables, and flowers?

   a. Forestry

   b. Crop Production

   c. Animal Husbandry

   d. Horticulture

Subjective Question

1. Discuss the concept, principles, and need of agricultural extension.
2. Describe the size and scope of the agriculture industry and its sub-sectors in India.
3. What are the emerging employment opportunities in modern agriculture, and how are technology and agri-based startups contributing to this transformation?

Session 2: Issues and Challenges of Agriculture Extension Service Provider

What is paradigm? In science and philosophy, a paradigm is a distinct set of concepts or thought patterns, including theories, research methods, postulates and standards for what constitute legitimate contributions to a fizeld. The word paradigm is Greek in origin, meaning "pattern". According to Guba and Lincoln, 1998, Paradigm defined as sets of basic believes that deals with ultimate or first principles.

Types of paradigm in Agriculture Extension

Any particular extension system can be described both in terms of both how communication takes place and why it takes place. It is not the case that

paternalistic systems are always persuasive, nor is it the case that participatory extension initiatives are necessarily educational. Instead there are four possible combinations, each of which represents different extension paradigms for development as follows (NAFES, 2005):

i) **Technology Transfer for Development (Persuasive + Paternalistic):** This paradigm was prevalent in colonial times and reappeared in the 1970's and 1980's when the Training and Visit system was established in many Asian countries. Technology transfer involves a top-down approach that delivers specific recommendations to people about the practices they should adopt for development.

ii) **Advisory Development Work (Persuasive + Participatory):** This paradigm can be seen today where government organisations or private consulting companies respond to people's enquiries for development with technical prescriptions. It also takes the form of projects managed by donor agencies and NGOs that use participatory approaches to promote development through pre-determined packages of technology.

iii) **Human Resource Capacity Building for Development (Educational + Paternalistic):** This paradigm dominated the earliest days of extension in Europe and North America and later in Asia and Africa, when universities gave training to people who were too poor to attend full time courses. It continues, today, in the extension activities of colleges, research organizations and development departments around the world. Top-down teaching methods are employed, but people are expected to make their own decisions about how to use the knowledge they acquire for development.

iv) **Facilitation for Development (Educational + Participatory):** This paradigm involves methods such as exposing people to learning experiences and person-to-person exchange of extension communication. Knowledge is gained through interactive processes and the participants are encouraged to make their own ideas / decisions for development. The best known agricultural extension examples in Asia are projects that use Farmer Field Schools or participatory technology development.

Paradigm shift in Agriculture Extension

Paradigm shifts are a change from one way of thinking to another and a radical change in underlying beliefs. In the context of agricultural extension, it means moving away from traditional, linear, top-down models of technology

transfer to more inclusive, participatory, knowledge-intensive and system-based approaches.

There is a pressing need for paradigm shifts in agricultural extension to address the rapidly evolving challenges and expectations in the agriculture sector. Farmers today are no longer passive recipients of advice. They seek market intelligence, weather forecasts, input linkages, risk management strategies and post-harvest solutions in addition to basic production guidance. Traditional extension approaches are insufficient in addressing critical concerns like climate resilience, biodiversity conservation and maintaining ecological balance, which are essential in the face of growing environmental challenges. Moreover, modern farming has become increasingly complex and integrated, involving crops, livestock, forestry and allied enterprises, thus necessitating multi-disciplinary and holistic extension approaches.

The reality of declining public resources further demands extension models that are not only cost-effective and scalable but also built on strong partnerships with NGOs, private sector entities and community organizations. Additionally, conventional systems often overlook the significant roles of rural youth, farm women and marginalized groups, which limits the inclusiveness and impact of extension efforts. The rapid advancement of digital technologies such as precision farming tools, artificial intelligence and drone technology calls for the development of new competencies and modernized extension methods. Finally, farmers today operate in a highly dynamic environment and act as active decision-makers. Therefore, extension services must transition from a supply-driven to a demand-driven approach, ensuring that the support provided aligns with the real-time needs and aspirations of the farming community.

Paradigm shifts in agricultural extension are not optional they are essential to meet the evolving challenges and opportunities in agriculture. These shifts ensure that extension systems remain relevant, inclusive, efficient and impactful, especially in the context of sustainability, livelihoods and food security in the 21st century.

Changing paradigm of Agriculture Extension Services

The following paradigm shifts have taken place in agricultural extension services which have a lot of implications for extension service providers to revitalize extension delivery.

- **From Green to Evergreen Revolution:** The green revolution has demonstrated India`s capabilities to balance agricultural and human

growth. However, it has also created social economic and environmental imbalances. Now Agriculture is at a cross roads. In developing countries like India, agriculture is not just for food production but it is the backbone of the livelihood security of the majority of the population. Therefore, there is a need for sustainable practices where large small-scale farmers in rain-fed areas are involved. Therefore, the evergreen revolution is needed for sustainable advances in crop productivity per unit of land, water and time without associated ecological harm.

- **From Traditional Farming to Agribusiness:** Farming was once viewed primarily as a means of survival a way to earn a basic livelihood and feed one's family. There was little emphasis on planning, financial management or market engagement. Today, this mindset is changing, as farming is increasingly being treated as a full-fledged business. Farmers are now encouraged to adopt agribusiness principles, such as proper planning, record-keeping, quality control, value addition, branding and marketing. This transformation enables them to make informed decisions, manage resources efficiently and maximize profits. For example, a fruit grower might sort, grade and neatly package produce to attract better prices in urban markets, while maintaining records of input costs and sales to evaluate profitability. This business-oriented approach enhances income opportunities and brings professionalism into agriculture.

- **From One-Specialist Help to a Team of Experts:** In the traditional extension approach, farmers usually received advice from a single specialist, often focused on a specific area such as crop science. This limited the scope of guidance and failed to address the diverse challenges faced by farmers in a holistic manner. However, the current agricultural extension model has shifted towards a more integrated and multidisciplinary approach. Now, teams of experts including crop scientists, animal husbandry specialists, soil health experts and market advisors work collaboratively to support farmers. This team-based approach ensures that farmers receive comprehensive, well-rounded guidance that covers various aspects of farming, such as crop planning, livestock management, soil and water conservation, pest and disease control, value addition and market linkages. As a result, farmers are better equipped to make informed decisions that enhance productivity, sustainability and profitability in the long run.

- **From Only Crop Technology to Many Technologies:** Previously agricultural development efforts were primarily centered on improving crop production techniques, with limited attention given to other

aspects of farming. The focus was on enhancing yields through better seeds, fertilizers. However, the modern approach to agriculture has expanded to include a wide range of technologies beyond just crops. Today, farmers are being introduced to eco-friendly and sustainable practices, such as natural and organic farming methods, integrated pest management and conservation agriculture. Biotechnology has also become a vital part of this transformation for instance, Bt cotton, a genetically modified crop that resists specific pests, has been widely adopted by farmers to increase yield and reduce dependence on chemical pesticides. Alongside crop innovations, farmers are also learning improved techniques for animal husbandry, fisheries and agroforestry, enabling them to diversify income sources and make their farming systems more resilient and profitable.

- **From Supply-Driven to Demand-Driven Farming:** Earlier, farming was largely supply-driven, where farmers cultivated crops based on external recommendations or traditional practices without much consideration for actual market demand. This often led to overproduction of certain crops, resulting in market gluts, low prices and post-harvest losses. In contrast, the modern agricultural approach emphasizes demand-driven farming, where farmers are encouraged to grow crops that align with consumer preferences and market trends. This shift helps ensure better price realization and reduces the risk of unsold produce. For example, instead of growing large quantities of tomatoes that may flood the market and remain unsold, a farmer might choose to cultivate high-demand fruits or vegetables that fetch better prices in local or regional markets. This approach not only increases farm profitability but also strengthens the link between production and consumption, making agriculture more market-oriented and sustainable.

- **From On-Farm Jobs to Off-Farm Jobs:** In the past, agricultural livelihoods were almost entirely dependent on traditional on-farm activities like crop cultivation. This limited income opportunity and made rural households highly vulnerable to risks such as crop failure due to pests, droughts, or market fluctuations. Today, there is a growing emphasis on promoting off-farm and allied activities alongside farming to diversify income sources and enhance economic resilience. Farmers are now encouraged to engage in small-scale enterprises such as dairy farming, poultry, goat rearing, beekeeping, mushroom cultivation and food processing. These ventures not only provide additional income but also generate year-round employment for rural families. For instance, a farmer may set up a small dairy unit on his

farm or mushroom production unit, which ensures a steady income even if the crop yield is affected due to unforeseen circumstances. This integrated approach contributes to livelihood security, reduces migration pressures and helps build a more robust rural economy.

- **From Self-Reliance to Self-Sufficiency:** Traditionally, farming in many parts of India was centered around self-reliance, where farmers primarily used their own limited resources to produce just enough to meet their family's needs. There was minimal surplus for sale and limited integration with the market economy. However, the modern agricultural approach encourages farmers to move towards self-sufficiency, where they not only meet their household requirements but also produce surplus for commercial purposes. This shift empowers farmers to become economically independent and actively participate in local and regional markets. For example, instead of growing vegetables solely for home consumption, a farmer now cultivates a larger quantity to sell at nearby markets, generating additional income. This transition from subsistence to market-oriented farming strengthens rural livelihoods, enhances food availability and contributes to the broader economy.

- **From One-Source Help to Many Sources Working Together:** Previously, agricultural support and information were provided almost exclusively by government extension services, which often had limited reach and resources. Today, agricultural development is supported by a collaborative network of stakeholders, including government agencies, private companies, non-governmental organizations, research institutions and farmer producer organizations. This multi-stakeholder model leverages the strengths of each partner to provide more holistic, timely and practical support to farmers. For example, a government agricultural department might work with a local cooperative to organize training, while a private company supplies improved seeds and digital tools for farm management. This collective effort enhances the quality and accessibility of services, helping farmers adopt better practices and improve productivity and profitability.

Challenges and Future Prospects of Agricultural Extension Service Providers

Agricultural Extension Service Providers (AESP) play a key role in educating farmers, promoting new technologies and improving agricultural productivity. However, they face several challenges in the modern agricultural landscape.

At the same time, there are many opportunities and future prospects to make extension services more effective and impactful.

Challenges in Agricultural Extension Services

1. **Lack of Trained Manpower and Resources**: Many extension officers experience a heavy workload due to limited staff availability. Additionally, shortages of funds and infrastructure restrict the ability to reach all farmers effectively. For example, in remote villages, farmers often do not receive timely advice because extension workers are unable to visit them frequently.
2. **Limited Farmer Awareness and Participation**: A significant number of farmers, especially smallholders, remain unaware of available extension services. Furthermore, lack of interest or mistrust in government programs can reduce farmer participation. For instance, some farmers prefer traditional farming methods over modern techniques simply due to a lack of awareness.
3. **Slow Adoption of New Technologies**: Farmers may hesitate to adopt new agricultural technologies due to fears of failure or high associated costs. The absence of demonstration farms and practical training sessions further slows technology transfer. For example, despite the benefits of drip irrigation, many farmers continue using flood irrigation, leading to inefficient water usage.
4. **Climate Change and Environmental Challenges**: Unpredictable weather patterns, droughts, and floods adversely affect agricultural production. There is an urgent need to promote climate-smart agriculture and disaster-resilient farming practices. In Assam, frequent floods during the monsoon season destroy standing crops, yet many farmers lack access to flood-tolerant crop varieties or effective water management techniques.
5. **Inadequate Market Linkages and Price Fluctuations**: Farmers often sell their produce at low prices due to dependence on middlemen and lack of direct access to markets. There is also limited awareness about demand-driven agriculture and value addition. For example, tomato farmers may face financial losses when overproduction causes prices to plummet.
6. **Low Use of Digital Tools and Information Communication Technology (ICT)**: Although digital agriculture is growing rapidly, many farmers do not have access to mobile applications, the internet, or digital literacy. Extension officers themselves often require training to utilize digital advisory tools effectively. For example, weather update mobile apps exist, but many small farmers in Bihar do not use them due to low smartphone penetration.

7. **Weak Public-Private Coordination**: Coordination between government extension services and private agribusinesses is often inadequate. Improved partnerships are necessary to expand outreach and enhance the quality of extension services. For instance, while private companies supply high-quality hybrid seeds, government agencies may not always provide training on their proper use.
8. **Migration and Declining Interest in Farming**: Rural youth migration to urban areas leads to labour shortages in agriculture. Additionally, low income and lack of incentives discourage young people from pursuing farming. An example is when rural youth prefer city jobs over continuing their family's farming business.
9. **Gender Inequality in Agricultural Extension**: Women farmers, who contribute significantly to agriculture, frequently receive less extension support than men. There is a pressing need for gender-inclusive training programs. In some villages, agricultural training is offered exclusively to men, despite women performing most of the farm work.

Despite these challenges, there are many opportunities to improve and strengthen agricultural extension services in the future. Public-private partnerships offer potential to scale up outreach and improve input and knowledge delivery. Youth can be re-engaged through entrepreneurship opportunities and modern agri-tech tools, while gender-inclusive programmes can ensure women farmers receive equal support and training. These combined efforts can transform extension services into a more dynamic, responsive and inclusive support system for all farmers.

Future Prospects for Agricultural Extension Services

Future prospects for agricultural extension services in India are evolving with increasing integration of digital technologies, agri-startups and precision farming.

Emerging Pathways for Agricultural Extension

Future extension services will rely on digital tools, climate-smart practices and stronger partnerships. Focus is shifting to inclusive, tech-driven and market-oriented advisory systems.

The government's role is shifting towards policy facilitation and capacity building, while private players and NGOs are becoming key in-service delivery and innovation. Public sector institutions continue to anchor research-based knowledge dissemination, fostering collaboration among stakeholders for sustainable growth.

1. **Digital and ICT-Based Extension:** The use of digital technologies is transforming agricultural extension. Mobile applications, SMS services, WhatsApp groups, and social media platforms can provide farmers with instant access to agricultural advice. Additionally, AI-powered chatbots and virtual advisory services offer scalable solutions to reach a larger number of farmers with personalized recommendations.

2. **Climate-Smart and Sustainable Agriculture:** Extension services are increasingly promoting climate-resilient crops, water conservation techniques, and organic farming methods. Training farmers on sustainable agricultural practices helps protect soil health and biodiversity, ensuring long-term environmental sustainability.

3. **Market-Oriented and Demand-Driven Extension:** Farmers are encouraged to cultivate crops based on current market demands rather than traditional preferences. Strengthening linkages between farmers, processors, and retailers ensures better market access and fair prices, leading to increased profitability.

4. **Strengthening Public-Private Partnerships:** Collaboration between government agencies and private agribusinesses is vital for delivering comprehensive extension services. NGOs and cooperatives also play a significant role in bridging gaps, providing training, and ensuring the availability of quality inputs to farmers.

5. **Youth Engagement in Agriculture:** To attract rural youth to agriculture, promoting agripreneurship (agricultural entrepreneurship) is essential. Skill development programs tailored for young people help build their capacities in agribusiness, making farming a more viable and attractive career option.

6. **Strengthening Women's Role in Extension:** Extension programs need to be gender-inclusive by designing training specifically for women farmers. Increasing the recruitment of women extension officers encourages greater female participation and addresses gender disparities in agricultural support.

7. **AI, Drones, and Precision Agriculture:** Advanced technologies such as artificial intelligence (AI) and drones are being used for soil testing, pest control, and crop monitoring. Training farmers in the use of these modern tools can significantly enhance productivity and resource efficiency.

8. **Farmer-Led Extension and Peer Learning:** Encouraging experienced farmers to share their knowledge with peers fosters community-based

learning. Establishing "model farms" provides practical examples where farmers can observe and adopt successful agricultural practices first hand.

Practical Exercises

Activity

Identify one extension service organization and enlist their challenges and future prospects from secondary source (books, internet, magazine, etc.)

Materials required: Pen, pencil, notebook, Internet/Books/Magazines, etc.

Procedure:

- Identify and select one agricultural extension service organization.
- Collect information from secondary sources such as books, internet, magazines, or research articles.
- Note down the following details:
    - Name of the extension service organization
    - Objectives and major services offered
    - Target Audience
    - Major achievement
    - Any innovative practices or success stories adopted by the organization

Check Your Progress

Fill in the Blank

1. The word paradigm is derived from the _____ language.
2. The Technology Transfer paradigm follows a _____ approach.
3. The Facilitation for Development paradigm encourages people to make their own _____.
4. Modern farming emphasizes a _____driven rather than a supply-driven approach.

Multiple Choice Questions

1. What does the term "paradigm" primarily mean?
    a. Growth

b. Pattern
c. Advice
d. System

2. Which paradigm involves persuasive and participatory approaches?
    a. Facilitation
    b. Technology Transfer
    c. Advisory Development
    d. Capacity Building
3. Farmer Field Schools are an example of which paradigm?
    a. Technology Transfer
    b. Advisory Work
    c. Human Capacity Building
    d. Facilitation for Development
4. Which of the following is a key component of agribusiness?
    a. Flood irrigation
    b. Branding and marketing
    c. Crop rotation
    d. Crop bundling
5. What is the biggest limitation of traditional supply-driven farming?
    a. High profit
    b. Lack of rainfall
    c. Labour shortage
    d. Market saturation
6. What is a common challenge faced by extension service providers?
    a. Farmer participation
    b. High technology adoption
    c. Surplus manpower
    d. Excess funding

Subjective Question

1. Explain the different paradigms of agricultural extension with suitable examples. How do they differ in terms of communication and participation?
2. What is a paradigm shift in agricultural extension? Why is it essential in today's agricultural context?
3. Describe the changing paradigms in agricultural extension services.

Module 2 Planning and Implementation of Agricultural Extension Services

Module Overview

This module equips students with the knowledge and skills required for effective planning and implementation of Agricultural Extension Services aimed at empowering farmers and improving agricultural outcomes. In Session 1, students will learn about planning strategies for delivering effective extension services, focusing on the identification of farmers' needs, resource allocation, stakeholder involvement, and the formulation of realistic, goal-oriented extension plans. Session 2 covers the implementation phase of agricultural extension programmes, introducing students to various tools, methods, and technologies used to deliver services to farmers. This includes practical approaches to communication, demonstration, and capacity-building activities, all aimed at ensuring the successful transfer of knowledge and innovation to the farming community.

Learning Outcomes

After completing this module, you will be able to:

- Explain the key components and steps involved in planning effective agricultural extension services tailored to farmers' needs.
- Describe the process of implementing agricultural extension programmes and identify relevant tools and methods used to deliver services to farmers effectively.

Module Structure

Session 1: Planning for Effective Extension Services

Session 2: Implementation of Agricultural Extension programme services and relevant tools to provide Agricultural Extension Services to farmers

Session 1: Planning for Effective Extension Services

Extension services play a vital role in rural and agricultural development. Effective extension service delivery depends heavily on sound planning and organized implementation. This session introduces the key concepts and terminology related to planning in extension work. Understanding these terms—such as plan of work, project, calendar of work, aim, goal, and objective—helps extension professionals structure their activities efficiently and achieve desired outcomes. It also emphasizes the importance of comprehensive programme planning for long-term and short-term

development goals. Here are different words related to planning, each having a specific meaning and importance in the process of planning extension services:

- **Plan or Plan of work** is an outline of activities so arranged as to enable efficient execution of the entire programme. It answers the questions of what, why, how, when, where and by whom the work is to be done.

- **Project** is a single item of the annual plan focused on solving a particular problem using a defined method. Calendar of work is a timeline-based plan that arranges tasks in the order they are to be completed. It acts as a schedule indicating when each stage of the work should be completed.

- **Objective** is a direction of action. A clearly stated objective is always measureable. It is also said to be a goal of growth.

- **Aim** is a broad objective. It is a generalised statement of direction and may have several objectives. It is also said to be an end in view to give direction to the creative process.

- **Goal** is a distance in any given direction, proposed to be covered in a given time.

- **A programme** can be defined as all the job being done in a particular setting.

Planning

Planning is a process that involves studying the past, and present in order to predict the future and in the light of that predication the goals to be achieved and what must be done to reach them.

Planning is also defined as the process which includes decision on what to do, how to do it, and when to do it. It also entails setting goals, identifying and listing resource requirement and developing a course of action to achieve those goals. A proper planning helps organizations and individuals to manage their relationships with the future by making decisions that will influence future actions and outcomes.

Extension Programme Planning

According to **Kelsey and Hearne (1967)** Extension Programme is a statement of situation, objectives, problems and solutions.

Leagans (1961) says that an "extension programme" is a set of clearly defined, consciously conceived objectives or ends, derived from an adequate analysis of the situation, which are to be achieved through extension teaching activity'.

Based on above definitions it is clear that an extension programme is a written statement. It can also be called as the end product of extension programme planning. A well written extension programme plan will includes a statement of situation, objectives, problems and solutions. It also illustrates long-term as well as short-term programme objectives. The extension programme plan forms the basis of extension teaching plans and has been drawn up in advance.

Importance of Programme Planning

Programme planning helps in understanding the statement of purpose both by the extension workers and the people. The reasons for having a programme may be specifically stated as follows (Kelsey and Hearne, 1967).

1. To ensure careful consideration of what is to be done and why.
2. To furnish a guide against which to judge all new proposals.
3. To establish objectives towards which progress can be measured and evaluated.
4. To have a means of choosing the important (deep rooted) from incidental (minor, less important) problems and the permanent form temporary changes.
5. To develop a common understanding about the means and ends between various functionaries and organizations.
6. To ensure continuity during changes in personnel.
7. To help develop leadership.
8. To avoid waste of time and money and promote efficiency.
9. To justify expenditure and to ensure flow of funds.
10. To have available in written form a statement for public use.

Principles of Extension Programme Planning

Improving rural life through individual, group and community action is the definite purpose of extension programme. The planning of these programmes

is guided by certain fundamental principles that remain applicable, regardless of the type of audience or the activities they are engaged in, viz.

1. Extension programmes must be based on an analysis of the past experiences, present situation and future needs: To determine appropriate programmes, it is essential to gather comprehensive data about the people and their circumstances. This present information should be analyzed and interpreted in light of past experiences, involving local communities in the process. Such an approach helps in accurately identifying and addressing future needs.

2. Extension programmes should have clear and significant objectives, which could satisfy important needs of the people: The primary objective of programme development is to address the needs of people. To achieve this, it is important to identify and clearly define specific objectives that reflect the most pressing needs of the community. The emphasis will be on what is realistic and achievable rather than on what is ideal although one should not lose sight of the ideal. It is also to be noted that rural people may face a variety of issues but at the same time all problems cannot be addressed simultaneously due to limited resources. Therefore, priorities must be set based on the significance of the objectives, as well as the availability of time and resources.

3. Extension programmes should clearly indicate the availability and utilization of resources: To ensure that a programme is practical and feasible, it is essential to clearly specify the availability of funds, facilities, supplies, and required personnel and a detailed plan on how these resources will be effectively utilized.

4. **Extension programmes should have a general agreement at various levels and involve local people and institutions:** Programme can be prepared at various levels such as village, district, state and national levels. The extension programme of any department or level should not be conflict or contradict with the extension programme of the any other department or level. Extension programme are implemented at local level. Therefore, local people should be involved in all stages starting from programme formulation to programme implementation. It is also worth noticing that extension programme cannot be implemented in isolation. It requires the support of many institution and organizations. The programme should broadly indicate the institutions and organizations to be involved and how they shall contribute in attaining the programme objectives.

5. **Extension programme should have definite plan of work and provision for evaluation:** The work plan may be separately developed or incorporated in the programme. The programme should at least broadly indicate how it will be implemented. The programme should make provision for periodical monitoring and evaluation of results to assess progress. Based on the findings of evaluation, the programme can always be suitably modified for attainment of objectives within the stipulated time.

6. **Extension programmes should provide for equitable distribution of benefits amongst the members of the community:** In community generally resource full persons benefited more compared to resource poor in any programme. As this leads social disparity and tension therefore As this creates social disparity and social tension, the extension programmes planning should give adequate emphasis on the weaker section of the community.

Planning for Agriculture Extension

Participatory Agricultural Extension Programme Planning

Participatory Agricultural Extension is an approach that actively involves farmers in the development of agricultural programs. Farmers are considered important stakeholders who take part in decision-making, planning, and implementation of agricultural policies and programs.

Key Principles:

- **Community Participation:** Farmers are included in every stage of the planning process.
- **Relevance:** Agricultural programs should address the real needs and concerns of farmers.
- **Sustainability:** Programs should focus on long-term solutions by strengthening local knowledge and skills.
- **Flexibility:** Extension programs should be adaptable to suit different farming communities and their specific conditions.

Levels of Participation

There may be several levels of participation by the people. Following **Pretty (1994)**, these are:

1. **Passive participation:** People participate by being informed what is going to happen or has already happened. It is a one-sided communication from the administration or project management, with no consideration for the people's feedback or input.

2. **Participation in information giving:** People participate by responding questions asked by extractive researches using questionnaire survey or similar approaches. People do not have the opportunity to influence proceedings, as the findings of the researches are neither shared nor checked for accuracy.

3. **Participation by consultation:** People participate by being consulted, and external agents listen to views. These external agents define both problems and solutions and may modify these in the light of people's responses. Such a consultative process does not concede any share in decision making, and professionals are under no obligation to accept people's views.

4. **Participation for material incentive:** People participate by offering resources such as land, labor, or irrigation in exchange for external inputs like seeds, fertilizers, pesticides, or even cash rewards. In the case of on-farm trials, their involvement tends to be limited, with minimal knowledge sharing. Once the incentives are withdrawn, there is often little motivation for them to continue the activities.

5. **Interactive participation:** People participate in joint analysis, which leads to action plans and the formation of new local institutions or strengthening of existing ones.

6. **Self-mobilization:** People take independent initiative to bring about change without relying on external institutions. While they may seek support, resources, or technical guidance from outside sources, they maintain full control over how these resources are utilized. An example of this is the three-tier Panchayati Raj system (Local Self-Government) in India.

Methods and Tools:

- **Participatory Rural Appraisal (PRA):** A method where farmers share their knowledge and experiences to help researchers understand local conditions better.

- **Farmer Field Schools (FFS):** A hands-on learning approach where farmers learn through practical experience and discussions with extension workers.

- **Participatory Technology Development (PTD):** Farmers and researchers work together to develop and test new farming techniques and technologies.

Benefits:

1. Farmers gain better knowledge and skills.
2. Increased adoption of sustainable farming methods.
3. Strengthening of community ties and rural livelihoods.
4. Farmers take ownership of programs, making them more effective and long-lasting.

Non-Participatory Agricultural Extension Programme Planning

Non-Participatory Agricultural Extension follows a top-down approach where government or extension staff design and implement programs without consulting farmers. Non-Participatory Agricultural Extension is a traditional approach where agricultural programs are planned and executed by government officials, scientists, or extension staff without actively involving farmers in the decision-making process. In this approach, information, techniques, and policies are introduced to farmers with minimal or no consideration of their input, local knowledge, or specific needs. As a result, programs may not always be aligned with the actual challenges faced by farmers, leading to lower adoption rates and reduced long-term impact.

Key Principles:

- **Top-down Planning:** Agricultural experts decide everything without involving farmers in the decision-making process.
- **Limited Farmer Input:** Farmers have little to no role in planning programs.
- **Focus on Technical Solutions:** Programs emphasize technical knowledge and solutions without considering farmers' real needs.

Benefits:

1. **Faster Implementation:** Since decisions are made by experts, programs can be rolled out quickly without lengthy consultation processes.

2. **Standardized Solutions:** Programs follow a uniform approach, ensuring consistency in agricultural practices across regions.

3. **Access to Expert Knowledge:** Farmers receive guidance from trained professionals, ensuring they are introduced to modern techniques and innovations.

4. **Government Support:** Programs are often backed by government policies and funding, which can ensure large-scale outreach and impact.

5. **Clear Objectives:** Since programs are designed by specialists, they have well-defined goals and structured implementation plans.

Example of a Non-Participatory Agricultural Extension approach is the Green Revolution in India. While the introduction of high-yielding variety (HYV) seeds, chemical fertilizers, and irrigation techniques significantly boosted food grain production, the approach was largely top-down. Many small-scale and marginalized farmers were not consulted, leading to challenges such as soil degradation, increased farmer debts, and regional disparities in agricultural growth. Similarly, the promotion of BT Cotton in India followed a non-participatory model, where genetically modified seeds were introduced without adequately addressing the concerns of small-scale farmers, leading to mixed results in productivity and farmer welfare.

Both Participatory and Non-Participatory Agricultural Extension approaches have been implemented in India with varying degrees of success. A notable example of a Participatory Agricultural Extension approach is the Self-Employed Women's Association (SEWA) in Gujarat. SEWA has worked closely with rural women farmers, involving them in planning and decision-making to improve their agricultural practices, market access, and financial independence. Another example is the Krishi Vigyan Kendras (KVKs), which emphasize farmer involvement in learning and adopting new technologies through training and demonstrations.

Steps of Programme Planning

1. Selection of the Target Area and Groups

1.1. Geographic Considerations in Targeting Area: this is an important factor in program planning is geographic focus. Targeting specific regions based on their agricultural potential or existing challenges helps in directing resources where they are most needed. However, a common mistake in agricultural extension is assuming a broad, undefined target group such as "farmers" or "the rural population," which overlooks the geographic diversity

within these communities. A participatory planning process should involve the identification of specific groups and subgroups to ensure inclusivity and effectiveness.

Strategic selection of target areas and groups in agricultural extension is critical for designing effective programs that meet the real needs of farmers. Audience analysis, combined with participatory approaches, ensures that extension services are well-aligned with the challenges faced by different geographic area. By acknowledging the diversity within farming communities and leveraging existing community structures, extension professionals can create impactful and sustainable agricultural development initiatives.

1.2. Selecting the right target groups : It is fundamental to the success of agricultural extension programs. Effective program planning requires an in-depth understanding of the needs and challenges faced by farmers, enabling the identification of specific groups—such as smallholders, women farmers, or youth—and the customization of extension services to their unique circumstances. The selection of target groups plays a pivotal role in determining the most appropriate extension strategies, as approaches effective for one group may not necessarily work for another. In some cases, target group selection happens by default rather than through a conscious effort, which can impact the overall effectiveness of the program. By conducting a thorough audience analysis, extension professionals can identify different needs and preferences that influence program development and implementation and group the target. A well-structured extension program is rooted in a deep understanding of its intended beneficiaries. The target may even comprises individuals who have the ability and opportunity to address identified agricultural challenges in a manner that aligns with their availability, resources, and learning preferences. Audience analysis serves as a valuable tool for gaining insights into the target groups, placing extension professionals in a strong position to make a meaningful impact.

1.3. Key Characteristics for Audience Analysis

To ensure an effective extension strategy, it is crucial to gather relevant information about the target audience, including:

- **Demographics:** Age, gender, ethnicity, primary language, housing status, geographic location, and access to resources.
- **Educational Needs:** Learning styles, literacy levels, and training requirements.
- **Social and Economic Context:** Family responsibilities, financial constraints, and access to credit or agricultural inputs.

- **Interests and Affiliations:** Membership in farmer groups, cooperatives, or other organizations.
- **Challenges and Barriers:** Problems they seek to address, obstacles to behavior change, and resistance to new agricultural practices.
- **Awareness and Readiness for Change:** Whether they recognize the problem, understand potential solutions, or are prepared to take action. i.e. they are aware of the problem and actions they can take to solve it, if they are thinking about taking or preparing to take that action, or even if they have begun to take action.
- **Perceptions of the Proposed Solution:** Their views on feasibility, complexity, compatibility with their lifestyle, and opportunities for experimentation before full adoption. Perceptions of the action you want them to take, such as whether they can see it in practice if it is too complex, better than what they have done in the past, compatible with their life and values, or something they can test before committing to.

Audience analysis activities can be conducted by accessing existing data sources, while some information may be collected through direct engagement method.

1.4. Existing Data Sources

- Government reports and policy documents.
- Past needs assessments conducted in the community.
- Program records, attendance sheets, and meeting minutes.
- Media reports, newspaper articles, and community requests for information.

1.5. Direct Engagement Methods

- Observations of farming practices and community interactions.
- Public forums and focus group discussions to gather local insights.
- Consultations with Extension advisory boards.
- Interviews and surveys to collect first-hand information.

Once the necessary information is collected, extension professionals can design learning opportunities tailored to the target audience. A successful extension program should address real needs, solve pressing agricultural challenges, and be delivered in a format that is accessible, engaging, and effective.

2. Needs Assessment and Objective Formulation in Agricultural Extension Programs

The success of an agricultural extension program depends on how well it addresses the specific needs of farmers. Involving them in the planning and decision-making process helps identify critical challenges, such as low productivity, pest control, and market access. A needs assessment is an essential component of program planning. It systematically identifies and prioritizes the key agricultural challenges faced by farmers, helping in the formulation of targeted extension interventions.

2.1. Approaches to Conducting a Needs Assessment

- **Primary Data Collection: It can be collected through community surveys** where data is collected through structured questionnaires at extension meetings or training sessions. Extension professional can also conduct **Key Informant Interviews** engaging local agricultural leaders, extension officers, and experienced farmers for insights. Besides, **Focus Group Discussions and filed observations** are also powerful tools for need assessment which brings together farmers to discuss shared challenges and potential solutions and can help in documenting farming practices, resource availability, and constraints through direct observations.
- **Secondary Data Collection:** Given the paucity of time and resource constraints extension professional can take help of secondary data. The major source for secondary data could be Government Reports & Policy Documents, Program Records & Past Needs Assessments and NGO & Research Institution Reports. This would involve reviewing national and regional agricultural extension strategies, analyzing historical data to track trends in agricultural challenges, utilizing studies conducted by organizations working in agricultural development.

2.2. Prioritizing Needs and Mobilizing Resources

Once needs are identified, the next step is to prioritize them based on urgency and impact. This process also includes identifying the resources available within the community and externally. After needs assessment and resource mobilization are completed, an **Action Plan** must be developed. This serves as a roadmap, outlining the steps required to implement solutions. A well-structured action plan includes clear goals aligned with farmers' needs and regional agricultural policies, estimation of financial requirements and funding sources, deadlines for key activities and milestones and identifying the roles of extension workers, community leaders, and stakeholders.

2.3. Objective Formulation in Agricultural Extension Programs

2.3.1. Defining Clear and Effective Objectives

Objective formulation is a critical step in agricultural extension program development. Clearly defined objectives serve as a roadmap for program implementation, guiding decision-making, activity selection, and evaluation. By applying SMART (Specific, Measurable, Attainable, Realistic, Time bound) principles, using Bloom's Taxonomy, and structuring objectives in a hierarchical format, extension programs can achieve measurable, sustainable, and impactful results. The general objective of program planning is to solve a problem or, in other words, to satisfy a need. The objectives should be open to negotiation, flexible, changeable, and adjustable. They can start simple and be less ambitious, but should allow for expansion as the capacities of the partners grow, as experience is acquired, and as confidence is gained.

2.3.2. Key Considerations for Objective Formulation

- **Problem-Solution Alignment**: Objectives should directly address the challenges identified in the needs assessment.
- **SMART Framework**: Objectives must be **Specific, Measurable, Achievable, Relevant, and Time-bound** to ensure clarity and feasibility.
- **Process-Oriented Approach**: In a dynamic environment, objectives should be flexible, adaptable, and open to modification based on stakeholder feedback and changing conditions.
- **Hierarchical Structure (Objective Trees)**: Objectives can be organized in a hierarchical manner, where lower-level objectives contribute to achieving higher-level goals.

2.3.3. Bloom's Taxonomy for objective

Using Bloom's Taxonomy for objective formulation helps in systematically enhancing farmers' learning and application of best agricultural practices. At the foundational level, remembering involves identifying key agricultural challenges by analyzing historical data and farmers' experiences. Moving to the next cognitive level, understanding requires analyzing factors that contribute to low productivity, pest infestations, and soil degradation. This deeper comprehension allows farmers to make informed decisions about their farming practices. Application follows as farmers implement best agricultural techniques to address these challenges, such as adopting improved irrigation methods or utilizing organic pest control measures. At a more advanced level,

analyzing involves comparing the effectiveness of various pest control strategies, soil management techniques, and marketing approaches to determine the most suitable solutions for specific conditions. Evaluation is a crucial step where farmers assess the impact of agricultural extension interventions by conducting field observations, collecting relevant data, and seeking feedback from fellow farmers. Finally, the highest cognitive level, creating, involves developing innovative solutions tailored to specific agricultural needs. This may include designing ICT-based advisory systems for better decision-making, establishing digital marketplaces for improved access to buyers, or formulating community-driven extension models to strengthen local agricultural support systems.

2.3.4. Hierarchical Structure (Objective Trees): Objective trees provide a visual representation of how different objectives are interconnected, helping to clarify expected outcomes by clearly defining project goals and their dependencies. They establish logical relationships by showing how lower-level objectives contribute to higher-level program aims, ensuring a structured and systematic approach to program planning. Additionally, objective trees enhance monitoring and evaluation by facilitating the assessment of progress through measurable outcomes.

3. Design and Development of Program Plan

Agriculture extension program planning is a systematic process aimed at improving agricultural practices and rural livelihoods by addressing the specific needs and challenges of farming communities. It involves a series of well-defined steps that guide extension workers, local stakeholders, and farmers in designing and implementing effective interventions. By following a structured approach, extension programs can ensure that resources are optimally utilized, objectives are clearly defined, and solutions are practical and sustainable. The **Steps in Extension Program Planning design and development are as follows;**

1. **Collection of Facts:** The planning process begins with gathering relevant data from existing records, surveys, and community engagements. Information about the people, their agricultural enterprises, technological adoption levels, available resources, challenges, and socio-economic conditions should be collected. Local governance bodies, cooperatives, and other organizations can serve as valuable sources of information. For example, in a village where farmers struggle with poverty, a survey could collect data on land use patterns,

water resource utilization, access to credit and markets, employment opportunities, and farmers' attitudes toward extension services.

2. **Situation Analysis:** Once data is collected, it must be analyzed in collaboration with the local community to gain an accurate understanding of the existing conditions. An unbiased assessment, considering both qualitative and quantitative aspects, ensures that the situation is evaluated from multiple perspectives.

Fig. 2.1: Steps in Extension Programme and Planning

3. **Problem Identification:** A thorough analysis helps in correctly identifying key challenges. While multiple issues may exist, only those that are urgent, significant, and realistically solvable with the available resources should be prioritized. Addressing too many problems at once can overwhelm the program, leading to ineffective implementation and community frustration. For instance, after data analysis in the given village, three critical concerns may emerge as low farm income, limited employment opportunities, and poor nutritional standards among farming families.

4. **Determination of Objectives and Goals:** Objectives should be established based on identified needs. These must be clear, direct, and realistically achievable within the given timeframe and available resources. To enhance feasibility, objectives should be framed as

specific goals. Revisiting the data may be necessary to ensure that the proposed objectives align with the community's willingness to participate and available institutional support. Collaborative discussions with local stakeholders and institutions help legitimize the planning process.

5. **Developing plan of work and calendar of operations:** The plan of work should be documented in a structured format, clearly outlining the roles and responsibilities of all stakeholders. It should specify the tasks assigned, along with the involvement of relevant institutions, organizations, and departments. Additionally, the plan must detail financial requirements, funding sources, market arrangements for produce, and training programs for farmers.

   The calendar of operations should be developed based on the plan of work, specifying the timeline for each activity, including exact dates and durations. It must outline the required quantity of inputs, including credit availability, and their scheduled distribution. The calendar should also define the training schedule for farmers and farmwomen, identifying the specialists involved, the preparation of training materials, and the publication timelines for informational resources.

6. **Follow through plan of work and calendar of operations:** Once the programme is implemented, multiple activities may run simultaneously. Therefore, it is essential that the planning phase anticipates and includes strategies for addressing unforeseen challenges and taking corrective measures as needed. The success or failure of a programme may depend on the performance of the extension agent and the organizational support received at this stage. Therefore, it is essential to make provisions for collecting feedback on the farmers' experiences and responses after the introduction of new technology, as this information is critical at this stage.

7. **Evaluation of progress :**Evaluation is the process of assessing the extent to which we have been achieve our objectives. Every programmes must have an inbuilt system of evaluation to monitor how well the work is done. This process should be a continuous process not only to assess the final result but also to verify that each steps are correctly followed. Evaluation may be formal or informal, depends on the significance of the programme and also on the availability of trained manpower, funds, facilities and time.

8. **Reconsideration and revision of the programme:** Based on the results of the evaluation, the programme should be reconsidered and

revised where necessary. This process of reconsideration should involve not only the participants but also scientists, extension administrators, and representatives from local bodies such as Panchayats. Reconsideration shall help in making necessary corrections and modifications in the programme. In reconsideration, emphasis should be on the removal of technical defects if any and how to obtain more cooperation and involvement of the participants and various organizations.

Practical Exercises

Activity

Develop a plan on spreading awareness related to any agriculture practices.

Materials required: Pen, pencil, notebook, Chart papers/Poster materials (optional), etc.

Procedure:

- Select one agricultural practice that is important for farmers (e.g., organic farming, water conservation, integrated pest management, use of bio-fertilizers, soil testing, etc.).
- Develop a step-by-step awareness plan to educate and inform farmers about the selected practice.
- Note down the following points:
  - Name of the agricultural practice
  - Importance and benefits of the practice
  - Target audience
  - Methods to spread awareness
  - Timeline or schedule of awareness activities
  - Required resources
  - Expected outcomes or impact

Check Your Progress

Fill in the Blank

1. A _____ is a single item of the annual plan designed to solve a specific problem.

2. _____ helps in anticipating the future based on past and present analysis.
3. A clearly stated _____ should be measurable and achievable.
4. The purpose of an _____ programme is to improve rural life through community action.
5. In extension programme planning, _____ participation ensures local relevance and ownership.

Multiple Choice Questions

1. What does a "calendar of work" represent in agricultural extension planning?
    a. A financial budget
    b. Chronological schedule of tasks
    c. List of employees
    d. Compilation of feedback forms
2. Who defined an extension programme as *"a statement of situation, objectives, problems, and solutions"*?
    a. Leagans
    b. Kelsey and Hearne
    c. Dahama and Bhatnagar
    d. Rogers
3. What is the fundamental aim of an agricultural extension programme?
    a. Profit maximization
    b. Improve rural life through action
    c. Expand bureaucratic control
    d. Promote only high-tech farming
4. What principle of programme planning emphasizes fair benefit distribution?
    a. Central planning
    b. Equal opportunity marketing
    c. Equitable distribution of benefit
    d. Single crop promotion
5. A "goal" in planning refers to:
    a. Broad mission statement
    b. Estimated fund requirements

c. An abstract vision

d. A distance to be covered in a given time

True or False:

1. The aim of extension programme planning is solely to achieve financial profit.
2. A project is part of the plan that solves a specific issue.
3. Programme planning should ignore past experiences to focus only on the future.
4. All extension programmes must have provisions for evaluation.
5. Extension programmes are effective even without community participation.

Subjective Question

1. Describe Extension Program Planning design and development.
2. Define Objective Formulation in Agricultural Extension Programs.

Session 2: Implementation of Agricultural Extension programme services and relevant tools to provide Agricultural Extension Services to farmers

Steps in implementation of Agricultural Extension programme /services

Agricultural extension programs are designed to provide farmers with the latest knowledge, skills, and technologies to improve agricultural productivity and livelihoods. Implementing an agricultural extension program is a structured process that helps ensure the success and long-term sustainability of the program. It involves a series of well-planned steps that guide the program from its initial stage to its final impact assessment. The implementation process can be broadly categorized into three phases: Pre-Implementation, Implementation, and Post-Implementation. Each phase plays a crucial role in making the program effective and beneficial for farmers. Understanding these phases helps in developing agricultural policies and programs that are practical, relevant, and sustainable for the farming community.

Prerequisite to Implementation:

This is the preparation stage where experts and farmers analyze the current agricultural situation. The key steps in this phase include:

- **Situation Analysis:** It is necessary to understand the existing farming conditions, challenges, and needs of farmers. As it helps in proper

implementation and optimum resource utilisation. Besides it also provides for any kind of minor change if required in program. For example, before implementing an organic farming program, researchers may study soil health and water availability in different regions as it will give critical insight for implementation of program.

- **Problem Identification:** Once the program is finalised it is necessary that before implementation of the programme, problem identification must be carried out once again. The major issues affecting farming, such as low crop yield, pest attacks, or lack of market access etc keeping the primary objective of the programme in consideration are recognized. For example, declining groundwater levels and excessive pesticide use were identified as major issues before launching a sustainable agriculture initiative can help in reconsidering objectives.

- **Objective Setting:** Based on situation analysis and problem identification clear goals that the program aims to achieve, such as increasing crop yield, promoting sustainable farming, or improving market access etc. can be finalised. Any reconsideration based on additional data may be added in plan at this stage itself. Thereafter once the implementation starts it will be difficult to change any of objective or plan of action.

During Implementation:

This is the action phase where the actual work begins, and farmers start applying new knowledge and techniques. The key steps in this phase include:

Executing the Plan: The planned activities, such as training workshops, field demonstrations, and technology distribution, are carried out. It is important that all the planned efforts reach the farmers effectively.

Key Considerations in Executing an Agricultural Extension Program

1. The approach should be Farmer-Centered and ensure the program addresses real needs and priorities of farmers. It is necessary to encourage farmer participation and feedback throughout the process.

2. The communication should be clear. Use simple language and effective demonstration techniques to convey new practices. One may plan to conduct awareness campaigns to ensure farmers understand the benefits of the program depending on the objective of program.

3. Capacity Building and Training of all stakeholders is necessary. Training sessions and hands-on demonstrations will ensure farmers can apply new

techniques effectively. It will also help to engage local farmer leaders to promote peer learning.

4. It is necessary to ensure timely availability of seeds, fertilizers, irrigation facilities, and financial assistance and other related resources. It will help in smooth execution of the program and will help in avoiding any delay. Collaboration with government agencies and NGOs will also facilitate resource availability and distribution.

5. Regular Monitoring and follow up for entire duration of implementation. Conducting follow-up visits will help to track progress and address any difficulties faced by farmers. It will also help in making necessary changes based on real-time challenges and farmer feedback.

6. In implementation phase use of technology may come handy. Leveraging mobile applications, digital platforms, and remote sensing technology will help in better outreach and impact assessment. It will also promote digital literacy training to help farmers use technology efficiently. For example the 'e-NAM' initiative helped farmers in Maharashtra access better market prices through online trading platforms.

7. To avoid the effect of pilot project syndrome where the project after implementation doesn't sustain, it is necessary to think and plan for sustainability and Long-Term impact of the project. Ensure that the program fosters self-sufficiency among farmers rather than long-term dependency. If farmers actively take part in overall implementation the chances for program to sustain are higher.

Post-Implementation:

This is the evaluation and improvement stage. The key steps include:

- **Evaluation:** Assessing the effectiveness of the program by measuring improvements in farming practices, productivity, and farmer satisfaction.

- **Reconsideration:** Identifying what worked well and what needs to be changed for future programs.

- **Sustainability Planning:** Ensuring that farmers can continue applying the learned techniques even after the program ends, making the impact long-lasting.

Evaluate programme planning

Evaluating agricultural extension programs is essential to ensure they effectively enhance farmers' knowledge and practices. There are certain steps in the Evaluation Process of an Extension Program;

1. Define Evaluation Objectives
2. Break down the program's goals into measurable terms for focused evaluation.
3. Identify Indicators
4. Decide the Type of Information Needed
5. Select a Sampling Technique and data collection tools
6. Data Collection and Analysis
7. Share Findings with Stakeholders
8. Communicate results transparently to all relevant stakeholders.

It is advisable that for extension programs the "participatory evaluation" model which actively involves stakeholders in the evaluation process, fostering a sense of ownership must be used. By systematically evaluating extension programs, stakeholders can identify strengths, address weaknesses, and enhance the overall impact on the agricultural community.

Relevant Tools and Technologies to provide Agricultural Extension Services to farmers

The agricultural extension system in India plays a crucial role in disseminating knowledge and information to farmers. Agricultural extension services in India have evolved significantly with the integration of modern tools and technologies. The advent and extensive use of digital technologies have significantly transformed agricultural extension services, enhancing their efficiency, accessibility, and sustainability. These advancements help farmers access timely and relevant information, improve productivity, and enhance decision-making. However, challenges such as digital literacy, infrastructure gaps, and the need for human interaction remain crucial considerations. The widespread integration of tools such as smartphones, the internet, data analytics, and sensor-based devices has marked a new phase in agricultural extension commonly called as ICTs (Information Communication Technologies) tools. Few popular ICT tools in Agricultural Extension Services are as follows;

a. **Mobile Phones:** Farmers receive advisory services, market prices, and weather updates through SMS and voice messages.

b. **Internet Platforms including Chatbots and Virtual Assistants:** Websites, online portals, and social media provide access to agricultural training materials and real-time updates and tools such as Chatbots and voice assistants provide instant responses to farmers' queries and enhance knowledge dissemination

c. **Geographic Information Systems (GIS) and Drones:** GIS helps in mapping agricultural land, analyzing spatial data, and identifying location-specific farming challenges, whereas Drones assist in crop monitoring, precision agriculture, and pest control

d. **Artificial Intelligence (AI):** AI-based tools help in disease detection, crop surveillance, and personalized farming recommendations.

Besides ICTs, several institutions and programs play a crucial role in supporting agricultural extension services. Farmer Field Schools (FFSs) provide practical, hands-on training in sustainable farming practices, helping farmers adopt innovative techniques. Krishi Vigyan Kendras (KVKs) serve as agricultural science centers that offer research-based extension services to improve productivity and resource management. Additionally, agri-preneurs and private sector entities contribute by providing technical support, modern tools, and market-driven solutions to enhance farming efficiency. Farmer Producer Organizations (FPOs) further empower farmers by facilitating collective marketing, strengthening bargaining power, and improving access to better market opportunities, ultimately enhancing their livelihoods.

Applications and importance of Agricultural Extension Technologies

Successful initiatives like eNAM (National Agriculture Market), Kisan Call Centers, and Digital Green in India highlight the transformative impact of digital solutions in empowering farmers. These technologies bridge knowledge gaps, provide real-time weather and market updates, and promote sustainable agricultural practices, demonstrating their growing importance in modern farming. Technological tools in agricultural extension has provided several advantages, such as;

a. Enhanced Access to Information for farmers as they receive timely updates on crop management, market trends, and weather forecasts through ICT tools. Also, Digital platforms connect farmers with buyers, reducing dependency on intermediaries and ensuring fair prices

b. ICTs enabled direct interaction between farmers, extension workers, and researchers.

c. Increased knowledge and access to modern technology help farmers make well-informed decisions.

d. Adoption of smart technologies has demonstrated improved crop yields and promoted efficient resource management.

e. ICT tools help track the impact of agricultural extension programs, improving their effectiveness.

Challenges in Adopting Technology in Agricultural Extension

In India, the adoption of ICT tools in agricultural extension has demonstrated the potential to transform farming by improving access to critical information, enhancing productivity, and strengthening market linkages. However, several challenges hinder its widespread implementation. Despite its potential, the integration of technology in agricultural extension faces several obstacles such as;

a. While digital tools enhance agricultural extension, limited infrastructure and unequal access to technology remain significant barriers, particularly in remote areas. Many farmers struggle with digital literacy and resistance to change, making it difficult for them to adopt new technologies. Additionally, the cost of advanced tools and their maintenance can be prohibitive for small-scale farmers.

b. Concerns related to data security and privacy also need to be addressed to ensure safe and ethical use of digital technologies. Although technology provides efficiency, the human element in agricultural extension remains vital for trust-building and effective knowledge dissemination.

c. Capacity-building initiatives for both farmers and extension workers are necessary to maximize the benefits of technology.

d. Sustainability and policy support are key challenges as well. The long-term viability of ICT-based solutions depends on government initiatives, institutional support, and inclusive policy frameworks. Most of ICT initiative suffered from Pilot project syndrome due to lack of funds and sustainability plan.

The integration of technology in agricultural extension services is reshaping the way farmers access knowledge and make decisions. While ICTs, AI, and other innovations provide significant benefits, addressing challenges such as accessibility, affordability, and user adaptability is crucial. A balanced

approach combining technology with human interaction will ensure sustainable agricultural development and improved livelihoods for farmers in India.

Emerging methods and trends in Agriculture extension programme plan and implementation of Agriculture Extension Services

E-Extension

E-Extension refers to the use of digital technologies to provide agricultural knowledge, advisory services, and essential information to farmers in a more efficient, scalable, and cost-effective manner. E-Extension has significantly transformed agricultural extension services, bridging the gap between farmers and experts. It enables farmers to access crucial information on farming techniques, weather updates, market prices, and pest control measures without relying solely on traditional extension workers. One of the key features of e-Extension is the use of digital communication platforms, including mobile applications, SMS services, WhatsApp groups, and interactive voice response (IVR) systems. Additionally, online knowledge portals developed by government agencies and private organizations provide training materials, weather forecasts, market trends, and best farming practices, making agricultural knowledge easily accessible. Another crucial aspect is the Geographic Information System (GIS), which uses satellite imagery and mapping technology to assist in precision agriculture, pest control, and soil health monitoring. Moreover, Artificial Intelligence (AI) and chatbots play an essential role in delivering personalized farming recommendations and quick responses to farmers' queries.

Additionally, e-Extension is a cost-effective solution, reducing the need for frequent physical visits by extension officers and making knowledge dissemination more affordable. E-Extension is a revolutionary approach in modern agriculture, offering farmers access to critical knowledge and advisory services with ease.

Sustainability and Climate-Smart Agriculture

Agricultural extension services are evolving to address the pressing challenges of climate change, resource depletion, and environmental sustainability. One of the most significant emerging trends in extension program planning is the integration of sustainability and climate-smart agriculture (CSA). This approach focuses on increasing agricultural productivity while ensuring long-term environmental conservation and resilience to climate variability. Climate-smart agriculture promotes efficient resource use, improved soil health, and reduced greenhouse gas emissions. Extension program plans now

emphasize precision farming, agroforestry, organic farming, conservation agriculture, and integrated pest management to help farmers adopt sustainable practices. These strategies not only enhance productivity but also protect natural ecosystems and improve the adaptability of farming communities to climate change. Government initiatives, international organizations, and private stakeholders are increasingly supporting climate-smart agriculture through financial incentives, policy interventions, and capacity-building programs. Many agricultural extension strategies are now aligned with global sustainability frameworks such as the Sustainable Development Goals (SDGs) to ensure long-term agricultural resilience and food security.

Extension programs also emphasize soil health management, advocating organic amendments and crop rotation to maintain soil fertility. Natural farming, including organic farming and agroecology, encourages chemical-free cultivation, improving soil biodiversity and reducing environmental impact. Water management strategies, such as efficient irrigation techniques and rainwater harvesting, help conserve water and enhance resilience to droughts.

Inclusivity and Empowerment

In modern agricultural extension planning, inclusivity and empowerment have become integral components, ensuring that diverse groups of farmers benefit from technological advancements and knowledge dissemination. Targeted extension programs are designed to address the unique challenges of women farmers, smallholder farmers, and marginalized communities, fostering equitable growth. Capacity building initiatives focus on enhancing the skills of both farmers and extension agents through continuous training and education. Community-based extension actively involves local communities in program design and implementation, ensuring relevance and effectiveness. Farmer-to-farmer extension leverages experienced farmers as knowledge sources, promoting peer learning. Furthermore, public-private partnerships strengthen extension services by integrating private sector expertise, expanding outreach, and ensuring long-term sustainability.

Practical Exercises

Activity 1

Visit nearby Krishi Vigyan Kendra or SAUs and observe implementation steps of agriculture related practices.

Materials required:
Pen, pencil, notebook, etc.

Procedure:

- Visit a nearby Krishi Vigyan Kendra (KVK) or a State Agricultural University (SAU) where agricultural practices or demonstrations are being implemented.
- Interact with scientists, extension officials, and farm staff present at the location.
- Carefully observe and note down the step-by-step process of implementing any one agricultural practice.
- Note down the following information:
    - Name of the agricultural practice being implemented
    - Objective of the practice
    - Step-by-step implementation process
    - Inputs required
    - Time and labour involved
    - Technologies or machinery used
    - Support provided by extension officials or research staff
    - Farmer participation and response

Activity 2

Prepare a questionnaire with the help of teacher and collect information from nearby agencies or service provider.

Materials required:
Pen, Printed Questionnaire Forms, pencil, notebook, etc.

Procedure:

- In consultation with your teacher, prepare a questionnaire related to agricultural services.
- Identify nearby agencies or service providers (e.g., Krishi Vigyan Kendras, Agriculture Input Suppliers, Co-operatives, NGOs, etc.).
- Visit them and conduct interviews using your questionnaire.
- Record their responses accurately in your notebook or form.
- Note down the following details:
    - Name and address of the agency/service provider

- Type of services provided
- Target beneficiaries
- Common problems faced by the service provider
- Level of farmer participation
- Use of modern technology or ICT in service delivery
- Feedback or suggestions for improvement

Check Your Progress

Fill in the Blank

1. The _____ phase involves evaluation and planning for sustainability.
2. _____ is an approach that empowers farmers through practical, hands-on training.
3. ICT tools such as _____ provide instant responses to farmers' queries.
4. _____ helps in mapping farmlands and identifying spatial farming issues.
5. A major challenge in adopting ICT tools is lack of _____ in rural areas.

Multiple Choice Questions

1. What is the first step in the implementation of an extension programme?
    a. Funding allocation
    b. Objective setting
    c. Situation analysis
    d. Media announcement
2. Which of the following is a post-implementation activity?
    a. Distribution of seeds
    b. Field demonstrations
    c. Evaluation
    d. Awareness campaign
3. The primary purpose of using ICT tools in agriculture is to:
    a. Enhance access to information and services

b. Automate irrigation only

c. Replace all physical interactions

d. Create job opportunities for engineers only

4. What initiative helps Indian farmers trade agricultural goods online?

   a. KVK

   b. SEWA

   c. ICAR

   d. eNAM

5. Which tool is used in precision farming and pest control from the air?

   a. SMS alerts

   b. Drones

   c. Weather stations

   d. Call centres

True or False:

1. Participatory evaluation excludes farmer feedback.
2. Digital platforms can support market access for farmers.
3. Reconsideration of the programme is only needed at the beginning.
4. A program that promotes long-term farmer dependency is considered sustainable.
5. Artificial Intelligence is now being used in agriculture for disease detection.

Subjective Question

1. Describe procedure for Steps in implementation of Agricultural Extension programme.
2. What are the Emerging methods in Agriculture extension programme plan and implementation of Agriculture Extension Services.

Module 3 Extension Methods for Agriculture Extension Service Provider

Module Overview

To become a successful agriculture extension service provider a person has to have not only very good technical knowledge in agricultural technologies and crop management but also need to be strong in his/her communication skills. Since the role of agriculture extension service providers largely focused on informing and educating farmers about best technologies and potential practices to resolve various agriculture related issues of rural areas, communication method(s) they adopt to impart the knowledge and skills play the key role in deciding the success or failure of the technology transfer process.

This module provides students with an understanding of the various approaches used in delivering agricultural knowledge and services to farmers, with a focus on enhancing outreach and impact. In Session 1, students will explore the different types of extension methods used in agricultural extension. The session emphasizes how each method—such as farm visits, training sessions, farmer field schools, radio broadcasts, and mobile advisories—serves different purposes and audiences. Students will learn how to select and apply appropriate methods based on the context, target group.

Learning Outcomes

After completing this module, you will be able to:

- Identify and describe various types of agricultural extension methods used to disseminate information to farmers.
- Select appropriate extension methods based on the target audience, objectives, and available resources to ensure effective communication and outreach.

Module Structure

Session 1: Types of extension methods

Session 1: Types of extension methods

Extension methods in agriculture also known as extension teaching/communication methods comprises of techniques used by extension agent(s) to share information and knowledge related to innovative agricultural technologies with farmers so as to facilitate their technology adoption

decision. In general, extension methods are classified based on their form as *written*, *spoken* and *objective/visual* methods. However, the most widely recognized classification is based on their use and nature of contact as *Individual methods*, *Group methods* and *Mass methods*.

A-Individual Methods

Individual methods are direct contact methods wherein an agriculture service provider have face to face interaction with the farmer individually either at his/her office or at farmer's home or farm. Individual methods are being used in situations where the service provider or the extension agent need to contact only a few numbers of farmers, farms are located relatively close to the service provider, and also there are farm specific problems to be resolved. Individual methods are considered as the most effective ways of technology transfer since they facilitate fast rapport building between the extension agent and farmer, there won't be any unclear messages between them since the contact is direct, and promote getting feedback. Major drawbacks with individual methods are they are costly and time consuming and also chances of favoritism towards some farmers is high. Some of the individual methods are discussed below.

1. Farm and Home Visit

In this method, extension agent visits the farm or home of the farmer either informally to familiarize with the farmer's family or with specific purpose such as to conduct farm field survey, monitoring the performance of a newly adopted practice, identify the reason of a crop failure, advice farmer to change/modify an existing farm management practice with a better alternative etc. Here, discussion between the extension agent and farmer would be mostly focused around farm specific issues, opportunities for further advancement, risks associated with available solutions etc. to identify customized solutions for that particular farmland. While making a

Fig. 3.1: Farm and Home Visit

farm and home visit it is always good to inform the farmer in advance about the visit so that the farmer may be able to adjust his/her activities to make the visit successful. If required, the extension agent need to make follow-up visits however, it is also important to avoid frequent visit to a particular farm to avoid the feeling of exclusion among his/her fellow farmers. This method is a most effective way to motivate farmers to adopt innovative agricultural technologies because, through personalized interaction the extension agent could achieve trust and confidence of farmers effortlessly compared to other extension methods.

2. Personal Call

Personal call is the call either made by the farmer to the extension agent or by the extension agent to the farmer for information sharing. In general, farmers make use of personal calls to get the quick assistance of extension agent to resolve farm related problems like that of pest and disease infestation, to avail new information about market trend, government schemes etc. Whereas, the extension agents make use of personal calls for both giving information to farmers and obtain information from farmers. Though personal call was not popular in rural areas earlier due to under-developed facilities, advancements in telecommunication has made this quick and cost-effective method a widely popular way-out for technology transfer even in the interior rural India. It is important to note that while making personal calls the person who initiated the call should get opportunity to talk first and make his/her point to ensure that the purpose of the call is accomplished. This method is though ideal for sharing information does not work well if the extension agent want to impart new knowledge and skills or if the farmer wants solution to an unidentified problem in his/her farm. However, personal calls can be used as a follow-up activity to other extension methods.

Fig. 3.2: Personal Call

3. Field Flag Method

The field flag method or flag method is applicable in those situations when farmer or farm family members are not available at farm fields during the field visit of agriculture extension service provider. In this method, after monitoring the farm field the extension agent writes his/her observations and recommendations in flags made of paper, card or any other material

and placed them in farm fields using wooden or metallic sticks. Based on the severity of identified problems the extension agent makes use of flags of different colures. For example, red or orange flags are used to communicate major problem whereas blue, green or yellow flags indicate relatively minor problems. Here, the messages used to be action oriented and extension agent also makes a note of the same in his/her field diary that in which field a red flag is placed and which field blue or yellow flag is placed. The farmer read the message whenever he/she visits the field and take action based on the same. Even though this method is a form of one-way communication if farmer has any doubt in the written message, he/she can later clarify the same through making a personal call to the message communicator. This method is ideal for field problems that require immediate action from the side of farmers like pest and disease infestation or nutrient deficiency in crops. Flag method allows extension agents to keep contact with more number of farmers in short time compared to other individual methods and also have the freedom to plan visits to farmer fields whenever he/she gets time without worrying about the availability of famers at their farm fields. Besides, since the extension agent visits the farm fields and make problem diagnosis in the absence of farmers this method helps to develop a feeling among farmers that he/she is really concerned about their crops. This makes the farmer-extension agent linkage more trustworthy and stronger.

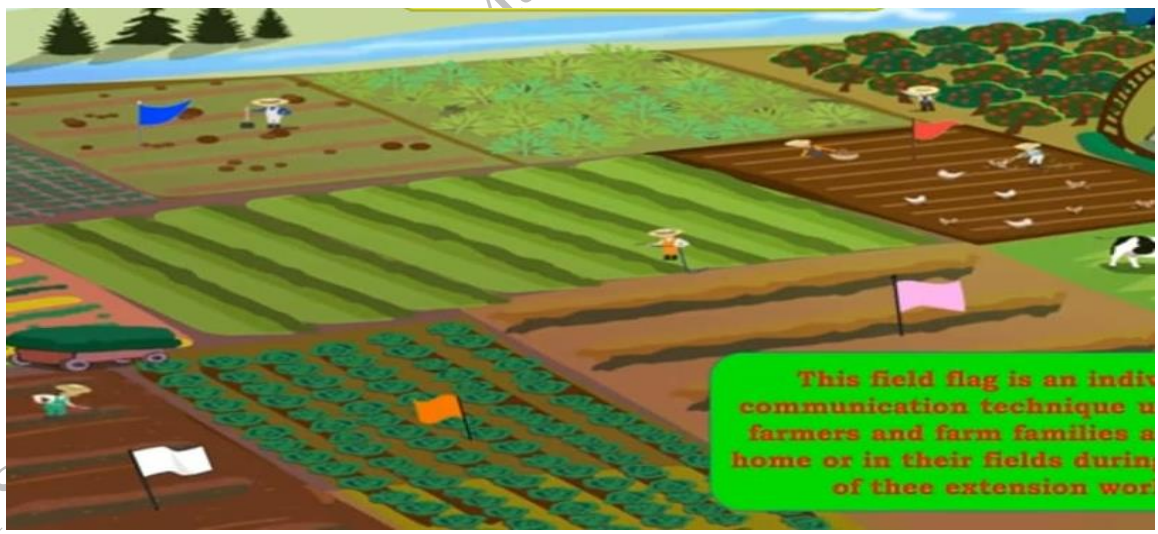

Fig. 3.3: Field Flag Method

B- Group Methods

Group methods are used when the extension service provider need to contact a group of 20-25 farmers for face-to-face interaction. Here, farmers groups are formed based on the situation or as common interest groups. Group

methods are used for awareness creation, to impart a new skill, demonstrate a new technology, discuss problems related to a particular crop or farm management practice, get feedback from farmers about a newly adopted technology, or even to finalize future activities to improve agricultural productivity and farm profitability of a particular area. Compared to individual methods chances of personal favoritism is less in group methods and the extension agent can reach a larger number of farmers in less time. This helps a greater number of people to have access to agricultural information sources, technologies and other resources. Some of the group methods are discussed below.

1. Farmers Meeting

Farmers meeting or group meeting is being used for collective decision-making process in the planning and implementation of activities impact the entire society or farming community. In this method, the person who called the meeting introduce the topic or issue on which decision need to be made. The topic can be for example, constructing a village pond for ensuring irrigation for all farmers of the village for summer and winter crops, or developing warehouse facility in the village for safe storage of farm produce, or even related to group marketing of farm produce for better profit. Members of the meeting arrive at any decision in a democratic way after listening to individual opinions and discussions on those opinions. Important aspects that need to take care in farmers' meeting are inviting only relevant individuals for the meeting who can constructively contribute to the decision-making process since presence of irrelevant members often affect the group dynamics and decisions negatively. , start and end the meeting on time, encourage healthy discussions without any chaos in the group, and try to arrive in a decision that ensure the involvement of the beneficiary community as a whole rather than individualistic actions.

Fig. 3.4: Farmers Meeting

2. Focus Group Discussion

Focus group discussion is a conversation conducted among small group of 6-10 people for the in-depth analysis of specific issues. Hence, the preliminary step in conducting a focus group discussion is to specify the objective, information needs and discussion points and/or questions based on the information required. The group includes one or two facilitators to moderate the discussion and to ensure a congenial environment that motivate members to talk comfortably and discuss points when required. Discussions usually carry out on pre-selected topics and after a brief introduction about the topic as well as purpose of organizing the discussion facilitator encourage members to talk about their perspectives on the discussion topic or specific themes under the topic. For example, in the present agriculture context farmers' knowledge and understanding about the linkage between climate change and pest and disease infestation can be a good topic for the focus group discussion. Here, the topic can be further subdivided into different themes i.e., Theme 1: Chronology of pest and disease infestation in various crops; Theme 2: Interlinkage between changing weather pattern and pest and diseases Theme 3: Interlinkage between agroecosystem sustainability and pest and disease outbreak. Further, it is important that the facilitators need to have good understanding about discussion topic then only the discussion could achieve intended results. This activity also facilitates knowledge exchange among the members. Prerequisites for conducting a focus group discussion includes selection of ideal venue, transportation facilities of group members, refreshment etc. for the smooth conduct of the activity.

Fig. 3.5: Focus Group Discussion

3. Demonstrations

Working on the principle that 'seeing is believing' farm demonstrations are considered as the best method to educate farmers about innovative agricultural practices and show the benefits of a new technology. It is easy to remember things if farmers see something with their own eyes compared to reading or listening about the same. In the case of new technologies like farm machineries farmers often prefer to have hands-on-experience or new crop varieties they wish to see the crop performance before adopting the same and demonstrations are ideal in these kinds of

situations. Demonstrations are primarily of two types viz., *method demonstration* and *result demonstration*, and are conducted with the help of farmers in local farms.

- **Method demonstration** is carried out by an extension agent to teach farmers about new skills in a step-by-step way in a short time period. In general, method demonstration is meant for teaching relatively simple skills associated with entirely new or improved agricultural practices. For example, demonstrating how to use drones for fertilizer application in farm fields or how to do processing of off-season fruits and vegetables at farm and home level. While conducting method demonstrations it is important to decide the size of the group in advance because, effective learning happens in small groups. In big sized groups, those who stand near to the extension agent only get the chance to see th ings properly.

Fig. 3.6: Method demonstration

- **Result demonstration** is an approach for motivating farmers to adopt a new agricultural technology by showing its superior results under farmer field conditions. This kind of demonstrations mostly conduct with a cost-sharing approach wherein the cost of new technology will be borne by the technology developers or promoters and the cost of other practices like irrigation or other general land management practices by the farmer. Result demonstration helps farmers to compare the yield and monetary benefits from the new technology over his/her existing practice or old technology. Compared to

Fig. 3.7: Result demonstration

method demonstration result demonstration is costly and time taking. For example, in the case of demonstrating the superior results of a new crop variety it takes at least 6-12 months based on the crop duration whereas, in the case of environment friendly farming methods like organic agriculture, conservation agriculture and regenerative agriculture the distinctive yield and income benefits can be achieved generally after 3-5 years.

4. Farmers Field School

Farmer field school (FFS) is an innovative group learning approach introduced by the Food and Agricultural Organization (FAO) in order to help farmers to tackle complex issues of their farm fields. FFS is a people-centered learning process where farmers get opportunity to improve their knowledge and skills through self-learning as well as participatory mode. An FFS consist of a group of 20-25 farmers guided by a trained facilitator who meet once in a week regularly for field-based learning, either for a short period like 8-12 weeks or for an entire crop season.

Fig. 3.8: Farmers Field School

The facilitator of FFS can be a farmer, extension agent or agriculture service provider who had undergone season-long trainings conducted by master trainers. This non-formal learning activity is being carried out on a customized curriculum developed by the facilitator, based on specific theme identified by group members, for e.g., integrated pest management in crops, integrated watershed management, integrated soil health management etc. To carry out FFS activities a learning site will be selected in the beginning and learning process happens primarily through a series of activities such as field observation, sharing knowledge among themselves through discussions, and asking questions to the facilitator. Field observations are conducted by dividing farmers into small groups of 4-5 so that different groups come up with different aspects of the same issue. Further, the discussions followed by the field activity of each class act as an analysis of the whole situation i.e., what? why? when? For

example, in FFS on integrated pest management, one activity will be collection of insect eggs or larvae and affected plant parts for insect rearing using plastic bags or bottle so that farmers can critically observe the life cycle of different insect and identify attack of different insects simply by observing the damage pattern in plants. Since all FFS activities are conducted in a structured manner under the close supervision of the facilitator after the completing a few FFS farmers become capable of solving almost all simple to complex issues of their farm field.

5. Farmer Field Day

Farmer field day or field day is a form of field-oriented learning process organized by extension agents to convince farmers about the benefits of a new technology or farming practice and motivate them to adopt the same. Here, farmers are invited to the farm field where the new technology or farming practice is tested (by the extension agency) or adopted (by the progressive farmer) to see its ultimate superior results under farmer field conditions. Since farmers get chance to see the visible evidence of the results of a new technology and discuss about various aspects of the new technology with the progressive farmer and fellow farmers, farmer field days enhances learning and fasten the technology adoption and diffusion process. Farmer field days are generally short duration events of 2-3 hours or sometimes a half day program.

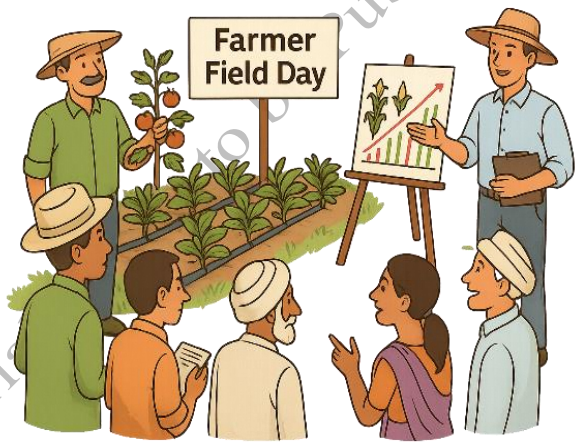

Fig. 3.9: Farmer Field Day

C- Mass Methods

Mass contact methods refer to those which enable development agents or agencies to reach a large number of persons, directly or indirectly with one exposure or a single source. Some of the mass methods are discussed below.

1. Farmers Fair

Farmers fair or Agriculture fair popularly known as *Kisan mela* or *Krishi mela* in Hindi, is a public event that offers a single platform for different stakeholders of agriculture like farmers, researchers, technology developers, government and non-government agencies, financial institutions, input suppliers, traders, agribusiness people, consumers etc.

to get connected. In India, the concept of farmers fair has become popular along with the Green Revolution Period and the 1st National Agriculture Fair was organized by 'Farmer's Forum India' in Calcutta (presently Kolkata) and inaugurated by the Vice-President of India Dr. S. Radhakrishnan on January 8, 1961. Farmers fairs are an important mode of technology dissemination throughout the world. At farmers fairs, visitors can see a wide variety of displays and demonstrations of new varieties of field crops, vegetables, fruits, flowers, and farm machineries; new breeds of livestock animals and birds; and working models of latest agriculture methods like automated irrigation systems, sensor-based field monitoring techniques, drone-based techniques etc. Besides, sometimes organizers conduct farmer-scientist interaction meet, farmers seminar, scientific discussions etc. in farmers fairs. Since visitors get much information about latest developments in agriculture through the exhibition stalls of various public and private agricultural research organizations, farmers fairs attract large number of farmers. Duration of farmers vary from few days to weeks and depending up on the fund availability and level of organization (e.g., village level, regional level, state level, national level). In India, farmers fairs are organized mainly by ICAR Institutions, State Agricultural Universities, NGOs, farmers forums and private companies either as a general event or around specific themes. Organization of farmers fair requires huge financial investment for leasing the venue, development of basic infrastructure, advertisement and operational costs etc. The common source of fund for organizing these mass events are government grants and subsidies, sponsorships, vendor fees etc.

Fig. 3.10: Farmers Fair

2. Radio

Radio is an audio-based electronic device used for information dissemination to mass audience. Radio is a powerful media for the transmission of intended messages to target audience within the shortest possible time. Compared to other mass media tools radio is affordable all social groups and available in the remote locations of a country. In India, radio broadcasting was introduced by Radio Club Bombay in 1923, a few years after the first commercial radio broadcasting at international level. Though radio was famous for entertainment in the country later became popular for education with the launch of government initiative All India Radio (AIR) also known as *Akashvani* in 1936. With the success of the post-independence effort 'Radio Rural Forums' AIR started the Farm & Home Unit for the widespread dissemination of information on new technologies like high yielding variety seeds, fertilizers, and crop management practices like irrigation, pest and disease control etc. in the Green Revolution Period. Radio based agricultural education program to farmers and farm women s like that of 'Farm School on Air' were helped to narrow the gap between farmers and modern technologies and increased adoption of modern agricultural technologies. Since all these information was communicated in different regions in local languages and rural people listened radio programs without compromising their works at farm or home, radio based agricultural and rural development programs triggered the growth of rural economy at a fast pace and improved agriculture based rural livelihood in India. Radio broadcast has a crucial role in the present era of advanced communication technologies as it is the major tool of awareness creation campaigns. For example, broadcasting of short audio messages about voting rights of a citizen during the time of elections or Cleanliness (*Swachhata*) by government officials or celebrities. The idea used here is 'media massage the brain' because, short messages broadcasted frequently reinforce that particular message in listeners' brain and affect the though process.

Fig. 3.11: Radio

3. Community Radio

Community Radio is a form of radio broadcasting service developed in the late 1900s as a substitute to the mainstream broadcast media in the Western countries. In the context of community radio, 'community' refers

to *a specific group of people with common interests or goals and share same geographical location over which the signal of that radio can be heard.* In simple words, community represents *everyone who comes in the broadcasting range of a community radio station.* Community radio stations are generally of low powered, short-range, and not-for-profit type, owned and operated by communities for catering the information needs of people locally in their own languages and dialects. Also, contents of the community radio programs are customized for the local community they serve. Community radio provides opportunity to all members to become a content creator to share their own thoughts and knowledge as well as to be the voice of the people for sharing others stories which have relevance to that specific community or region. In this way, while ensuring peoples' participation community radio help its members to achieve social recognition. In rural areas, co mmunity radio deals with a variety of t opics that are interlinked with rural life like agriculture, weather information, public health, nutrition, education, local issues, natural resource conservation, preservation of local culture, daily news analysis of important national and international events along with local news etc. Moreover, community radio stations operating in mountainous and coastline areas support communities to survive unexpected natural disasters by acting as early warning systems and during disaster management.

Fig. 3.12: Community Radio

Realizing the importance of Community Radio in empowering local communities, the Indian Government approved a Policy in December 2002 to grant licenses to well established educational institutions including IITs/IIMs for setting up of community radio stations. In 2004, the first community radio station *Anna FM* established at Anna University in Tamil Nadu. Later in 2006 the new government policy permitted ICAR institutions, Agricultural Universities, Krishi Vigyan Kendras, Non-Governmental Organizations etc. to setup and operate community radio stations so as to enhance community participation in social development. The government guidelines emphasize that at least 50 per cent of the community radio programs should be produced locally in the local language or dialect to the maximum extent possible. Also, there should be

50 per cent women representation in the advisory and content committee constituted from the local community. Irrespective of the initial slow pace, community radio has gained momentum in its expansion and popularity. As per the government data total number of Community Radio Stations approved by GoI is 532 as of March, 2025 in India.

4. Television

Television (TV) is an audio-visual medium used for transmitting moving images and sound from source to receivers. TV broadcasting initiated in Western countries in the late 1930s reached India in the late 1950s and gradually expanded to a national network in the 1980s. When introduced TV sets were black & white, relatively bulky and had external *antenna* to receive *over-the air signals*, and TV programs were also limited. Television broadcasts are either recorded or live telecasts and programs include both commercial (entertainment programs) and non-commercial (educational programs) types. The first agricultural education program in Indian TV *Krishi Darshan* was premiered on DD National on 26 January 1967. Thereafter, transformations in the television broadcasting mode from terrestrial based to satellite and over-the-top (OTT) based has made Indian television industry more competitive with a wide range channels with "24x7" hours service for entertainment, news and education. Along with DD Kisan a number of national as well as regional channels focus on agricultural education too.

Fig. 3.13: Television

5. Newspaper

Newspaper is a traditional print media in which news, advertisements, and many other information are printed on special type of low-cost paper called *newsprint*, and then folded as a bunch of loose papers for distribution on daily or weekly basis. This mass c ommunication tool

traditionally keeps people informed about different national and international events and help people to have awareness about what is going on around them. Newspapers have crucial role in disseminating agricultural information too since farmers get inf ormation about many technologies through newspapers. When internet take over the global communication newspapers also transformed from prin t form to digital form and many people prefer online newspapers particularly the working class and young generation.

Fig. 3.14: Newspaper

6. Social Media

The word *'social media'* represents all the internet based interactive platforms used for creating, sharing, and exchanging information in virtual communities and networks. In this digital era social media platforms like Facebook, Twitter, Instagram, YouTube, TikTok, WhatsApp, Telegram, LinkedIn etc. play key role in mass communication compared to the traditional mass media channels like radio, television, and print media. The greatest advantage with social media platforms is instant communication due to advancement in mobile phone technology and accessibility to internet even in remote locations. Real-time sharing of news and events to people locate anywhere in the world without much financial investment making social media platforms the powerful mass contact tools. Since the user base of social media are wide anything shared through these platforms reach millions of global audiences within a very short time period through features such as *likes, shares, comments,* etc. One of the best examples of the social media reach we have witnessed during the time of the Global pandemic COVID-19. However, although social media has a number of advantages they have disadvantages too. Social media platforms always raise concern about privacy of users since they collect a lot of personal data while registering in those platforms. News about selling of personal data collected through these platforms and associated incidences are becoming common nowadays. Spread of fake

news is another disadvantage. People often share fake news without any fact check and sometime people even do targeted activities to defame others.

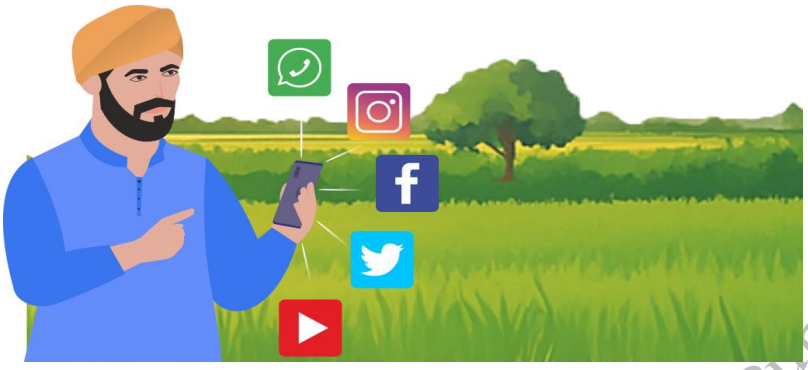

Fig. 3.15: Social Media

Practical Exercises

Activity 1

Choose any methods and demonstrate its usability.

Materials required: Pen, pencil, notebook, etc.

Procedure:

- Choose one extension method from any of the following categories: Individual Methods, Group Methods, Mass Methods
- Demonstrate how the selected method is used to spread agricultural information among farmers.
- Note down the following:
    - Name of the method
    - Type of method
    - Purpose of method
    - Step-by-step procedure for its implementation
    - Required resources or materials
    - Target Problem
    - Key message delivered
    - Response or feedback from the audience
    - Advantages and limitations of the method

Activity 2

Visit nearby farmers fair and enlist Package of Practices displayed.

Materials required: Pen, pencil, notebook, etc.

Procedure:

- Visit a nearby Farmers' Fair (Kisan Mela) organized by Krishi Vigyan Kendra (KVK), Agricultural University, or Agriculture Department.
- Explore various stalls, exhibitions, and demonstrations at the fair.
- Interact with agricultural scientists, extension officials, and farmers to collect information.
- Note down the following details:
    - Name and date of the Farmers' Fair
    - Technologies or tools demonstrated
    - Details of the Package of Practices demonstrated
    - Advisory services demonstrated in fair

Check Your Progress

Fill in the Blank

1. _____ method is used when the farmer is not available during the extension agent's field visit.
2. Community radio stations are required to have at least _____ percent of their programs produced locally.
3. Demonstrations are based on the principle of "_____ is believing."
4. The first community radio station in India was _____ FM, established at Anna University.
5. In Focus Group Discussion, the ideal number of participants ranges between_____and_____.

Multiple Choice Questions

1. Which of the following is an individual extension method?
    a. Farmers Fair
    b. Focus Group Discussion
    c. Farm and Home Visit

d. Farmer Field Day

2. The Field Flag Method uses different colors to indicate:
    a. The type of crop
    b. Severity of the problem
    c. Weather forecast
    d. Farmer's preferences
3. Which of these is a major advantage of Group Methods?
    a. Minimal planning required
    b. Only one farmer is involved
    c. Encourages favoritism
    d. Reaches more farmers in less time
4. Which of the following is NOT a mass extension method?
    a. Radio
    b. Social Media
    c. Personal Call
    d. Newspaper
5. Which program is considered India's first agricultural TV program?
    a. Krishi Darshan
    b. Farm & Home Show
    c. DD Kisan Samachar
    d. Agri Vision

True or False

1. Personal calls are the best method for imparting complex new agricultural knowledge.
2. Farmer Field School activities are designed based on a customized curriculum.
3. Radio is an expensive and rarely used medium for agricultural education in rural India.
4. Demonstrations can be categorized into method and result types.
5. Group methods increase the chances of favoritism in agricultural extension.

Subjective Question

1. Describe any two individual methods in detail with their advantages and limitations.
2. How do group methods help in knowledge sharing and technology dissemination among farmers? Explain with suitable examples.
3. What are mass methods in agriculture extension? Describe any two methods in detail.

Glossary

ACABC (Agri-Clinics and Agri-Business Centres):: A government scheme that promotes agri-based entrepreneurship by training and financially supporting agricultural graduates to establish agri-clinics and agri-business centers.

Advisory Extension: An extension model where services are tailored to the specific questions and needs of farmers, often combining expert consultation with participatory problem-solving.

Agribusiness: A business-oriented approach to agriculture that includes farming, processing, input supply, and marketing, focusing on profitability and competitiveness.

Agricultural Extension Service Provider (AESP): A professional or organization that delivers agricultural knowledge, technologies, and advisory services to farmers with the aim of improving their productivity and livelihoods.

Agricultural Technology Management Agency (ATMA): An autonomous institution at the district level that coordinates research, extension, and other agricultural activities to ensure effective technology dissemination.

Agri-Tech: The application of advanced technologies such as drones, sensors, mobile apps, and data analytics to improve the efficiency and sustainability of agriculture.

Agri-Warehousing: The infrastructure and services required for safe storage, preservation, and handling of agricultural commodities to reduce post-harvest losses.

Agri-preneur: An entrepreneur operating in the agriculture sector who uses innovation, business skills, and risk-taking ability to develop sustainable agri-based enterprises.

Agri-preneurs: Trained individuals who start businesses related to agriculture, including input supply, mechanization services, or extension support to other farmers.

Agro-processing Industry: An industry involved in transforming raw farm produce into value-added products such as packaged foods, oils, or juices.

Agroecosystem: A managed ecosystem that includes crops, livestock, soil, water, and interactions with the environment, all designed to produce agricultural goods sustainably.

Agroforestry: A land-use system that integrates trees and shrubs with crops or livestock to improve soil health, biodiversity, and long-term sustainability.

Apiculture: The scientific practice of beekeeping for honey production, crop pollination, and other hive products.

Artificial Intelligence (AI) in Agriculture: The use of machine learning, data analytics, and automation to support farming decisions, such as predicting pest outbreaks or optimizing irrigation.

Aquaculture: The cultivation of fish, shellfish, and aquatic plants under controlled conditions for commercial or subsistence purposes.

Block Samiti: A local governing body at the intermediate level in rural India that coordinates development activities in a cluster of villages or blocks.

Capacity Building: The process of developing skills, knowledge, and institutional capabilities in individuals or communities to enable effective participation in development programs.

Climate-Smart Agriculture: An approach to farming that increases productivity, enhances resilience to climate change, and reduces greenhouse gas emissions.

Conservation Agriculture: A set of sustainable farming practices that conserve soil, water, and biodiversity, typically involving minimum tillage, crop rotation, and cover cropping.

Cost-Sharing Approach: A collaborative funding model in which both the farmer and the extension or development agency contribute to the cost of adopting a new technology or service.

Custom Hiring Center (CHC): A facility where modern agricultural equipment is made available to small and marginal farmers on a rental basis, promoting mechanization and efficiency.

Data Collection Tools: Instruments such as surveys, questionnaires, interviews, and observation guides used to gather information for planning, monitoring, or evaluating extension programs.

Demand-Driven Extension: An extension strategy that responds to the expressed needs and priorities of farmers rather than delivering pre-determined services.

Digital Green: A community-based platform that uses locally produced videos to share best agricultural practices among farmers through group viewings and discussions.

Educational Communication: A form of communication that emphasizes learning and knowledge sharing, helping farmers understand, evaluate, and apply agricultural information.

e-Extension: The use of digital and internet-based technologies to deliver extension services, including mobile apps, online training, and SMS alerts.

Evergreen Revolution: A concept referring to sustainable agricultural growth that increases productivity without harming the environment or natural resources.

Extension Education: A branch of education that focuses on informal, non-formal learning to improve the knowledge and skills of rural communities, especially in agriculture.

Extension Method: A specific tool or approach used to transfer agricultural knowledge and encourage the adoption of improved practices, such as demonstrations, field days, or media broadcasts.

Extension Services: Organized efforts aimed at delivering agricultural knowledge, skills, and technologies to farmers to enhance their productivity and well-being.

Farmer Field Schools (FFS): A participatory learning approach where groups of farmers meet regularly in the field to observe, experiment, and make informed decisions on crop and farm management.

Farmer Interest Group (FIG): A small group of farmers with shared interests who collaborate to learn, adopt new technologies, and access inputs and markets more effectively.

Farmer Producer Organization (FPO): A legally registered collective of farmers that engages in joint production, procurement, processing, and marketing to enhance bargaining power and profitability.

Farmer-Centered Approach: A development philosophy that places farmers' needs, knowledge, and participation at the core of agricultural extension and innovation efforts.

Farmer-Led Extension: An approach where trained or progressive farmers act as facilitators and share their experiences and knowledge with other farmers in the community.

Farmer-to-Farmer Extension: A peer-based method where experienced farmers train or mentor other farmers, promoting the spread of best practices through local leadership.

Feedback Mechanism: A process for collecting and using farmers' responses and opinions to assess, refine, and improve agricultural programs and services.

FIG (Farmer Interest Group): A self-formed group of farmers organized around a common crop, enterprise, or issue to collaborate and gain better access to technology and resources.

Floriculture: A branch of horticulture focused on the cultivation and marketing of flowers and ornamental plants.

FPO (Farmer Producer Organization): An institution formed by farmers to collectively manage agricultural production and marketing, enhancing their scale and market access.

GIS (Geographic Information System): A computer-based tool used to collect, manage, and analyze geographical data, aiding decision-making in precision agriculture and resource planning.

Grassroots Level: The most basic level of community organization, typically referring to rural villages or local groups where development interventions are implemented.

Grassroots Principle: A participatory approach that ensures development initiatives start at the community level, incorporating local knowledge and priorities.

Green Skills: Skills that enable individuals to engage in environmentally sustainable practices in agriculture and related sectors.

ICT (Information and Communication Technology): A broad term covering digital tools like computers, smartphones, internet, and mobile apps used to disseminate agricultural information and services.

Inclusivity in Extension: An approach that ensures equitable access to agricultural knowledge and services for all, especially marginalized groups such as women, smallholders, and tribal farmers.

Indicators (in Evaluation): Quantitative or qualitative signs used to measure the success, efficiency, or impact of a program, such as yield increase or participation rate.

Integrated Farming: A diversified farming system that combines crops, livestock, aquaculture, and other components to maximize resource use and reduce risk.

Interactive Voice Response (IVR): A phone-based system that enables farmers to access agricultural information using voice menus in local languages.

Answer Key

Unit 1

Session 1

Fill in the Blank

1. Problem
2. Interest, Needs
3. Non-formal
4. Science
5. Learning
6. National

Multiple Choice Questions

1-C, 2-B, 3-C, 4-A, 5-C, 6-B, 7-C, 8-D

Session 2

Fill in the Blank

1. Greek
2. Top-down
3. Decisions
4. Demand

Multiple Choice Questions

1-B, 2-C, 3-D, 4-B, 5-D, 6-A

Unit 2

Session 1

Fill in the Blank

1. Project
2. Planning
3. Objective
4. Extension
5. Community

Multiple Choice Questions

1-B, 2-A, 3-B, 4-C, 5-D

True or False:

1. False
2. True
3. False
4. True
5. False

Session 2

Fill in the Blank

1. Post-implementation
2. Farmer Field School (FFS)
3. Chatbots
4. GIS (geographic information system)
5. Infrastructure

Multiple Choice Questions

1-C, 2-C, 3-A, 4-D, 5-B

True or False:

1. False
2. True
3. False
4. False
5. True

Unit 3

Fill in the Blank

1. Field Flag
2. 50
3. Seeing
4. Anna
5. 6 and 10

Multiple Choice Questions

1-C, 2-B, 3-D, 4-C, 5-A

True or False:

1. False
2. True
3. False
4. True
5. False

List of Credits

Dr. Kamini Bisht, JNKVV, Jabalpur

Fig 1.1

Fig 1.2

Fig 1.3

DAAH, PSSCIVE, Bhopal

Fig. 1.4

Fig. 1.5

Fig. 2.1

Fig. 3.1

Fig. 3.2

Fig. 3.3

Fig. 3.4

Fig. 3.5

Fig. 3.6

Fig. 3.7

Fig. 3.8

Fig. 3.9

Fig. 3.10

Fig. 3.11

Fig. 3.12

Fig. 3.13

Fig. 3.14

Fig. 3.15

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