

SECTION

8

**IMPORTANCE OF VEGETABLE
AND ORNAMENTAL CROPS
IN THE LIVELIHOOD OF
PRODUCERS, AND METHODS
OF TRANSFERRING
PRODUCTION TECHNOLOGY**



Mobilisation of resources and networks

Support Systems In Agriculture

INTRODUCTION

Hello learner! Welcome to section 8. In this section, you will explore how to mobilise resources and build networks that are crucial for successful agricultural production. As agriculture evolves from a subsistence activity to a modern commercial enterprise, understanding these concepts is essential. You will discover the economic importance of selected vegetable crops and ornamental plants, not only for the livelihood of producers but also for the broader value chain. Additionally, you will learn about the role of technology transfer in agriculture, especially the participatory approaches that enable farmers to adopt innovative practices and enhance productivity.

At the end of this section, you will be able to:

- Describe the economic importance of selected vegetable crops and ornamental plants to the livelihood of producers and the broader value chain.
- Describe technology transfer methods with emphasis on participatory approaches.

Key Ideas

- **Value chain:** This encompasses the full range of activities and services required to bring a product or service from conception to sale and consumption.
- **Value chain approach:** This deals with the interrelatedness of actors in the enterprise who add value to products and services as they pass from one link in the chain to the next.
- **Value chain actors:** These are individuals connected along a chain producing, transforming and bringing goods and services to end consumers through a sequenced set of activities.
- **Resource mobilisation:** This refers to the process of gathering, organising, and utilising various resources - such as financial, human, and material resources - needed to support agricultural production.
- **Agricultural networks:** These are systems of connections among farmers, suppliers, buyers, and other stakeholders in the agricultural value chain.
- **Economic importance of crops:** This refers to the value that specific crops, such as vegetables and ornamental plants, contribute to the economy.
- **Technology transfer:** This involves the process of sharing new technologies, practices, and innovations with farmers and other stakeholders.
- **Participatory approaches:** These are methods that actively involve farmers and other

stakeholders in the decision-making process when introducing new technologies or practices.

- **Agricultural extension:** Agricultural extension is the transfer of scientific research and new knowledge to farmers.

Now, delve into the economic importance of selected vegetable crops and ornamental plants to the farmer and the nation.

ECONOMIC IMPORTANCE OF SELECTED VEGETABLE CROPS AND ORNAMENTAL PLANTS TO THE FARMER AND THE NATION

The economic importance of vegetable crops and ornamental plants is closely linked to the processes from production to consumption (value chain) therefore, it is necessary to introduce the concept of value chain and its importance in agricultural production.

What is a Value Chain?

Value chains encompass the full range of activities and services required to bring a product or service from conception to sale and consumption.

The value chain approach in any agricultural enterprise deals with the interrelatedness of actors in the enterprise who add value to products and services as they pass from one link in the chain to the next.

Actors are connected along a chain producing, transforming and bringing goods and services to end consumers through a sequenced set of activities. Value chains include input suppliers, producers, processors, and buyers, as well as the support services and enabling environments that form a dynamic market system.

Why a Value Chain Approach?

1. Value chains develop interventions focused on improving business operations at the level of producers, processors and other actors in the chain.
2. Value chains promote the flow of information and innovation among the actors along the chain.
3. Value chain development can also foster coordination along the chain and reduce entry barriers to international markets.
4. Value addition may create a new commodity or product and make an agricultural product more valuable.

Economic Importance of Vegetables and Ornamental Plants to the Farmer

- 1. Employment:** The producers, wholesalers and retailers of vegetables and ornamental plants do this as a full-time job. As well as producing vegetables and ornamental plants, there are job opportunities in providing tools and accessories such as seeds and planting materials, pots, fertilisers, pesticides, and herbicides. Job opportunities are also created in the export industry through the production, processing and marketing of the produce and associated products.
- 2. As sources of food and nutrition:** Vegetables form an essential part of main dishes and are good sources of proteins, minerals and vitamins that promote healthy growth and development of both humans and other animals.
- 3. Income generation:** Both vegetable crops and ornamental plants can be lucrative sources of income for producers. Vegetable crops are in high demand for consumption, whether sold fresh, processed, or as value-added products such as salads or canned goods. Ornamental plants, on the other hand, are sought after for landscaping, decoration, and gifting purposes. Producers can capitalise on this demand by cultivating and selling these plants for profit.
- 4. Crop diversification and risk management:** Growing a variety of vegetable crops and ornamental plants allow producers to diversify their income streams and reduce dependency on a single crop or market. This diversification strategy helps mitigate risks associated with factors like market fluctuations, pests, diseases, and adverse weather conditions. For example, if one crop fails due to unfavourable conditions, producers can rely on income generated from other crops.
- 5. Closing the hunger and income gap:** Vegetable crops and ornamental plants often have different growing seasons, providing producers with year-round income opportunities. By planting a mix of seasonal crops and plants, producers can optimise their production schedules to meet market demand and maximise profits throughout the year. Additionally, some ornamental plants, such as those used for holiday decorations, experience seasonal spikes in demand, creating opportunities for increased sales and revenue during specific times of the year.
- 6. Export opportunities:** Vegetable crops and ornamental plants are often traded internationally, presenting producers with opportunities to access lucrative export markets. Producers can leverage their expertise in cultivating high-quality crops and plants to tap into foreign markets and expand their customer base beyond domestic borders. Exporting also diversifies revenue streams and enhances the resilience of producers to fluctuations in local markets.
- 7. Environmental benefits:** Both vegetable crops and ornamental plants contribute to environmental sustainability and ecosystem health. They enhance biodiversity, beautify landscapes, and improve air quality. Producers can capitalise on the growing demand for sustainably produced crops and plants by adopting eco-friendly farming practices and promoting their products as environmentally conscious choices.
- 8. Medicinal benefits:** Some ornamental plants are used in folk medicine for the treatment of ailments.

Economic Importance of Selected Vegetable Crops and Ornamental Plants to the Nation

- 1. Provision of raw materials to feed processing industries:** Industries process vegetables and fruits into tins, cans and bottles to help preserve and extend their shelf life.
- 2. Job creation:** The cultivation, harvesting, processing, and distribution of vegetable crops and ornamental plants create employment opportunities across the agricultural sector. From farm labourers to agricultural scientists, workers are employed in various stages of production, contributing to rural and urban employment. Additionally, there are employment opportunities in related sectors such as transportation, packaging, marketing and retail.
- 3. Development and expansion of agricultural manufacturing industries. These are industries that manufacture inputs for agricultural production such as tools, machines, seeds, fertilisers, pesticides and other equipment.**
- 4. Revenue generation:** Vegetable crops and ornamental plants contribute significantly to agricultural revenue and overall gross domestic product (GDP). Both sectors generate income through domestic sales, exports and value-added products. By cultivating and selling these crops and ornamental plants, farmers and horticulturists contribute to the national economy by generating revenue streams.
- 5. Trade balance:** Exporting vegetable crops and ornamental plants can positively impact a country's trade balance by generating foreign exchange earnings. Countries with favourable climates and expertise in growing specific crops and plants can capitalise on international demand and establish themselves as key exporters in the global market. This not only boosts export revenues but also strengthens the country's position in international trade.
- 6. Tourism and aesthetics:** Ornamental plants contribute to the aesthetics of a country, enhancing landscapes, public spaces and tourist sites. Well-maintained gardens, parks and botanical gardens featuring ornamental plants attract visitors, boosting tourism revenues and supporting local economies.
- 7. Food security and nutrition:** Vegetable crops play a crucial role in ensuring food security and nutrition within a country. They provide essential vitamins, minerals and dietary fibre necessary for a healthy diet. By promoting the cultivation and consumption of diverse vegetable crops, governments can improve public health outcomes, reduce malnutrition and enhance food security for vulnerable populations.
- 8. Environmental benefits:** Ornamental plants contribute to environmental and ecosystem sustainability. They contribute to urban greening, air purification and noise abatement.
- 9. Cultural and social significance:** Vegetable crops and ornamental plants hold cultural and social significance within a country, representing traditions, customs, and cultural heritage. They are used in religious ceremonies, festivals, celebrations and rituals, fostering a sense of community and identity.

Now that you have successfully studied the content, do the following activities below.

Activity 8.1

With a friend, map the value chain for a selected vegetable crop or ornamental plant from production to consumption. Highlight the key stages and economic impacts and share your findings with other friends.

Follow the steps below to assist you in mapping the value chain for a selected vegetable crop or ornamental plant

Steps:

- a. Choose a specific vegetable crop (e.g. tomatoes) or ornamental plant (e.g. roses) to map the value chain.
- b. Outline the key stages from input supply to consumption. Ensure you include a comprehensive list of stages and activities in the value chain. These stages include:
 - i. **Input supply:** Sources of seeds, fertilisers, and tools.
 - ii. **Production:** Cultural practices and harvesting techniques.
 - iii. **Processing:** Any processing steps (e.g. washing, packaging).
 - iv. **Distribution:** Methods of transportation and storage.
 - v. **Marketing and sales:** Channels and strategies for selling the product.
 - vi. **Consumption:** Final use of the product by consumers.
- g. Using the stages provided in (b), create a visual value chain diagram that clearly shows the progression and interconnections within the value chain stages.
- h. Share your value chain map with other friends.

I hope you have enjoyed creating your value chain map for a selected vegetable crop or ornamental plant and sharing your ideas with other friends.

Activity 8.2

Search on the Internet for the economic importance of selected vegetable crops and ornamental plants to your country. Prepare a presentation summarising your findings and discuss them with other members of your class.

Follow the steps below to achieve activity 8.2.

Steps:

- a. Select a specific vegetable crop or ornamental plant to focus on.
- b. Use search engines to find reliable information on the economic impact of the chosen crop or plant.
- c. Review the information gathered and give a concise summary of the economic importance of the selected crop or plant.
- d. Create a well-structured presentation to present your findings to your class. You may use visual aids such as slides, charts, or posters to present your findings.

Well done! I hope you and your friends enjoyed the activity and presentation.

Project Work

Visit local producers and vendors of vegetable crops and ornamental plants to gather information on their roles and economic benefits. OR watch documentaries from the Internet about the economic impact of vegetable crops and ornamental plants on farmers and the nation. Share your findings with other members of the class.

TRANSFER OF TECHNOLOGY APPROACHES WITH EMPHASIS ON PARTICIPATORY AGRICULTURAL EXTENSION DELIVERY

Agricultural extension is an out-of-school activity in which adults and young people learn by doing. It is a partnership between the government, extension workers and the people who provide services and education designed to meet the production needs of the people. Agricultural extension is the transfer of scientific research and new knowledge to farmers. The field of agricultural extension now encompasses a wider range of communication and learning activities organised for producers by professionals from different disciplines, including agriculture, agricultural marketing, health and business studies.

Types of Agricultural Extension Systems

Agricultural extension delivery can be classified into four main systems based on the source of funding:

1. **Public extension system:** Funded by ministries and departments of agriculture and agricultural research centres.
2. **Private extension system:** Provided by private extension agents such as input manufacturers or distributors and private consulting enterprises.

3. **Non-profit sector system:** Financed by local, provincial, national or international nongovernmental organisations such as foundations, commodity groups and other non-commercial associations.
4. **Cost-sharing system:** The cost of agricultural extension is shared between the clients (local farmers or producers) and the other stakeholder groups, namely the public sector.

Importance of agricultural extension

1. Capabilities among farmers are developed to enable them to understand their problems and how best to resolve them.
2. It helps to make scientific methods available to the producers so that they can raise their production and standard of living.
3. It helps in community development. Extension education plays a major role in bringing desirable change to producer groups which facilitates community development.
4. It helps to improve productivity. It equips farmers with the necessary knowledge and skills to enable them to produce more efficiently, resulting in increased productivity.
5. It enables farmers to use their production resources efficiently leading to profit maximisation.

Technology Transfer in Agricultural Extension Delivery

Technology transfer in agricultural extension delivery refers to the process of disseminating knowledge, innovations and best practices from research institutions, agricultural experts, and technology developers to farmers and other stakeholders in the agricultural sector. It involves transferring technological advancements, scientific discoveries, and practical solutions to address agricultural challenges and improve productivity, sustainability and livelihoods.

Key components of technology transfer in agricultural extension delivery

1. **Identification of technologies:** Agricultural extension agents and experts identify relevant technologies, practices and innovations that have the potential to benefit farmers and address specific agricultural challenges. These technologies may include improved crop varieties, pest management strategies, irrigation techniques, mechanisation solutions, and post-harvest technologies.
2. **Adaptation and customisation:** Technologies may be adopted as first presented. However, since farmers' agroecological zones and conditions and crops grown usually differ, there is the need to adapt and customise technologies to suit local agroecological conditions, farming systems and socio-economic contexts.

3. **Capacity building:** Agricultural extension programs focus on building the capacity of farmers, extension agents and other stakeholders to understand, adopt and utilise new technologies effectively.
4. **Demonstration and learning:** Technology transfer often involves the organisation of field demonstrations, technology showcases, and farmer-to-farmer information exchange to showcase the benefits and outcomes of adopting new technologies. Farmers have the opportunity to observe, interact with and learn from successful demonstrations, building their confidence and motivation to adopt innovative practices.
5. **Extension services:** Agricultural extension services play a crucial role in facilitating technology transfer by providing advisory support, technical assistance and information dissemination to farmers. Extension agents traditionally serve as intermediaries between research institutions, academia, government agencies and farmers, facilitating the flow of knowledge and resources to improve agricultural productivity and sustainability.
6. **Monitoring and evaluation:** Continuous monitoring and evaluation are essential to assess the uptake, effectiveness and impact of the technology. Feedback from farmers, extension agents and other stakeholders is collected to identify challenges and refine strategies to enhance the scalability and sustainability of the technology.
7. **Policy support:** Governments and policymakers play a key role in creating an enabling environment for technology transfer in agriculture through supportive policies, investments in research and development, infrastructure development and incentives for innovation adoption. Policy frameworks that promote knowledge sharing, collaboration and public-private partnerships facilitate the dissemination and adoption of agricultural technologies.

Technology transfer methods

1. **Training workshops:** Conducting training workshops is an effective way to transfer technology and knowledge to farmers. Training workshops provide a platform for interactive learning, allowing farmers to acquire new skills and information through lectures, demonstrations and hands-on exercises.
2. **Farm visits and consultations:** Extension agents conduct farm visits and consultations to provide farmer-specific advice and guidance to individual farmers. During these visits, extension agents assess the specific needs and challenges of farmers, offer recommendations based on scientific knowledge and best practices, and provide technical assistance on various aspects of crop production, livestock management and farm operations.
3. **Demonstrations and field days:** Organising field demonstrations and farmer field days allows farmers to observe first-hand the implementation and benefits of new technologies and practices. Extension agents set up demonstration plots where farmers can see the performance of improved varieties, planting techniques, irrigation methods, or pest management strategies. Field days

provide opportunities for farmers to ask questions, exchange ideas and learn from each other's experiences.

4. **Mobile advisory services:** With the widespread use of mobile phones, mobile advisory services have emerged as a convenient and accessible method of technology transfer in agriculture. Extension agencies and agricultural organisations send Short Message Service (SMS) and voice messages over social media platforms to disseminate timely information, weather forecasts, market prices, pest alerts, and agronomic advice to farmers. Mobile advisory services reach a large number of farmers quickly and cost-effectively, enabling them to make informed decisions and adopt recommended practices.
5. **Farmer field schools:** Farmer field schools (FFS) are participatory learning platforms where groups of farmers engage in experiential learning and experimentation. FFS sessions typically involve a series of field-based activities, discussions, and group exercises focused on specific agricultural topics or themes. Farmers learn by doing, working collaboratively to test new technologies, evaluate different practices, and solve problems collectively. FFS promote peer-to-peer learning, empowerment and farmer-led innovation.
6. **Printed extension materials:** Distributing extension materials such as pamphlets, brochures, manuals, fact sheets and posters is a traditional method of technology transfer in agriculture. Extension materials contain practical information, illustrations, and guidelines about various agricultural topics, making them valuable educational resources for farmers. Extension materials can be distributed during training workshops, farm visits, or community events and may be available in print or digital formats.
7. **Radio and television programmes:** Broadcasting agricultural radio and television programmes are effective ways to reach remote and rural communities with agricultural information and extension services. Radio and television stations air programmes dedicated to agricultural topics, featuring expert interviews, farm reports, success stories, and educational segments. These programmes provide farmers access to timely information, market updates, weather forecasts and technical advice, enhancing their knowledge and decision-making abilities.

Participatory Approach in Technology Transfer

The participatory approach in technology transfer emphasises the active involvement and collaboration of farmers and other stakeholders throughout the process of technology dissemination and adoption. Unlike traditional top-down approaches where knowledge is transferred unilaterally from experts to farmers, the participatory approach recognises farmers as active participants, decision-makers and co-creators of knowledge. This approach aims to empower farmers, enhance their capacities and promote sustainable agricultural development through inclusive and participatory processes.

Key principles of the participatory approach in technology transfer

- 1. Inclusiveness:** The participatory approach involves all relevant stakeholders, including farmers, extension agents, researchers, policymakers and local communities. It ensures that the voices and perspectives of all stakeholders are heard and considered in the decision-making processes related to technology transfer and agricultural development.
- 2. Empowerment:** Participatory approaches empower farmers by recognising their knowledge, skills, and expertise. Farmers are actively engaged in identifying their needs, setting priorities, and co-designing solutions that are appropriate and relevant to their farming systems. By involving farmers in decision-making processes, the participatory approach enhances ownership, commitment and sustainability of technology adoption efforts.
- 3. Collaboration and partnership:** The participatory approach promotes collaboration and partnership among diverse stakeholders, fostering synergies and leveraging collective strengths. It encourages the exchange of knowledge, expertise and resources among farmers, extension agents, researchers, NGOs, government agencies and other actors. Collaborative partnerships enhance the effectiveness, scalability and impact of technology transfer.
- 4. Participatory learning and action:** Participatory approaches emphasise experiential learning and action-oriented approaches, such as farmer field schools, learning groups and participatory action research. Farmers engage in hands-on activities, field experiments and problem-solving exercises to explore new technologies, test innovative practices and learn from each other's experiences.
- 5. Adaptation and flexibility:** The participatory approach recognises the diversity of farming systems, socio-economic contexts and local realities. It emphasises flexibility and adaptability in technology transfer processes, allowing for the customisation and tailoring of interventions to suit the specific needs, preferences and constraints of farmers. Participatory approaches promote bottom-up innovation and continuous learning, enabling farmers to adapt and refine technologies based on local feedback and experiences.
- 6. Capacity building and extension services:** Participatory approaches prioritise capacity building and extension services to support farmers in adopting and implementing new technologies. Extension agents play facilitative roles, providing technical assistance, training and advisory support to farmers. Extension services are demand-driven, responsive to farmers' needs and delivered through participatory methods that promote interactive communication, knowledge sharing and mutual learning.

Advantages of the participatory approach in extension delivery

The participatory approach in technology transfer offers several key advantages which contribute to more effective, sustainable and equitable outcomes. Some of the advantages are:

1. Recognising knowledge, skills and experiences of farmers as valuable assets.
2. Enabling the co-creation of relevant and customised solutions that address the specific needs, preferences and constraints of farmers.
3. Enhancing the relevance, acceptability and legitimacy of technologies by incorporating local knowledge, practices and cultural norms into the design and implementation process.
4. Fostering community ownership and collective action that promotes the long-term sustainability of technology transfer initiatives.
5. Strengthening the capacity and effectiveness of extension agents by promoting facilitative, participatory and client-centred approaches in extension delivery.
6. Stimulating continuous learning, innovation and adaptive management among farmers, extension agents and other stakeholders.

The key stages of the participatory extension approach

The participatory extension approach typically follows a cyclical process, which includes several key stages. These stages are designed to engage farmers and other stakeholders in collaborative decision-making, problem-solving and knowledge-sharing processes. The key stages of the participatory extension approach cycle are:

- 1. Preparation and planning:** In this stage, extension agents and stakeholders engage in preparatory activities to identify objectives, assess needs and plan interventions. This may involve conducting baseline surveys, stakeholder consultations and participatory rural appraisals to gather information about farmers' priorities, challenges and opportunities. Based on the findings, extension agents develop work plans, set goals, and design strategies for technology transfer and extension activities.
- 2. Technology identification and selection:** In this stage, extension agents, farmers and other stakeholders jointly identify appropriate technologies, innovations and practices that address specific agricultural challenges and opportunities. Technologies are selected based on their relevance, feasibility and potential impact on improving productivity, sustainability and livelihoods. Participatory methods such as focus group discussions, field visits, and farmer surveys are used to prioritise the technologies.
- 3. Adaptation and testing:** Identified technologies are adapted and tested to ensure their suitability and effectiveness in local contexts. Approaches such as on-farm trials, where demonstration plots are used to evaluate technologies under real-life conditions and gather feedback from farmers. Farmers actively participate in testing and adapting the technologies, providing valuable insights and suggestions for improvement.

4. **Training and capacity building:** Training workshops, farmer field schools, and hands-on demonstrations are organised to impart technical know-how, agronomic practices and problem-solving skills. Extension agents serve as facilitators and advisors, supporting farmers in learning, experimenting and applying new knowledge in their farming operations.
5. **Technology adoption and implementation:** Once farmers are trained and equipped with the necessary knowledge and skills, they begin to adopt and implement the selected technologies on their farms.
6. **Monitoring and evaluation:** Throughout the extension cycle, monitoring and evaluation activities are conducted to assess the progress, effectiveness and impact of the interventions. Key performance indicators are used to measure changes in farmers' knowledge, attitudes, practices and livelihoods.
7. **Reflection and learning:** Extension agents and stakeholders regularly review and reflect on their experiences, challenges and lessons learned from the implementation of technology transfer interventions.
8. **Technology modification:** Based on the findings from monitoring, evaluation and reflection activities, extension agents and stakeholders make adjustments and adaptations to extension interventions as needed.

By following these key stages of the participatory extension approach cycle, extension agents and stakeholders can facilitate the transfer of technology and knowledge in agriculture in a collaborative, inclusive, and empowering manner, leading to improved agricultural productivity, sustainability, and livelihoods.

Well done, now carry out the activities below.

Activity 8.3

Search online for information on conventional and participatory technology transfer methods in crop production. Compare and contrast your findings between the conventional and participatory technology transfer methods in crop production.

Follow the steps below to achieve activity 8.3.

Steps:

- a. Go online.
- b. Type “conventional technology transfer methods in crop production” in the search engine and press the Enter button to open the browser. Read through and write down relevant notes.
- c. Similarly, type “participatory technology transfer methods in crop production” in the search engine and press the Enter button to open the browser. Read through and write down relevant notes.

- d. Compare and contrast your findings between the conventional and participatory technology transfer methods in crop production.
- e. Construct a table showing the differences between the two transfer methods.
- f. Present your findings to the whole class.

REVIEW QUESTIONS

1. Explain the roles that ornamental plants play in promoting environmental health.
2. Discuss the economic importance of vegetable crops and ornamental plants to the farmer.
3. Evaluate the impact of vegetable crop and ornamental plant production on the national economy.
4. Discuss the contribution of technology transfer by extension services to agriculture.
5. Evaluate the effects of participatory extension services delivery on vegetable crop and ornamental plant enterprises.

ANSWERS TO REVIEW QUESTIONS

1. Ornamental plants significantly contribute to environmental health in several ways:
 - Ornamental plants help enhance air quality by absorbing pollutants such as carbon dioxide, sulphur dioxide, and nitrogen oxides, and by releasing oxygen through photosynthesis. Their presence in urban areas can lead to cleaner, more breathable air.
 - Ornamental plants help to reduce the urban heat effect by providing shade and releasing moisture through transpiration. This cooling effect can moderate temperatures, making urban environments more comfortable and reducing the need for artificial cooling.
 - Ornamental plants create habitats for a variety of species, including insects, birds, and other wildlife. This increased biodiversity supports ecological balance and contributes to the health of local ecosystems.
 - The root systems of ornamental plants help stabilise soil, reducing erosion and improving soil structure. This contributes to soil health and prevents the loss of valuable topsoil.
 - Dense plantings of ornamental plants can act as natural sound barriers, reducing noise pollution in urban areas. This noise abatement can improve the quality of life for residents by decreasing the impact of urban noise.
2. Refer to the content on the economic significance of vegetable crops and ornamental plants to the farmer.
3. Refer to the content on the economic importance of vegetable crops and ornamental plant production to the nation.
4. The contribution of technology transfer by extension services to agriculture includes improved crop yield, adoption of best practices, increased efficiency, enhanced decision-making, empowerment of farmers, improved livelihood, food security, sustainability and economic growth.
5. Refer to the content on the advantages of the participatory approach in extension delivery.

EXTENDED READING

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