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Handbook on establishing and operating multi-actors agricultural innovation platforms



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Foreword

Agrifood systems are by nature complex systems of ecological, economic and social interactions.^{1, 2} Worldwide, they are also facing complex sustainability challenges due to the nexus of population growth, environmental and climate pressures, among others.^{3, 4} It is against this backdrop that multistakeholder platforms (MSPs)⁵ have been promoted as collaborative governance arrangements and collective solutions to complex challenges.^{6, 7, 8} Among all the existing MSP experiments and real-world implementations, multi-actors agricultural innovation platforms (MAIPs) emerge as one of the most mature models with local practices in various forms.

A MAIP is a co-innovation platform established in rural communities where farmers and key value chain actors become empowered through participatory on-farm research and training, new technology demonstrations, and interest group or clubs, market linkages and so on.⁹ MAIPs, as models for inclusive and collaborative innovation, are increasingly deployed in farmer communities to solve the last-mile

- ¹ **Thompson, J. & Scoones, I.** 2009. Addressing the dynamics of agri-food systems: an emerging agenda for social science research. *Environmental Science and Policy*, 12(4): 386–397. <https://doi.org/10.1016/j.envsci.2009.03.001>
- ² **Thorpe, J., Sprenger, T., Guijt, J. & Stibbe, D.** 2022. Are multi-stakeholder platforms effective approaches to agri-food sustainability? Towards better assessment. *International Journal of Agricultural Sustainability*, 20(2): 168–183. <https://doi.org/10.1080/14735903.2021.1921485>
- ³ **HLPE.** 2017. Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome. <https://www.fao.org/3/i7846e/i7846e.pdf>
- ⁴ **World Economic Forum.** 2010. *Realizing a new vision for agriculture : A roadmap for stakeholders*. 32. http://www3.weforum.org/docs/IP/AM11/CO/WEF_AgricultureNewVision_Roadmap_2011.pdf
- ⁵ The High Level Panel of Experts on Food Security and Nutrition defines MSP as “any collaborative arrangement between stakeholders from two or more different spheres of society (public sector, private sector and/or civil society), pooling their resources together, sharing risks and responsibilities in order to solve a common issue, to handle a conflict, to elaborate a shared vision, to realize a common objective, to manage a common resource and/or to ensure the protection, production or delivery of an outcome of collective, and/or, public interest” (HLPE, 2018).
- ⁶ **Breeman, G., Dijkman, J. & Termeer, C.** 2015. Enhancing food security through a multi-stakeholder process: The global agenda for sustainable livestock. *Food Security*, 7(2): 425–435. <https://doi.org/10.1007/s12571-015-0430-4>
- ⁷ **Haarich, S.N.** 2018. Building a new tool to evaluate networks and multi-stakeholder governance systems. *Evaluation*, 24(2): 202–219. <https://doi.org/10.1177/1356389018765797>
- ⁸ **Hermans, F., Sartas, M., Van Schagen, B., Van Asten, P. & Schut, M.** 2017. Social network analysis of multi-stakeholder platforms in agricultural research for development: Opportunities and constraints for innovation and scaling. *PLoS ONE*, 12(2): 1–21. <https://doi.org/10.1371/journal.pone.0169634>
- ⁹ **Yang, P., van de Fliert, E., Musayev, N., Akhundov, Y. & Ou, Y.** 2022a. *Multi-actors agricultural innovation platform: Guideline for master trainers*. Rome, FAO. <https://doi.org/10.4060/cb9080en>

bottleneck, namely, the empowerment of smallholder farmers and value chain actors to access innovation and services to drive field-level change.

With multi-actor partnership being its key characteristic,^{10, 11, 12} a MAIP links researchers, extension agents, entrepreneurs, smallholder farmers and other value chain actors, creating a space for them to co-learn and co-innovate. This facilitates technological innovations, knowledge generation and transfer among agricultural value chain actors, thereby contributing to innovation-led sustainable agricultural development. For this reason, MAIPs are increasingly deployed as a holistic and transformative approach to delivering agricultural extension and advisory services (EAS). When properly operated, they are able to provide place-sensitive and demand-driven services to farmers, smallholders in particular, and key value chain actors when they encounter production, processing or marketing problems. In addition, MAIPs, as an open innovation platform, can also allow agricultural innovation to go beyond the original scope, geographical focus or target audience.¹³ This is conducive to generating spillovers and co-benefits. Therefore, MAIPs can be established to undertake and underpin a series of co-innovation activities to address agricultural innovation challenges while harnessing opportunities.

Facilitation has proved crucial for stimulating and underpinning interactions among MAIP actors. This is the key to supporting co-innovation and co-learning processes and enabling individuals or organizations to reflect on their experience and encourage critical thinking.¹⁴ MAIPs require skilled facilitators to use a variety of methods and tools according to local context and conditions to enable all platform actors to jointly realize their innovation objectives. It is worth noting that the roles of facilitators in a MAIP differ from their roles in classic education, research and EAS systems. Facilitation of the innovation process in a MAIP is rooted in local innovation systems that engage both internal and external actors, including clients (e.g. farmers, pastoralists, fish farmers, etc.) and providers of knowledge, services and products (including research institutes, extension agencies, input suppliers and local traders). Its aim is to spur participatory and collaborative learning processes to solve a specific problem or support a

¹⁰ **Davies, J., Maru, Y., Hall, A., Abdourhamane, I.K., Adegbedi, A., Carberry, P., et al.** 2017. Understanding innovation platform effectiveness through experiences from west and central Africa. *Agricultural Systems*, S0308521X16309180.

¹¹ **Klerkx, L., Adjei-Nsiah, S., Adu-Acheampong, R., Saïdou, A., Zannou, E., Soumano, L., Sakyi-Dawson, O., van Paassen, A. & Nederlof, S.** 2013. Looking at agricultural innovation platforms through an innovation champion lens: an analysis of three cases in west Africa. *Outlook on Agriculture*, 42(3): 185–192.

¹² **Swaans, K., Boogaard, B., Bendapudi, R., Taye, H., Hendrickx, S. & Klerkx, L.** 2014. Operationalizing inclusive innovation: lessons from innovation platforms in livestock value chains in India and Mozambique. *Innovation and Development*, 4(2): 239–257. 10.1080/2157930X.2014.925246.

¹³ **Schut, M., Cadilhon, J., Misiko, M. & Dror, I.** 2018. Do Mature innovation platforms make a difference in agricultural research for development? A meta-analysis of case studies. *Experimental Agriculture*, 54(1): 96–119. 10.1017/ S0014479716000752.

¹⁴ **TAP.** 2016. *Common framework on capacity development for agricultural innovation systems*. Rome: Tropical Agriculture Platform.

particular outcome, thus promoting sustainable agriculture while improving the livelihoods of farmers.

Facilitators play a critical role in establishing and operating MAIPs. They are usually specialized MAIP actors (e.g. researchers, extension agents, agricultural educationists, brokers, NGO activists, traders and processors). Qualified MAIP facilitators, as value chain intermediaries and coordinators, are required to have strong facilitation skills and relevant technical background. They are normally trained through training of MAIP facilitator courses or through the implementation of a MAIP.

This handbook aims to support MAIP facilitators to establish and operate MAIPs. It summarizes the experience of the MAIPs in persimmon, hazelnut and honey value chains that FAO implemented as part of the EU-funded project “Development of sustainable and inclusive local food systems in north-west region of Azerbaijan (GCP/AZE/014/EC)”, the “Tropical Agricultural Platform Agricultural Innovation System (TAP-AIS)” project implemented in Malawi, and the Science and Technology Backyard (STB) initiative led by the China Agricultural University (CAU). It also draws on the lessons learned from the training course “Training of master trainers for establishing and operating Multi-actors Agricultural Innovation Platforms” co-organized by FAO and CAU on July 11–15, 2023.

MAIP facilitators should keep in mind that MAIPs promote learning-by-doing through demand-driven and value chain-based practices. They are suggested to facilitate, in accordance with local conditions and context, the implementation of MAIPs with reference to this handbook, rather than replicating the listed activities and examples. This handbook does not cover all the possible contents of MAIPs, given the complexity of AIS in different agricultural production systems and socioeconomic conditions in different regions and countries. Therefore, MAIP facilitators are encouraged to adapt this handbook, giving full play to their creativity to design facilitation activities and methods according to local contexts and the target agricultural value chain(s).

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Abbreviations

AIS	agricultural innovation systems
BBT	ballot box test
CAU	China Agricultural University
CU	coordination unit
CV	curriculum vitae
DEED	description, explanation, exploration and design
EAS	extension and advisory services
FAO	Food and Agriculture Organization of the United Nations
FFS	farmer field school
GAP	good agricultural practice
ICT	information and communications technology
IPM	integrated pest management
MAIP	multi-actors agricultural innovation platform
M&E	monitoring and evaluation
MT	management team
NGO	non-governmental organization
PAR	participatory action research
SDG	Sustainable Development Goal
STB	Science and Technology Backyard
TAP	Tropical Agricultural Platform
ToF	training of facilitators
ToT	training of trainers

PART 1

CONCEPT



1. Concept of multi-actors agricultural innovation platforms

1.1 Definition

A multi-actors agricultural innovation platform (MAIP) is an inclusive co-innovation platform established in rural communities where farmers and key actors of an agricultural value chain(s) become empowered through participatory on-farm research and training, new technology and innovation integration and demonstration, and interest group or clubs, market connections and so on (Yang *et al.*, 2022a). It aims to fill the last-mile innovation gap and thereby drive sustainable agricultural development by promoting the development of the agricultural innovation system (AIS) at the field level. This is done by fostering co-innovation and co-learning mechanisms through linking key agricultural value chain actors, such as researchers, extension agents, inputs suppliers, private enterprises, market actors and smallholder farmers. In doing so, a MAIP facilitates technological innovation, information exchange, knowledge generation and transfer that are crucial for innovation-led agricultural development towards sustainability.

BOX 1. “Stakeholder” vs “actor”

The term “stakeholder” is generally used to refer to any individual or group who have a “stake”, an interest or role, whether financial or not, in an issue (Brouwer et al., 2016; HLPE, 2018). The difference between actors and stakeholders is primarily participation. Actors play an active role in the service creation and provision process, while stakeholders a more passive role. Actors are also stakeholders because of the benefits they derive from the use of public goods and services. The “stakeholder” part is the most essential (Biekart and Fowler, 2018), yet equally the most contentious aspect of multistakeholder platforms (Warner, 2006). The term “actor” is preferred over the neutral term “stakeholder” when food security and nutrition (FSN)-related issues are addressed (HLPE, 2018).

Source: **Biekart, K. & Fowler, A.** 2018. Ownership dynamics in local multi-stakeholder initiatives. *Third World Quarterly*, 39(9): 1692–1710. <https://doi.org/10.1080/01436597.2018.1450139>

Brouwer, H., Woodhill, J., Hemmati, M., Verhoosel, K. & van Vugt, S. 2016. *The MSP Guide: How to design Multi-stakeholder Partnerships*. The Netherlands, Centre for Development Innovation, Wageningen University. <http://www.mspguide.org/msp-guide>

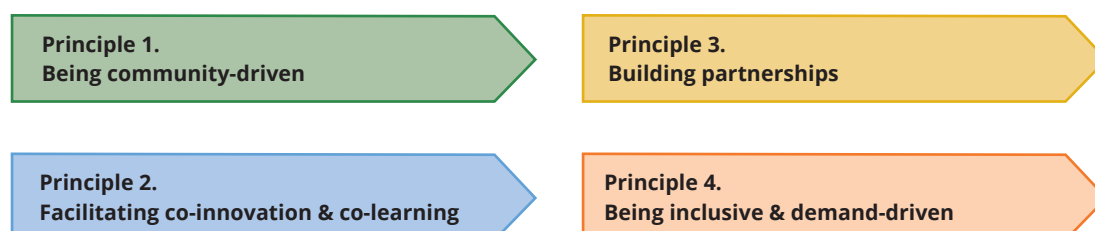
HLPE. 2018. *Multi-stakeholder partnerships to finance and improve food security and nutrition in the framework of the 2030 Agenda. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security*. Rome. <https://www.fao.org/3/CA0156EN/CA0156en.pdf>

Warner, J.F. 2006. More sustainable participation? Multi-Stakeholder Platforms for integrated catchment management. *International Journal of Water Resources Development*, 22(1): 15–35. <https://doi.org/10.1080/07900620500404992>

1.2 Principles

MAIPs stick to four main principles to ensure inclusive innovation processes that benefit smallholder farmers and key value chain actors on an equal footing (FIGURE 1).

FIGURE 1. Principles of multi-actors agricultural innovation platforms



Source: The Authors' own elaboration.



Principle 1. *A MAIP is community-driven*

As a community-based and community-driven platform, a MAIP facilitates a process that fosters an “endogenous innovation subject”. This subject, also a community of common interest, is composed of key community-level agricultural value chain actors such as smallholder farmers, small-scale processors, traders and so on. By participating in a MAIP, these value chain actors can:

- embark on collaborative learning, knowledge generation and informed action processes to solve real-world problems of common interest to them. Through these processes, these actors can not only gain ownership of the knowledge generated, but enhance their collective agency, collaborative skills, mutual trust, and self-confidence;
- become co-founders and equal members of the co-innovation platform, co-providers of essential resources for innovation, and co-designers and participants of on-farm innovation activities, rather than passive recipients of technical assistance and knowledge transfer. Moreover, they are co-owners of the innovation outputs; and
- be empowered as through participatory mechanisms, MAIPs can provide demand-driven extension, financial and other agricultural services that are tailored to the community's specific needs and frame conditions.



Principle 2. *A MAIP facilitates co-learning and co-innovation*

As a platform that links and engages multiple actors along the agricultural value chain, a MAIP allows for different types of interactions. Multi-actor interactions, including farmer to farmer, trader to farmer, input supplier to farmer, processor to farmers, extension agent to farmer and so on, are critical to:

- foster co-learning and co-innovation processes that are participatory and collaborative;
- build up trust among the various actors; and
- spur social processes conducive to spillover effects through which knowledge and innovation are disseminated within and across communities.

A MAIP supports these interactions which often do not occur naturally by making necessary institutional arrangement and activating a facilitation mechanism.



Principle 3. *A MAIP builds partnerships*

A MAIP is a platform for building multi-actor partnerships among actors from research, agricultural EAS, market and farming sectors. A MAIP supports partnership building in three ways:

- By identifying the need of solving a real-world problem(s) that is of common interest to all MAIP actors, it lays the foundation for building multi-actor

partnerships aimed at addressing context-specific problems along the agricultural value chain.

- By offering all the actors a collaborative, inclusive and equal space for innovation and knowledge generation and transfer, it creates conditions for joint actions through which the partnerships will be further consolidated.
- By undertaking participatory situation analysis and problem-solving, especially when a sound enabling environment is present, it can extend existing partnerships to involve all related AIS actors, including policy makers, private sector and civil society. This is much needed to enhance the resilience and functionality of a MAIP.



Principle 4. A MAIP is inclusive and demand-driven

A MAIP needs to be inclusive and demand-driven. Only when made inclusive can MAIPs efficiently promote pluralistic and demand-driven services to farming communities. The farming community is highly diverse in terms of family income, educational background, gender, age, market access, crops and livestock systems. Therefore, different multi-actor initiatives in the community will require different types of information and services. To enhance inclusiveness and effectively serve different groups in the community with varied needs, a MAIP should adopt approaches that are:

- participatory – to involve all relevant MAIP actors in decision-making and implementation processes. This is critical to ensure the effectiveness and relevance of MAIP activities.
- gender- and youth-sensitive – to ensure that marginalized or vulnerable groups, such as women and youth can access support and services for their empowerment.
- open to new members and partners – to build and foster a network of multiple actors from the entire AIS by taking advantage of available institutional and financial supports. Pay attention to the importance of facilitation in this process with the aim to strengthen the linkages among the actors.

BOX 2. Examples of multi-actor agricultural innovation platforms***Science and Technology Backyard***

The Science and Technology Backyard (STB) is a platform located in rural communities, which brings together researchers, extension agents, smallholder farmers (also including local government and private sector entities) and postgraduate students. Its aim is to facilitate information exchange and technological innovation in agriculture. In an STB setup, agronomists, including researchers and postgraduate students live in smallholder farming communities and work together with farmers and extension agents. Farmers and researchers co-innovate through a variety of multi-actor interactions and participatory approaches, such as farmer field schools (FFS), participatory on-farm research, new technology demonstrations and farmer interest groups or clubs. Subsequently, when farmers encounter agronomic problems, they have easy access to the services of scientists and experts without delay, limitations, extra fees or travel time.

Farmer Field School

A farmer field school (FFS) is a platform for farmer education and empowerment. It is meant to strengthen knowledge for comprehensive agroecosystem management, improve decision-making skills, and facilitate group collaboration and action (FAO, 2019). The FFS approach: (1) builds on local knowledge systems while testing and validating scientific concepts developed elsewhere; (2) enhances participants' skills for critical analysis and problem-solving; (3) develops observation skills transforming them into scientific evidence; (4) promotes collective action, fostering group cohesion and community decision-making to improve agriculture and livelihoods; and (5) helps rural communities transform current production systems, driving changes towards more sustainable practices and systems. It consists of a number of components which all follow a bottom-up participatory approach and can be broadly categorized into: (1) the inception phase (field school development); (2) the training phase (technology and curriculum); (3) the dissemination phase (components to promote diffusion of messages to non-participants (field days) or other FFS (exchange visits); and (4) institutionalization of the schools through platform building and training of farmer trainers) (Waddington et al., 2014).

Agroecosystem Living Laboratory

Agroecosystem Living Laboratories (ALL) working group was established at the 2018 G20 Meeting of Agricultural Chief Scientists (MACS) in Argentina. ALL are defined as transdisciplinary approaches that involve farmers, scientists, and other interested partners in the co-design, monitoring, and evaluation of new and existing agricultural practices and technologies on working landscapes to improve their effectiveness and early adoption. The ALL approach highlights three main components,

including (1) transdisciplinary approaches, (2) co-design and co-development with participants, and (3) monitoring, evaluation and research on working landscapes. The transformative power of the agroecosystem living lab approach can best be captured when an initiative implements the three components simultaneously and comprehensively.

Agroinnovation Boot Camps

In the field of sustainable agricultural development, boot camps are emerging intense and short innovation and leadership programmes that guide participants to collaborate on open innovation activities and collectively act to identify and address challenges for the SDGs. For example, the Future Food Boot Camps (FFBC) run by the Future Food Institute guide participants to learn design thinking and prototyping. Leveraging experiential learning methods and including insights from relevant best practices, startups, spin-offs, and innovative projects, FFBCs include interactive workshops and integrate participants with local communities, using ecosystemic and prosperity thinking approaches. This allows participants to get out in the community to connect with local food heroes, attend events to experience different food cultures, have one-on-one sessions with Food System Mentors, and work on real-life challenges in the culminating Hackathon. Another example is the World Food Programme's innovation boot camps, which are intense, five-day workshops with expert mentors and facilitators to help teams dive deep into challenges, ideate solutions, and refine project plans. The aim is to search for game-changing innovations addressing the global food crisis.

Source: **FAO**. 2019. *Farmers taking the lead - Thirty years of farmer field schools*. Rome. <https://www.fao.org/3/ca5131en/ca5131en.pdf>

Future Food Institute. 2023. *Food & Climate Shaper Boot Camps*. <https://futurefoodinstitute.org/academy/boot-camps/>

G20-MACS. 2019. *Agroecosystem living laboratories: Executive report*. https://www.macs-g20.org/fileadmin/macs/Annual_Meetings/2019_Japan/ALL_Executive_Report.pdf

Yang, P., Jiao, X., Feng, D., Ramasamy, S., Zhang, H., Mroczek, Z. & Zhang, W. 2021. *An innovation in agricultural science and technology extension system – Case study on science and technology backyard*. Rome, FAO. <https://doi.org/10.4060/cb2939en>

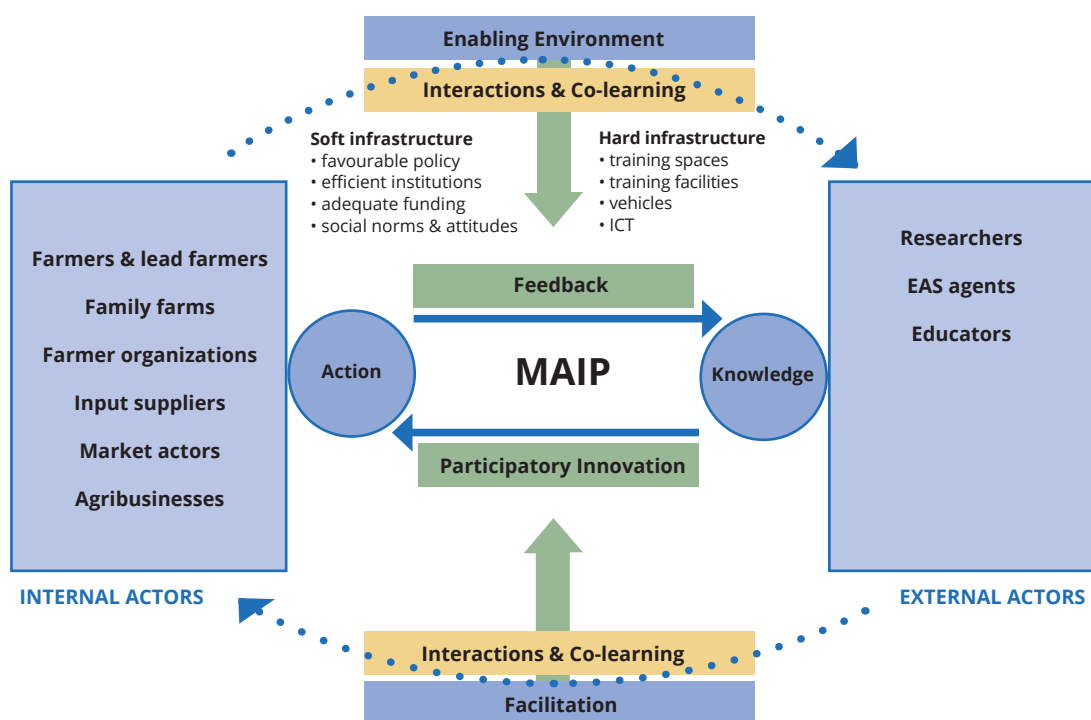
Waddington, H., Snilstveit, B., Hombrados, J., Vojtkova, M., Phillips, D., Davies, P. & White, H. 2014. *Farmer field schools for improving farming practices and farmer outcomes: A systematic review*. Philadelphia, The Campbell Collaboration. <https://onlinelibrary.wiley.com/doi/pdf/10.4073/CSR.2014.6>

World Food Programme. 2023. *WFP Innovation Challenge 2022*. <https://innovation.wfp.org/wfp-innovation-challenge>

2. Design of multi-actors agricultural innovation platforms

In general, a typical functional MAIP has four components, namely, infrastructural settings, key actors, interaction mechanisms, and enabling environment (FIGURE 2).

FIGURE 2. Composition model of multi-actors agricultural platform



Source: Adapted from Yang, P., van de Fliert, E. & Ou, Y. 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

2.1 Infrastructural settings

A typical functional MAIP consists of all or parts of the following infrastructural settings, including (1) meeting and residential places (physical spaces), (2) training and EAS facilities (e.g. computers, projectors, vehicles), (3) experimental and demonstration plots, and (4) technical promotion, communication and advocacy facilities (posters, standing placards, brochures, etc.).

Working and residential places: As MAIPs are community-driven, working and accommodation spaces are preferably located in rural communities. Accommodation places for professionals (researchers and extension agents) and postgraduate students are to be rented from local household(s). As for working spaces, preferences are to be given to rural community centres to which farmers can easily access. This is critical to trigger and maintain engagement and interactions between the rural communities and the professionals on the one hand. On the other hand, it is convenient for the professionals to communicate and build up mutual trust with local farmers and authorities.

Experimentation fields or farms: In MAIPs, experimentation fields (for crops) or farms (for animal husbandry and aquaculture) are to be established to explore or develop new technological innovations. They provide an important space for the professionals to closely collaborate with actors from local communities and conduct field research or on-farm experimentation if needed. This proves a major way to address the key problems or remove bottlenecks of local agricultural production and identify the most feasible and location-specific solutions through participatory research. In doing so, farmers are fully engaged in the knowledge generation process and exposed to new technologies. This will guarantee an active interaction and creates a feedback loop between professionals and farmers.

Tips

- On-farm participatory research is the first step for MAIPs to trigger co-innovation and collaborative knowledge generation at the community level.
- Experimentation fields or farms can be normal fields or farms in the rural community where the MAIP is located. A rent is to be paid to the farmers who are owners of such fields or farms.
- Farmers are required to actively participate in research or experiments and be responsible for field or farm management, including providing necessary inputs.

Demonstration plots or farms: Demonstration plots or farms can be identified and established to apply the key technological innovations and practices obtained from the on-farm research or introduced by the MAIP professionals (researchers and extension agents). However, their most important function is to show case and disseminate experience, good practices, and place-sensitive technologies.

Tips

- Lead farmers are those who usually have better agricultural skills, capacities and interpersonal relationships and are more sensitive to change and trusted in the rural community.
- Demonstration plots or farms are normally owned and managed by lead farmers, under the supervision of MAIP professionals.
- The joint efforts of MAIP professionals and lead farmers are indispensable to enhancing the diffusion, adaptability and effectiveness of new technological innovations.
- It is recommended to use demonstration plots or farms also as a place to involve local EAS agents, both public and private, to demonstrate new agricultural inputs, new crops or animal varieties and new agroproducts. This will help extend existing partnerships and thereby grow the MAIP.

Vehicles, training facilities and digital devices: In MAIPs, vehicles like motorbikes or tricycles are used for the transportation of equipment for on-farm research. Training facilities include one classroom, computers, projectors, public broadcasting systems and other necessary facilities.

Tips

- Research equipment can include soil and plant nutrient quick-testing toolkit, cameras and other experimental and research tools for field experiments and trials.
- MAIP managers should value the importance of communication and advocacy to support the dissemination of innovation and knowledge. A variety of facilities are to be used in combination, such as poster stands, display placards, flyers and so on for communicating and demonstrating technological innovations and practices to visiting farmers.
- Communication and advocacy facilities are to be set up in places that enjoy high visibility, such as on the demonstration plots or farms and training rooms.

2.2 Key actors of multi-actors agricultural innovation platforms

Multiple actors along a certain agricultural value chain, who provide or co-create information, knowledge and EAS through participatory research, play unique roles at different levels of interactions and exchange within a MAIP. There are three categories of actors, namely (1) *internal actors* who are the actors along the entire agricultural value chain from production, processing to marketing, including lead farmers, farmers' organizations, input suppliers, market actors and so on; (2) *external actors* who are the actors supportive of the agricultural value chain development, including researchers, EAS agents and educators; and (3) *facilitators* who act as a bridge between the first two.

Key internal MAIP actors are as follows:

Lead farmers: Lead farmers are both co-creators and disseminators of innovation. Compared to their fellow farmers, they are often more interested in agricultural innovation and enthusiastic to work with the MAIP professionals. As the backbone of a MAIP, they receive direct training from it. After being properly trained, lead farmers are capable of working with professionals to conduct on-farm participatory action research (PAR) and technical demonstrations. They also play an important role in generating spillovers of the MAIP, disseminating the co-created knowledge and innovation among their fellow farmers.

Farmers' organizations: In MAIPs, farmers' organizations mainly function to guide and facilitate the organization of farmers by promoting such values as self-respect, self-confidence, self-reliance and self-improvement. This paves the way for enhancing the overall agency and capacity of local farmers.

BOX 3. Challenge of organizing farmers in rural communities

It is often a significant challenge for farmers to be fully organized due to a lack of competent social workers in rural organizations or weak community cohesion. Through farmers' organizations, farmers can be mobilized and reorganized so that they actively participate in both learning and cultural activities. These activities are conducive to strengthening farmers' collective agency and the community cohesion while increasing the sustainability of the MAIPs.

Source: Yang, P., Jiao, X., Feng, D., Ramasamy, S., Zhang, H., Mroczek, Z. & Zhang, W. 2021. *An innovation in agricultural science and technology extension system – Case study on science and technology backyard*. Rome, FAO. <https://doi.org/10.4060/cb2939en>

Family farms: Family farms are agricultural holdings managed and operated by individual households. The farm labour is largely supplied by the households themselves. In MAIPs, family farms can either be active actors in the on-farm PAR or providers of key infrastructure such as demonstration plots, accommodation, etc.

Input suppliers: MAIPs are excellent platforms for agricultural input suppliers (enterprises) to undertake experiment of their new products. For example, input enterprises could send their specialists to work and conduct field trials and demonstrations together with researchers, extension agents and lead farmers. They can redesign fertilizer or pesticide formula based on the results of participatory field trials, and develop more adapted products by optimizing the formula of combined fertilizers or pesticides. They can even establish and fund their own MAIPs of various agricultural value chains.

Local leaders and entrepreneurs: The supports from local leaders and entrepreneurs are crucial for conducting MAIP activities in rural communities. Local leaders can provide additional resources for MAIP establishment and coordination. Entrepreneurs can provide financial and managerial support. They also act as key partners in on-farm PARs.

Market actors: Market actors play a unique and important role in community-level AIS development from the perspective of value chain development. They establish linkages between supply and demand that help bring farmers, processors, transporters and distributors to consumer market. This is vital if the value chain is to function effectively.

BOX 4. Market actors and knowledge generation

In MAIPs, market actors extend the knowledge generation beyond production sector to market sector, based on price competitions and more on their abilities to provide new products or improve the quality management of agroproducts. They provide the opportunities of interactions between agricultural production and market demand in the MAIP in terms of consumer demands (product, food safety and certification standards, etc.), changing conditions and dynamics of markets, which are driving forces for navigating innovations in the MAIP.

Source: The Authors.

Key external MAIP actors are as follows:

Researchers: Researchers from agricultural universities or research institutes, both public and private, are key actors in organized and systematic investigations into a specific value chain problem. Working closely with farmers, extension agents and other value chain actors, they initiate and/or facilitate PAR and technological innovations.

Extension agents: Extension agents from both public and private sectors may play multiple roles, for example, providers or seekers of knowledge and facilitators in various circumstances. They are principal MAIP actors to initiate and/or facilitate on-farm PAR and technological innovations.

Educators: In a MAIP, educators mainly include professors and trainers. While the former are mainly from agricultural universities, colleges or schools, the latter are professional trainers who work to empower different types of value chain actors. Educators are key actors who introduce external knowledge, technologies and skills which are to be tested, adapted and optimized through interactions and co-learning with internal MAIP actors.

The third type of MAIP actors are bridging actors, namely, facilitators:

Facilitators: Training and coordination are crucial for successfully establishing and operating MAIPs. Facilitators play an important role of training and coordination, which is often assumed by public EAS agents. Researchers, market actors or other actors may also play this role in case that the public EAS system is unavailable or weak in the local community.

BOX 5. What do MAIP facilitators do?

Facilitators are usually committed to:

- leading the MAIP activities, clearly shaping the vision, mission and implementation process along the selected value chain;
- continuously monitoring and evaluating (M&E) the performance of the multiple MAIP actors;
- coordinating the EAS provided by the multiple MAIP actors; and
- enhancing technical, marketing, financial and institutional innovations to support MAIPs to foster AIS.

Source: Yang, P., van de Fliert, E. & Ou, Y. 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

2.3 Mechanisms of interactions

In MAIPs, multi-actor interactions are triggered through a combination of top-down and bottom-up approaches. Farmers and other key actors, as core elements of this combined approach, are fully engaged in the generation and sharing of knowledge and technologies. The interaction mechanism of innovation practices is driven by five dynamics:

- ◆ the innovation process of agricultural value chain driven by challenges or opportunities (research, market demand, policies, etc.);
- ◆ the integration of technologies and innovative solutions driven by market or policy demands;
- ◆ co-learning among multiple key actors;
- ◆ transformative partnership building among key actors; and
- ◆ MAIP management and coordination.

Co-learning interactions among multiple key actors: During the on-farm PAR with farmers, the MAIP professionals, while transferring their technological knowledge, co-learn with farmers by understanding their knowledge, perceptions and attitudes. They also co-learn with market actors by learning accurate market criteria or standards of agroproducts (Garforth *et al.*, 2004; Molina *et al.*, 2021). Market actors co-learn with farmers and input suppliers by understanding processing technologies and production costs through partnerships or information exchanges. Farmers co-learn with market actors and agroproduct processors by understanding market requirements of quality or standards, market prices and market volatility of agroproducts.

Co-learning interactions between farmers and other key actors: Co-learning interactions of farmers with other key actors, often occurring during on-farm PAR, farmer field schools (FFSs), field visits and observations, are crucial for knowledge and technology transfer. They also help create a benign feedback loop between MAIP professionals and farmers, thereby contributing to the MAIP sustainability and the strengthening of the relevance of the technological innovation and knowledge generated to farmers' actual needs.

Building transformative partnerships among key actors: Agricultural innovation requires strong networks, interactions and partnerships among different actors (Fieldsend *et al.*, 2020; Turner *et al.*, 2017). In this sense, MAIPs are not only platforms for agricultural technology innovation, but for networking and partnership building.

BOX 6. “Members” vs “partners” of multi-actor agricultural innovation platforms

Stakeholder engagement in a MAIP is either through membership or partnership. Members of a MAIP are those with a direct and active role in the value chain, including farmers, processors, and traders. Members sign up for the MAIP on a voluntary basis, after understanding its mechanisms and potential benefits. As membership of the MAIP is voluntary, it should not be remunerated, unless a role in the MAIP becomes a job. A membership fee may be charged once the members have experienced benefits to support sustained MAIP operations and enhancement, which, however, should be a decision by the membership itself.

Partners are those who provide services to support the collective innovation, learning and action, including EAS providers, researchers, technical officers from a public or private organization/company. Existing EAS providers, both public and private, are to be involved in MAIPs, although they do not necessarily operate through MAIPs. Nevertheless, MAIPs provide a vital space wherein they can coordinate and bundle their services and thereby provide pluralistic and more integrated and demand-driven services. There are also other external stakeholders with a potential influence on the operation and outcomes of a MAIP, such as input and finance providers and policy makers, and the relationship can be managed on a need basis.

Source: **Yang, P., van de Fliert, E., Musayev, N., Akhundov, Y. & Ou, Y.** 2022a. *Multi-actors agricultural innovation platform: Guideline for master trainers*. Rome, FAO. <https://doi.org/10.4060/cb9080en>

MAIP management and coordination: As part of the establishment process, a MAIP will select a management team (MT) among its members and define its roles.

Coordination is crucial for successful MAIP establishment and operation and takes place at both the regional and national levels. A network of MAIPs within one region is coordinated by a MAIP coordination unit (CU). The MAIP CU is responsible for (1) recruiting and coordinating facilitators, (2) organizing training of facilitators (ToF) courses, and (3) facilitating the exchange across individual MAIPs.

The CU will commit to: (1) consolidating leadership and clearly shaping the vision, mission, and implementation process of the MAIP along the selected value chain(s); (2) continuously monitoring and evaluating the performance of MAIPs; (3) integrating AIS through MAIPs along the selected value chain; and (4) enhancing technical, marketing, financial and institutional innovations to promote MAIPs while supporting the AIS.

Tips

- To build up trust among the members, it is important to have the roles and responsibilities of the management team (MT) office holder agreed on and clearly described, including the procedures to select and replace the MT.
- During the pilot phase as part of a project or programme, the coordination unit (CU) could be the project team. But ideally, after evaluation of the pilot and formulation of an outreach strategy, this function is to be handed over to a permanent institution in the existing AIS.
- Generally, the public EAS agency will be the most suitable candidate to take the permanent coordination role. In some instances, however, it is more desirable to involve researchers, market actors or other AIS actors who might be in a better position to coordinate the development of a particular MAIP value chain.
- In addition to the mandated roles of MAIP facilitators, additional coordination bodies consist of key agricultural value chain actors integrated through partnerships. They can be organized to perform a complementary coordination role.



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2.4 Enabling environment

Enabling environment is a precondition for MAIP establishment and implementation. Government and institutional commitment to financial and infrastructural investments are crucial at all stages of the MAIP life cycle.

Tips

- Functioning MAIPs demand a strong, continued support from the local government, public extension agencies, private sectors and farmer communities. It involves the active participation of all local stakeholders and coordination between different sectors and sustainable funding mechanisms to support joint actions on agricultural innovation for value chain development.
- Appropriate incentives are crucial for tightening the linkages between research, extension and farmers (for example, evaluating research and education achievements of professionals should not simply be academic, but prioritize farmer needs). The private sector is also to be involved in MAIP development and where possible, the building of MAIP ownership.
- Adequate funding and clear regulatory framework are needed for building up capacities of MAIP actors for participatory research, extension and farmer education across multiple sectors.

3. Basics of multi-actors agricultural innovation platforms

Although MAIPs often take different forms for different agricultural value chains and different countries and regions, they share some common basic components, activities and characteristics. This is because they have the common goal of empowering smallholder farmers and value chain actors to access innovation and services:

- ◆ A typical MAIP consists of a multifunctional space for research, training and demonstration, professionals (researchers or extension agents), a group of lead farmers, training and technological service facilities (e.g. computers, projectors, electric tricycles, brochures), experimental plots, demonstration plots, digital communication devices, etc.
- ◆ A typical MAIP is located in farmers' communities and links researchers, extension agents, local government, private enterprises and smallholder farmers. By building partnerships and creating a collaborative environment, it facilitates technological innovation, information exchange, and innovation diffusion so as to address practical problems and strengthen agrifood value chains.
- ◆ Designed according to selected value chains, MAIPs focus on providing demand-driven and pluralistic EAS.
- ◆ MAIPs facilitate interactions and strengthen linkages among multiple AIS actors for knowledge co-creation, sharing and co-learning. Common linkages include farmers to farmers, market actors to farmers, input suppliers to farmers, processors to farmers, public EAS to input suppliers, etc. The facilitation of different forms of interactions and co-learning processes is critical to provide demand-driven EAS to support AIS. Interactions and co-learning processes among multiple AIS actors should be facilitated according to a need analysis. Besides, MAIPs support the capacity building of multiple AIS actors.

- ◆ MAIPs conduct baseline survey and analysis to identify:
 - existing public and private EAS for the selected value chain;
 - the agricultural production gap between the actual and what is attainable based on scientific research results and advancements, agroproduct market potentials;
 - training needs of EAS providers to promote market-oriented services and facilitate innovation; and
 - recommendations, including policymaking and coordination mechanisms for the implementation of MAIPs.
- ◆ Facilitation and coordination of MAIPs are crucial for the success of establishing and operating them. EAS agents can serve as the facilitator or coordinator in most times. But researchers, market actors or other AIS actors, when well trained, may also play this role in case that public EAS agencies are absent or weak.
- ◆ MAIP training of facilitator (ToF) course is aimed at training qualified facilitators or coordinators to establish and operate MAIPs in rural communities.



- ◆ In a MAIP, co-innovation and co-learning among the value chain actors are facilitated through such activities as identification of innovation agenda(s), PAR, field trials and demonstrations, technology and innovation integration process, entrepreneurship, etc.
- ◆ MAIPs encourage transformative partnership building among the key value chain actors by fostering collaborative mechanisms, interest clubs, stakeholder associations or business contracts.

CASE 1. Multi-actors agricultural innovation platforms for inclusive and efficient agrifood value chains

In the North-West Region of Azerbaijan, a lack of food safety standards, certification system, access to market and basic business skills as well as limited access to advisory and information services are the main constraints of agrifood value chain development. Multi-actors agricultural innovation platforms, an approach developed by the Office of Innovation of FAO, are inclusive co-innovation platforms established in rural communities. Through multi-actor interactions and a variety of participatory actions that engage key agrifood value chain actors from farming, market, education, research, extension sectors among others, they are conducive to fostering sustainable and efficient value chains while strengthening smallholders' access to market. To address the above-mentioned problems, within the European Union-funded project "Development of Sustainable and Inclusive Local Food Systems in North-West Region of Azerbaijan (GCP/AZE/014/EC)", six multi-actors agricultural innovation platforms (MAIPs) were established in October 2021 in Azerbaijan, with technical support from the Office of Innovation of FAO. The MAIPs, each located in a rural community and targeting a selected agrifood value chain, aimed to develop inclusive and efficient value chains. The MAIPs strengthened the business environment for agrifood systems and promoted community driven advisory and information services. This contributed to the development of efficient and inclusive agrifood systems supportive of smallholder agriculture and poverty reduction in the northwest region of Azerbaijan.

Source: Musayev, N., Namazov, E. & Mustafazade, A. 2023. FAO Partnership and Liaison Office in Azerbaijan.

4. Establishing and operating multi-actors agricultural innovation platforms

To establish and operate a MAIP, the following four steps are to be followed:

Step 1: Train MAIP facilitators to enhance their technical, facilitation and management skills. This is critical to enable them to support participatory innovation and promote market-oriented services. The trained facilitators will continue to facilitate the following steps.

Step 2: Conduct a participatory situation analysis as a basis for the site selection and baseline studies on innovation agenda(s) setting to gain a sound understanding of existing roles of and relationships among actors along the value chain, assess their needs, and identify opportunities and constraints for value chain development.

Step 3: Establish a MAIP once its membership, partnerships, boundaries, management, operation and an action plan have been defined by the key actors and stakeholders through a participatory process.

Step 4: Operate the MAIP preferably as a hub for the key actors to introduce, co-create, co-test and share innovative practices and technologies that will improve production and agricultural value chain. In general, different types of multi-actor interaction and co-learning processes should be facilitated through different activities. The categories of common MAIP activities include:

- identification of innovation agenda(s);
- co-innovation;
- co-learning;
- knowledge transfer;
- transformative partnership building;
- market linkage facilitation;
- entrepreneurship mentorship; and
- policy advocacy.

Tips

- Training modules and methods need to be tailored based on the specific needs of the MAIP facilitators in a particular value chain and geographic region, which are to be identified in the situation analysis.
- The participatory situation analysis is to be conducted in collaboration with stakeholder representatives.
- The MAIP action plan is to be defined jointly by the key stakeholders through a participatory process. This is best done at one or several multi-actor planning workshops that are organized and facilitated by the MAIP facilitators. The key stakeholders to be invited to the planning workshop(s) are selected based on the results of the situation analysis in Step 2, which does not necessarily include all the actors along the value chain. The focus should be on stakeholders who produce and process agroproducts and key EAS providers who can address the gaps identified in Step 2 (as they are more likely to become MAIP members or partners).
- MAIP facilitators need to cross-check whether findings and conclusions from the situation analysis in Step 2 are reflected in the outcomes of all of the above activities.
- During the operation of a MAIP, facilitators are expected to guide local actors to (1) formulate the right questions to overcome barriers to achieving improved agricultural systems, (2) identify potential options that can lead to innovation, and (3) link with suitable EAS providers.
- Interactions and co-learning processes among the MAIP actors, different types of interaction and co-learning processes farmer to farmer, market actors to farmers, input suppliers to farmers, processors to farmers, and public advisory service providers to input suppliers should be facilitated according to the situation analysis in Step 2 and the action plan developed in Step 3.

Source: Yang, P., van de Fliert, E. & Ou, Y. 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

CASE 2. Promoting market-oriented smallholder farming with the Smallholder Horticulture Empowerment and Promotion approach

Smallholder Horticulture Empowerment and Promotion (SHEP) is an approach in agricultural extension that facilitates small-scale farmers to conduct market-oriented agriculture of horticultural crops. It originally emerged through trial and error in the process of technical cooperation between Kenya and Japan for improving Kenya's agricultural extension services. It tries to build farmers' capacity to undertake farming as a business in a sustainable manner through imparting necessary marketing and production skills to them. In the process, SHEP attaches a special emphasis on supporting farmers' autonomous motivation as it is an

essential ingredient for achieving farmers' self-reliance and sustainable outcome that SHEP envisions.

Basically, SHEP has two pillars, namely, "promoting farming as a business" and "empowering and motivating farmers". While the former is supported by an economic theory called "markets with asymmetric information (i.e. imbalanced information between smallholder farmers and market actors as one of the strongest factors of inefficient local economy)", the latter is underpinned by a psychological theory called "Self-Determination Theory (people feel motivated when their needs for autonomy, competence or relatedness are satisfied.)". SHEP helps farmers to fill the information gap between them and their business partners through means such as promoting the sharing of market information among farmers and stakeholders of the market, teaching farmers how to conduct market surveys as well as helping them to establish business linkages with market actors. Farmers are guided to conduct market surveys on their own so that they can feel in control of their own action, which leads to supporting their need for autonomy. By carrying out market surveys successfully, farmers also feel that they have gained mastery (skills and knowledge) of this particular task and learned new skills, which is a competence support. Finally, SHEP asks those farmer representatives who have conducted the market surveys to go back to their farmer group and share the results of the surveys with their fellow farmers. Through that process, the farmers feel a sense of belonging and attachment to the group members, which in turn, contributes to supporting their psychological need for relatedness. SHEP is implemented in four steps:

- Step 1. Organizing a Sensitization Workshop to share this goal with the target farmers
- Step 2. Raising farmers' awareness in the area of opportunities and potential of horticultural farming
- Step 3. Facilitating farmers to make decisions to select target crops and make a plan called Crop Calendar (so that they will be able to strategically supply their target crops to the specific markets of their choice with the right timing)
- Step 4. Building farmers' capacities by providing technical solutions to them, i.e. giving in-field training for the crops that the farmers selected

After finishing the four steps, follow-up and monitoring is conducted to ensure that farmers are applying the knowledge they gained to their daily farming business.

Source: **JICA**. 2018. *SHEP Handbook for extension staff: A practical guide to the implementation of the SHEP approach*. Tokyo, Japan International Cooperation Agency (JICA). https://www.jica.go.jp/english/our_work/thematic_issues/agricultural/shep/c8h0vm0000bm5ayp-att/handbook.pdf

PART 2

ESTABLISHING MULTI-ACTORS AGRICULTURAL INNOVATION PLATFORMS



1. Training facilitators of multi-actors agricultural innovation platforms

In general, MAIP programmes should start from the design and implementation of training of facilitators (ToF) courses. The trained facilitators establish a MAIP and operate it in a certain rural community to promote agricultural value chain development. After a period of practice, MAIP facilitators can further improve themselves through refresher ToF.

1.1 Principles of training of facilitators course

A training of MAIP facilitators (MAIP ToF) course prepares the future facilitators for establishing and operating MAIPs targeting a certain agricultural value chain. The specific objectives of the MAIP ToF are for candidate facilitators (i.e. the participants) to:

- ◆ develop an understanding of the MAIP model and related core concepts and methods;
- ◆ gain knowledge and skills related to MAIP facilitation, organization and management;
- ◆ strengthen knowledge and skills on technical and business aspects of the selected value chain; and
- ◆ learn about the co-design, establishment and workplan development of the MAIP at a pilot site.

Tips

Participatory methods are a key element in MAIP ToF courses. This is because that the trained facilitators are expected to adopt a participatory approach to MAIP design, establishment and implementation on the one hand. On the other hand, they are responsible for facilitating activities with MAIP members and partners that involve discovery learning and action research. Therefore, they should familiarize themselves with the participatory approach and find out how it is different from the way they were trained in the formal education system.

BOX 7. Principles of training of facilitator course

The MAIP ToF model should follow the principles of adult education:

- Learning should be aligned with the goals of and anticipated benefits for the learner.
- Learning activities are designed as a process of discovery.
- Learning is personalized through: Activities that are adapted to different learning preferences of the participants and activities that encourage collective learning.
- Helpful feedback should be provided.
- The learning event and materials should be easily accessible, in terms of geographical location, language used, and communication platforms employed.

Source: **Yang, P., van de Fliert, E. & Ou, Y.** 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

Tips

- These principles require a training structure that accommodates a combination of theory, skills development, dialogue/sharing, field experience, and reflective practice.
- While some generic topics will be applicable in all ToF events, most of the contents and activities will need to be contextualized, the value chain(s) to be targeted, and, most importantly, the profile of the ToF participants with regard to their educational background, language, communication and learning style preferences, and work experiences.
- A MAIP ToF requires a team of master trainers with diverse knowledge base, skills and experience to effectively design and facilitate the participatory and experiential learning processes in the given context.

1.2 Preparation for the training of facilitators course

To prepare for the training of facilitators (ToF) course, trainers and trainees (future MAIP facilitators) are to be carefully selected, training site identified, and training facilities and materials prepared beforehand. The following checklist (Table 1) is useful for guiding related preparations:

TABLE 1. Preparation for the training of facilitators course

Preparations	Action indicators	Note*
<i>Selection of trainers</i>	Select only qualified trainers with rich experience of organizing training of trainers (ToT) courses related to agricultural EAS and AIS development.	
	Normally assign a group of three to four master trainers with one coordinator.	
<i>Selection of trainees</i>	Select trainees from the key MAIP actors, including researchers, extension agents, lead farmers, market actors, processors or other actors.	
	Select trainees directly engaged with the targeted MAIP value chain.	
<i>Identification of training site</i>	Preferably select an easily accessible site with well-equipped training facilities and close to the local community (e.g. a hotel or local school or farmers' community centre) where MAIP activities can be held as part of the course.	
	Select a training space large enough for the participants to work in small groups.	
<i>Preparation for training facilities and materials</i>	Rent houses from local farmers or provide nearby hotel rooms to accommodate trainers and trainees.	
	Equip the training site with facilities and materials, including at least one classroom for indoor activities, computers, projector(s), blackboard/whiteboard, markers, sheets of paper and other necessary facilities and materials.	
	Possibly identify experimental and demonstration plots or farms for the demonstration of technological innovations and practices.	

* For the Note column, check if each action has been appropriately taken against the indicators.

BOX 8. Making logistical arrangements

Logistical arrangements are also important preparations for the training of facilitators course. Main arrangements include (1) confirmation of the timing of training events and fieldwork activities, (2) the venue, facilities and catering, and (3) the preparation of training materials. For each of these aspects, budgetary considerations need to be negotiated with the project management team. A sufficient stock of coloured markers, large sheets of paper, coloured cards, masking tape and other materials required for the training sessions needs to be provided. All details regarding dates and time, location, venue, and transport arrangements need to be clearly communicated to the ToF participants in advance.

Source: Yang, P., van de Fliert, E. & Ou, Y. 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

1.3 Curriculum development of the training of facilitators course

Curriculum development workshop: Conduct a curriculum development workshop prior to the opening of the ToF course. All the master trainers and relevant project coordinators or managers will participate in it to develop a detailed curriculum.

BOX 9. Curriculum in detail

In general, a detailed curriculum should be developed in respect to the learning objectives of the course as follows:

- understanding the MAIP concept and objectives;
- building the coordination and networking capacities of multiple actors in the AIS;
- developing EAS agents' technical skills, including needs assessment, agricultural value chain analysis, agroecosystem analysis, farmer science, participatory on-farm research and demonstration and training, etc.;
- developing specific skills of facilitating different patterns of interactions, including farmers to farmers, researchers to farmers, extensionists to farmers, researchers to extensionists, public to private, business to business, business to farmers, business to processors and interactions of multiple actors among all key MAIP actors;
- enhancing necessary communication, coordination and organization skills of the participants; and
- developing relevant workplans and budget on establishing and facilitating MAIPs.

Source: **Yang, P., van de Fliert, E. & Ou, Y.** 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

1.4 Implementation of the training of facilitators course

The ToF follows the general adult education principles applied in agricultural training programmes that are participatory and interactive rather than the conventional spoon-fed training models. The aim is to provide hands-on and discovery-based training. To guide the ToF implementation, the following checklist (Table 2) is useful:

TABLE 2. Checklist for the implementation of the training of facilitators course

Activities	Implementation		Note*
<i>Opening ceremony</i>	Organize an opening ceremony in the form of a field meeting.		
	Invite local farmers, leaders, and/or relevant actors of the selected value chain.		
<i>Training implementation</i>	Abide by the adult education training model.		
	Divide a maximum of forty trainees into six groups.		
	Elect the class leader(s) and group heads in a democratic way.		
	Allow for group discussions, interactions and teamwork to enhance the participants' learning experience.		
<i>Practice of MAIP facilitation</i>	Possibly provide a break of a couple of days to allow the participants to conduct some facilitation activities within the existing MAIP to gain experience and draw lessons.		
<i>Workplan formulation</i>	Have the participants formulate a workplan for establishing and facilitating MAIPs towards the end of the ToF.		
	Have the participants include the following in the workplan	identifying the agricultural value chain to be intervened through the MAIP according to the results of local value chain analysis and needs assessment	
		identifying the MAIP location and infrastructural setting, including meeting and accommodation places, training and EAS facilities and materials, experimental and demonstration plots (if needed), and technical promotion, communication and advocacy facilities	
		identifying the key actors of the selected value chain and their role in the MAIP	
		defining facilitation methods in accordance with the interaction patterns among the key MAIP actors	
		developing a detailed schedule for interaction facilitation of the key MAIP actors	
		developing a detailed budget for the MAIP establishment and facilitation	
<i>Closing ceremony</i>	Organize a closing ceremony at the end of the MAIP ToF in the form of a field day or meeting.		
	Have the participants review and exchange their learning experience and lessons learned.		
	Have the participants share their vision and perspective on establishing and facilitating MAIPs.		

* For the Note column, check if each action has been appropriately taken against the indicators.

Tips

- Like most training, a MAIP ToF can start with an opening session and end with a closing session, which should be organized in a way that responds to the various stakeholders' expectations.
- At the start of the learning session, it is recommended to have the participants formulate a collective "learning contract" (see Section 1.5 for the details). This provides a consensus on the ToF's learning objectives and planned processes. As an agreement for participants to commit to and gain ownership of the learning process, it can also serve as a baseline for the evaluation at the end of the ToF.
- Regular monitoring activities should be conducted, either per session or at the end of each day, to assess the participants' degree of satisfaction with the training content and processes. This can be done through mood meters, questions about learning outcomes and suggestions for topics to be covered in future session. Data collection can be done either on blank sheets stuck on the wall of the training venue, on individual score sheets, or electronically (online polls or brief questionnaires). To assess knowledge gains, pre- and post-ToF tests can be held.
- Evaluations are to be done at the end of each block of training sessions, with the final one, to assess participants' perceptions of the achievement of the overall training objectives. This can be done through a questionnaire, a group discussion, or a combination of both.
- The core of the ToF is defined by the learning curriculum. Ideally, it consists of three blocks of training sessions, each of minimally two days, with several weeks of fieldwork in between. The fieldwork is aimed at testing ideas in the real world and implement the first steps of MAIP establishment. In each block, the participants will reflect on prior field experiences, explore new concepts, practise skills, and develop workplans for the next period of fieldwork. Training activities should be diverse to remain attractive to the participants and relevant to their real needs.

1.5 Learning contract of the training of facilitators course participants

A learning contract of the MAIP ToF should be jointly developed at the beginning of the training course and signed at the end of it with a consensus reached among all the participants. This is meant to oblige them to apply the capacities and skills that they have gained from the training course to establish and facilitate MAIPs.

BOX 10. Learning contract

What is a learning contract?

A learning contract helps the trainer set transparent expectations for the trainees. It specifies a set of positive behaviours and habits during the training and is expected to stimulate the trainees to reflect on how they learn. The contract is often shared at the beginning of the training to clarify its expectations and have the trainees reach a consensus on the learning objectives.

What does a learning contract include?

Learning contracts usually consist of statements on behaviours that trainees need to agree on. At the end of these statements, trainees are often asked to sign to indicate their agreement. Some example statements that a learning contract may include are listed below:

- I have read and understood the course syllabus.
- I have reviewed the course schedule and noted deadlines.
- I will interact with fellow trainees.
- I will regularly communicate with the trainer to report my experience, suggestions and problems if any.
- I understand that all course announcements will be posted in the Facebook/WhatsApp group.

Source: Yang, P., van de Fliert, E., Musayev, N., Akhundov, Y. & Ou, Y. 2022. Multi-actors agricultural innovation platform: Guideline for master trainers. Rome, FAO. <https://doi.org/10.4060/cb9080en>

1.6 Mentoring of multi-actors agricultural innovation platform facilitators

Upon the completion of the ToF, it is recommended to:

- ◆ establish a mentoring mechanism to support the candidate MAIP facilitators during the fieldwork;
- ◆ undertake mentoring in the form of a chat group on a social media platform that is regularly used by all participants (e.g. WhatsApp group, Facebook Messenger group, WeChat group, etc.); and
- ◆ conduct, if necessary and feasible, a refresher training in around six months after the implementation of the first round of MAIPs to further strengthen the capacity of the candidate MAIP facilitators and prepare for further outreach.

Tips

- A refresher training should start with the sharing of the various experience of the different teams of candidate facilitators. The participants are to reflect on the MAIPs principles and functions, as introduced during the original ToF.
- Through reflective practice and exchange, the candidate facilitators will be able to analyse what worked for them, what they did well and what needs improvement, and also provide feedback to the master trainers on what should be adjusted in the MAIP model and/or the ToF.
- New topics, as requested by the participants, can be introduced and plans for further outreach of MAIPs can be collectively developed.

2. Selecting the location of multi-actors agricultural innovation platforms

Before establishing a MAIP in a rural community, it is first necessary to select a suitable location. To select a MAIP location, the “Four Zeros” principle advocated by the Science and Technology Backyard approach (Jiao *et al.*, 2019; Yang *et al.*, 2021), namely, “zero time difference, zero cost, zero distance, and zero barrier” for the members, can be followed:

Zero time difference, meaning that all the MAIP members can access the site at any time.

Zero cost, meaning that MAIP members do not have to pay a fee to access the site or collaborate with the MAIP professionals on relevant activities.

Zero distance, meaning that the participants can easily interact with the MAIP professionals, collaborating with them on knowledge generation and technological innovation as well as service provision.

Zero barrier, meaning that the selected site is open to all and no restrictions are in place that may limit the participation.



The following are the key indicators used to determine a MAIP location (Table 3):

TABLE 3. Key indicators used for MAIP location selection

Key indicators	Whom to be surveyed	Survey methods
<i>Ecological zone level</i>		
- the main production area of the target agricultural value chain - presence of good market opportunities (conditions) - environmental conditions - the main source of income of local farmers - willingness of the local government to support - presence of good natural conditions to produce crops - presence of (potentially) good MAIP trainers	- local government leaders and related personnel - project officers - institutions and enterprises related to agricultural production and operation	- collect basic data of the ecological region under investigation: Visit the place where the MAIP will be implemented and verify the data - consult the regional agricultural management authorities - organize a seminar for local agricultural extension agents
<i>Community level</i>		
- the community/village perceived as a representative of agricultural production in the region - presence of a large area of crop cultivation that is concentrated and mainly commercial, or a large scale of livestock farming - sound community infrastructure (irrigation, transportation and power supply) - community leaders are likely to support	- local farmers - local agricultural extension agents - sellers of agriproducts - sellers of agricultural inputs - institutions and enterprises related to agricultural production and operation - local community leaders	- conduct field surveys and observations of environmental conditions - organize seminars with the participation of trainers, EAS agents, community leaders and other related value chain actors

Source: Adapted from Yang, P., van de Fliert, E. & Ou, Y. 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

Tips

- Take advantage of existing spaces as much as possible so as to run MAIPs in a cost-efficient way.
- Accommodate professionals, as long as the living conditions allow, at local farmers' houses. This will create a sense of trust and ensure a timely response to farmers' needs. Farmers can conveniently visit the professionals when they encounter problems.
- Highlight the role of the house owner(s) who can serve as a trust-building medium between the farmers and professionals.
- Make sure that the selected work spaces are convenient to access for farmers.
- Use the existing meeting rooms or public spaces in the rural community for organizing training activities. A good option is village offices or centres if any (such as in the case of the Science and Technology Backyard (STB) project) which are often well located and convenient for farmers to access and gather.



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3. Identifying the focused value chain of multi-actors agricultural innovation platforms

After the MAIP location is determined, it is necessary to facilitate key MAIP actors to select the target value chain (e.g. the key crop) and members of the MAIP. The commonly used selection methods are as follows (refer to *Guide for training of facilitators of multi-actors agricultural innovation platforms* for the details):

A. Cross-sectional survey: This activity is aimed at gaining a good knowledge of the agricultural value chains of the rural community where the MAIP is located.

Tips

It should be carried out before the focus group discussion to gain some background information, so that the members of the survey team can better understand the farmers' discussions. Observe the village and its farmland, and talk to random people encountered on a walk. The interview team is best accompanied by 1–2 key actors (farmers, grassroots leaders). Observations and conversations should be recorded in a notebook at any time. A field observation record table can be designed and modified according to the specific situation (make copies as needed), considering:

- land use situation, e.g. crops, land fertility, water supply, etc.
- buildings
- the use of non-agricultural and non-residential land (e.g. forests, reservoirs, etc.)

B. Key informant interview: This activity is aimed at obtaining relevant information, such as the principal source of income, production outputs and bottleneck, need for innovation and so on about agricultural production and post-harvest from key local community members.

Tips

It is recommended that local farmers or other stakeholders participating in the survey use the following contents for reference and discussion:

Farmers

- the roles played by men and women in crop planting, market sales and vegetable processing and utilization
- crop planting modes
- reasons for choosing crop types and varieties
- utilization of crop cultivation patterns
- problems in production and market
- ways to solve these problems
- perception of opportunities to improve agricultural production

Retailers of agricultural inputs

- the inputs formulations that cultivating farmers like
- types of inputs farmers are used to buying, or they know what types of inputs they need to buy

Agricultural product vendor

- local market network
- procedures and formalities for entering the market
- the constraints of the market for agroproducts
- perceived opportunities for improving agricultural production

Community leader

- roles and tasks in agricultural development
- constraints of agricultural production
- perceived opportunities for improving agricultural production

C. Focus group discussion: This activity is aimed at understanding the importance of agricultural production, problems encountered during cultivation and post-harvest, and participation patterns of male and female farmers during and after cultivation.

Tips

- A focus group discussion should be open and inclusive and any community member interested can participate, but preferably no fewer than 20 and no more than 50 persons.
- It is better not to let the village leaders choose the participants, nor guide them to discuss and speak. The latter must take the initiative to participate.
- The strategy of inviting farmers to participate can be discussed and negotiated with the village leaders in advance to ensure gender balance and a mixture of poorer farmers and more affluent ones.
- The timing of the meeting should be such that all types of actors can participate. Different meeting timings are to be arranged according to different types of actors, such as male and female farmers, growers and distributors, community leaders and members, etc.
- The following methods are recommended (although not all need to be used in a meeting): seasonal calendar, crop importance ranking (define the MAIP main crop on this basis), ranking of the important problems encountered in the production of the selected crop, distribution map of work tasks of different genders, and open discussion.
- Before starting the discussion, the members of the survey team should introduce their background to the participants, mentioning that the meeting is a part of training in the village and a foundational work for identifying the training objects and contents and evaluating the effectiveness of the training in the future.

PART 3

OPERATING MULTI-ACTORS AGRICULTURAL INNOVATION PLATFORMS



When operating a MAIP, the facilitators are suggested to undertake key facilitation activities in terms of identification of innovation agenda(s), co-innovation, co-learning, knowledge transfer, transformative partnership building, market linkage facilitation, entrepreneurship mentoring, and enabling environment creation. For each category of activities, implementation methods are to be selected according to (1) the nature and purpose of the activity, i.e. whether it is aimed at addressing an open-ended issue or a close-ended issue; (2) the priorities of a MAIP in relation to the key members' needs, i.e. whether it is focused on production, processing or distribution; and (3) local contexts in terms of infrastructure, social norms, literacy, gender issues and so on. This handbook lists the commonly used methods for conducting MAIP activities as follows. MAIP facilitators, when referring to these methods, are encouraged to give full play to creativity and make necessary adjustment so that the training activities can be more effective and responsive to participants' needs.

1. Guiding the identification of innovation agenda(s)

The starting point of MAIPs is to overcome the last-mile barrier of knowledge generation, information and technology transfer that constrains the development of community-level agricultural innovation systems (AIS). This is the major limitation of sustainable agricultural value chain development for smallholder farmers and key value chain actors. MAIPs therefore foster grassroots innovation by building transformative partnerships among agricultural schools and universities, research institutes, EAS agencies, market, agribusinesses and farming communities. To this end, an appropriate identification of innovation agenda(s) is the very first step.

Tips

The following aspects are normally considered to identify a MAIP innovation agenda(s):

During production:

- health soil or breeding environment (animal husbandry and fishery) management, such as soil-borne diseases or soil degradation caused by continuous cultivation, environmental pollution due to animal waste;
- crop pest or animal disease management;
- productivity improvement while lowering costs, crop or animal varieties trials and applications, crop cultivation or animal husbandry technologies; and
- crop nutrient and water management (crop production) or animal or fishery nutrition management.

Post-harvest:

- storage and processing management;
- pesticides, harmful chemicals or organisms residue testing;
- agroproduct quality and food safety management and certification, including packaging and compliance with domestic and international standards and norms; and
- marketing.

Social and environmental agenda(s):

- poverty alleviation by pro-poor value chain development;
- farmer empowerment through continued education;
- ethical and green marketing strategies; and
- socially and environmentally sustainable value chain development.

MAIP actors are to be facilitated to identify the innovation agenda(s) aimed at addressing the bottlenecks, challenges, and opportunities in the targeted agricultural value chain development. In a typical MAIP innovation agenda, the process of agricultural value chain innovation is participatory and driven by multi-actor mechanisms. Abiding by the predefined innovation agenda(s), multiple MAIP actors from different sectors along the agricultural value chain co-create, share, exchange and diffuse knowledge, information and technologies through participatory research and co-learning.

CASE 3. Identifying the innovation agenda using the DEED model

The DEED (description, explanation, exploration and design) model is adopted by Science and Technology Backyard (STB) staff to conduct participatory research in rural communities. Farmer practice in their own fields is systematically described by STB professionals or farmer technicians through survey and real-time tracking data. Professors and students living in the STBs provide detailed explanations of farmer practices. The performance of these practices is in turn explored systematically with various tools, such as model analysis. New choices and configurations and the associated technologies are designed by the professors and students in the STBs. This research methodology links the extension system closely with farmer fields. Finally, the problems encountered by farmers in their own fields are solved and a new model of technology transfer is developed for wider adoption.

In detail, the DEED concept is implemented through the “1351” action model (one village for farm survey, 30 farmer households, 50 farmer field plots and a 100-*mu* demonstration field (15 *mu* = 1 ha)) (Jiao *et al.*, 2019). A baseline crop management survey is conducted to identify research priorities and establish a benchmark adoption rate for agricultural technologies. Based on survey results, the major limiting factors for sustainable crop intensification are identified, and the recommended practices are discussed with local experts and smallholders. The agreed management technologies are then implemented in a field trial. The field trial includes two types of management: Practices already used by local farmers and new practices based on the recommended technologies. Thirty farmers are randomly selected to monitor the application of the recommended practices in the STB village. Meanwhile, 50 fields (100 *mu*) of these farmers are selected for pilot trials on the applications of the recommended practices and tracing the changes of farmer practices. Finally, the demonstration field is implemented for *in situ* technology evaluation. In the demonstration field, crops are managed by the recommended practices and field days are held each month during the growing season. Farmers are informed and invited to attend these field days, where key practices for sustainable crop intensification are outlined and demonstrated in the field.

Source: Jiao, X., Zhang, H., Ma, W., Wang, C., Li, X. & Zhang, F. 2019. Science and technology backyards: a novel approach to empower smallholder farmers for sustainable intensification of agriculture in China. *Journal of Integrative Agriculture*, 18(0): 2–11.

Yang, P., Jiao, X., Feng, D., Ramasamy, S., Zhang, H., Mroczek, Z. & Zhang, W. 2021. *An innovation in agricultural science and technology extension system – Case study on science and technology backyard*. Rome, FAO. <https://doi.org/10.4060/cb2939en>

Use the following methods to facilitate key MAIP actors to identify the innovation agenda(s):

Activity 1: Gap analysis and network mapping

→ Step 1: Introduction

- ✓ Introduce to the participants the main objectives, contents and basic elements of the innovation in the MAIP.
- ✓ Ask the participants to share their opinions, expectations and needs.
- ✓ Besides, ask them to think about how to define the innovation themes and approaches around the target agricultural value chain.

→ Step 2: Gap analysis

- ✓ First, have the participants discuss in small groups and write down their opinions on sticky notes. Each sticky note contains only one opinion.
- ✓ After the group discussion, collect all the notes, classify and paste them on the wall.
- ✓ Then, take a selected agricultural value chain as an example, guide the participants to analyse the gaps between the pre-, mid- and post-production links and the ideal state.
- ✓ Finally, train the participants to analyse and discuss the themes, actors, and methods of innovation activities.

→ Step 3: Network mapping

- ✓ First, have the participants sit altogether in a circle instead of breaking them into groups. Ask each of them to use a short sentence to talk about their personal opinions.
- ✓ Record or have one participant record and roughly classify the opinions of the participants on paper/whiteboard.
- ✓ Then, take a selected agricultural value chain as an example and guide the participants to analyse the key actors in the pre-, mid- and post-production links.
- ✓ Finally, guide the participants to discuss the actors' mutual influence.

→ Step 4: Wrap-up

- ✓ Classify the outputs of the gap analysis and network mapping.
- ✓ Explain in an as itemized way as possible to increase the enthusiasm of the participants and make them feel that the activity is responsive to their needs.

Note: The gap analysis and network mapping can be used together or separately according to the actual situation.

Activity 2: Agricultural value chain analysis

→ Step 1: Introduction

- ✓ Introduce to the participants the main objectives, contents, basic methods and steps of agricultural value chain analysis.
- ✓ Ask the participants to share their opinions, expectations and needs.

→ Step 2: Brainstorming

- ✓ First, have the participants discuss in small groups and write down their needs on sticky notes. Each sticky note contains only one need.
- ✓ After the group discussion, collect all the notes, classify and paste them on the wall. Classify the notes according the types of needs, such as knowledge, skills, solutions to a certain difficulty, assistance and services from government or extension agents, etc.

→ Step 3: Focus group discussion

- ✓ First, have the participants sit altogether in a circle instead of breaking them into groups. Ask each of them to use a short sentence to tell what they want to learn most in this training.
- ✓ Record or have one participant record and roughly classify the opinions of the participants on paper/whiteboard.

→ Step 4: Wrap-up

- ✓ Classify the outputs of the brainstorming and focus group discussion.
- ✓ Explain in an as itemized way as possible which needs will be addressed in the ToF course, which can be solved by themselves, and which is not covered in the training.

BOX 11. Introduction to agricultural value chain analysis**What is agricultural value chain?**

A “value chain” in agriculture identifies the set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product. A value chain can be a vertical linking or a network between various independent business organizations and can involve processing, packaging, storage, transport and distribution. The terms “value chain” and “supply chain” are often used interchangeably¹⁵.

What is agricultural value chain analysis?

It is an approach that analyses a production unit or process in a market chain—from input suppliers to final buyers—and the relationships among them. It analyses the factors influencing performance, including (1) access to and the requirements of end markets; (2) the legal, regulatory and policy environment; (3) coordination between firms in the industry; and (4) the level and quality of support services. Value chain analysis is a useful analytical tool that helps understand overall trends of industrial reorganization, identify change agents, and leverage points for policy and technical interventions. Therefore, it:

- breaks the value chain into its constituent parts in order to better understand its structure and functioning;
- identifies chain actors at each stage and discerns their functions and relationships and thereby determines the chain governance or leadership to facilitate chain formation and strengthening;
- identifies value-adding activities in the chain and assigns costs and added-value to each of those activities;
- identifies the flow of goods, information and finance through the various stages of the chain; and
- evaluates each stage in order to detect problems or identify opportunities to improve the contribution of specific actors and the overall performance of the chain.

Tools used in value chain analysis

There are no fixed rules as to how value chain analysis should be carried out. A range of qualitative and/or quantitative research tools can be used:

- participant observation
- semi-structured interviews
- focus group discussions
- structured questionnaire
- market mapping

Source: **Yang, P., van de Fliert, E. & Ou, Y.** 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

¹⁵ See **FAO, ILO & IFAD.** 2010. *Gender and Rural Employment Policy Brief #4: Agricultural value chain development: Threat or opportunity for women's employment?*. Retrieved from <http://www.fao.org/3/i2008e/i2008e04.pdf>.

CASE 4. Robust value chain analyses for transforming local agrifood systems

Understanding the value chain of agroproducts is critical to improve market access. Within the European Union-funded project “Development of sustainable and inclusive local food systems in north-west region of Azerbaijan (GCP/AZE/014/EC)”, thorough analyses of local agrifood value chains were conducted to help enhance local agrifood producing communities. The analyses sought to identify and address the gaps and needs within each value chain.

The value chain analyses were meticulously planned and executed using both qualitative and quantitative data, with various methods deployed to acquire and analyze the data. This process began with comprehensive desk research, examining a multitude of relevant documents from sources like the Food and Agriculture Organization (FAO), World Food Programme (WFP), the World Bank, and various government ministries. These materials allowed the project team to produce draft reports on each commodity under review, giving them a solid foundation from which to progress. Subsequently, the project team conducted stakeholder consultations, formal interviews, and focus groups with actors at various stages of the value chain. This process involved an exhaustive field data collection phase, which relied on three main techniques: Focus group discussion (FGD), key informant interviews (KIN), and market and profit margin analysis.

FGDs, involving actors from different stages along the value chain, allowed the team to gather relevant qualitative data on the commodities. Additionally, KINs were conducted to provide a triangulated understanding of the data collected. These interviews used structured questionnaires to gather insights from a variety of actors, while market and profit margin analysis involved informal interviews with market actors like retailers, wholesalers, and transporters. The detailed and comprehensive approach to the value chain analysis yielded positive results, contributing to enhance the food production capacity of the target rural communities. The project succeeded in understanding the unique characteristics of each value chain, revealing potential areas for improvement, and designing tailored strategies. The incorporation of various stakeholders – from manufacturers and suppliers to government bodies – and the utilization of different data collection techniques ensured that all relevant factors were considered. By understanding the value chain of their commodities, these communities were better equipped to enhance their market access, ultimately leading to increased profitability and sustainability.

Source: **Musayev, N., Namazov, E. & Mustafazade, A.** 2023. FAO Partnership and Liaison Office in Azerbaijan.

2. Facilitating co-innovation

Co-innovation is the core function of MAIPs. It is mainly triggered by challenges that the agricultural value chain faces or market opportunities. Co-innovation aims to overcome the bottlenecks of agricultural value chain development and the last-mile barrier of knowledge, information and technology transfer. In MAIPs, PAR led by farmers and key value chain actors plays a key role in generating, in an inclusive and equitable way, technological innovation, knowledge and information and driving the innovation and technological transfer processes.

BOX 12. Driving co-innovation with a combined bottom-up and top-down approach

To facilitate co-innovation in MAIPs, it is recommended to adopt a combined bottom-up (farmer participation) and top-down (public EAS agents and researcher guidance) approach. The PAR on the identification and analysis of this production gap and other advancement drives the subsequent co-innovation process among multiple actors. The knowledge generation and technological innovation are driven by PAR, and the subsequent application and transfer process is continuously supported and facilitated by co-learning activities. Through co-innovation and co-learning processes, the key participants are empowered to tap into their innovation potential based on actual needs. This potential, crucial for achieving national agricultural development goals and United Nations Sustainable Development Goals (SDGs), is often times difficult to harness using conventional approaches to knowledge and technology transfer.

Source: **Yang, P., Jiao, X., Feng, D., Ramasamy, S., Zhang, H., Mroczek, Z. & Zhang, W.** 2021. *An innovation in agricultural science and technology extension system – Case study on science and technology backyard*. Rome, FAO. <https://doi.org/10.4060/cb2939en>

Undertake the following activities to facilitate MAIP participants to co-innovate:

Activity 1: Facilitating participatory action research

To effectively understand and solve the problems faced by MAIP participants, it is necessary to design, organize, and facilitate different types of PAR according to different purposes. Facilitators play an important role in PAR, guiding participants to apply appropriate and place-sensitive research methods. Normally, the PAR topics should be selected in line with the identified innovation agenda(s) and further defined by all the participants in a participatory way.

BOX 13. Types of participatory action research

Participatory action research (PAR) carried out by individual or groups of MAIP participants is an important tool for acquiring new knowledge, testing and comparing new methods, improving transferred technologies and innovations to adapt to local conditions, and solving the problems and bottlenecks of the agricultural value chain. PAR can be classified into the following types according to its different objectives:

- **Learning-oriented PAR:** The facilitators know the research results whereas the participants do not beforehand. The main objective of this type of research is to facilitate the participants to learn new methods, new knowledge, new technologies and innovations. The results are meant to demonstrate the effects, efficiency and efficacy of those new methods, and applications of new knowledge, new technologies and innovations to key MAIP participants.
- **Adaptive PAR:** The facilitators know the research results whereas the participants do not know or are uncertain beforehand. The main objective of this type of research is to test the adaptability of the new methods and applications of new knowledge, new technologies and innovations to local conditions. Its purpose is to carry out localized adaptive research and introduce new technologies and innovations.
- **Innovative PAR:** Neither the facilitators nor the participants know the research results beforehand. The main objective of this type of research is to explore and find new methods, new solutions and applications of new knowledge, new technologies and innovations to solve the existing problems. Its purpose is to design a new research in response to the existing problems.

Source: 杨普云, 梁俊敏, 李萍 & 王强. 2014. 农作物病虫害绿色防控技术集成与应用. 中国植保导刊, 34(12): 65–68+59.
[Yang, P., Liang, J., Li, P. & Wang, Q. 2014. Integration and application of green crop pest management technologies. *China Plant Protection*, 34(12): 65–68+59.]

CASE 5. Building smallholders' capacity of nutrient management through participatory action research

Chemical fertilizer overuse is quite common in crop production. Previous studies show that many lab-generated agronomical solutions are effective in improving grain yield and nutrient use efficiency. However, distributing such technologies to smallholders, especially on a large scale, remains a challenge. This is not only due to their limited education and capacities, but also a demand-supply mismatch. Participatory action research (PAR) allows multiple actors to co-innovate with farmers with a good understanding of the latter's motivation and needs. It is therefore an effective tool for building farmers' capacities, co-creating tailored technologies and transferring them into practice for more sustainable agricultural production while paving the way for scale-up.

To enhance smallholder farmers' capacities of nutrient management through participatory action research, a Science and Technology Backyard (STB) was established in Wangzhuang village in Quzhou County in 2015 by the China Agricultural University (CAU). This STB was aimed at strengthening the value chain of formula chemical fertilizer manufacture based on crop production demand. The STB engaged multiple actors, including smallholders, R&D personnel and product designers from Yuntianhua Company (a fertilizer producer), professors and postgraduate students from the CAU, and leaders from Wangzhuang village committee. The following activities were undertaken: (1) investigating the demands and current situation of chemical fertilizer use in crop production by farmers through surveys and field observation; (2) analysing the root causes of crop performance and the motivation behind the behaviour of smallholders and extension agents; (3) exploring potential effective approaches to change behaviour of farmers with regards to optimized chemical fertilizer use, with multi-stakeholders (e.g. a chemical fertilizer enterprise) based on resources endowed to smallholders; (4) conducting field trials and demonstrations with smallholders on their own fields based on the agreed upon solutions; (5) developing an effective localized nutrient management approach and formulate products such as chemical fertilizer; and (6) distributing the developed methods on a large scale using various approaches such as training.

Within this STB, professors and postgraduate students (hereinafter referred to as STB staff) conducted farm and farmer surveys to learn about the motivation and needs of smallholders. Those surveys also provided information on the characteristics and conditions of the village, as well as soil fertility and land characteristics. STB staff also partnered with Yuntianhua Company, Wangzhuang village committee, and lead farmers. In doing so, existing resources from the local farming community, enterprise, and research sector were integrated. STB staff co-designed and validated solutions using the PAR method together with smallholders, taking into full consideration their demand and encountered agronomic problems. In the PAR process, smallholders and STB staff closely

worked together. Under the guidance of STB staff, they co-identified the problem and underlying causes of chemical fertilizer overuse, collaborated on field research and demonstrations, and co-designed the formula fertilizer. Then Yuntianhua Company produced in large scale the STB-generated formula fertilizer and set up a station in neighbouring villages to demonstrate and distribute it. This made the localized formula fertilizer more visible and accessible to broader rural communities. Smallholders applied the fertilizer in their own fields under the guidance of STB staff. STB staff also jointly developed a localized nutrient management approach with local extension agents, smallholders, and enterprises, which was extended by the grassroots public EAS agencies. The local government gave the permission to distribute the chemical fertilizer and train smallholders throughout the county.

Some significant results were obtained as follows: (1) the current situation of nutrient management and farmers' motivation for use were identified; (2) the chemical fertilizer produced through the participatory action research was effective and improved grain yield and N use efficiency and was easily applied by smallholders; compared with non-STB villages, 80 percent of farmers in the villages served by the STB knew the (3) chemical fertilizer and its efficacy and were willing to use it in their own fields; and (4) the adoption rate of chemical fertilizer by smallholders throughout Quzhou County increased by 30 percent due to the training and dissemination of nutrient management technology, with help from the local government.

Source: Jiao, X. 2023. China Agricultural University.

It is recommended to take the following steps to design simple, easy-to-do, and credible PAR:

➔ Step 1: Defining the research topic

- ✓ Have the participants propose one research topic in line with the MAIP innovation agenda(s).
- ✓ Use a "topic selection matrix" (refer to *Guide for training of facilitators of multi-actors agricultural innovation platforms* for the details) that can be used when preparing for the PAR and field trials.

➔ Step 2: Proposing a hypothesis

- ✓ Inspire every value chain actor to come up with as many hypotheses as possible through brainstorming.
- ✓ Use a "concept matrix" to summarize these hypotheses (refer to *Guide for training of facilitators of multi-actors agricultural innovation platforms* for the details).

Tips

- Avoid the situation where there is only one hypothesis and the facilitator dominates the participants' thinking. For example, as for the research topic "urea use", some participants believe that "increasing urea will increase yield", while others may propose that "more urea will increase weeds" and so on.
- The concept table is like the blueprint of a house. With it, the participants can plan how the PAR experiments will deal with, determine what to observe and so on.

➔ Step 3: Designing the PAR

- ✓ Explain to the participants the two important principles of PAR design, namely, natural variation and deviation.
- ✓ Make sure that farmers gain a sound understanding of the two principles and guide them to apply them in the PAR design.

Example

Take the research topic "the amount of urea usage in Chinese cabbage" as an example (refer to *Guide for training of facilitators of multi-actors agricultural innovation platforms* for the details):

- List the existing problems in detail and define the research topic. It is best to test only one variable at a time in a PAR experiment to make it as simple as possible. Simplicity means clear results.
- Determine the purpose of the PAR experiment in detail as much as possible. What do we need to know after the end of the experiment?
- Determine the PAR experiment treatment. First determine the control treatment, generally using conventional operations with known results as a control, such as farmers' conventional methods or standards recommended by the agricultural technology extension office. Other treatments should consider the actual situation in the field and the capacity of the participants (economy, labour). The range of differences between treatments should be appropriately increased to facilitate farmers to analyse and compare experimental results with simple statistical methods.
- Ensure the reliability of the PAR experiment. In experimental research led by the participants, 2–3 repetitions of each treatment are sufficient. The same field comparison should be adopted as much as possible. The area of the plot should not be too large. The soil quality and fertility of the test site should be basically uniform.

➔ Step 4: Observing during the PAR

- ✓ Explain to the participants the importance of observation in the PAR.
- ✓ Guide the participants to know what to observe, who will observe, when to observe, how to observe and so on.

➔ Step 5: Analysing the PAR results

- ✓ Familiarize the participants with simplified mathematical statistical methods, such as analysing single-factor, “three-treatment and three-repetition” farmer research data analysis with range mapping and consistency comparison methods.
- ✓ Guide the participants to apply these methods in the analyses of the PAR results.

➔ Step 6: Evaluating the PAR results

- ✓ Guide the participants to fully discuss the analytical results of all observation indicators.
- ✓ Ask the participants to make a summary table of the results, comprehensively analyse the impact of the studied factors on ecosystem, and make conclusions.
- ✓ Meanwhile, guide the participants to compare the summary table of the results with the concept matrix table formulated in Step 2.
- ✓ Finally, guide the participants to discuss the evaluation results: What new discoveries and new knowledge have been obtained from the PAR, which aspects need further research and so on.

Tips

- Before that the participants conduct PAR, it is very important to train them on the “rules of research”. This is important for ensuring the credibility and usefulness of the experimental results. Often times, many participants compare their own operations with those of others, or use another field or the next season to test and compare some new methods, concepts, materials, etc.
- Raising farmers’ awareness of the importance of systematic experimental PAR and design will greatly enhance their ability to solve problems.
- When farmers have grasped the basic experimental methods and agreed to conduct experimental PAR in accordance with the requirements (for example, how many repetitions they are willing to set), it is very important to provide them with the opportunity to practise. MAIPs should carry out some simple experiments that can obtain clear results, such as a variety comparison tests or a test with different fertilizer dosages.
- The facilitator is mainly responsible for introducing the experiment design and steps of implementation. The trainees should however be allowed to determine each step.
- The participants’ evaluation of the research results is a very important step. They should be guided to actively discuss and assess the research results. This will give them a sense of accomplishment after completing the PAR, stimulating their creative thinking and enthusiasm for agricultural production.

Activity 2: Facilitating participatory on-farm technology and innovation trials and demonstrations

The on-farm field trials should be conducted at the pilot sites to assess the economic, social and environmental appropriateness of the selected technologies or innovations. Once it is confirmed after the on-farm trials, the technologies and innovations can be demonstrated at an appropriate scale for verification before their scale-up. Facilitators should guide the participants to implement on-farm technology and innovation trials and demonstrations in a participatory way. Implementation steps are as follows:

➔ Step 1: Selection of key technologies and innovations

- ✓ Conduct baseline survey to review the participants' current practices, knowledge and perceptions in accordance with the MAIP innovation agenda(s).
- ✓ Facilitate the participants to select technologies and innovations for on-farm trials and demonstrations in accordance with local conditions and their needs.
- ✓ Select key technologies and innovations from the available information, PAR results and participants' experience.

➔ Step 2: Facilitation of field trials and demonstrations

- ✓ Demonstrate the selected key technologies and innovations at the pilot site(s).
- ✓ Adapt the key technologies and innovations according to the local agroecosystem and integrate them into a kind of technical modules (agroecological production and processing systems).
- ✓ Demonstrate the integrated technical modules on a large scale to assess their social, economic and environmental appropriateness if necessary.

➔ Step 3: Promotion and scale-up of the technical modules

- ✓ Design and implement a training for farmers or value chain actors or a demonstration programme to educate or empower farmers or value chain actors on the adoption of the technical modules.
- ✓ Prepare, prior to the implementation, a detailed workplan of the demonstration, promotion and training activities.
- ✓ Disseminate demonstration results and experience gained from the MAIP pilot site(s) to non-participating value chain actors.
- ✓ Plan activities to evaluate the results of field demonstration of the integrated technical modules and prepare a replication follow-up plan or programme to promote the replication and scale-up of the modules in other areas.

Activity 3: Facilitating technology and innovation integration

→ Step 1: Introduction

- ✓ Introduce to the participants the main objectives, basic elements and procedures of integrating technology and innovation into an integrated agricultural production management system, covering crop production, processing and marketing.
- ✓ Ask the participants to share their opinions, expectations and needs.
- ✓ Ask the participants to think about how to define the technical modules based on the target agricultural value chain.

→ Step 2: Technology and innovation selection

- ✓ Select the technologies and innovations using two approaches in a complementary way:
 - *focus group discussion*, to facilitate the participants to discuss and select technology and innovation against the MAIP innovation agenda(s) based on PAR and participatory on-farm trials and demonstrations of technologies and innovations.
 - *brainstorming* by collecting the participants' experience and indigenous knowledge wherein the participants discuss in small groups and write down their opinions on sticky notes. Each sticky note contains only one opinion.
- ✓ collect all the notes and paste them on the wall after the focus group discussion and brainstorming.

→ Step 3: Integration of technologies and innovations into the operational technical modules

- ✓ Facilitate the participants to integrate the selected technologies and innovations into the operational technical modules against the crop calendar or the agroproduct quality standards.
- ✓ Two approaches can be used: Focus group discussion and brainstorming.

→ Step 4: Standardization of the operational technical modules

- ✓ Upgrade the operational technical modules into standardized procedures like good agricultural practices (GAP) or others if possible once they have been reviewed and summarized by MAIP facilitators or relevant experts.
- ✓ Ensure the involvement of participants in the upgrading process.
- ✓ Explain the standardized technical modules in an as itemized way as possible to increase the enthusiasm of the participants and make them feel that the activity is responsive to their needs.

Activity 4: Facilitating technology and innovation integration into agricultural practices

Agricultural technology and innovation integration refers to the process of a series of research, evaluation, refinement and assembling and packaging of technologies that have been developed through PAR (research and development), field trials and demonstrations or selected by the participants based on their indigenous knowledge, and will be applied in production. The basic process is a repetitive cycle composed of four links:

- ◆ **Selection:** Select agricultural technologies and innovations;
- ◆ **Adaptive research or trials:** Conduct PAR or field trials to verify or adapt the selected technologies and innovations to local conditions;
- ◆ **Assembling and packaging:** Assemble and package the verified or adapted technologies and innovations into agricultural production operational modules through the field trials and demonstrations; and
- ◆ **Standardization:** Standardize the operational procedures of the agricultural production modules for scale-up.

To facilitate the participants to conduct crop production technology and innovation integration, take the following steps:

➔ Step 1: Selection

- ✓ Before selecting the technologies and innovations, conduct in-depth field investigations to understand the ecological environment, climatic conditions, planting system and scale of the target value chain(s), farmers' relevant knowledge, attitudes and practices.
- ✓ Through systematic investigations, identify the major problems in terms of agricultural production, quality and safety requirements of agroproducts, and the agroecological environment.
- ✓ Explore the root causes of these problems and determine future solutions, so as to select corresponding technologies or innovations in line with the predefined innovation agenda(s).
- ✓ While paying attention to the safety, simplicity and effectiveness of technologies or innovations, ensure the safety of agroproducts, the environment, humans and animals and the quality of agroproducts.

➔ Step 2: Adaptive research or trials

- ✓ Conduct PAR or field trials of the selected technologies or innovations for possible adaptation.

- ✓ The purpose is mainly to test relatively new methods, improve the selected new technologies or innovations in case that they are not adapted to local conditions, and test their effectiveness in solving problems.

➔ Step 3: Assembling and packaging

“Assembling and packaging” refers to the process of evaluating, refining, selecting and assembling various technologies or innovations that have been verified in the adaptive research completed in Step 2. This process leads to the integration of the selected technologies with other agronomic measures, such as variety selection, cultivation, fertilizer and water management, and agromachinery measures such as sowing, tillage, harvesting and storage. The assembling and packaging of technologies or innovations will lead to the development of key technological or innovative products or GAPs.

- ✓ Assemble and package the verified or adapted technologies and innovations into agricultural production operational modules through the field trials and demonstrations.
- ✓ Evaluate and select technologies with such criteria as (1) sustainable effects of agricultural production benefits; and (2) the maximization of the comprehensive economic, social and ecological benefits, rather than simply pursuing economic ones.

➔ Step 4: Standardization

Standardization of the operational procedures of the crop production modules is critical for scale-up. It is the process of further integrating technologies through further refining, selection or exclusion, assembling or packaging to form a standard package that farmers can follow and use easily and readily.

- ✓ The integration of agricultural technologies or innovations may include a variety of different combinations of technologies or innovations. Therefore, technological or innovation standardization is particularly important.
- ✓ The process of technology or innovation integration occurs often at the pilot and demonstration sites. After years of applied technology research, selection and assembling and packaging processes at the pilot and demonstration sites, various technical parameters and indicators have been tested and verified.
- ✓ Through the standardization of technology or innovation integration, the resulting technological or innovation specifications and standards can ensure that the input-output ratio can be optimized. This will make the integrated technologies or innovations more convenient and easy for farmers to use, thereby significantly promoting their scale-up.

BOX 14. Principles of agricultural production technology and innovation integration

The integration of agricultural production technologies and innovation must conform to the following principles:

Ecological approach: (1) Based on the healthy cultivation of crops, integrate and put in place good agricultural cultivation measures; (2) based on the enhancement of farmland biodiversity, integrate and support the use of ecological control measures to fully protect and use of biological diversity to control pests and diseases; (3) based on the protection and utilization of natural enemy populations, integrate and support the use of natural enemies or artificial release of natural enemy to control crop pests; and (4) based on the rational use of inputs, eliminate the use of inputs of high toxicity, high residues and high pollution and minimize the use of chemical inputs.

Simple and easy to use: The purpose of agricultural technology or innovation integration is to promote its application and scale-up. In general, the new technology or innovation application ratio of farmers or value chain actors is inversely proportional to the complexity of the technology or innovation. Technology or innovation integration is therefore aimed at achieving the simplification of complex technologies or innovations through technology adaptive researching, assembling and standardization. This will increase the adoption rate of new technologies or innovations and solve the problems that using technologies or innovations has a too high cost or requires higher quality or quantity of labor investment.

Standardization: Agricultural technology or innovation integration must follow certain rules and standards. This is because that the effectiveness of integration depends largely on the standardization and specification of the technologies or innovations. For example, in the application of biological control in a field, a balance must be maintained between the number of natural enemies released and the crop areas. Too little release will not have the effect of prevention and control, whereas too much release will cause waste and increase unnecessary costs. Maintaining such a balance is the so-called standardization and specification. Agricultural technology or innovation integration is aimed at achieving the best results with minimal cost. Therefore, it is necessary to formulate specifications and standards for the use of integrated technologies or innovations.

Source: 杨普云. 2018. 农作物有害生物全程绿色防控技术模式的集成与推广应用. 中国植保导刊, 38(04): 21–25.

[Yang, P. 2018. Integration and application of the whole-process integrated technical scheme of green crop pest management. *China Plant Protection*, 38(04): 21–25.]

杨普云, 梁俊敏, 李萍 & 王强. 2014. 农作物病虫害绿色防控技术集成与应用. 中国植保导刊, 34(12): 65–68+59.

[Yang, P., Liang, J., Li, P. & Wang, Q. 2014. Integration and application of green crop pest management technologies. *China Plant Protection*, 34(12): 65–68+59.]

BOX 15. Three typical outcomes of agricultural production technology and innovation integration

First, a certain kind of key technology or innovative product. Through the integration of a variety of agricultural technologies or innovations, new key technologies or innovative products are developed and integrated. For example, a frequency-vibrating insecticidal lamp, its research and development uses the characteristics of insect phototaxis, wave, color, and sex information. After attracting adult insects to the lamp, they are to be killed by the frequency-vibrating high-voltage power grid on its exterior. Another example is the application of the technology or innovation integration of artificial natural enemies such as predatory mites, parasitic *Trichogramma sp.*, etc which has integrated natural enemy breeding, packing and release devices (release bags, cards, etc.).

Second, operating modules. The operating modules generally target the whole process of production of certain crops or certain agroproducts. It has comprehensively integrated a set of multifaceted technologies or innovations. For example, for citrus crops, a set of integrated pest management (IPM) module that integrates ecological, physical, chemical and biological control technologies or innovations: Such as grass cultivation (mainly *Digitaria sanguinalis*, *Erigeron acer* Linn, and *Stellaria media*) + pre-treatment (1500D spirochete ethyl ester and 1.8% EC avermectin) + releasing predatory mites in May + light entrapment + point spray olfactory attractant to control citrus flies.

Third, good agricultural practice standards. The development of good agricultural practice (GAP) standards is the final product, which are based on the whole process of agricultural technologies or innovation integration. GAP should not only include the above-mentioned specific technical or innovation application standards, but also technology or innovation principles, specific agroproducts requirements, technical or innovation implementation staffing, etc.

Source: 杨普云. 2018. 农作物有害生物全程绿色防控技术模式的集成与推广应用. 中国植保导刊, 38(04): 21–25.

[Yang, P. 2018. Integration and application of the whole-process integrated technical scheme of green crop pest management. *China Plant Protection*, 38(04): 21–25.]

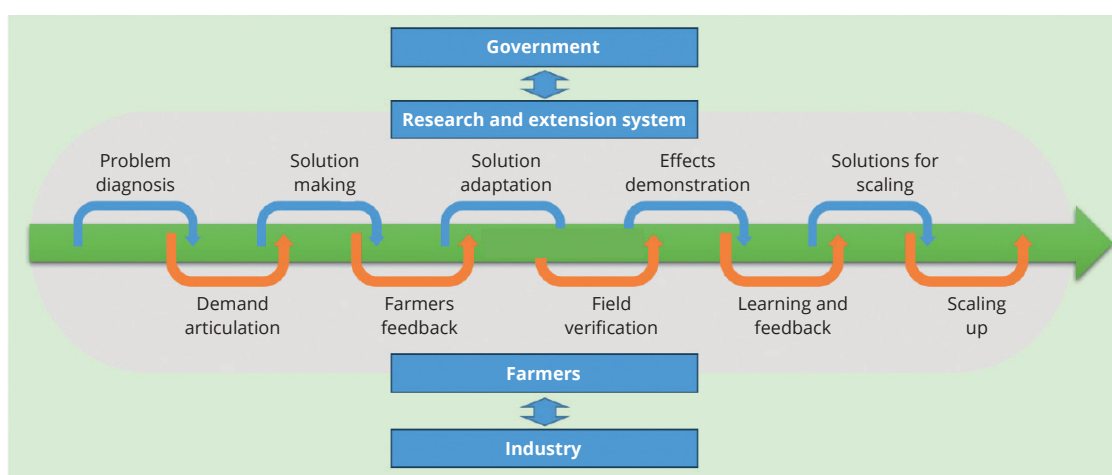
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[Yang, P., Liang, J., Li, P. & Wang, Q. 2014. Integration and application of green crop pest management technologies. *China Plant Protection*, 34(12): 65–68+59.]

3. Facilitating co-learning

By facilitating multiple patterns of interactions, MAIPs are not only platforms for agricultural technology innovation, but co-learning platforms for the participants along the selected value chain (FIGURE 3). Co-learning between farmers and other MAIP actors is crucial for knowledge and technology transfer. Such interactions occur when they participate in on-farm research, FFSs, field visits and observations and field days. Along with PAR and integration of technologies and innovations, MAIP facilitators are expected to design and deliver a series of co-learning activities. In addition to FFS, other co-learning activities can be organized according to the participants' needs. For example, field visits and observations, farmer rally or field days can be integrated into the farmer education curriculum according to local conditions.

FIGURE 3. Dynamics of the co-learning process within a multi-actor agricultural innovation platform



Source: Zhang, W., Li, J. & Yang, P. 2023. *Facilitation skill and tools of co-learnings in MAIPs*. PowerPoint presentation during the “FAO-CAU training of master trainers for establishing and operating multi-actor agricultural innovation platforms”.

BOX 16. Empowerment of participants through multi-actor co-learning processes in MAIPs

Essentially, the MAIP approach is a learner-centred, participatory process that seeks to empower the participants through participatory and informal education processes to solve real-world problems by promoting their participation, self-confidence, dialogue, joint decision-making and self-determination, which could not otherwise have been achieved through standard training approaches (Yang *et al.*, 2021). Market actors co-learn with farmers and input suppliers by understanding processing technologies and production costs through partnerships or information exchanges. Farmers co-learn with market actors and agroproduct processors by understanding market requirement of quality or standards, market prices and market volatility of agroproducts. In the Science and Technology Backyard (STB) initiative, a type of MAIP, an education curriculum is designed to empower postgraduate students as fully qualified future agricultural innovators or extension agents. Postgraduate students have to participate in the co-learning process with farmers, researchers and extension agents to conduct technology innovation, knowledge transfer and organizing farmers' training activities.

Source: Yang, P., Jiao, X., Feng, D., Ramasamy, S., Zhang, H., Mroczek, Z. & Zhang, W. 2021. *An innovation in agricultural science and technology extension system – Case study on science and technology backyard*. Rome, FAO. <https://doi.org/10.4060/cb2939en>

Activity 1: Brainstorming and group discussion

The objective is to facilitate participants to understand the co-learning mechanism in MAIPs. Take the following steps to familiarize the MAIP participants with ways to facilitate multi-actor co-learning:

➔ Step 1: Introduction

- ✓ Introduce to all the participants the main objectives, content and basic elements of the interaction and learning processes of MAIPs.
- ✓ Ask the participants to share their opinions, expectations and needs.

➔ Step 2: Group discussion

- ✓ Have the participants discuss in small groups the main types of interactions in the innovation systems along agricultural value chain.
- ✓ Have them write down their opinions on sticky notes. Each sticky note contains only one opinion.
- ✓ After that, collect and roughly classify all the notes and paste them on the wall.

→ Step 3: Brainstorming

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups
- ✓ Have each of them use a short sentence to talk about the facilitation methods that he/she wants to learn most regarding the major types of interactions.
- ✓ Record or have one participant record the conversation of the participants on paper/whiteboard. Roughly classify the records.

→ Step 4: Wrap-up

- ✓ Classify the outputs of the group discussion and brainstorming.
- ✓ Explain in an as itemized way as possible to increase the enthusiasm of the participants and make them feel that the activity is responsive to their needs.

BOX 17. Main types of interactions among the key MAIP actors

In the process of agricultural value chain development, lack of interactions among the actors tends to undermine innovation processes. MAIPs are an effective tool to promote the interactions among the key actors. The types of interaction are as follows:

Farmers to farmers Farmer-to-farmer interactions promote the spread and transfer of agricultural production and post-harvest technologies and innovations among farmers. Normally, this type of interactions rarely occur without facilitating or organizing lead farmers or other key actors of agricultural value chains. MAIPs serve as a space conducive to farmers to farmers interactions through various actions, such as farmer field days, farmer rally, farmer interest club and associations and FFS, etc. Farmer co-learning interactions also occur through their participation in on-farm research, FFS, field visits and observations. Co-learning interactions of farmers with other stakeholders are crucial for knowledge and technology transfer. MAIPs empower farmers through participatory and non-formal education processes.

Researchers to farmers In MAIPs, researchers should play a leading role in knowledge and technology innovation and coordinate the innovation process of technology development and transfer. For the research-triggered innovation process, a combined bottom-up farmer participation and top-down researcher guidance approach should be used to generate knowledge and technologies in the fields, on the farms and in the farming systems. This helps overcome the last-kilometer barrier of knowledge transfer by developing practical and

farmer-owned knowledge and technologies. Research in the MAIPs generally compares agricultural production on research plots with conventional farmer fields. The results from the research plots demonstrate clearly that agricultural productions achieved through scientific research consistently exceed those in the conventional practices. Farmer participatory research on the identification and analysis of this production gap and other advancements drive the subsequent knowledge co-learning process of multiple actors. The innovation of knowledge and technology is triggered by research, and the subsequent process of knowledge and technology applications is continuously supported and facilitated by on-farm participatory research and follow-up demonstration and training activities. These research activities trigger innovation that provide “zero time difference, zero cost, zero distance and zero barrier” knowledge and technology services to smallholder farmers. It also empowers smallholder farmers through follow-up training activities to fulfil their potential based on scientific advancement. These attainable potentials are usually desirable in national policies and SDGs, but prove difficult to achieve using conventional knowledge and technology transfer approaches.

Extension agents to farmers MAIPs provide pluralistic EAS to smallholder farmers by engaging public education, research and extension sectors and private enterprises. MAIPs are not only an agricultural technology innovation platform, but a farmer education one. Along with on-farm participatory research, a series of training activities are designed and delivered by MAIP professionals including extension agents and lead farmers to train farmers to understand agricultural production ecosystem and learn new technologies and good practices. In addition to FFS, other training methods are used in response to farmer needs. For example, field visits and observation, farmer rally, fairs and shows are integrated into the farmer training curriculum according to local conditions. During the cropping season, MAIP professionals including public and private extension agents and market actors also provide EAS.

Business to farmers It is well recognized that MAIPs are one of the best platforms for private enterprises to undertake experimental evaluation of their business innovations. For example, input suppliers can cooperate with MAIPs to test and improve their products in local communities. They can send their specialists to work with lead farmers, conducting farmer participatory field trials and demonstrations to expand the applications of their products and markets. The business to farmer interactions are conducive to win-win and pro-poor business innovations in terms of the economic profits of the enterprises and the income increase of the smallholder farmers. It is also commendable that through these interactions, both farmers and enterprises can better comply with standards and criteria set by domestic and international markets.

Business to business Business-to-business interactions rarely occur when coordinating mechanisms and facilitation by public associations are absent in agricultural value chain development. MAIPs provide optimal platforms to coordinate business-to-business interactions among key market actors. The market competitive pressure stimulates key market actors to interact and innovate so as to provide high quality and new value-added products at lower prices. This kind of business-to-business interaction can coordinate agricultural value chain development in terms of upgrading marketing standards, promoting production technical advancements and other forms of innovations.

Interactions among multiple actors It is argued that innovations require dense networks and partnerships among multiple actors. Through MAIPs, multiple actors interact with each other in various ways once good coordination mechanisms are in place. For example, knowledge and technology innovation is triggered by research, while the subsequent process of knowledge and technology applications are continuously supported and facilitated by researchers, extension agents, lead farmers and farmers through the follow-up training activities and EAS. To cope with fluctuating markets, partnerships and networks need to be built up among market actors, researchers, extension agents and farmers. This is supportive of sharing accurate information about market price and production costs and expertise to jointly improve productivity, quality and branding of the agroproducts.

Interactions and co-learning processes among multiple actors MAIPs are established to provide necessary EAS to support AIS by facilitating interactions and co-learning processes among the multiple AIS actors. This should be facilitated according to the needs analysis. In general, different dimensions of interactions and co-learning processes, such as farmers to farmers, market actors to farmers, input suppliers to farmers, processors to farmers, and public EAS to input suppliers, should be facilitated through different EAS activities.

Source: Yang, P., van de Fliert, E., Musayev, N., Akhundov, Y. & Ou, Y. 2022a. *Multi-actors agricultural innovation platform: Guideline for master trainers*. Rome, FAO. <https://doi.org/10.4060/cb9080en>

Activity 2: Facilitating co-learning through digital platforms

Agricultural digital platforms are emerging online spaces where different participants can interact, exchange and co-learn. For example, farmers can interact with EAS agents and experts through online platforms and apps which offer a variety of services. Undertake the following activities to facilitate MAIP actors to co-learn through digital platforms:

➔ Step 1: Introduction

- ✓ Introduce to the participants typical agricultural digital platforms available locally, focusing on their features and functions.
- ✓ Ask the participants to share their experiences with agricultural digital platforms. Depending on their experiences, ask them how they have interacted and co-learned with other users of a certain platform.

➔ Step 2: Group discussion

- ✓ Choose a commonly used agricultural digital platform and guide the participants to download the app and install it on their smartphone.
- ✓ Guide the participants to navigate the app and familiarize them with its main features and functions. Take questions if any.
- ✓ Ask them to discuss in small groups and identify possible scenarios to interact and co-learn via the platform.

➔ Step 3: On-farm mock application

- ✓ Visit a demonstration farm together with the participants. Ask the farmers to work in small groups and observe the crops or livestock depending on the type of the value chain.
- ✓ Guide each group to identify production or management problems that cannot be solved by themselves.
- ✓ Guide the participants to interact with the experts or other participants via the app selected in Step 2 depending on the nature of the identified problems.
- ✓ Facilitate the participants to work out solutions based on the co-learning with the experts or other participants via the app.

➔ Step 4: Wrap-up

- ✓ Comment on the group discussion and on-farm mock application and highlight the lessons learned.
- ✓ Summarize the entire activity and give suggestions on ways to strengthen the co-learning through agricultural digital platforms.

CASE 6. Facilitating smallholder farmers' uptake of new technologies by establishing digital co-learning platforms

Due to low level of education, lack of awareness and non-contextualized extension services, smallholder farmers often have limited access to innovations and new technologies. They also lack timely assistance when facing production issues. Consequently, they tend to adhere to traditional agricultural methods. It is therefore necessary to build their capacities, change their attitudes towards innovations and new technologies, and provide timely services. It is equally important to integrate scientists' theoretical knowledge with farmers' local experience.

To address these issues, the Science and Technology Backyard (STB) in Wangzhuang village, which targets the local wheat value chain, has established a digital co-learning platform. It aims to enhance communication and interactions between scientists and farmers, thereby facilitating the uptake of new technologies and empowering farmers with knowledge and resources. This digital platform promotes co-learning between scientists and farmers and empowers the latter in the following ways:

- **Live online Q&A and technical support WeChat group:** The STB teachers and students has created live online Q&A sessions and WeChat group chats, so that farmers' questions can be addressed anytime and anywhere. These sessions provide prompt production guidance to farmers. Through in-depth discussions and knowledge sharing, scientists and farmers jointly address agricultural challenges: Scientists share the latest research findings, while farmers contribute practical experience and insights into local agricultural conditions. This collaborative exchange has promoted continuous learning and enabled the exploration of place-sensitive solutions.
- **Short video campaign for science and technology popularization:** To strengthen farmers' access to valuable information and ensure that they have access to relevant technologies during various stages of crop growth, the STB encourages farmers to provide feedback on production issues. Based on this feedback, STB produces short videos for science and technology popularization, which are then made available online. These videos serve as a timely resource to inform and remind farmers about the critical aspects of their farming practices. They deliver wheat-related information in plain language, making complex professional knowledge more accessible and understandable to farmers.

This digital co-learning platform has led to continued improvement in the technology transfer. More importantly, it has facilitated a transformation in farmers' learning mode, shifting them from passive recipients to active co-learners. Through this platform, the STB has empowered local farmers with the latest scientific knowledge, facilitated knowledge sharing between scientists and

farmers, and enhanced the adoption of advanced agricultural technologies at the grassroots level. Farmers now have access to a broader range of information channels and sources, leading to a growing awareness of the importance of learning. This heightened awareness has resulted in a growing number of farmers who have changed their attitude towards new technologies, replaced traditional farming practices with innovative approaches, and developed a greater sense of responsibility towards environmental protection. In addition, the platform's ability to timely and conveniently respond to farmers' needs has earned it the trust and recognition of farmers.

Source: **Chen, L.** 2023. China Agricultural University.



4. Supporting partnership building

Various partnerships are the key to the success of MAIP activities. Partnership establishment is a premise for carrying out key activities such as co-innovation and co-learning. Partnership building among individual or groups of MAIP value chain actors/stakeholders is fundamental for facilitating their interactions. These interactions are supportive of generating new knowledge, testing and comparing available innovative solutions to adapt to local conditions, and solving the problems and bottlenecks of value chain development.

There are formal and informal partnerships built among the facilitators and MAIP value chain actors. While a formal partnership refers to MAIP membership and an informal one refers to non-mandatory obligations embodied among the MAIP stakeholders. For example, in order to adapt technologies or innovations to local conditions, facilitators or MAIP professionals or technicians must establish the partnerships with farmers or other value chain actors/stakeholders to carry out PAR or field trials and demonstrations. The partnership ensures agreed management strategy and multi-actor interactions conducive to co-innovation. It is necessary to build different kinds of partnership in accordance with the MAIP objectives. In general, at least four categories of partnerships are needed to operate a MAIP:

- ◆ partnerships for co-innovation and co-learning in response to the identified MAIP innovation agenda(s);
- ◆ partnerships for value chain development;
- ◆ partnerships for market linkages; and
- ◆ partnerships for entrepreneurship.

Undertake the following activities to facilitate MAIP actors to build partnerships:

Activity 1: Actors mapping and partnership building

➔ Step 1: Introduction

- ✓ Introduce to the participants the main objectives, content and basic elements of MAIP partnerships.

- ✓ Ask the participants to share their opinions on the topic. Besides, ask them to think about how to define the partnership themes and approaches in relation to the target agricultural value chain.

➔ Step 2: Actors mapping

- ✓ Have the participants discuss in small groups and write down their opinions on key actors along the selected agricultural value chain.
- ✓ After the discussion, collect all the notes and roughly classify and paste them on the wall.
- ✓ Take the selected agricultural value chain as an example, and analyse and map the key actors using a mapping matrix (Table 4).

TABLE 4. Value chain actors mapping matrix

Value chain sectors	A. Main actors	B. Partnership building among actors
1. Crop soil health management		
2. Crop nutrient and water management		
3. Crop yield and quality management		
4. Crop health management		
5. Harvest and storage management		
6. Safety and quality testing and monitoring		
7. Processing and package management		
8. Certification and marketing		

➔ Step 3: Partnership building

- ✓ Select a co-innovation activity (e.g. a PAR in MAIP) in response to the identified innovation agenda(s) for the selected value chain.
- ✓ During a networking event, have the participants sit altogether in a circle instead of breaking them into groups.
- ✓ Have each of the participants talk about their personal opinions on the partnership and networking between the key actors/stakeholders of the selected value chain. Record or have one participant record the opinions on paper/whiteboard. Roughly classify the records.
- ✓ Take the selected agricultural value chain as an example and analyse its key actors/stakeholders and building their partnerships.
- ✓ Finally, train the participants to analyse the key actors/stakeholders in each partnership and guide them to discuss their roles and mutual influence and effect.

➔ Step 4: Wrap-up

- ✓ Classify the outputs of the actors mapping and partnership networking.

- ✓ Explain in an as itemized way as possible to increase the enthusiasm of the participants and make them feel that the activity is responsive to their needs.

Note: The actors mapping and partnership building methods mentioned above can be used together or separately according to the actual situation.

BOX 18. Education-research-extension partnerships for co-innovation, knowledge generation and transfers in MAIPs

Support for agricultural education and research systems is necessary but not sufficient to develop the capacities for facilitating agricultural knowledge and technological transfer and innovation. Knowledge created by participatory action research (PAR) is fundamental for technology transfer and innovative solutions in MAIPs. However, this cannot occur effectively in farmer communities without the effective interactions, linkages and partnerships between research, education and extension systems.

Agricultural education: Sustainable agricultural development and innovation need future professionals with new skills and knowledge. Agricultural education designed to foster future professionals should develop an adaptable paradigm to meet new challenges. In this regard, agricultural students are often engaged in MAIPs where their theoretical technical knowledge can be complemented with practical skills by conducting their research during the implementation of development-related projects and initiatives. Agricultural education is necessary for the dissemination of good agricultural practices and innovative approaches to establish partnership with local communities. The implication is that both public and private sectors should invest in agricultural education to modernize curricula and courses. The modernized curricula should be able to enhance capacity development and develop the practical skills of students, such as networking, coaching, facilitating, advocacy, communication, leadership, teamwork and entrepreneurship skills. Investment in the agricultural education systems should be shifted to enhance partnerships and relevance of academic communities towards strengthening knowledge transfer and co-learning approaches to improve sustainable rural livelihoods among professors, students, farmers and other stakeholders, including local farmer organizations, traders, extension agents, rural community leaders and others.

Agricultural research: Research is essential to trigger agricultural innovation in most cases, including sustainable crop intensification. However, only supporting the research system, or isolating it from other stakeholders will not lead to effective agricultural innovation. Investment in and support for research should emphasize not only research outcomes, but its interactions and partnerships with extension and farming sectors to realize sustainable development through agricultural innovation rather than supporting research activities in isolation. Agricultural development projects should view the knowledge generation (research) and utilization of research results (development) as an integrated process.

Agricultural extension: Current providers of agricultural extension services, including public EAS agencies, NGOs, private companies and farmer

organizations, are increasingly pluralistic. Support for agricultural extension should encourage pluralism and seek effective and efficient partnerships on agricultural knowledge and technological transfer and innovation. The partnerships of agricultural extension among key stakeholders including public education, research and extension sectors and private enterprises to provide pluralistic extension services to smallholder farmers in particular. Investments in such effective partnership models will be more flexible and less defined in terms of restricted numbers of extension agents and expensive infrastructure. But good governance, coordination and accountability should be clearly defined for the MAIPs to counterbalance the risks that are inherent in greater flexibility.

Source: Yang, P., Jiao, X., Feng, D., Ramasamy, S., Zhang, H., Mroczek, Z. & Zhang, W. 2021. *An innovation in agricultural science and technology extension system – Case study on science and technology backyard*. Rome, FAO. <https://doi.org/10.4060/cb2939en>

Activity 2: Facilitating the identification of the partnership types required for key MAIP activities

Facilitators play an important role in establishing partnerships among MAIP value chain actors/stakeholders. They support them to adopt appropriate approaches to build different types of partnerships required for different key MAIP activities and provide guidance in the partnership building process. Normally, the types of MAIP partnerships should be selected in accordance with the key activities identified in the MAIP innovation agenda(s).

BOX 19. Types of partnerships for undertaking the key MAIP activities

To effectively understand and solve the problems faced by value chain actors, it is necessary to organize, facilitate and design different types of partnerships according to different objectives. MAIP partnerships can be classified into the following types according to their specific objectives: (1) collaborations; (2) contracts; (3) clubs; and (4) associations.

Source: The Authors.

Undertake the following activities to facilitate the MAIP actors to identify the appropriate partnerships required for a specific MAIP activity:

➔ Step 1: Defining the key activity

- ✓ Have the participants propose the key MAIP activity. The key activity should be aimed at solving problems in line with the MAIP innovation agenda(s).

- ✓ Help the participants define the key activity using an “activity selection matrix” (Table 5). This can be used to facilitate the identification of partnership types required for key MAIP activities. Generally, only one activity is to be selected using one matrix.

TABLE 5. Participatory action research activity selection matrix for screening out bio-pesticides to substitute targeted chemical pesticides*

Key activities in line with a specific MAIP innovation agenda(s)	Feasibility	Constraints	Activity selected
PAR for screening out bio-pesticides to substitute the targeted chemical pesticides			
Carry out farmer training on IPM: FFS-IPM			
Ban chemical pesticides			
...			
...	...	...	...

* This activity is in line with the identified MAIP innovation agenda(s) which, for example, is aimed at eliminating the targeted chemical pesticide residues in a green tea value chain.

➔ Step 2: Mapping the actors of the selected activity

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups.
- ✓ Have each of the participant use a short sentence to talk about their personal opinions.
- ✓ Record or have one participant record the opinions of the participants on paper/whiteboard. Roughly classify the records.
- ✓ Take the selected MAIP activity as an example and analyse the linkages between its key actors in the pre-, mid- and post-activity (Table 6).
- ✓ Finally, guide the participants to analyse the key actors in each link and discuss their mutual roles and possible impacts on this activity.

TABLE 6. Actor mapping of the selected MAIP activity

Different implementation periods of the selected MAIP activity	Actors identified	Brief views on the roles of the actors
Preparation		
Initiation		
Implementation		
Conclusion		
Reflection and follow-up action plan formulation		

➔ Step 3: Building partnerships

- ✓ Take the mapped actors in the selected MAIP activity as an example, build partnerships in the different implementation stages respectively.
- ✓ Have the participants sit altogether in a circle instead of breaking them into groups during the networking event.
- ✓ Have each participant talk about their personal opinions on partnerships among key actors. Record or have one participant record the opinions of the participants on paper/whiteboard.
- ✓ Roughly classify the records. Take a selected agricultural value chain as an example and analyse its key actors and building their partnerships.
- ✓ Finally, train the participants to analyse the key actors in each partnership and discuss their roles and relationships.

➔ Step 4: Wrap-up

- ✓ Classify the outputs of the actor mapping and partnership building.
- ✓ Make a summary of the types of partnerships related to different implementation stages and an integrated partnership among the key actors for the whole process.
- ✓ Explain in an as itemized way as possible to increase the enthusiasm of the participants and make them feel that the activity is responsive to their needs.



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5. Enabling market linkages

Agriculture is the main source of livelihood for most of the value chain actors. If value chain actors can grow, process and provide the agroproducts and meet the quality demanded by the market at a specific time, then there tends to be a higher chance for them to make profits. If they decide and produce their products without looking at market needs, they can seldom expect to sell their products on the market at a desired price. A common problem among the value chain actors in developing countries is that they tend to produce agroproducts without adequately understanding the market (Abraham and Pingali, 2020; Meemken and Bellemare, 2020). A MAIP serves as a platform to facilitate its members to understand the market and strengthens their market linkages through the following activities:

Activity 1: Facilitating participants to understand the market

→ Step 1: Introduction

- ✓ Introduce to the participants the basics of the market.
- ✓ Ask the participants to share their knowledge on the topic. Besides, ask them to think about why the market is important.

→ Step 2: Group discussion

- ✓ Have the participants discuss in small groups the main characteristics, functions, types of interactions, supply-demand dynamics, etc. on the market.
- ✓ Have them write down on sticky notes the difficulties or obstacles that limit their market access. Each sticky note contains only one difficulty or obstacle.
- ✓ After that, collect and roughly classify all the notes and paste them on the wall.

→ Step 3: Group reporting

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups during the group reporting.
- ✓ Ask each group in Step 2 to choose a representative to make a report on their discussion results.

→ Step 4: Wrap-up

- ✓ Make a summary of the basics of the market in an as itemized way as possible.
- ✓ Wrap up the discussion results.

BOX 20. Importance of farmers' autonomous decision-making

As a participatory platform supportive of training, MAIPs have unique advantages in training farmers to gain knowledge of agricultural product marketing. In the MAIP training, farmers can discover market sales problems and find ways to solve them through participatory discussions. The core of MAIP training is to cultivate farmers' scientific marketing decision-making ability, rather than making marketing decisions on their behalf.

Most farmers consider themselves as passive receivers of agricultural product prices and can do nothing about it. Especially under the production model dominated by numerous smallholder farmers, farmers often do not take the initiative to understand the market. They neither understand market needs and changes, nor know how to produce agroproducts that meet market needs while increasing profits. Therefore, there is an urgent need for smallholder farmers to receive training in agricultural product marketing.

MAIP training on agricultural product marketing can help farmers make scientific and reasonable decisions. A participatory training method is to be adopted to foster farmers' self-decision-making ability, instead of telling farmers how to do it. This is because first, only by improving their autonomous decision-making ability and quality standards can farmers produce competitive products in the fierce market competition. Second, extension agents should not force or directly tell farmers to plant certain crops. Because if such crops are produced, once the market changes negatively and the crops become unmarketable, the latter may demand the former to bear the economic loss.

Source: **Yang, P., van de Fliert, E. & Ou, Y.** 2022b. *Guide for training of facilitators of multi-actors agricultural innovation platforms*. Rome, FAO. <https://doi.org/10.4060/cb8278en>

Activity 2: Facilitating participants to increase the profitability of their production

Conventional approaches to agricultural technology extension emphasize the improvement of production capacity and crop yield, rather than increasing the profit of farmers. Participants need to be trained to increase their production profits, especially for those engaged in cash crop production. To this end, guide the participants to learn how to increase the profitability of their production following the steps below:

➔ Step 1: Introduction

- ✓ Introduce to the participants the concept of profitability.
- ✓ Ask the participants to share their experience with profit-making.

➔ Step 2: Group discussion

- ✓ Have the participants discuss in small groups factors that affect the profit of agroproducts and ways to increase their profitability.
- ✓ Have them write down on sticky notes the difficulties or obstacles that limit their profitability. Each sticky note contains only one difficulty or obstacle.
- ✓ After that, collect and roughly classify all the notes and paste them on the wall.



➔ Step 3: Profitability mapping

- ✓ Introduce the profitability matrix (Table 7) to the participants and guide them to set the baseline level, including yield, sales volume, unit price, sales, production cost, market cost, profit, etc.
- ✓ Ask the participants to make different assumptions, such as an increase in output of 20 percent, half of the products transported to the market, a reduction in price of 20 percent, an increase in price of 20 percent, all of the products transported to the market, and a reduction in marketing cost of ten percent. Guide the participants to calculate the corresponding impact on sales, total cost and profit.
- ✓ Guide the participants to calculate the profitability change compared to the baseline.

TABLE 7. Main factors affecting the profit of agroproducts

	Baseline level	Output (20 percent increase)	Half onto the market	Price (20 percent reduction)	Price (20 percent increase)	All onto the market	Marketing cost (10 percent reduction)
Yield (Kg)	10 000	12 000	10 000	10 000	10 000	10 000	10 000
Sales volume (%)	90%	90%	50%	90%	90%	100%	90%
Sales volume (Kg)	9 000	10 800	5 000	9 000	9 000	10 000	9 000
Unit price (USD/Kg)	5	5	5	4	6	5	5
Sales (USD)	45 000	54 000	25 000	36 000	54 000	50 000	45 000
Production cost (USD)	15 000	18 000	15 000	15 000	15 000	15 000	15 000
Marketing cost	12 000	14 400	6 000	12 000	12 000	12 000	9 720
Total cost	27 000	32 400	21 000	27 000	27 000	27 000	24 720
Profit	18 000	21 600	4 000	9 000	27 000	23 000	20 280
Compared to baseline		+20%	-78%	-50%	+50%	+28%	+13%

➔ Step 4: Wrap-up

- ✓ Make a summary of the concept of profitability in an as itemized way as possible.
- ✓ Wrap up the discussion and profitability mapping results.

Tips

- According to the table above, it can be seen that the facilitator should guide the farmers' market behaviour and decision-making in the following aspects:
- If the farmers' sales channels are not smooth, that is, the sales ratio is low, the profit of agroproducts will be significantly reduced. This result shows that if the market is saturated, overproduction of agroproducts is very dangerous. In MAIP training, the facilitator should help farmers understand the importance of marketable agroproducts and production decision-making based on market demand.
- The increase in prices has a significant effect on the increase of agroproducts, because their production and marketing costs are generally fixed. A small price increase can greatly increase the profit; and conversely, a small price decrease may lead to a large decrease in profit.
- Marketing costs (including advertising, transportation, packaging, etc.) may be higher than production costs in some cases, especially in the sale of gardening or vegetable crops. Reducing marketing costs can also greatly increase the profitability of agroproducts.

Activity 3: Facilitating participants to weigh profits and risks

Facilitators are encouraged to train farmers to correctly weigh the profits and risks of farming and make reasonable decisions based on their own economic conditions and ability to bear risks. To this end, take the following steps:

➔ Step 1: Introduction

- ✓ Introduce to the participants the basic knowledge on profits and risks of the market.

- ✓ Ask the participants to share their knowledge on the topic. Besides, ask them to think about why it is important to weigh profits and risks.

➔ **Step 2: Group discussion**

- ✓ Have the participants discuss in small groups the profitability of certain agroproducts and the risks that they may confront throughout the process of production and marketing.
- ✓ Have them write down profitability factors and risk factors on sticky notes. Each sticky note contains only one profitability factor or one risk factor.
- ✓ After that, collect and roughly classify all the notes and paste them on the wall.
- ✓ Comment on the most popular factors.

➔ **Step 3: Mapping of profits and risks**

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups.
- ✓ Take an agricultural product as an example. Ask the participants to share their opinions on ways to weigh the profits and risks as the most popular factors in Step 2 imply.
- ✓ Record or have one participant record the opinions of the participants on paper/whiteboard. Roughly classify the records.
- ✓ Finally, guide the participants to analyse the tradeoff between the profits and risks.

➔ **Step 4: Wrap-up**

- ✓ Wrap up the discussion results and brainstorming.
- ✓ Make a summary in an as itemized way as possible.

Tips

The facilitator can help farmers weigh profits and risks in the following aspects:

- understanding how is the buyer competition is. First, look at how many buyers are competing to buy the products. If there is only one buyer, the price of agroproducts may be very low. If there are more buyers, the price and profit may be higher due to competition among several buyers;
- fostering farmers' habit of collecting market information. If they do not understand market conditions, it is difficult to bargain with buyers/sellers;
- understanding how the quality of agroproducts is. Buyers tend to give higher market prices for high-quality agroproducts. Train farmers to pay attention not only to the quantity, but to the quality of agroproducts; and
- understanding how the transportation cost is. Buyers often offer lower prices for agroproducts that have high transportation costs, especially those that are purchased in small quantities, far away from the market or from places with poor transportation conditions. Buyers bid lower prices when purchasing at the origin of agroproducts in order to maintain their sales profits.

BOX 21. Tradeoff between profits and risks

High profits are always associated with high risks. Agricultural companies that gain high profits are often takers of high risks. For example, in the production of flowers and some special varieties of fruits, although the price and profits are high, the market demand is very limited (this means that there is a niche market). The price is prone to dropping significantly due to overproduction. Moreover, such high-profit crops have high requirements for production technology, are more sensitive to pests and diseases, and have higher production risks. In contrast, some bulk agroproducts (such as grain crops like rice, corn, wheat, etc.) have relatively stable market prices due to their high demand. The advantage of producing these bulk agroproducts is that the market risk is relatively low, but the profit is also relatively low.

Source: **Yang, P., van de Fliert, E., Musayev, N., Akhundov, Y. & Ou, Y.** 2022a. *Multi-actors agricultural innovation platform: Guideline for master trainers*. Rome, FAO. <https://doi.org/10.4060/cb9080en>

Activity 4: Facilitating participants to understand market price change

The facilitators are suggested to train the farmers to understand the factors that cause market price change. Therefore, the following steps are to be taken:

→ Step 1: Introduction

- ✓ Introduce to the participants the phenomenon of market price change.
- ✓ Ask the participants to share their knowledge or experience on the topic. Besides, ask them to think about why market price is subject to change.

→ Step 2: Group discussion

- ✓ Have the participants discuss in small groups the factors that may lead to the market price change of certain agroproducts.
- ✓ Have them write down demand-side factors and supply-side factors on sticky notes. Each sticky note contains only one demand-side factor or one supply-side factor.
- ✓ After that, collect and roughly classify all the notes and paste them on the wall.
- ✓ Comment on the most popular factors.

→ Step 3: Brainstorming

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups.
- ✓ Take an agricultural product as an example. Ask the participants to share their opinions on how its market price may change.

- ✓ Record or have one participant record the opinions of the participants on paper/whiteboard. Roughly classify the records.
- ✓ Finally, guide the participants to analyse the factors of market price change.

➔ Step 4: Wrap-up

- ✓ Wrap up the discussion and brainstorming results.
- ✓ Make a summary in an as itemized way as possible.

Tips

The following three aspects are to be considered when facilitating participants to understand market price change:

- New market demand is to be identified and well analysed, so as to select new high-profit crops. In developing countries, the market demand for agroproducts always follows this law of change: Urban consumers have an increasing demand for processed food or semi-finished products. With the development of the catering industry, the demand for vegetables and fruits is increasing. The retail market for agroproducts is becoming more diversified, and at the same time, the market share of agroproducts sold by supermarkets is increasing. Changes in market conditions have provided farmers with new opportunities.
- When sellers make profits, they also have costs and risks. On an active market, the role of sellers is very important. To a certain extent, they can reduce the market risk of agroproducts.
- Product loss: Economic loss often occurs in the chain of agroproducts from production to market, especially horticultural products such as vegetables and fruits. This can be the loss of weight. For example, when you purchase 100 Kg of vegetables, they may only weigh 90 Kg when they are shipped to the market due to the evaporation of water. With time, the economic value also decreases as the freshness decreases.

BOX 22. Price change along the market chain

The price of agroproducts gradually rises along the industrial chain from the place of production to the market. Generally speaking, the selling price of agroproducts in the field is the lowest. For example, many fruits, after the seller purchases them in the orchard, they need to be processed, packaged and transported to the market and reach consumers after wholesale and retail. It is not difficult to understand that the retail price is the highest. The price is also affected by the location of the link where farmers sold the products on the market chain. Although the highest price can be obtained by selling agroproducts in the last market link, exceptional costs must be paid, such as transportation, packaging and other marketing costs.

Source: Yang, P., van de Fliert, E., Musayev, N., Akhundov, Y. & Ou, Y. 2022a. *Multi-actors agricultural innovation platform: Guideline for master trainers*. Rome, FAO. <https://doi.org/10.4060/cb9080en>

Activity 5: Facilitating farmers to understand short-term change in agroproduct prices

Farmers should be taught to analyse the seasonal changes in agricultural product price. This is important to help them determine the appropriate planting and harvesting time, so as to obtain good profits. To this end, the following steps can be taken:

→ Step 1: Introduction

- ✓ Introduce to the participants the phenomenon of short-term market price change.
- ✓ Ask the participants to share their knowledge or experience on the topic. Besides, ask them to think about why market price is subject to change in the short run.

→ Step 2: Group discussion

- ✓ Have the participants discuss in small groups the factors that may lead to the market price change of certain agroproducts in the short run.
- ✓ Have them write down these factors on sticky notes. Each sticky note contains only one factor.
- ✓ After that, collect and roughly classify all the notes and paste them on the wall.
- ✓ Comment on the most popular factors.

→ Step 3: Mapping of short-term price change

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups.
- ✓ Take an agroproduct as an example. Ask the participants to share their opinions on its short-term price change.
- ✓ Record or have one participant record the opinions of the participants on paper/whiteboard. Roughly classify the records.
- ✓ Finally, guide the participants to analyse the price change of the selected agricultural product in the short run.

→ Step 4: Wrap-up

- ✓ Wrap up the discussion and brainstorming results.
- ✓ Make a summary in an as itemized way as possible.

Tips

Facilitators are suggested to familiarize farmers with the three aspects as follows:

- In a certain season, the supply of agroproducts is abundant on the market, while the sales volume is large in the first few days of the season. If the sales volume is small whereas the supply volume is large, the market price will definitely go down. Consequently, selling should be avoided in this season to get a better income.
- Focus on a specific short-term market demand change, such as the period of traditional festivals and national holidays. The price may be higher before these holidays as there is often a considerable increase in market demand.
- Know the selling time of similar products from other farmers, and avoid selling the same products in large quantities at the same time. Use greenhouses and other technologies to advance or postpone the selling time of agroproducts.

BOX 23. Changing price of agroproducts in the short run

The prices of agroproducts change with the changes in market demand, reflecting that the prices of the same products vary greatly at different times and seasons. Differences in the prices of agroproducts in different seasons, especially those of vegetables and horticultural products, have significantly affected farmers' income. Generally speaking, at the beginning of the harvest period of a certain agricultural product, its price is relatively high. As it is harvested in large quantities, its price is also greatly reduced. However, in the later part of the harvest season, prices will rise as the market supply decreases. For vegetables and other agroproducts with strong seasonality, if produced and supplied off-season, both the market price and profits are the highest.

Source: **Yang, P., van de Fliert, E., Musayev, N., Akhundov, Y. & Ou, Y.** 2022a. *Multi-actors agricultural innovation platform: Guideline for master trainers*. Rome, FAO. <https://doi.org/10.4060/cb9080en>

Activity 6: Facilitating participants to understand long-term change in agroproduct prices

It is very important for farmers to learn how to analyse the long-term change in agroproduct prices. This will help them plan the structure of crop cultivation so as to obtain good and stable profits. Therefore, familiarize them with basic skills to analyse long-term market price change of agroproducts following the steps below:

→ Step 1: Introduction

- ✓ Introduce to the participants the phenomenon of long-term market price change.
- ✓ Ask the participants to share their knowledge or experience on the topic. Besides, ask them to think about why market price is subject to change in the long run.

→ Step 2: Group discussion

- ✓ Have the participants discuss in small groups the factors that may lead to the market price change of certain agroproducts in the long run.
- ✓ Have them write down these factors on sticky notes. Each sticky note contains only one factor.
- ✓ After that, collect and roughly classify all the notes and paste them on the wall.
- ✓ Comment on the most popular factors.

→ Step 3: Mapping of long-term price change

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups.
- ✓ Take an agricultural product as an example. Ask the participants to share their opinions on long-term price change.
- ✓ Record or have one participant record the participants' opinions on paper/whiteboard. Roughly classify the records.
- ✓ Finally, guide the participants to analyse the price change of the selected agricultural product in the long run.

→ Step 4: Wrap-up

- ✓ Wrap up the discussion and brainstorming results.
- ✓ Make a summary in an as itemized way as possible.

Tips

The facilitator should help farmers understand the long-term market price change of agroproducts from the following aspects:

- Changes in the long-term market demand for agroproducts are mainly due to changes in people's tastes and attitudes and socioeconomic structure. For example, some studies have shown that broccoli is rich in antioxidants, which can reduce the occurrence of cardiovascular diseases, and garlic has the same effect. Therefore, the long-term market demand for broccoli and garlic is likely to increase or at least sustain.
- The economic growth of a country or region brings about changes in the market demand for agroproducts. For example, as the economy grows, the market demand for grain crops will not change much, while the demand for fruits, vegetables and garden products will increase substantially.

BOX 24. Changing price of agroproducts in the long run

If you pay attention to the annual price change of agroproducts, it is not difficult to find that the average price of a certain agricultural product may be high in a certain year, but drop a lot in the following year, and then rebound in the next year. It is easy to understand this kind of inter-year trend of price change, because that the rise in the price of a certain agricultural product will inevitably lead to other farmers' starting to plant the same crop. The market supply will increase rapidly in the short term, and the market price will quickly drop in the following year.

Source: **Yang, P., van de Fliert, E., Musayev, N., Akhundov, Y. & Ou, Y.** 2022a. *Multi-actors agricultural innovation platform: Guideline for master trainers*. Rome, FAO. <https://doi.org/10.4060/cb9080en>

Activity 7: Facilitating participants to understand marketing functions of the value chain

Marketing agroproducts is a complex issue. Marketing links producers with consumers, which involves infrastructure, harvesting equipment, storage and processing facilities, transportation vehicles and wholesale and retail platforms. Facilitators should help farmers and other key MAIP participants understand complete marketing functions of the selected value chain, covering not only technical aspects, but infrastructural and policy development. Therefore, the following steps are to be taken:

➔ Step 1: Introduction

- ✓ Introduce to the participants the marketing functions of the value chain.
- ✓ Ask the participants to share their knowledge or experience on the topic. Besides, ask them to think about why marketing functions are important for the value chain development.

➔ Step 2: Group discussion

- ✓ Have the participants discuss in small groups on marketing functions.
- ✓ Have them write down different marketing functions of the value chain on sticky notes. Each sticky note contains only one function.
- ✓ After that, collect and roughly classify all the notes and paste them on the wall.
- ✓ Comment on the main functions.

➔ Step 3: Mapping marketing functions of the value chain

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups.
- ✓ Take an agricultural value chain as an example. Ask the participants to share their opinions on marketing functions of the value chain.
- ✓ Record or have one participant record the opinions of the participants on paper/whiteboard. Roughly classify the records.
- ✓ Finally, guide the participants to analyse the marketing functions of the selected agricultural value chain.

➔ Step 4: Wrap-up

- ✓ Wrap up the discussion and mapping results.
- ✓ Make a summary in an as itemized way as possible.

BOX 25. Marketing functions of value chain

The provision of agroproducts from farm to fork refers to the marketing functions of value chains, which are normally composed of four categories of functions:

- function of **harvesting**, which happens on farms and at ranches. Harvesting methods vary among different products. Some products are harvested by hand, some by machines while others by specific tools.
- function of **assembling**, which means delivering products to a centre like packaging shelter, grain elevator, ginning or processing site. Assembling is meant to get large quantities together to make marketing more efficient. With recent innovations of digital platforms, it is possible to assemble agroproducts online.

- function of **grading**, which means sorting products for uniformity. Grading can take place during or after assembling. Grading involves several factors, for example, size, colour, variety or chemical residues and so on.
- function of **transportation**, which means moving products from one place to another and reaching end consumers. agroproducts are transported in various vehicles such as wagons, trucks, barges, railways and airplanes. Certain special vehicles are also needed for cold-chain transportation of fresh products with a short shelf-life.

Source: **Crawford, I.M.** 1997. *Agricultural and food marketing management*. Rome, FAO. <https://www.fao.org/3/w3240e/W3240E00.htm#TOC>

Activity 8: Facilitating participants to conduct market survey

Market survey is important for collecting first-hand data from customers, vendors, stakeholders, or the general public. These data of user experience are crucial for making better decisions on marketing, growth and product. Therefore, market survey can help strengthen market linkages. The following steps are to be taken to facilitate the participants to conduct market survey (refer to *SHEP Handbook for extension staff: A practical guide to the implementation of the SHEP approach* for the details):

→ Step 1: Introduction

- ✓ Introduce to the participants the basics of market survey.
- ✓ Ask the participants to select their representatives (an interviewer, note-taker and time-keeper, a total of three representatives) who will participate in the market survey training.

→ Step 2: Preparing for market survey

- ✓ Obtain the permission for conducting a market survey exercise from the manager(s) of the market that the participants are going to visit.
- ✓ Conduct a preliminary market survey before taking the participants to the market if they are not so familiar with how crops are traded on the market.
- ✓ Investigate and choose the most appropriate day(s) of the week or time of the day so that the participants can efficiently collect necessary information.

➔ Step 3: Conducting market survey training

- ✓ Organize a training session on how to conduct the market survey by means of lectures.
- ✓ Then guide the participants to undertake a practical market survey exercise at a nearby marketplace.

➔ Step 4: Wrap-up

- ✓ Recap the information that the participants have collected on the market.
- ✓ Ask them to share the information with other group members within a certain period of time (e.g. within a week after the market survey) to ensure that all the group members will have access to the information that the representatives have obtained.

BOX 26. Key takeaways for conducting market surveys

- Market surveys are to be conducted by the participants, not by government staff, with a questionnaire form in hand.
- Both male and female participants should be selected as representatives who will participate in the market survey training. Literate participants may be selected for the ease of training. However, past experience suggests that with sufficient help from literate fellow participants, illiterate participants can also work as group representatives.
- Market surveys are aimed at collecting information on not only market prices but also required quality and quantity of agroproducts, seasonal fluctuations of prices and traded quantity, mode of payments, etc.
- During the market surveys, the participants are encouraged to establish business relationships with the market players that they meet at the market.
- Make sure to set a clear time frame for sharing the information with other participants. The EAS agents should help the representatives organize an information-sharing meeting.
- Farmers should understand that market surveys need to be carried out continuously by themselves on a regular basis without the help of the government.

Source: JICA. 2018. *SHEP Handbook for extension staff: A practical guide to the implementation of the SHEP approach*. Tokyo, Japan International Cooperation Agency (JICA). https://www.jica.go.jp/english/our_work/thematic_issues/agricultural/shep/c8h0vm0000bm5ayp-att/handbook.pdf

CASE 7. Making farming more profitable by analysing the market

Most farmers do not make profits from farming, or make money occasionally and lose money in most years. This is because most farmers do not analyse the supply and demand of crops and the market situation. A rational choice of what crops to grow is the key to solving this problem. To select a profitable crop, the Shenzhen Muhe Eco-Technology Co., Ltd., a youth-founded agricultural start-up, analysed the supply and demand relationship of more than 10 crops in China. The indicators used included (1) the main production area of a particular crop; (2) the supply amount of this main producing area; (3) the concentrated market availability; (4) existence of small production areas that allow for different periods of market availability; and (5) the potential size and supply amount of these small production areas. As a result of the analyses, it was found that there were significant opportunities for cultivating crayfish in winter and spring in China because:

- (1) The main production areas (about 2 000 000 ha) of crayfish in the country are concentrated in the Yangtze River basin, covering Hubei, Hunan, Jiangsu, Anhui and Jiangxi provinces.
- (2) The above-mentioned main production areas account for more than 99 percent of the total national supply, with market availability concentrated in summer and autumn.
- (3) The production of crayfish in winter and spring can be achieved in the south of Nanning City, Guangxi Province.
- (4) There are currently only about 6 700 ha of crayfish production in winter and spring. The production areas that can be developed in the future will not exceed 33 000 ha.
- (5) The production conditions in the south of Nanning City feature flat land, abundant water and proximity to rivers.

This means that crayfish will be in short supply in winter and spring for a long time, therefore promising considerable profits. The company then extended the production technology of crayfish in winter and spring to farmers in Guangxi Province on a small scale. Most of the farmers who have adopted it have made profits.

Source: **Guo, M.** 2023. Shenzhen Muhe Eco-Technology Co., Ltd.

Activity 9: Facilitating rural e-commerce

E-commerce is a robust tool to allow producers, especially smallholder farmers, to capture more value added on the agrifood value chain (FAO, 2023). This is made possible by enhancing their ability to access resources and market, especially in remote and marginal rural areas. It reduces transaction costs through the digitalization of the business process. To facilitate rural e-commerce, the use of a variety of online marketing tools has a major role to play. Agribusinesses and farmers are to be trained to use a variety of online marketing tools, such as social media, smartphone apps and third-party vertical marketing platforms dedicated to agroproducts. Take the following steps to familiarize the participants with e-commerce:

➔ Step 1: Introduction

- ✓ Introduce to the participants the basics of rural e-commerce.
- ✓ Have the participants discuss e-commerce in small groups. Ask them to share their knowledge or experience on the topic. Besides, ask them to think about why rural e-commerce is important for market access.

➔ Step 2: Training

- ✓ Familiarize the participants with the use of smartphone for the purpose of e-commerce in terms of app download and installation, access to market, networking and so on.
- ✓ Conduct training sessions on e-commerce procedures based on smartphone, including account creation on e-commerce platforms, packaging and logistics, branding, online promotion and sales, customer services and so on.

➔ Step 3: Demonstration

- ✓ Organize a visit to an agribusiness with well-functioning e-commerce activities.
- ✓ Guide the participants to explore such key features as online promotion of agroproducts, logistics, the organization of online sales festivals, livestreaming sales, integration of online and offline marketing and so on.

➔ Step 4: Wrap-up

- ✓ Wrap up the discussion results and demonstration findings.
- ✓ Make a summary in an as itemized way as possible.

BOX 27. Basics of rural e-commerce

E-commerce is the buying and selling of goods and services on the Internet. In rural areas, as inexpensive, powerful digital tools are becoming widely available, the marketing, together with the business networking, is undergoing a rapid digitalization. E-commerce is considered as an important means of transforming the agricultural economy. It is able to promote agricultural upgrading, rural development, and increase producers' capture on the value chain. It also creates opportunities to promote rural entrepreneurship, reduce rural surplus labour and help mitigate rural decline due to outmigration.

Generally, rural e-commerce is composed of two sectors: *Online procurement* of rural consumer goods and agricultural production materials and *online sales* of agroproducts, rural industrial products and rural services. Its key actors include local farmers (producers), rural entrepreneurs and urbanites.

The development of rural e-commerce is often impeded in developing countries due to (1) a lack of digital literacy of farmers; (2) poor enabling environment in terms of favourable policy and regulatory frameworks, funding and infrastructure; (3) inefficient or insufficient supportive services in terms of online payment or delivery; and (4) difficulty in changing consumer behaviour and habits.

Source: **FAO**. 2023. *Guide on digital agricultural extension and advisory services – Use of smartphone applications by smallholder farmers*. Rome. <https://doi.org/10.4060/cc4022en>

Activity 10. Facilitating market linkages through we-media

We-media (also called “self-media”) are online platforms which give users the facility to publish articles, short video clips or audio contents with unique characteristics. Usually smartphone-based, these platforms can reach a large number of people (often subscribers) and provide them a cyberspace to interact with content creators and among themselves. In this process, a critical mass that shares similar attitudes, needs and interests is likely to form. For this reason, we-media is increasingly used as a creative tool for online marketing. Take the following steps to familiarize the participants with online marketing through we-media:

→ Step 1: Introduction

- ✓ Introduce to the participants the basics of we-media.
- ✓ Ask the participants to share their knowledge or experience on the topic. Besides, ask them to think about how we-media can serve as a useful tool for online marketing.

➔ Step 2: Group discussion

- ✓ Have the participants discuss the role that we-media play in establishing market linkages in small groups.
- ✓ Train the participants on the procedures of livestreaming commerce.

➔ Step 3: Demonstration

- ✓ Organize a field visit to a we-media studio run by an experienced we-media practitioner who creates popular contents in the field of agricultural e-commerce.
- ✓ Guide the participants to explore such key e-commerce features of we-media as online promotion of agroproducts, logistics, the organization of online sales festivals, integration of online and offline marketing, etc.

➔ Step 4: Wrap-up

- ✓ Wrap up the discussion results and brainstorming.
- ✓ Make a summary in an as itemized way as possible.

BOX 28. Basics of we-media

According to the content formats, we-media platforms fall into three types, namely, text, video- and audio-based, although there can be mixed platforms. Apart from the conventional we-media like blogs, other we-media platforms that are gaining prominence are live streaming platforms and self-made funny video platforms. The we-media has overridden the usage of traditional media, starting to decentralize the media industry. It gives users and an average person the ability to create and share, where everyone can produce contents and become a we-media creator.

Source: **Daedal Research**. 2021. *China we-media marketing market: Size and forecasts with impact analysis of COVID-19 (2021-2025)*.

CASE 8. Strengthening the linkage between pomelo smallholders and the market through we-media

Smallholder farmers from Pinghe County, Fujian Province faced two major limitations to strengthen the marketing of pomelo, a protected geographical indication (PGI). On the one hand, the linkage between farmers and markets was weak. For farmers, they had difficulty in selling their produce due to poor marketing skills and branding. For the market, it needed quality fruits at a suitable price and failed to connect with farmers directly due to a lack of communication channels. On the other hand, farmers' access to market was restricted due to

limited extension services that could link farmers with market, especially during the Coronavirus (COVID-19) pandemic.

With the rapid development and popularization of communication and information technologies (ICTs) and social media, informatization has become a necessary condition in the sale of agroproducts, especially via emerging we-media. Therefore, to address this issue, the staff of the Pinghe Pomelo Science and Technology Backyard (STB) explored a new method to link farmers and the market through we-media. Farmers could livestream and promote pomelo in the fields and warehouses at anytime. Through the sales via we-media, farmers addressed the dilemma of high quality but low price by undertaking the following activities:

(1) Design a brand. To begin with, market survey and interviews with sellers were conducted, to help farmers understand the needs, preferences, and habits of potential consumers, as well as the situation of competitors. On this basis, STB students co-created “Yunbian” (as part of their innovation and entrepreneurship programme), a pomelo brand, according to the market survey, interviews, and cultural context of this agricultural produce.

(2) Guarantee good products and good price. Based on the market survey and scientific research results of the nutrient requirement of pomelo, on the one hand, the “Good Pomelo Good Price (GFGP)” model, an adaptive green production technology system was developed in collaboration with leader farmers, so as to improve the pomelo quality. On the other hand, partnerships with retail enterprises with sound reputation were built. Through quality testing, certification and classification in collaboration with these enterprises, high-quality pomelo with high standards were guaranteed. This allowed for a higher purchase price for farmers and a higher sale price for enterprises.

(3) Organize creative online sales. STB students and farmers promoted pomelo together online. The promotion and sale strategies were developed based on the market survey results. A variety of we-media tools such as WeChat, blogs, TikTok and so on were used to widely promote Pinghe pomelo and extend green production technologies. Pomelo festivals, which took a hybrid form, were also organized to promote and sell Pinghe pomelo both online and offline.

(4) Provide real-time post-sale customer services. STB students helped farmers ensure the quality of logistics service and followed up with consumer feedback and demand in real-time.

This GFGP model combined with we-media sales has created a win-win situation for both farmers and agribusinesses. The technological uptake and profits of farmers have significantly improved. Farmers were not only producers in the upstream of the pomelo value chain, but also online sellers in its downstream. This has increased their value capture on the pomelo value chain. In brief, farmers realized the integration of production and marketing. Besides, they had a deeper understanding of market regulation. This has stimulated them to adopt green production technologies, thereby improving the sustainability of the pomelo value chain.

Source: **Wu, L.** 2023. Fujian Agriculture and Forestry University.

6. Mentoring entrepreneurship

MAIPs introduce the concept of entrepreneurship, which is the practice of some agricultural value chain actors who start and run a new business on their own to produce agroproducts or services. Being an entrepreneur means that MAIP participants have to take multiple responsibilities, collaborate with partners and overcome challenges in the future. To empower key MAIP participants to become entrepreneurs, they need to be facilitated to assess their strengths and weaknesses appropriately, communicate and negotiate efficiently, and cope with stress and tension effectively. MAIP facilitators should use a series of methods or tools to facilitate the participants to strengthen their capacities of establishing small agribusinesses.

Activity 1: Familiarizing the concept of agribusiness

→ Step 1: Introduction

- ✓ Ask the participants to think about and share their understanding of agribusiness: What is an agribusiness? What makes a certain activity an agribusiness?
- ✓ Allow some discussions, and after a few answers, explain that an agribusiness provides agroproducts or services that other people need and want to pay for them.

→ Step 2: Group discussions

- ✓ Have the participants sit altogether in a circle instead of breaking them into groups. Ask them to give examples of different types of agribusiness, i.e. producers, retailers or service providers with different products or services based on their own experience or observation in their community.
- ✓ Ask the participants to choose a certain type of agribusiness and have them discuss in small groups its activities, comparative characteristics, resources needed, etc.
- ✓ Ask each group to choose a representative to make a report on their discussion.

Tips

There are different types of businesses: (1) some businesses provide products, for example, growing crops, vegetables or fruits and selling them to other people; (2) some businesses buy things and then sell them again at a higher price, for example a retailer; and (3) another type of businesses provides services which people need, like building a house or grinding grain into flour.

What is an agribusiness?

"Agribusiness" is a combination of "agriculture" and "business" and refers to any business related to farming and farming-related commercial activities. It involves all the steps required to send an agricultural good to market, namely production, processing, and distribution. It refers to any firm or business entity that produces or provides inputs, produces raw materials and fresh products, processes or manufactures food or other agroproducts, transports, stores or trades agricultural production, or retails such products (FAO, 2016). Key agribusiness actors cover input suppliers, processors, traders, exporters and retailers.

Source: **FAO**. 2016. *Public-private partnerships for agribusiness development – A review of international experiences*, by Rankin, M., Gálvez Nogales, E., Santacoloma, P., Mhlanga, N. & Rizzo, C. Rome.

→ Step 3: Wrap-up

- ✓ Comment on and wrap up the discussion results.
- ✓ Make a summary in an as itemized way as possible.

Activity 2: Raising the awareness of the importance of business idea

Choosing the right business idea is like choosing the right seed to plant. It is one of the most important steps in running a business. Starting a business is not easy. Once a person has decided to start a business, a lot of attention needs to be paid to choosing the right business. Indeed, people spend lots of time and energy planning before starting a business, as their efforts and investment may be in vain if they start with a wrong business idea. Raise the participants' awareness of the importance of business idea following the steps below:

→ Step 1: Introduction

- ✓ Introduce to the participants what a business idea is and what makes a business idea.

- ✓ Ask the participants to share their knowledge or experience on the topic. Besides, ask them to think about why business ideas are important.

➔ Step 2: Group dynamics

- ✓ Introduce a soft ball, such as a ball made of paper in the classroom and have the participants sit or stand in a circle.
- ✓ Throw the soft ball to one participant who has five seconds to come up with a business idea.
- ✓ Ask him/her to think of some business that he/she has considered running in the past, seen others doing, or wished to have in the community. Ask him/her to mention what are products or services of the business idea and who are the target customers.
- ✓ Count five seconds together with the participants, except the one who is holding the ball, while he/she throws it to the next participant who also has five seconds and needs to say another business idea.
- ✓ Start the second round of the game once all the participants have had the chance to share their ideas. Ask the participants to identify the needs of their target customers and assess whether their business idea that they proposed in the first round can adequately address those needs.
- ✓ Write down all the ideas on paper or a flipchart so that everyone can look at them afterwards.

Tips

A good business idea always has customers and their needs in mind. In order to generate a good business idea, a person can think about, for example, what products or services that his or her community members wish to buy, or what kind of product or service is lacking in their community that is essential for daily life and/or farming. First find out if there is a market for the product or service (people who want to buy it). For a product or service that appears attractive on the market, check whether there are many producers or retailers who sell similar products in the area (competitors).

A successful business must meet the needs of its customers but in a way that enables it to make profits. It must provide people with the products or services that they want at an affordable price. However, that price must also be high enough to bring profit to the business.

➔ Step 3: Group discussions

- ✓ Have each participant select one business idea mentioned during the group dynamics and imagine themselves running that particular business. Then ask the participants to form small groups and discuss the following questions:

- How your business will meet customer needs and how your product or service will benefit the customer?
 - What products or services your business is going to sell?
 - To whom your business is going to sell products or services (your customers)?
 - How your business is going to sell its products or services (your marketing)?
 - How your business will depend on the environment and utilize existing local natural resources in an environmentally sustainable manner, minimizing harm to the ecosystem (a good business idea will respect the environment and make sustainable use of natural resources)?
- ✓ After the group discussion, explain the five questions one by one, referring to the answers in Annex 1.

➔ Step 4: Wrap-up

- ✓ Comment on and wrap up the storytelling and discussion results.
- ✓ Make a summary in an as itemized way as possible.

Activity 3: Developing personal business idea(s)

This activity is a summary activity, where participants will apply all the skills that they learned from the training to start developing their own business plan. Participants can formulate their own team. The number of people in each team will depend on the total number of participants. They can also choose to work on their own. The following instructions target individuals and can be adjusted to target groups.

➔ Step 1: Warm-up

- ✓ Ask the participants whether they already have one or a few business ideas in their mind.
- ✓ Invite one or two participants to briefly share their business ideas and ask how they developed their business ideas if there are participants who have developed some business ideas. Also ask them if they developed the idea by themselves, or brainstormed with family members, friends and other networks.

➔ Step 2: Group discussions: How to identify your own list of business ideas?

- ✓ Following the warm-up, ask the participants to discuss ways to get inspiration to come up with business ideas. Invite participants to present their thoughts to the entire group.

- ✓ Afterwards, start introducing that when generating business ideas, it is necessary to keep mind open to anything that could become an idea.
- ✓ Guide the participants to think about as many ideas as possible and make a list of all possible options. Once a list is developed, they can look over the list quickly and identify the idea(s) that are the most feasible and will be the most profitable.
- ✓ Then introduce different approaches to generating business ideas (Box 29). It is important to mention that sometimes people do not take only one approach to get business ideas. The information gathered with one approach could be useful and complementary to the information gained with other approaches. Follow an open discussion style by presenting each concept of the approach, giving examples from local experience and allowing time for questions posed by participants.

BOX 29. Different approaches to generating business ideas

Exploring past experiences

Often, people do not build up their business ideas from scratch. Instead, they take advantage of existing knowledge and experience and work on and adapt them to local context. Indeed, experience of oneself and people from his or her network is an important reference for generating business ideas. Facilitate the participants to consider the following ways when they explore experience:

- thinking about what they are good at and their past and current work, education and life experiences. Ask them to think about if any experience could be turned into a business idea.
- solving a problem that many people face:
 - ask the participants to start with themselves and think about their experience as customers in the marketplace.
 - ask them such questions as: Are there any products that they have searched for a long time that could not be found in any local store? Have they ever wanted any services that no one could provide?
 - then ask them to think about other people's experience. Did they try to find products or services that are non-existent or do not meet their needs. Have they ever heard somebody making such complaints: "The choice of vegetable seeds in the shops is very limited." "The food processing machine in our area has been broken for long time, and nobody can fix it." "Fertilizers from the market are very expensive and there is no organic alternative."?
- improving their existing business by introducing new ideas, technologies and good practices. Ask them to think about the existing types of business or agricultural production methods in their communities and assess whether

they are efficient, productive and profitable. Ask them to consider and check with their community members:

- Whether there are problems and challenges that the production and business are facing?
- Are there any gaps that they can identify?
- Can they take up some new techniques, approaches and best practices, for example the introduction of organic farming and other types of green practices to improve the existing businesses in their community?
- Can they learn about new ways of using materials, producing something or solving a problem from other areas or other people?
- learning new business ideas that are already working in other places and introducing them to their community. Ask the participants to think about products or services that many people buy from other communities and the chance of their buying them once they introduce those products or services to their community.
- import substitution: Ask the participants if there are products in their community that are imported from other countries and whether it is possible to produce them locally by their business.

Then ask the participants to do some homework by asking their family members and friends about the products and services that they would like to have but could not find locally. If possible, advise them to expand their reach and talk with people from farmer associations, women and youth groups, colleges, private sectors, etc. to generate more business ideas. Ask them to fill in the form below after talking with other people. If time allows, ask them to share their results with the group.

Personal work and educational experience to build on:	Business ideas:
Personal experience as a customer:	Business ideas:
Other people's experience as customers:	Business ideas:
Production challenges that local people face: Environmental concerns and problems that local people face: Possibility to improve existing business of oneself or others:	Business ideas:
Introduction of news ideas learned from other people or places:	Business ideas:
Import substitution:	Business ideas:

Finding out what they already have

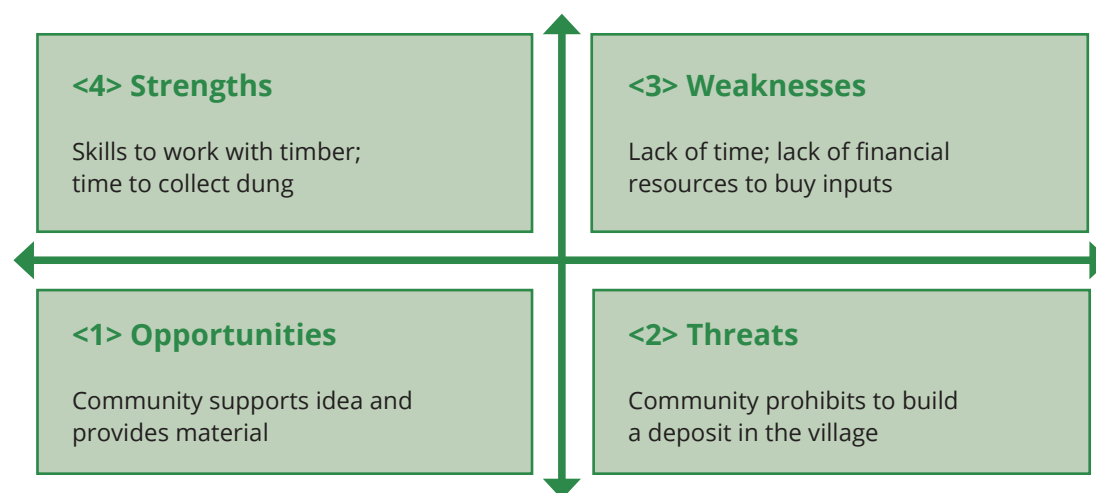
Besides learning from experience, another useful way to facilitate the participants to generate business ideas is to ask them to take a close look at their community to find out what resources they have, such as natural resources, human resources, etc.

- Natural resources: Ask the participants to think about what kinds of natural resources that their community has and whether they can be turned into products without harming the environment. Remind participants that certain businesses are harming the environment while making profits, for instance causing water pollution, soil degradation, etc.
- Turn waste into value: Ask the participants to be as creative as possible, as sometimes they can make a business by turning waste into something useful. If people can find a way to turn waste into something useful and profitable, then a business idea is created.

Source: **FAO**. 2023. *Guide on digital agricultural extension and advisory services – Use of smartphone applications by smallholder farmers*. Rome. <https://doi.org/10.4060/cc4022en>

→ Step 3: Analysis of business ideas

- ✓ Introduce the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis to the participants, the best tool to analyse the internal and external factors/context of business ideas (FIGURE 4 for example).
- ✓ Guide the participants to first examine the external factors – opportunities and threats – and then proceed to the internal ones – strengths and weaknesses. This helps keep a stronger focus on results and helps identify which threats are critical threats and which opportunities are the promising opportunities.
- ✓ After having the participants complete the analysis individually, divide them into groups of 3–5 people, and let them present their SWOT analysis to the other group members. It is suggested to give and exchange any feedback among them.

FIGURE 4. A typical SWOT analysis chart

Source: The Authors.

Activity 4: Presentation of the marketing flower

Marketing is an important part of starting and running a business. It helps business owners to sell their products or services at an appropriate price, place and to the right people so as to create a steady income. Marketing is the ability to identify the general and specific needs of potential customers and to satisfy those needs better than competitors, in order to make a profit. In order to remain viable, all businesses must be aware of changing market needs and adapt themselves accordingly. It is suggested to familiarize the participants with basic knowledge on marketing through a “marketing flower”:

➔ Step 1: Introduction

- ✓ Start by asking the participants what they understand about the term “marketing”.
- ✓ Then introduce the meaning and purpose of marketing and explain the main elements/ways of marketing.

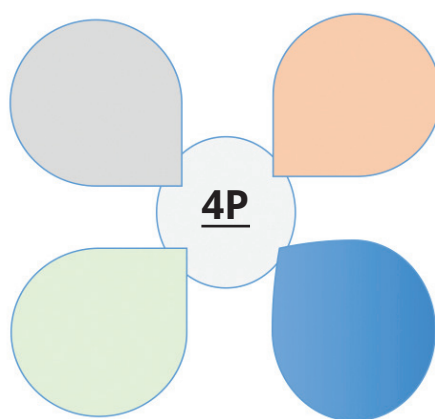
➔ Step 2: Presentation

- ✓ Prepare four pieces of paper in the shape below or draw a flower shape on the flip chart. Use it to present the four main elements of marketing: Product, Price, Place and Promotion.
- ✓ Mention that there are three additional elements of marketing, including people, processes and physical evidence (see Annex 2). Given the time

limitation, focus on the four main elements and provide concrete examples and explanations of each element.

- ✓ Do not draw anything inside the four petals. Explain to the participants that they are the four main elements to attract consumers. Ask them to guess what they are and what each element means. While participants answer, draw the corresponding name of the marketing elements in the petals on the flip chart or on the paper, with a brief description:
 - Product: The product itself, its quality, etc.
 - Price: The money that a business asks customers to pay for their products or services
 - Place: The place where the business is located
 - Promotion: How the product is promoted (e.g. signs, special offers, sales talk, etc.)

FIGURE 5. The “marketing flower”



Source: The Authors.

Activity 5: Presentation and group exercises on the 4Ps of marketing

➔ Step 1: Introduction

- ✓ Introduce the four elements of marketing to the participants.
- ✓ Allow for a Q&A session and ask them to discuss in small groups, if necessary.
- ✓ After the presentation of each element, ask the participants to develop a marketing plan of the product or service proposed in line with their business idea(s).

➔ Step 2: Presentation of the 4Ps

Product: The products or services provided to satisfy customers' needs. The product or service, more precisely its quality, is very important. A good quality is critical to gain and maintain loyal customers. Customers

buy products or services to satisfy their basic needs and their specific needs. Meeting customers' basic needs is only the beginning or the first step that a business should take. Meeting their specific needs is the one step further to make the business surpass the competitors on the market. Besides the quality of the product or service, ask the participants to think about how to provide added value by providing something extra or a special service (i.e. competitive advantage of your product).

Group exercise one:

Ask the participants to work in small groups on a product or service proposal. Ask them to:

- ✓ explain the type of product that the target customers would want;
- ✓ describe their proposed product or service in as much detail as possible; and
- ✓ check whether the proposed product or service meets the basic and possibly specific needs of potential customers in their community or in urban areas.

Price: How much customers are asked to pay for the products or services. Price is the amount of money that customers need to pay for the products or services. Sometimes price also includes any offer or discount given to customers. Many factors influence price setting.

- ✓ Ask the participants to have a short discussion on what factors could affect price setting.
- ✓ Introduce the factors and ways (see Box 30) to help set an appropriate price for a product or service.
- ✓ Explain that price may not be as important as most people think. This is because that people might buy products or get services from somewhere close to them or prefer the atmosphere of the place where the business is located.

BOX 30. Factors to be considered when setting price

When making pricing decisions, a range of factors should be taken into account. Some of these are internal to the agribusiness, such as its marketing objectives (including profitability, volume, competition, prestige, strategic and relationship objectives), its marketing mix strategy and the structure of its costs. Factors external to the agribusiness include the state of market development, the pattern of supply and demand, the nature and level of competition and a host of environmental considerations (e.g. legislation, political initiatives, social norms and trends within the economy).

Source: **Crawford, I.M.** 1997. *Agricultural and food marketing management*. Rome, FAO. <https://www.fao.org/3/w3240e/W3240E00.htm#TOC>

Tips

- Be fully aware of the cost of the products or services so as to set a price that is above the cost.
- Be aware of the price of a similar product or service.
- Get information about the highest and lowest prices asked by the competitors of the same product or service.
- Consider whether the product or service responds to any specific unmet need of customers. If it does, ask the participants to calculate how much customers will be willing to pay for the extra fees.
- If it is a new product or service on the market, check with potential customers about different levels of price that may be set and see how many of them would like to buy the product or service at each price level.
- Do not take it for granted that a low price is always better. Sometimes, business owners try to give a lower price to attract customers, which may however not always work. The reason is that sometimes a low price makes people think that the product or service is of low quality. It is worth noting that most customers actually want best value for their money.
- Offer discounts wisely. Once the price is set, the business owner might consider doing some promotions, offering discounts to increase the competitiveness of the product on the market. However, it is important to make sure that each discount or offer are clearly calculated, so that it will cover the cost.

Group exercise two:

Ask the participants to develop an initial price setting analysis form using the table below. Depending on the development level and readiness of the business idea, this exercise may be skipped for some or all the participants.

TABLE 8. Price setting analysis form

Price setting analysis	Unit of value
Cost of the product or service:	
The price that customers are willing to pay: (for a new product or service)	
Competitors' price: The highest and the lowest price	
Price of your product or service:	
Reasons for setting this price:	
Possible discounts or offers could be given to the customers:	
Reasons for giving discounts or offers:	

Place: How and where to reach the customers. Place is where one's business is located. Most people prefer to shop in a place close to where they live, especially for something that they often need, like food and grocery. Therefore, a business generally needs to be located close to customers.

Tips

- There are various ways to sell products: Directly selling to customers, selling to retailers, and selling in very large quantities to wholesalers, who then sell them in smaller quantities to retailers. It is worth noting that retail and wholesale distribution are the most useful forms for businesses that usually produce large quantities of products, sell them at lower prices and have many customers spread over in a large area.
- If people buy expensive things, they might choose to spend more time to go somewhere far to get a better price, or a special quality.
- When selecting place of your business, think about the following questions:
 - Where is the product sold?
 - Is the place of sale easy to reach?
 - Can you bring the product to your customers? Is this a good idea?
 - Does the place of sale attract the right people to buy?
 - Can you locate your business somewhere close to your raw materials?
 - Can you locate your business somewhere close to unemployed people, such as youth, who can be employed in your business?

Promotion: How to make more customers know the products or services better and attract them to buy?

Common promotion methods include:

- ◆ **Sales and promotion:** Provide discount to customers as incentives to attract them to buy the product.

Example: Giving a special offer/discount of product or service, coupons, samples of product, etc.

- ◆ **Direct marketing:** Communicate directly with the customer.

Example: Hiring an experienced salesperson to explain the benefits of a product or service to customers, make phone calls to potential customers, text message via cellphone, email, interactive website, etc.

- ◆ **Advertisement:** Give information to potential customers to make them interested in purchasing.

Example: Putting signs in front of a store, paying for a small section on newspapers, magazines, television, radio and other forms to broadcast and present information about the products or services, etc.

- ◆ **Publicity:** Gain visibility among potential customers by organizing and participating in public events. Especially, this method can be applied to products and services that address social and environmental concerns. An effective publicity will help a business to maintain a good reputation among the customers.

Example: If you are an organic fertilizer producer, you could consider cooperating with an agricultural EAS agency to provide a short educational session about the benefits of organic manure to local community members. You could also consider organizing a display or demonstration session on how to use the compost manure for crops, flowers and other plants and invite the target customers and local newspapers, television journalists, representatives from farmer associations and government officers to attend.

Tips

Overall, when considering promotional methods, think about:

- How do people know that your product is for sale?
- Is the product being advertised correctly?
- Can everyone see the product on display?

Besides the above four main elements of marketing, if time allows, introduce also three other elements, i.e. people, process and physical evidence (see Annex 2).

➔ **Step 3: Group dynamics: Marketing mix**

- ✓ Give one set of the “marketing mix game cards” to the participants (only the cards without the information on which P these cards belong to). Post the posters of each of the Ps (Product, Price, Place and Promotion) in different locations of the training room.
- ✓ Have one participant pick one card and read it aloud so that other participants can hear.
- ✓ Ask all the participants to reach an agreement on which of the selected marketing game card suits among the 4Ps. Intervene when they disagree by explaining that some activities cut across the 4Ps but they must decide where it falls more among the 4Ps.

Marketing Mix Cards (4Ps card for the game)

P R O D U C T	What do customers want (What will appeal to them?)	Deciding what to make and what to sell	Finding good suppliers at a good price
	Making packing and the finish more attractive	Finding out about other products	Imprving the quality of your product
P R I C E	Your selling price compared to your costs	Competitor's prices	Special prices to attract new customers
	Knowing the local population and what they can pay Do they buy on quality or price?	Considering the profit margin on various prices	Quantity Discounts and seasonal prices
P L A C E	Deciding where to sell your products (popular market away from competition etc)	Transport (From place of production to place of sale)	Selling products throught a middleman or wholesaler
P R O M O T I O N	What do customers want (What will appeal to them?)	Signs with information on your products	Signs advertising special offers
	Things to persuade customers to visit	Free samples for introducing new products	The manners of the sales people
	Advertising Signs, leaflets, letters, announcements	Demonstrating use of product	Creating a slogan about your business

Source: **Gachie, P. & Chege, W.** 2010. *Small business management skills: A community-based approach – facilitator's guide*. Nairobi: CARE Kenya.

➔ Step 4: Storytelling and discussion: Too many chickens?

- ✓ To review what has been learned, tell the story below about raising chickens or have the participants read it.
- ✓ Ask the participants to think about what the owner did right and wrong in terms of marketing methods.

Too many chickens?



Durah goes to town to visit her sister. The sister tells Durah that she raises and sells chickens and makes money this way. Durah thinks this is a great idea. She returns to her village and calls on two of her friends. Durah tells them about the need for more chickens and proposes that they do this business together. Everybody agrees and they all contribute 20 coins¹⁶. The following day Durah and one friend go to the town to buy 25 one-day-old chicks. By the time they arrive in town, there are no more chicks left because the demand is high for one-day old chicks. So they must spend the night in town to get the young chicks the next day. Since they had to spend some money on food and lodging, they can only afford to buy 15 baby chicks the next day.

When they get back to the village, they realize that they also need chicken feed. Durah's brother starts to build a shed for the chickens while Durah and her friend go and buy chicken mash from the village shop. This is expensive and the quality is low, because the shop cannot afford to buy fresh stock every week. The next day, three chickens are found dead in the shed due to the hot weather and because the brother did not finish building the protective roof.

During the next few weeks, the group take turns looking after their chickens. For various reasons (a dog making his way through the fence, an illness killing some chickens), only seven out of the 15 chicks remain. Eventually the chickens are old enough to be sold. However in their own village, nobody wants chickens because everybody has their own. Due to this lack of demand they decide to sell the chickens in the town market.

At the market, it appears that everybody is selling chickens that look healthier and bigger than their chickens. In fact, there are many types of chickens for sale on the market. When they finally manage to sell their smaller chickens, they realize that they did not make any profit on their initial investment. Back home, they discuss what went wrong.

- ✓ After reading the story, pose the following questions:
 - Where did Durah and her friends get the idea for selling the **product**?
 - Who were their customers?
 - Did they think a lot about the **price** for the chickens?
 - Did they think clearly about where they would sell their product (**place**)?
 - Did they think about how to attract customers (**promotion**)?
 - Did they have an overall plan for getting the chicken to the market (**process**)?
 - How dedicated were the **people** who were involved (Durah, her two friends and her brother)?

¹⁶ Change to the actual market price of 25 chicks in local currency.

- Overall, do you think Durah and her friends have a **market** for their chickens?
- Do you think the **product** was the right product?
- ✓ Ask the participants to answer the questions above and make some suggestions for improving the approach of each of the 4Ps.
- ✓ Comment on the discussions on the story. Sum up the exercise by telling the participants that marketing is about finding out about the needs of customers and answering those needs at a profit.

➔ Step 5. Wrap-up

- ✓ Make a summary in an as itemized way as possible.
- ✓ Explain that all the above elements are important ways to attract customers. However, it is not possible to be the best in all the areas. It is hard to offer all at the same time: The best quality, product or service, at the lowest price, in the best location with the best promotion method.
- ✓ Highlight that it is necessary to find out what is most important or a few elements that are more important and focus on them. Start by deciding what is the most important in the business, what is less important, and what is the least important.
- ✓ Ask the participants to pose any questions about the 4Ps of marketing.



Activity 6: Working out profit and loss to manage a small agribusiness

➔ Step 1: Warm-up: When we forget to think about profit

- ✓ From the previous session (Activity 5), how to “sell” was learned. In this session, the focus is on how to earn money, a key objective of any businesses. The participants will learn about profit and loss, which should be accompanied by the adequate marketing strategies with special relation to the “price” of the 4Ps. Although it is all possible to sell a lot of products and services, this does not necessarily mean that one can make a lot of money. For instance, in the previous example of chicken farming, the entrepreneur failed to make money although she was able to sell all the chickens. Furthermore, it also occurs that some businesses were having a lot of customers but still failed for some reasons.
- ✓ To lay the background of the session, read or ask the participants to read the following story about Uzuri and her potatoes:

Uzuri's potatoes

Uzuri is interested in crop management and took training on how to grow healthy potatoes. She learned about growing outside the rainy season and had already tried mulching. She ended up with a good harvest the first season after the training.

Uzuri also remembered the training facilitator saying that many people lose a lot of their harvest without good storage facilities. She was worried about this, as she didn't have a good place to store her potatoes and knew that her potatoes could get destroyed by rats and other pests fairly quickly. She decided that the best thing to do would be to quickly sell her potatoes at the market.

She brought 100 of her potatoes to the market and decided to sell the potatoes for one coin each. She found an empty table and placed her potatoes on the table for people to buy. Her friends told her that the man who owned the stall tables, would come to collect a fee in the afternoon. The price of one coin each was certainly not expensive and everyone who passed by seemed to want to buy from her. So by the afternoon Uzuri had sold all her potatoes. She had 100 coins from her sales. Then the man came to collect for the stall table. He told her that the cost was 100 coins. “But that was all that I earned today!”, cried Uzuri. Poor Uzuri, she had to give him the 100 coins and went home without any money!



- ✓ After reading the story, ask the participants the questions below and guide the discussions:
 - What did Uzuri do right?
 - What was Uzuri's problem?
 - What should she have done?
 - What would have happened if Uzuri had priced her potatoes at three coins each?
 - What other costs were probably involved?
 - What costs did Uzuri leave out?
- ✓ Comment on the discussions and conclude that it is critical to manage the profit and loss when running a business.

→ Step 2: Individual exercise: Calculation of profit and loss in a business

No one can afford to not make profit or continuously lose money when running a business. It is important to learn how to calculate profit and loss to make sure your business will not run dry.

- ✓ Introduce the concept of profit and loss by writing the words "profit" and "loss" on the flip chart or chalkboard.
- ✓ Ask the participants if they know what profit means. Allow for some discussions and then explain the following:

Profit is referred to as the difference between the money earned and the money spent to make the earning.

In Uzuri's story, she brought 100 potatoes and sold them at one coin each. In this case, have the participants calculate 100 (units sold: The number of potatoes, in this case) times by one coin, which is 100 coins, and call it "*revenue*". Revenue refers to the amount of money earned without removing the money a business spent on its production. Revenue of a business depends on the price that the business set for its product (price: The money that a business asks customers to pay for their products or services).

$$\text{Revenue} = \text{Sales (units sold)} \times \text{Price}$$

On the other hand, the money that Uzuri had to spend for the fertilizer and the stall table is called *cost*. In a simple way, the cost can be defined as the amount of money that a business needs to spend on the creation or production of goods or services.

There are two types of costs:

- ◆ **Fixed costs:** Costs that do not vary with output. In other words, the costs that you have to spend whether you have been able to make profit or not from your business (e.g. rent, equipment).

- ◆ **Variable costs:** Costs that vary with inputs (e.g. such as fertilizer, seeds, etc.) = Variable costs per unit x Units produced (quantity)

$$\text{Costs} = \text{Fixed costs} + \text{Variable costs}$$

Finally, the money left after removing all the costs from the revenue is *profit*. If the profit is equal to or lower than 0, the business owner has made a loss and the business might face a serious challenge. It is important to keep the profit as high as possible, and the price of the product or service must be set higher than the costs.

$$\text{Revenue} - \text{Costs} = \text{Profit (>0)} \text{ or Loss } (\leq 0)$$

- ✓ After explaining the concept, ask the participants to fill out the sheet, which is called “profit and loss statement” (Table 9), individually as much as possible with the case of Uzuri.

TABLE 9. Calculation of the profit and loss of Uzuri’s potatoes

Uzuri's potatoes			
Revenue			
Item	Quantity	Unit Price	Value
Potato	100	\$1	\$100
Total revenue	\$100		
Variable costs			
Item	Quantity	Unit Price	Value
Fertilizer	1	\$50	\$50
Total variable costs	\$50		
Fixed costs			
Item	Quantity	Unit Price	Value
Rent for stall table	1	\$100	\$100
Total fixed costs	\$100		
Total costs	\$50+\$100 = \$150		
Profit = Total revenue – Total costs	\$100 - \$150 = - \$50 (Loss)		

- ✓ After allowing 20 minutes to fill out the exercise sheet, explain and fill out the form with the participants together step by step (The answers were already mentioned while explaining the concepts of profit and loss).

→ Step 3: Wrap-up

- ✓ Comment on the exercise and summarize the entire session.
- ✓ Explain that the business owner should always clearly calculate the profit and loss of his/her business. For the cost and expense, it is not only about the raw materials (e.g. seeds) purchased for making the product, but equipment, supplies and supporting costs including fertilizer, staff salary, renting of office premises and land, etc.

Activity 7: Record-keeping

→ Step 1: Introduction

- ✓ Introduce the topic by asking what the participants know about record-keeping and if they currently keep records or did so before.
- ✓ Encourage the participants to share even the most rudimentary methods of “keeping track” of where the money goes.
- ✓ Ask the participants to find examples of transactions that show where and how money comes into a business and where and how money goes out of the business (to pay for goods, raw materials, labour, rent, electricity and all other costs).
- ✓ Ask the participants about the advantages of keeping records, and how these records can help their business (either a sole proprietorship or a joint venture).

BOX 31. Basics of record-keeping

Definition

Record-keeping refers to the process of writing down and keeping track of transactions and events in an accounting system in order to record:

- How much money your business receives
- How much money your business pays out
- How much money that different people owe you
- How much you owe to other people

A transaction is any exchange of money (or value) for goods or services. Money (or value) comes in and goes out of the business through transactions. Two examples of “money-in” transactions:

- A customer buys goods (a product or service) from your business and your business gets money from the customer.

- You keep your business money in a savings account and the bank pays you interest.

Two examples of “money-out” transactions:

- Your business has ordered goods and raw materials: The suppliers provide these, and your business pays them in exchange.
- You are the owner and pays salary to your staff.

Benefits of record-keeping

- **Records help you control your cash:** Your records show how much money the business should have at any point. Use the records to make sure that money does not disappear or is unaccounted for.
- **Records show you how your business is doing:** Your records help you find problems before it is too late. Use your records to find out if something is going wrong, if costs are too high, if sales are falling, if there is a leakage point (yourself or another person misusing the money), and so on.
- **Records show others how your business is doing:** You need proper records when you apply for a loan and pay your taxes. Use your records to show that everything is in order and that you are in control of your business.
- **Records help you plan for the future:** Records show how well your business did in the past and how well it is doing now. When you know your business strengths and weaknesses, you can properly plan for the future.
- **Records help you remember debtors and creditors:** Your records help you know the total amount of money that you should receive from your customers as well as their names. They also help you remember the amount of money that you still have to pay to others (your suppliers for example).

Source: The Authors.

→ Step 2: Presentation: Record-keeping system

Record book: This is the centre of the record-keeping system. In the record book, write down the following:

- ✓ All money that comes into your business and where it comes from.
- ✓ All money that goes out of your business and what it was used for.

Tips

- The record-keeping system should be as simple as possible.
- It should include the information that you need to put on record for your financial management, not more than that.
- It is necessary to develop a habit of keeping the transactions of each day in your Record Book during and at the end of each day.

- ✓ Show the participants with the example below of record-keeping and explain how it works.
- ✓ Highlight that this is a very basic model of record-keeping. Explain that the participants can also add different columns under the operation/transaction to show different types of items. For example, business owners can mark different rows for buying raw materials, cost of transportation, cost of paying staff salary, etc. At the bottom of the table, participants can also add another row which can be used for adding together the total for a period of time, for example a week or a month.

 Date	 Operation/ Transaction	 Money out	 Money in	 Balance

➔ Step 3: Wrap-up

Comment on the discussions and summarize the entire session. There are three key instruments that help turning a business idea into an opportunity that the participants learned:

- ✓ How to sell your product or service in the best way (marketing 4Ps).
- ✓ How to calculate what you earn (Profit, Revenue, Cost).
- ✓ How to keep improving and make your business last longer in the market (record keeping).

7. Creating an enabling environment

The success of MAIPs requires an enabling environment, including soft infrastructure (e.g. favourable policy, efficient institutions, adequate funding, social norms and actor attitudes) and hard infrastructure (e.g. training spaces, training facilities, vehicles, ICTs, etc.) (see Part 1, section 2). To underpin the MAIP establishment and operation, it is crucial for the government and public institutions to create an enabling environment by providing the following:

- ◆ support from local government and farmer communities, public EAS agencies, private sector to ensure active participation of all local stakeholders, effective coordination between different sectors, and sustainable funding mechanisms to support joint actions in agricultural innovation;
- ◆ support for capacity building in participatory education, research and extension for key MAIP actors at all levels across all sectors, with adequate funding and a clear regulatory framework;
- ◆ a clear set of mandatory standards or criteria for encouraging farmers, educationists, researchers and extensionists to co-innovate; and
- ◆ policies that encourage private engagement in MAIP development and where possible guarantee MAIP ownership by all stakeholders. Therefore, it is crucial that MAIPs facilitate the development of an enabling environment to ensure their sustainability.

Activity 1: Facilitating MAIP field days

Field days are an effective way to raise the awareness of the potential of MAIPs and provide information. They usually take a variety of forms, such as farmer rally, local agroproducts exhibitions, field demonstration days, high-yield crop evaluations, high-yield competition, etc. As public events that involve face-to-face interactions with policymakers, education and research experts and extension providers, field days require little literacy. However,

BOX 32. Different forms of field days

Fairs, rallies and shows are public events organized by extension providers (government agencies, NGOs, input dealers, lead farmers, etc.) and research organizations to showcase and raise the awareness about agricultural technologies and innovations, and obtain feedback from farmers. Fairs and shows tend to last longer than rallies (from a few days to weeks) and are organized around stands or exhibits. While fairs and shows require much planning and publicity, rallies may be spontaneous, attracting people with a banner or announcement.

All the three types of events focus on a topic or theme (e.g. innovation, technology, trade, knowledge-sharing, learning), attract a large number of people, may award prizes (fairs and shows) and involve entertainment such as drama and music. Videos may be shown at these events and printed materials distributed. Fairs, shows and rallies connect farmers to a range of EAS providers and research institutions, allowing them to ask questions and receive feedback on innovation and issues, and link them to other farmers.

Source: **David, S. & Cofini, F.** 2017. *A decision guide for rural advisory methods*. Rome, FAO. <https://www.fao.org/3/i8141e/i8141e.pdf>

CASE 9. Disseminating the integrated soil-crop system management technology through the field day

It is a big challenge for smallholders to access new technologies. Even if they get them, they often have difficulty in understanding and applying them in the right manner for most of them. Furthermore, risk-averse, smallholders tend to be unwilling to try them. To familiarize smallholders with the integrated soil-crop system management (ISSM) technology and persuade them to adopt it, a field day was jointly organized in the demonstration zone by the China Agricultural University, Bureau of Agriculture and Rural Affairs of Quzhou County, and the Science and Technology Backyard (STB) of Wangzhuang village with a focus on the local wheat value chain during the harvest season in 2022. The field day was aimed to (1) encourage smallholders to understand the principle of ISSM and apply them; and (2) disseminate the technology to broader rural communities. To this end, the following preparations were made:

- A demonstration field was selected as a site of field days. The field is about 5 *mu* (about 0.3 ha). The demonstration field was operated by farmers under the guidance of STB staff. The planting solutions, especially the application of ISSM, were designed by STB staff and farmers together. Both agreed the solutions.

- Farmers, extension agents, professors and village leaders were invited to take part in the field day. At least 30 farmers, including two village leaders, extension agents from Quzhou County and Handan City, and three professors from China Agricultural University participated in the activity.
- Professors and students in the STBs trained farmers with posters on ISSM in the field and extension agents explained the key points of operation in their field plots, including the specific sowing rate and date and the combination of formula chemical fertilizer with seed varieties. Then the wheat was harvested. The final wheat yield was announced in the field demonstrations to all participants.

Farmers were invited to the field demonstrations, especially the fields cultivated by their peers. After observing the significant difference on wheat growth and yield of the demonstration field compared to their own fields, they deeply experienced the power of technology. This sparked farmers' interest in learning ISSM and tried their best to understand its principles. As the entire experiment and demonstration process followed the participatory approach in close collaboration with farmers, the evidence made them convinced of the technologies tested on their plots. As a result, they did not worry about the risk of yield loss due to reduced application of chemical fertilizer and reduced number of spikes per hectare. More importantly, many farmers started to talk about the ISSM in the village. As the field demonstration was jointly conducted by them and STB staff, this on the one hand helped the STB create a positive word of mouth and set the lead farmers as a good model. On the other hand, it earned the lead farmers the authority in technology transfer in the village. This has created an enabling environment for ISSM dissemination both within and beyond the village. The field day also inspired extension agents. After the participation, extension agents from Quzhou County and Handan City realized that they should deliver extension services fully considering farmers' demand and characteristics, rather than just transferring technologies.

The results show that field days are an effective approach to empower smallholders. It can bring the technology to smallholders in time, especially for those willing to apply new technologies but unfamiliar with them. Through the field days, scientists and extension agents can understand well the real demand of technologies and services by farmers. They also can identify the true problems that farmers encountered in farming. All in all, field days are like a binder that links smallholders, scientists and extension agents while creating an enabling environment for knowledge transfer.

Source: **Jiao, X.** 2023. China Agricultural University.

it can be time-consuming and costly to organize field days and may involve challenging logistics. Factors that contribute to successful field days include (1) good planning, publicity and organization, (2) accessible location, (3) good representation of service providers to avoid bias towards one specific category, and (4) part of the costs covered by the sponsors.

Activity 2: Facilitating advocacy

Familiarize the participants with a variety of advocacy tools to create a positive narrative of MAIP activities, guide the public opinion change, and pave the way for spillovers. Such tools include both conventional tools such as printed materials and emerging ones such as social networks.

Printed materials: As an extension tool, printed materials provide information to producers and other local people a written and/or pictorial form. Such materials include posters, brochures, leaflets, bulletins, comic books/strips, booklets, guidebooks, newspapers, calendars, among others. They are often used in conjunction with common extension methods and approaches.

Tips

- When considering using printed materials, EAS providers should take into account the cost, availability of a designer and facility to print the materials, and how the materials will be distributed.
- In designing the materials, it is important to know the literacy level of the target audience and language(s) spoken to determine which format to use and the degree of emphasis on text versus pictorial content.
- Where possible, different types of producers (men, women, youth, etc.) should be involved in the design of printed materials to ensure that the content meets their needs and can be easily understood.
- Draft materials should always be pre-tested with target users.

Social networks: Social networks are web-based mass media that create a two-way flow of information among the members (users) of the same virtual community by allowing them to create, share and retrieve digital contents and interact with each other. Social networks require a moderator to manage and update the contents as well as ensuring quality control and relevance of information provided. Within the scope of this handbook, the use of social networks should be guided by a strategy that defines the use of these tools in relation to a MAIP's objectives.

BOX 33. Basics of social networks and commonly used social networks

Generally, social networks have a few common attributes:

- A social network will focus on user-generated content. Users primarily view and interact with content made by other users. They are encouraged to post text, status updates or pictures for viewing by others.
- Social networks allow the user or organization to create a profile. The profile contains information about the person and a centralized page with the content posted by them. Their profile may be associated with their real name.
- A social network has a way to form a lasting connection with other users. These connections are commonly called friending or following the other user. They allow the users to find other users and form webs of relationships. Often an algorithm will recommend other users and organizations they may want to form a connection with.

Although often used interchangeably, social network is different from social media. A social network focuses on the connections and relationships between individuals. Social networks fulfill four main objectives, namely, sharing, learning, interacting and marketing. Social media is more focused on an individual sharing with a large audience.

Commonly used social networks include:

- Social networking platforms such as Facebook and Twitter
- Messaging platforms like WhatsApp, WeChat and so on which allow group messaging and sharing of any form of content.
- Online forums, blogs and websites which provides a meeting point for exchanging ideas and views on a particular topic.
- A regularly updated website or web page, typically one run by an individual or small group, that is written in an informal or conversational style.
- Open-access and user-led knowledge hub, a website or database developed collaboratively by a community of users which allows any user to add and edit contents (e.g. Wikipedia).

Source: **Wright, G. & Yasar, K.** 2022. *Social networking*.

PART 4

MONITORING AND EVALUATING MULTI-ACTORS AGRICULTURAL INNOVATION PLATFORMS



Monitoring and evaluation (M&E) are critical to guarantee MAIP functionality and efficiency while supporting its continued upgrading. Similar to the M&E of EAS systems, the M&E of MAIPs also focus on two issues: The implementation process and the outputs and outcomes. While monitoring is concerned with regular collection and analysis of information to assist timely decisionmaking and necessary adjustment at various steps in the implementation process, evaluation deals with the systematic assessment of achievement of objectives, efficiency and impacts (Lai, 2012). When well conducted, M&E can generate results that reveal such key information as activities undertaken and their results. This is useful for making timely adjustment of the MAIP curriculum and management if M&E results show that it has deviated from the predefined innovation agenda(s). M&E results can also serve as reference for improving the overall design and methodology of MAIP initiatives in the future.

Generally, the M&E of a MAIP are aimed at assessing its role in promoting community-level uptake and generation of innovation and the consequential agricultural value chain development. Preferably, the M&E are to be done by the MAIP facilitators so as to reduce operation costs. Besides, the M&E are to be conducted on a regular basis. However, empirical experience from existing MAIP initiatives show that the M&E function is largely weak and even absent. This has to a certain extent limited the development and upgrading of MAIPs, hence impeding them from giving their potential to drive community-level innovation-led agricultural development to full play. Indeed, there is a general need to strengthen M&E in agricultural and rural development (Yang & Ou, 2023). Therefore, facilitators are to be trained on M&E planning and implementation, commonly used indicator frameworks, data collection and analysis methods, and M&E results utilization so as to strengthen the performance of MAIPs.

1. Multi-actors agricultural innovation platform monitoring and evaluation indicator framework

The M&E of MAIPs aim to (1) check if they are operating “on track” in terms of generating and providing the knowledge, innovations and services in relation to members’ needs; (2) understand to what extent MAIPs are efficient and effective by assessing their innovation performance; and (3) communicate the results to policymakers and decision-makers for gaining their support and thereby possibly creating an enabling environment for MAIP development. Key areas of investigation include:

- ◆ actual versus expected outputs and outcomes;
- ◆ experience and performance of key MAIP actors;
- ◆ gaps and ways to improve or adjust the activities or plan; and
- ◆ lessons learned and needs and opportunities for the next cycle of activities or future initiatives.

Therefore, a logical strategy, detailed plan, clear measurable objectives, well-designed activities, and well-defined indicators are needed to provide the structure for M&E (van den Berg *et al.*, 2023). Of all these elements, indicators, as the “yardstick” for tracking MAIP operation and assessing the expected change, are crucial. They should directly relate to the expected outputs and outcomes in line with the predefined innovation agenda(s). For the purpose of this handbook, a framework of indicators in terms of inputs, activities, outputs and outcomes are proposed (Table 10). It is however worth noting that facilitators need to use the proposed indicators as references and tailor them according to the specific MAIP innovation agenda(s) and community contexts. The data can be collected using MAIP log, participants survey, key informant interview, and ballot box test (BBT).

TABLE 10. Indicator framework for the M&E of MAIP implementation and performance

Item	Indicators	Data sources
1. Inputs		
1.1 Facilitators	IND.1 Number of facilitators	MAIP log
	IND.2 Participation in courses of training of facilitators	MAIP log
	IND.3 Empirical experience with MAIP facilitation	Key informant interview
	IND.4 Number of participants facilitated previously	Key informant interview
	IND.5 Balanced age cohorts and gender structure of participants	MAIP log
	IND.6 Use of participatory methods	MAIP log
	IND.7 Use of heuristic methods	MAIP log
	IND.8 Use of interactive methods	MAIP log
	IND.9 Time management	MAIP log
	IND.10 Presence of active participation	MAIP log
1.2 Community infrastructural setting	IND.11 Size (m ²) of office space	Key informant interview
	IND.12 Per capita size (m ²) of office space	Key informant interview
	IND.13 Number of travel vehicles	Key informant interview
	IND.14 Ratio between travel vehicles and professionals	Key informant interview
	IND.15 Size (m ²) of fields for experiments and demonstration	Key informant interview
	IND.16 Per capita size (m ²) of fields for experiments and demonstration	Key informant interview
	IND.17 Size (m ²) of farmer training venue	Key informant interview
	IND.18 Per capita size (m ²) of training space	Key informant interview
	IND.19 Size (m ²) of accommodation place	Key informant interview
	IND.20 Adequacy of training materials	Participants survey
1.3 Funding mechanism	IND.21 Publicly funded operation budget as a percentage of total budget	Key informant interview
	IND.22 Privately funded operation budget as a percentage of total budget	Key informant interview

Item	Indicators	Data sources
2. Activities		
2.1 Identification of innovation agendas	IND.23 Bottlenecks, challenges, and opportunities of value chain identification	MAIP log
	IND.24 Gap analysis and network mapping	MAIP log
	IND.25 Agricultural value chain analysis	MAIP log
2.2 Co-innovation	IND.26 Participatory introduction, field trial and demonstrations	MAIP log
	IND.27 Participatory identification of research topic and hypothesis	MAIP log
	IND.28 Participatory implementation, observation and evaluation	MAIP log
2.3 Co-learning	IND.29 Interactions between farmers and other key actors	MAIP log
	IND.30 Co-learning through digital platforms	MAIP log
	IND.31 Technical extension and advisory services	MAIP log
	IND.32 Lead farmer involvement	MAIP log
	IND.33 Farmers' organizations involvement	MAIP log
2.4 Partnership building	IND.34 Involvement of different value chain actors	MAIP log
	IND.35 Membership building	MAIP log
	IND.36 Outreach activities	MAIP log
2.5 Market linkage building	IND.37 Marketing information provision	MAIP log
	IND.38 Technical support for agroproducts certification and marketing	MAIP log
	IND.39 Safety and quality testing of agroproducts	MAIP log
	IND.40 E-commerce training	MAIP log
2.6 Entrepreneur- ship mentoring	IND.41 Training on business idea(s) development	MAIP log
	IND.42 Training on basics of marketing	MAIP log
	IND.43 Training on record-keeping	MAIP log
	IND.44 Training on agribusiness management	MAIP log
2.7 Policy advocacy	IND.45 Participatory technical advisory and policy advocacy	MAIP log
	IND.46 Participatory consultations	MAIP log

Item	Indicators	Data sources
3. Outputs		
3.1 Technical services provision	IND.47 Percentage of value chain actors that have accessed MAIP services	Participants survey
	IND.48 Percentage of women/young actors accessing MAIP services	Participants survey
	IND.49 Number of agroproduct safety and quality testing	MAIP log
	IND.50 Number of agroproduct certifications	MAIP log
	IND.51 Number of new crop varieties introduced, experimented and demonstrated	MAIP log
	IND.52 Number of new inputs introduced, experimented and demonstrated	MAIP log
	IND.53 Number of new cultivation technologies introduced, experimented and demonstrated	MAIP log
3.2 Capacity building	IND.54 Percentage of actors attending agricultural production training	MAIP log
	IND.55 Percentage of actors attending agricultural processing training	MAIP log
	IND.56 Percentage of actors attending marketing training	MAIP log
	IND.57 Percentage of actors attending digital literacy training	MAIP log
4. Outcomes		
4.1 Agricultural value chain development		
4.1.1 Agronomy	IND.58 Adoption rate of new crop varieties by farmers/farms	Ballot box test
	IND.59 Quantity of crops produced	Key informant interview
	IND.60 Adoption rate of balanced fertilization by farmers/farms	Ballot box test
	IND.61 Adoption rate of integrated pest management technologies by farmers/farms	Ballot box test
	IND.62 Adoption rate of advanced spraying facilities	Ballot box test
	IND.63 Adoption rate of new cultivation technologies	Ballot box test
	IND.64 Improved soil health	Ballot box test
	IND.65 Improved nutrient and water management	Ballot box test
	IND.66 Improved harvest and storage management	Ballot box test
	IND.67 Improved agroproduct safety and quality	Ballot box test
	IND.68 Improved processing and package management	Ballot box test

Item	Indicators	Data sources
4.1.2 <i>Animal husbandry</i>	IND.69 Quantity of meat produced	Key informant interview
	IND.70 Quantity of animal feed produced	Key informant interview
	IND.71 Quantity of dairy products	Key informant interview
	IND.72 Quantity of manure collected, processed and reused as fertilizers	Key informant interview
4.1.3 <i>Aquaculture</i>	IND.73 Quantity of aquatic products	Key informant interview
	IND.74 Adoption rate of AI-driven smart aquatic fish farming	Ballot box test
	IND.75 Adoption rate of new aquaponic technologies	Ballot box test
4.2 <i>Empowerment of agricultural value chain actors</i>	IND.76 Percentage of actors who have improved their technical skills after joining a MAIP	Ballot box test
	IND.77 Percentage of actors who have improved their entrepreneurial skills after joining a MAIP	Participants survey
	IND.78 Percentage of actors who have improved their soft skills after joining a MAIP	Participants survey
	IND.79 Percentage of actors who have improved their digital literacy after joining a MAIP	Ballot box test
	IND.80 Percentage of actors who have improved their processing and packaging skills after joining a MAIP	Ballot box test
	IND.81 Percentage of actors who have strengthened their market access after joining a MAIP	Participants survey
	IND.82 Percentage of actors who have improved their collaborative skills after joining a MAIP	Participants survey
	IND.83 Percentage of actors who have extended their social network after joining a MAIP	Participants survey

2. Multi-actors agricultural innovation platform self-monitoring and self-evaluation implementation

The self-monitoring and self-evaluation (self-M&E) of MAIPs are to be implemented in four steps: (1) making preparations, (2) training the facilitators on M&E, (3) conducting M&E, and (4) reflecting and taking action.

→ Step 1. Making preparations for M&E

The main objectives of this phase are to initiate the process, stimulate commitment, and gain support from the key MAIP stakeholders. The following activities are suggested for this phase:

- ✓ developing the terms of references (ToR) for the M&E team, defining the rationale of the M&E with specific objectives, clarifying expectations, agreeing on the common vision, and identifying entry points for the M&E;
- ✓ mapping actors and characterizing the boundary of the MAIP and performing stock analysis of its key challenges, opportunities, and constraints;
- ✓ carrying out an inception workshop to define the M&E scope and key questions from the perspective of MAIP participants and stakeholders; and
- ✓ conducting necessary training activities or courses to build the capacities of the M&E team.

→ Step 2. Training on M&E

This phase is an integral part of the capacity development process targeted at supporting MAIP facilitators to conduct M&E. The objectives of this phase are to:

- ✓ design an M&E workplan that meets expectations and makes efficient use of financial and human resources;
- ✓ help the M&E team review and assess the expectations against the M&E framework; and
- ✓ familiarize the M&E team with the M&E methodology, process, and approaches.

The following activities can be carried out:

- ✓ organizing team meetings to review and analyse the expected outputs of the M&E;
- ✓ reviewing and identifying the boundaries of the targeted MAIP and main entry points for the M&E;
- ✓ identifying and selecting the key indicators from the indicator framework for M&E in accordance with local contexts and frame conditions;
- ✓ selecting appropriate data collection tools and methods (qualitative and quantitative) and preparing necessary questionnaires, matrix or tables;
- ✓ identifying the key actors and partners of the MAIP to be involved in the M&E; and
- ✓ developing a workplan on the M&E of the MAIP in detail considering available human and financial resources.

→ Step 3. Conducting M&E

This phase consists of interconnected activities as follows:

- ✓ collecting data, using the approach and tools against the indicators selected in Phase 2;
- ✓ organizing a ballot box test (BBT) at the beginning of the MAIP to collect baseline data on the participants' knowledge and identify existing gaps. Reorganize the BBT at the end of the MAIP to collect post-participation data that will reveal the knowledge and skills that the participants have acquired from the participation in the MAIP. Compare the two sets of data to help evaluate the outputs and outcomes of the MAIP;
- ✓ interviewing key MAIP actors. The following actors can be included in the interviews:
 - lead farmers
 - farmers' organizations
 - input suppliers
 - entrepreneurs
 - market actors
 - researchers and extension agents
 - educators
 - facilitators
 - smallholder farmers, to assess their experience with and reflections on the efficiency and effectiveness of the MAIP and the relevance of the services delivered;
- ✓ analysing and interpreting the collected data, and formulating a preliminary M&E report with policy recommendations;
- ✓ organizing mini-workshops for reflection and learning for the consolidation of the preliminary M&E report with policy recommendations; and

- ✓ sharing the consolidated M&E report with policy recommendations and seeking feedback from key stakeholders.

BOX 34. Interviewing the key actors of multi-actor agricultural innovation platforms

- Some data tend to be difficult to get based on the desk study and normal data collection methods. Therefore, a series of semi-structured interviews are to be conducted with key MAIP actors.
- Preferably, face-to-face interviews, more empathetic and informative, are to be held with the selected actors (disadvantages include the personnel cost and non-guaranteed quality of data by the interviewer). However, telephone or video interviews are also acceptable when face-to-face interviews approaches are considered less feasible.
- Different information is to be sought from different actors during interviews. For example, interview with farmers will mainly seek information on the accessibility, affordability, adaptability, and accountability of information, innovation and services that the MAIP has delivered.

Source: **Yang, P. & Ou, Y.** 2023. *Guide for monitoring and evaluation of the public agricultural extension and advisory service system*. Rome, FAO. <https://doi.org/10.4060/cc4014en>

➔ Step 4. Reflecting and taking action

In this phase, the MAIP M&E results in the form of a report are to be thoroughly and widely discussed with MAIP actors, policymakers, decision-makers and other stakeholders. Based on the discussions, the M&E report is to be validated and communicated to MAIP stakeholders. The validation and communication of the M&E results is not a once-off activity; rather, it is a continuous part of the M&E. The following activities are to be undertaken:

- ✓ organizing a participatory and multistakeholder validation workshop;
- ✓ finalizing the M&E report with inputs, comments and suggestions collected during the validation workshop;
- ✓ organizing MAIP management and policy dialogue events;
- ✓ communicating and disseminating the validated M&E report to the key MAIP stakeholders; and
- ✓ developing and validating action plans to upgrade or strengthen MAIPs if necessary in accordance with the M&E results.



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Annex 1

Answers to the questions on Business Ideas

◆ What products or services your business is going to sell?

The products and services that you can sell depend on your knowledge and skills in the relevant field and the demand from customers. The products and services should not only meet the needs of people, but also have to be sold at a reasonable and profitable price.

A product is an item that customers pay for and use. It can be food, clothes, tables, etc. It can be something made by yourself or it is something that you buy from other people and resell at a higher price. Like at a grocery store, the owner buys fresh vegetables or fruits from local farmers and then sells them to customers at a higher price.

A service is something that people provide for others at a price. For example, delivering goods, babysitting, building a house, etc.

◆ To whom your business is going to sell products or services – your customers?

Only if you have customers can your business survive and make profit. Therefore, it is essential to know who your customers will be. Is your product or service targeting a specific type of customer or to everyone in your community? Some people design a business idea based on their individual need or a need of a friend or family member for example; however, it is important to understand that the business idea must meet enough people's demand and needs and these people should be able and willing to pay for the goods and services. Otherwise, it is not a good business idea.

◆ How your business is going to sell its products or services – your route to market?

Once your products are ready, how will you sell them to the market? There are different ways you could consider. For instance, you can sell directly to customers on the market, or you sell them to retailers, who buy ready-made goods from producers. Some examples of retailers are grocery stores, clothing stores, etc.

◆ **How your business will depend on and impact the environment? A good business idea will respect the environment and make sustainable use of natural resources.**

Given the increasing impact of climate change in our daily life and agricultural production, it is important to consider how to make the business work in harmony with nature, by respecting the environment and making sustainable use of natural resources. Only in this way can the business be sustainable in the long run.

Thus, when starting designing your business idea, you need to think about how much your business depends on the environment. Does it rely on the weather, soil or other natural resources? Will your business nurture the natural environment or will it have a negative impact on it? How would you minimize or reverse any negative effect that your business might have?

- ◆ In the end, invite the participants to reflect on what they have learned and ask any further questions.

Annex 2

Additional elements of marketing: People, processes and physical evidence

People: Business owner and his or her staff who can develop the unique characteristics of the business

From a marketing point of view, “people” refers to business owner and staff who have unique characteristics, especially customer-oriented and marketing skills. This can support the business to provide better customer service and/or present the products and services in a unique way. The person should be responsible, patient and flexible and enjoy working with different people. Sometimes, it is necessary to have someone with background knowledge in a specific field related to the business. In general, the following questions should be answered:

- ◆ What skills does the businessperson and staff require?
- ◆ What is the relationship between the businessperson and his/her clients?
- ◆ Is he/she friendly?
- ◆ Is he/she known in the area, village or town?
- ◆ Does he/she have a good reputation?

Process: Various mechanisms and procedures to get the product to customers. Process means the different ways to sell the product or service to customers. The rationale behind is that a pleasant experience of shopping can increase the possibility of buying.

Example

Imagine that you go to a grocery store, you will feel happy if the owner greets you. Also, if the products are all in good display, you will feel more comfortable and find it more convenient to find the products that you would like to buy. In addition, you may find it useful when someone there introduces different kinds of products and explain the benefits or discuss a discount with you.

Physical evidence: Overall appearance of the product, service or the business. Physical evidence is the overall appearance that the product, service or business shows to the customers. For instance, the appearance of the shop or office premises, packaging, signage, employee uniforms, business card and so on.

BOX 35. Environmental dimension of the marketing plan

Apart from the above information, the trainer is encouraged to bring the environmental dimension into each of the Ps of the marketing plan. Some examples are provided below, which refer to the International Labour Organization (ILO)'s Green Business booklet and will be further adapted into an agricultural and rural context.

- **Product:** By offering a green product that addresses an environmental challenge or does not harm the environment thanks to its recyclability/reusability, its green production process and its green packaging, for example, you will be able to attract customers who place importance on environmental, social and health issues. This will differentiate you from others and will give you a competitive advantage. You may also wish to consider having your product certified by a reputable organization to show that it meets the green standards that have been set.
- **Price:** Green products and services or green production processes might help the business to reduce costs. As you may charge the same price as your competitors while producing at a lower cost, this can enable you to have a larger profit margin. Sometimes, green products or services might be more expensive, if the cost of the green technology used is higher. But you can still attract customers by explaining the benefits of the products or services so that they see the value added and are convinced to pay a premium price.
- **Place:** When deciding on the location of your business, try to minimize distances to raw materials as well as to the market. Not only will this help the environment, but the business to reduce the cost of transport that results in less time-loss due to travel. To appeal to a health-oriented clientele, such as the customers of a beauty shop, you may wish to choose a naturally beautiful location which is clean and has a good vegetation.
- **Promotion:** When deciding on how to promote the product, consider ways of reducing resource use and the generation of waste/pollution. For example, go paperless and make use of electronic media, or, if using print material such as leaflets, opt for recycled paper and non-toxic ink.

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