



ENHANCING EXTENSION CAPACITIES: Improvement of Rural Agricultural Technology Extension System in Asia (RATES) Project

Supported by RDA-AFACI (2023-2025)

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September 2026

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1. INTRODUCTION

This paper is a synthesis of experiences from the project “Improvement of Rural Agricultural Technology Extension System in Asia (RATES)”, which was implemented during 2023-2025 in 12 Asian Countries (Bangladesh, Bhutan, Cambodia, Indonesia, Lao PDR, Mongolia, Nepal, Philippines, Sri Lanka, Thailand, Uzbekistan and Vietnam). This project, funded by the [Rural Development Administration \(RDA\)](#) of the Republic of Korea through [the Asian Food and Agriculture Cooperation Initiative \(AFACI\)](#), was primarily launched to enhance the capacities of extension and advisory services (EAS) in these countries.

[The Global Forum for Rural Advisory Services \(GFRAS\)](#), through its sub-regional network, [Asia-Pacific Islands Rural Advisory Services \(APIRAS\)](#) has been supporting the implementation of the RATES project. The RATES project interventions, especially through demonstrations of new technologies, training for farmers and extension personnel, and the development of numerous knowledge products, have significantly strengthened the capacities of the public extension system in these 12 countries.

This paper reflects on the evolution and progress of the RATES project during its three years of implementation and takes stock of the lessons it offers. The main findings of this paper are as follows: Firstly, public extension in Asian countries needs more support to enhance its capacities to address the new and increasingly complex challenges farmers face. Secondly, efforts should be made to organise more targeted support to extension and advisory services (EAS) based on specific priorities for capacity enhancement in each country. Thirdly, institutional reforms in public extension are long overdue, and supporting this reform process is critical to ensuring the long-term sustainability and effectiveness of EAS. This would necessitate support for organisational development, policy engagement, training-of-trainers, and partnership development. While these insights are useful, the paper argues that more systematic efforts are needed to strengthen EAS capacities in Asia. This would necessitate enhancing investments in EAS through national budgets and external development assistance.

The rest of the paper is organised as follows. The evolution of the RATES initiative is discussed in Section 2. The key features of the RATES interventions are presented in Section 3. This is followed by a discussion on challenges faced during project implementation in Section 4. Issues related to the sustainability of these interventions post-project, and the potential for scaling them up are discussed in Section 5 of this report. Section 6 presents the three main lessons drawn from project implementation. Conclusions are presented in Section 7.

2. EVOLUTION OF THE INITIATIVE

In 2022, the Rural Development Administration (RDA) of the Republic of Korea, through its Asian Food and Agriculture Cooperation Initiative (AFACI), held discussions with GFRAS (Box 1) and select Asian Countries to launch a project to strengthen extension services in these countries. This project, named “Improvement of Rural Agricultural Technology Extension System in Asia (RATES)”, was thus launched towards the end of 2022 in 12 Asian Countries. The GFRAS became a partner in this initiative, and its regional network in Asia, the APIRAS, directly supported the implementation of the RATES project. The project aimed to achieve two objectives:

- Improvement of the agricultural extension and capacity building system to strengthen agricultural competitiveness by providing professional agricultural extension services
- Establishment of a global network and cooperation basis by spreading Korea’s agricultural extension model

Box 1: GFRAS

GFRAS is the Global Forum for Rural Advisory Services. Its mission is to provide advocacy and leadership on pluralistic, demand-driven rural and agricultural advisory services within the global development agenda. GFRAS brings together two main stakeholder groups: RAS institutions from the public, private, and civil society sectors that provide RAS directly, and International development institutions involved in rural development. GFRAS helps these actors work more effectively with RAS providers, thereby improving their rural development initiatives. It also brings these actors together for stronger RAS advocacy.

In Asia, GFRAS operates through its Regional Network, the Asia Pacific Islands Rural Advisory Services (APIRAS), which is hosted at the Centre for Research on Innovation and Science Policy (CRISP), India. Over the past three years, the GFRAS support to RATES was organised through the APIRAS led by the focal points of its two sub-regional networks, Agricultural Extension in South Asia (AESAs) and Rural Advisory Services for South East Asia (RAS-SEA).

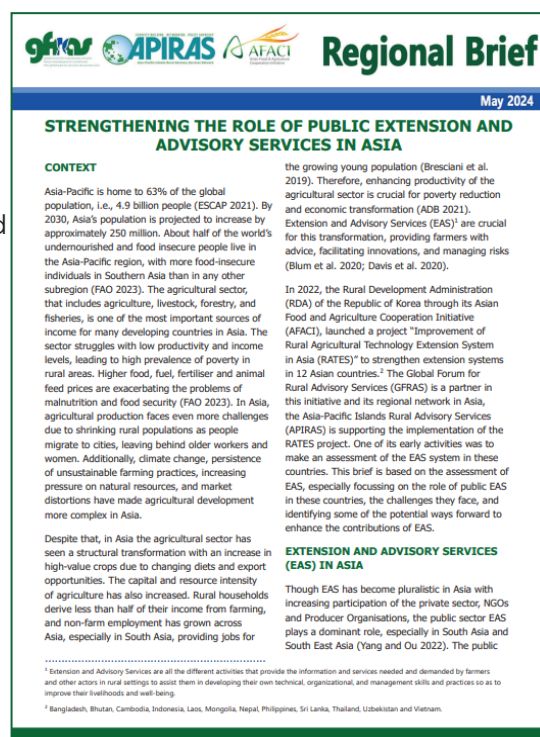
Assessment of the EAS System in project countries

One of the early activities of the RATES project was to assess the EAS system in the 12 partner countries. To guide this assessment, a template was jointly developed in consultation with the AFACI and GFRAS teams. Using this template, the Principal Investigators (PIs) and Co-PIs of the project in the respective countries developed a draft baseline study report. Both AFACI and GFRAS reviewed the draft baseline reports and the proposal for the 3-year project, and the feedback from this exercise was shared with the PIs. These were also presented in two online meetings in March and April 2022.

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The RDA and AFACI organised a workshop on the RATES projects from 24-28 April 2023 at the International Technology Cooperation Centre of the RDA in Jeonju, Republic of Korea, where PIs and Co-PIs of the RATES project from 12 countries, as well as the GFRAS team, participated. During this inception workshop, the PIs presented the results of the background analysis and the proposed interventions to improve the delivery of extension and advisory services in their respective countries through the RATES project. Suggestions to improve the project interventions were also provided during these presentations.

Based on the country-level assessment of EAS, a [Regional Brief](#) was subsequently developed and widely promoted, focusing on the role of public EAS in these countries, the challenges they face, and potential ways forward to enhance EAS's contributions. The key features emerging from the status paper are presented in Box 1.



Box 1: Key findings from the Baseline Study

The assessment of public Extension and Advisory Services (EAS) in Asia highlights several challenges that constrain their ability to provide effective support to farmers. A major concern is the shortage of human resources, with many public extension systems understaffed and extension personnel carrying responsibilities beyond extension work. This often leaves limited time for direct engagement with farmers. Insufficient funding is another persistent constraint, affecting the overall functioning of EAS, particularly at district and local levels, and limiting access to services in remote areas.

The study also identified significant capacity gaps among EAS personnel. Capacity needs are rarely assessed systematically, while opportunities for refresher and in-service training remain limited. Training is needed in areas such as protected cultivation, organic agriculture, digital technologies and the soft skills required to engage with farmers effectively. In addition, weak linkages among research, extension and other agricultural stakeholders constrain technical backstopping, knowledge exchange and coordination. In several countries, linkages among different levels of government and between public, private, NGO and producer organisations are also weak, resulting in overlaps, duplication and gaps in service delivery.

The brief proposes three major areas for strengthening EAS.

First, countries need to assess EAS performance and outcomes at the national level. There is limited information on the roles and contributions of different EAS providers, particularly within increasingly pluralistic systems. Establishing a national baseline and systematically monitoring performance and outcomes can support better planning, coordination, monitoring and evaluation, and inform the development of national extension policies or strategies.

Second, the brief calls for greater investment in EAS. Increased funding is needed to address shortages of frontline personnel and strengthen their competencies. The authors suggest developing an EAS financing plan supported by evidence and documented impact stories, while mobilising resources from governments, donors, private sector actors, philanthropists, NGOs and farmer organisations.

Third, countries should systematically assess capacity gaps and develop capacity-development plans for EAS. This should include developing relevant training modules, strengthening training-of-trainers, using digital platforms for staff learning, establishing trainer networks and allocating dedicated budgets for human resource development. Importantly, the brief emphasises that strengthening public EAS should also recognise the pluralistic nature of advisory provision in Asia and enhance its capacity to coordinate and facilitate the contributions of different actors.

3. KEY FEATURES

Diverse interventions for capacity development

During the three years of RATES project implementation (2023, 2024 and 2025), the project teams organised several interventions to strengthen the capacity of the extension system in the 12 countries. These interventions are presented in Table 1.

Most of these interventions aimed to promote knowledge of new, high-yielding crop varieties and to improve management practices in crop cultivation and livestock rearing. These interventions were implemented through the national extension system mainly to familiarise farmers and extension staff with these new technologies and practices. Efforts were also made to train both extension staff and farmers in applying these improved practices.

Apart from these, a few countries also focused on enhancing the capacities of extension staff on extension principles and approaches. Efforts were also made to use decentralised farmer settings as learning venues to demonstrate new practices and training. Most projects developed technology extension manuals that codified the newly promoted knowledge.

Table 1: Key Capacity Development Interventions

SI No	Interventions	Examples
1	Promoting new varieties of crops in farmer fields through trainings, demonstrations and field days	• HYVs of spices (onion, chilli, garlic, turmeric) and oilseeds (mustard) in Bangladesh; • Improved varieties of strawberry, sweet pepper, cucumber and tomato in Uzbekistan; • Improved varieties of Tomato in Nepal
2	Promoting improved farm practices through trainings and demonstrations	• High density planting in Banana and Maize; IPM, hybrid chilli cultivation and seedling broadcasting in paddy in Sri Lanka; • Vegetable farming, chicken rearing and rice cultivation in Cambodia; • Good practices in chilli cultivation in Thailand; • Commercial vegetable production in Lao PDR and Nepal; • Pest Management in Orange, Dragon Fruit and Rice in Vietnam.
3	Production and promotion of new inputs	• Establishment of bio-input production facility in Bhutan
4	Demonstration and training of farmers and extension personnel on protected cultivation	• Introduction of new vegetable species and varieties appropriate for protected cultivation, quality management and marketing of vegetables in Mongolia • Strengthening digital skills for smart farming in greenhouse production of fruit crops and vegetables in the Philippines (including market and business opportunities)
5	Training farmers on other topics	• Training of farmers on food safety, cattle sanitation and household processing of food in Indonesia; • Training on Artificial Insemination, making silage, liquid cattle dung fertilisers in Laos; • Use of water-saving technologies in Uzbekistan
6	Linking farmers to the private sector	Linking vegetable farmers to organised retailers in Lao PDR
7	Training of extension staff on improved extension methodologies, approaches and tools	• Agricultural extension methodology, facilitation, communication skills, adult learning for the newly recruited commune agricultural officers in Cambodia; • Training on agricultural extension guidelines for existing extension staff in Bhutan
8	Development of guidelines on extension approaches and roles of extension staff	• Cambodia • Bhutan
9	Development of technology extension manuals and other guidance notes in the form of leaflets	• All countries
10	Strengthening digital extension	• Enhancing infrastructure for digital extension (smart boards, web camera and multimedia projector) in Sri Lanka • Strengthening ICTs in Posludhes in Indonesia • Use of Facebook in Sri Lanka • Use of WhatsApp in Sri Lanka and Nepal • Use of Facebook and YouTube in Mongolia • Development of apps in Mongolia and promotion of existing apps in Bangladesh

Training farmers and extension staff in new technologies has been one of the most important capacity development interventions implemented by the project (Table 2).

Table 2. Training Sessions and Participant Engagement*

SI No	Country	Number of training sessions	No of participants
1	Sri Lanka	232	3,490
2	Bangladesh	32	1,227
3	Cambodia	19	770
4	Uzbekistan	10	670
5	Vietnam	7	660
6	Mongolia	11	315
7	Nepal	7	315
8	Lao PDR	18	207
9	Thailand	5	180
10	Indonesia	21	124
11	Bhutan	9	71
12	Philippines	3	66
Total		374	8,095

* Self-reported by the PIs.

Sri Lanka conducted the most training sessions (232) and engaged the most participants (3,490), while Bangladesh, Cambodia, Uzbekistan, and Vietnam demonstrated strong engagement through large-scale participant mobilisation despite fewer sessions. Countries such as the Philippines and Bhutan had relatively low training activity and reach. However, in the case of the Philippines, the activity was intense, spanning months at a single site on a very important topic: Smart Farming for Greenhouse Production. In many of these countries, there is potential to enhance reach by expanding face-to-face extension services and using digital tools. Overall, 8,095 participants were reached through 374 training sessions, illustrating a significant regional effort towards capacity development of farmers.

Involvement of multiple agencies in organising capacity development interventions

Irrespective of who led the project, both public-sector research and extension agencies collaborated to organise most of these interventions.

In five countries, the projects were led by research agencies (Bangladesh, Nepal, Vietnam, Laos and Mongolia). In six countries, the projects were led by extension agencies (Sri Lanka, Cambodia, Indonesia, Philippines, Thailand and Bhutan). In one case, they were led by an agency that combines both research and extension (AKIS, Uzbekistan). In Thailand, the project partnered with a University (Kasetsart University) halfway through the project as the Department of Agricultural Extension realised the need for adaptive research support.

In the baseline study, all countries reported poor research-extension linkages, and the RATES project interventions brought both research and extension actors together to work on specific interventions. In some cases, these initiatives also reached out to value chain actors and farmer groups. For instance, in Lao PDR, RATES linked vegetable farmers with the organised

retailer AgriLaos and worked closely with cooperatives such as the Thongmang Organic Agriculture Cooperative to build more sustainable market linkages. In Bangladesh, the RATES team organised a market linkage workshop primarily to educate private-sector input dealers on procuring and selling seeds of improved varieties of oilseeds and spices.

Using and strengthening decentralised extension platforms

The project's efforts to decentralise agricultural extension services and strengthen grassroots-level engagement have taken diverse forms across member countries, reflecting each country's distinct institutional and technological context.

Indonesia adopted a highly localised approach centred on the development of Village Extension Centres (Posluhdes). This initiative strengthened capacity and partnerships at the village level by engaging self-help extension workers, local champions, millennials, and private-sector partners. Several Posluhdes sites—including Pangrango, Karya Tani Mandiri, and Jomin Berkah—independently initiated community-based activities, such as reading corners, mobile libraries developed in collaboration with local library services, and training programs for home-yard processed foods.

In Thailand, RATES field extension initiatives were anchored in local Agricultural Learning Centres (ALCs). The project trained model farmers at these centres, who subsequently transferred value-added technologies—such as chilli production techniques—to their local farmer networks through community forums. The project plans to scale this decentralised model further by distributing educational media to 882 ALCs nationwide.

In the Philippines, the project interventions were based at one of the Learning Sites for Agriculture (LSAs). LSAs are successful farmers who are worthy of emulation and are willing to share their technologies right on their farms and partner with ATI to implement hands-on training. LSAs were used to anchor demonstrations of smart technologies and data-driven farming techniques.

In the Lao PDR, the project supported the development of a community learning centre for farm-based cattle management on an entrepreneur-farmer's farm. This involved constructing a training facility at the farm jointly funded by the RATES project and the farm owner. The centre supported a decentralised, farmer-to-farmer training model covering artificial insemination in cattle and the production of silage and liquid fertiliser from cattle dung, with sessions co-facilitated by the farm owner and livestock research experts. Supporting materials, including a Beef Cow-Calf Management Guidebook and an educational video on the artificial insemination process, reinforced these efforts.

In Bangladesh, the project decentralised technology transfer by cultivating robust stakeholder networks that directly link progressive farmers with local extension personnel, such as Sub Assistant Agriculture Officers, as well as with research organisations. Efforts also focused on institutionalising project-formed farmer groups at the local level to ensure long-term sustainability by connecting them directly to credit, input support, and market actors.

In Bhutan, decentralisation efforts targeted the grassroots level through Gewog (village block) Agriculture Extension staff, who received virtual sensitisation on the newly published Agriculture Extension Guideline. The project also advanced localised organic agriculture by

establishing household-level organic compost units. In Mongolia, the project established local pilot demonstrations across multiple provinces and prioritised strengthening the capacity of local extension workers to serve as intermediaries between farming communities and digital platforms, such as the plant.mofa.gov.mn application.

Uzbekistan integrated its advisory services through regional Agricultural Knowledge and Innovation System (AKIS) centres to reach dehkans (smallholder family farmers). The project trained 120 local advisory consultants, who in turn provided decentralised support to 550 dehkans. Hands-on learning was delivered directly at the community level through the establishment of 122 demonstration plots on household farms, complemented by 65 training seminars and 25 field demonstration days.

Finally, to address a fragmented, top-down system, Vietnam proposed the RATES-based Agricultural Extension Club, a decentralised model emphasising grassroots-level cooperation. This model is structured around a "Key Group" comprising key farmers (community representatives), local extension staff, and scientists, who work collaboratively to select and adapt technologies to local conditions. Local agricultural extension units are further empowered to conduct ongoing training, inspection, and monitoring to ensure farmers successfully sustain the transferred techniques.

Policy Engagement

Across the participating countries, project outcomes have translated into a range of policy-relevant deliverables tailored to national contexts. In Bhutan, the project's findings informed the development and publication of the [Agriculture Extension Guideline 2025](#), which provides formal policy support for strengthening extension services in the country. Indonesia has published a Policy Brief via APIRAS titled "[How can Indonesia Strengthen Village Extension Centres? Evidence and Policy Options from the AFACI-RATES Project](#)". In Nepal, a [policy brief](#) has been published advocating for the integration of a Research and Development (R&D) Participatory Approach into the country's existing agricultural extension system.

In Thailand, an analysis of prevailing agricultural extension practices delivered through Agricultural Learning Centres (ALCs) informed a set of policy recommendations, which have been submitted to the Director-General for approval and have additionally been incorporated as a core topic within the country's published educational manuals. Vietnam's project team produced a comprehensive policy brief titled "[Limitations of Vietnam's Agricultural Extension System and Policy Recommendations](#)," intended for submission to the Ministry of Agriculture and Rural Development. The policy implications of this brief are expected to inform forthcoming draft legislation concerning technology transfer and agricultural extension.

Collectively, these outputs demonstrate the project's tangible contribution to shaping national agricultural extension policy across the region, with outcomes ranging from finalised guidelines to briefs currently under government review.

Manuals and Guidance Notes

Across member countries, the project generated a substantial body of extension materials to support technology transfer, though the scope and format varied by national context.

Bangladesh published seven manuals and two leaflets, including a Manual on Varietal Identification and Production Technologies for BARI Sarisha-18 (mustard), BARI Pyaz-4 (onion), and BARI Halud-4 (turmeric), a Farmers Training Manual on Quality Seed Production of BARI Generated Spices and Oil Seed Crops, and a user manual for the Khamari Mobile App. These materials promoted climate-resilient crop varieties, quality seed production, and timely seeding, irrigation, and fertiliser practices for spice and oilseed crops.

Bhutan published the Agriculture Extension Guideline 2025, which outlined methodologies for farmer engagement, promoted ICT and mobile-based advisory systems, and encouraged climate-smart and organic agricultural practices.

Lao PDR developed a Beef Cow-Calf Management Guidebook, a Commercial Vegetable Production Guidebook focused on production cost calculations, and a document on the Principles of Agricultural Technology Extension Work. These materials supported cattle reproductive health and artificial insemination, silage and liquid fertiliser production, and efficient commercial vegetable production.

Mongolia produced a comprehensive manual on protected cultivation, later incorporated as a training module in Technical and Vocational Education and Training (TVET) schools. The manual covered greenhouse frost protection, soil and seedling management, early planting, irrigation, integrated pest management (IPM), and cultivation techniques for tomatoes and cucumbers.

The Philippines focused on developing training modules and toolkits for field trainers, promoting digital inclusion and Smart Agriculture Technologies (SATs) tailored to high-value crops.

Sri Lanka printed 50 booklets and 6,000 leaflets for use in mobile extension programs, including booklets on Beneficial Insects in Rice and Field Problems in Rice, as well as leaflets promoting potted chilli cultivation, IPM in paddy fields, home gardening, and the production of organic fertiliser, pesticides, and fungicides.

Uzbekistan published 15 technology extension manuals, including guides on high-yielding varieties such as Alfalfa (Toshkent 3091), Sweet Maize (Future 100), and Garlic (Feruza), as well as on climate-resilient, pest-resistant varieties and water- and energy-saving technologies.

Nepal produced informative publications and manuals used alongside ICT platforms, such as WhatsApp, to promote tomato farming technologies and insect pest management.

Vietnam utilised and distributed technical guidelines promoting Integrated Pest Management (IPM) to reduce chemical pesticide and herbicide use, as well as the application of Bio-VAAS.1, a biological product used in orange cultivation.

Promoting new extension approaches

Participating countries under the AFACI-RATES project employed a diverse range of extension approaches to promote technology adoption and modernise agricultural practices. These approaches can be broadly grouped into four major themes.

Digital and ICT-Enabled Extension (e-Extension)

Several countries leveraged information and communication technologies to bridge the gap between farmers, extension workers, and researchers. Nepal implemented an expert-farmer interaction model using WhatsApp and Viber groups, connecting 90 farmers, 12 local extension workers, and 11 disciplinary experts, enabling real-time expert-farmer interaction in which scientists shared best practices. In contrast, farmers contributed practical, field-based feedback.

In Sri Lanka, where in-person contact between farmers and extension officers is limited, the RATES project adopted e-extension programs comprising WhatsApp and Facebook groups, as well as organising virtual training sessions. The project also strengthened the ICT infrastructure (smart boards, web camera and multimedia projector) at the Namalthalawa Agriculture Extension Centre.

Mongolia prioritised the digitalisation of extension through social media and the plant.mofa.gov.mn website, with local extension workers trained to serve as intermediaries between these digital platforms and farming communities.

Vietnam utilised ZALO groups to provide farmers with direct access to advice and problem-solving support from scientists and local extension staff. At the same time, Lao PDR disseminated knowledge through mass and social media, particularly Facebook, complementing its online platform, the Farmers' Alliance for Agricultural Innovation (FAAI). Bangladesh used the Khamari Mobile App to deliver technologies directly to farmers.

Two websites, six YouTube channels or videos, eleven Facebook pages or posts, and twenty-two WhatsApp groups were used to promote new knowledge. The widespread use of WhatsApp and Facebook reflects a shift toward interactive, easily accessible channels that enable real-time knowledge sharing among farmers and extension workers.

Participatory, Decentralised, and Group-Based Models

Many countries emphasised decentralised, collaborative approaches to extension delivery. Vietnam proposed a shift away from top-down models through the "RATES-based Agricultural Extension Club," a decentralised approach built around a "Key Group" of key farmers, local extension staff, and scientists who collaborate directly on extension planning, technology selection, and local adaptation.

Lao PDR applied a participatory extension design grounded in action research principles (plan, act, observe, reflect), utilising a farmer-to-farmer training approach centred on a community learning centre where experienced farmers trained their peers directly. Both Indonesia and Thailand anchored their extension efforts in local community hubs: Indonesia through Village Extension Centres (Posluhdes) driven by self-help extension workers, and Thailand through Agricultural Learning Centres (ALCs) where model farmers transferred technologies to their community networks. Bangladesh decentralised outreach by forming local farmer groups of approximately 30 members each, with group meetings directly supervised by Sub Assistant Agriculture Officers (SAAOs) to sustain grassroots engagement.

Field Demonstrations and Hands-On Learning

Practical, field-based learning played a central role in several countries' extension strategies. Uzbekistan combined a "farmers' group approach" with a "one-on-one approach," establishing 122 demonstration plots on household farms, along with 65 training seminars and 25 field demonstration days, to provide tangible evidence of economic and yield benefits. Nepal enhanced technology adoption through method and result demonstrations conducted directly in farmers' fields, enabling practical evaluation of new technologies. Bangladesh established crop demonstration plots to compare yields with and without extension services, supported by a three-step training methodology delivered before, during, and after cultivation, along with dedicated field days.

Institutional Integration and Capacity Building (Training of Trainers)

Several countries focused on embedding project outcomes within broader institutional and training frameworks. Uzbekistan integrated the RATES project into its national Agricultural Knowledge and Innovation System (AKIS), emphasising Training of Trainers (ToT) programs that equipped 120 regional advisory consultants with skills in agricultural technology, communication, and extension moderation. The Philippines strengthened local capacities by developing training modules and toolkits to guide field trainers in promoting Smart Agriculture Technologies (SATs).

International Exposure and Cross Learning

PIs and Co-PIs of the RATES projects from 12 countries were exposed to various technologies and extension approaches during their visits to Korea, Vietnam, and Uzbekistan for the Project Evaluation Workshops.

In Korea (24-28 April 2023), the participants visited the Agricultural Science Hall at RDA, the Rural Human Resource Development Centre: Jeonnam Agricultural Research & Extension Services, and the Damyang Agricultural Development and Technology Centre, which helped them better understand Korea's research and extension system. In Vietnam (26-30 August 2024), the participants visited citrus demonstration farms in Cao Phong district of Hoa Binh province and met with the local agricultural staff. In Uzbekistan (13 to 17 October 2025), the participants visited the National Centre for Knowledge and Innovation in Agriculture and its research and seed production facilities, including advanced polyhouse cultivation.

These annual face-to-face interactions of project teams during these workshops served as a strategic platform for evaluating project progress, sharing country experiences, and identifying best practices to strengthen rural advisory and agricultural extension systems across Asia. The event fostered regional dialogue and mutual learning among project teams, national partners, AFACI, and GFRAS. Apart from these, a delegation from Thailand comprising 2 model farmers and 4 DOAE officers visited Korea from 1-5 September 2024 to learn about advances in chilli cultivation. The GFRAS team also facilitated an online cross-learning interaction between the Philippines and Mongolia RATES teams, where the Philippines team shared their experiences in developing curricula on protected cultivation, which is also an important priority in Mongolia.

APIRAS team participated in all these project workshops. Dr Rasheed Sulaiman V and Dr Siti Amanah from APIRAS participated in all online interactions with project teams and in the three project evaluation workshops. Dr Botir Dosov participated in the initial online meetings, and Dr Carl Larsen, Executive Secretary, GFRAS, participated in the final project workshop in Uzbekistan.

Technical support from GFRAS

Since the inception of the RATES project, GFRAS has adopted a phased and collaborative methodology to support the 12 member countries in implementing the project and strengthening their agricultural extension systems.

Year 1 (2023)

In Year 1, a standardised baseline study template was developed and used to assess national extension systems. The GFRAS team reviewed the baseline study drafts and provided inputs for improvements. A Regional Brief was developed based on a synthesis of baseline findings.

Year 2 (2024)

In Year 2, technical backstopping was provided through consultations, six-monthly meetings (held during April-May 2024 and October 2024), and field visits to two countries, namely Sri Lanka and Lao PDR. In Sri Lanka, the project support mission had two extension specialists from RDA, Mr Kin Chang-Soo and Mr Roh Sug-won, and the team visited project sites in the Namalthalawa agrarian services division in Ampara District during 8-11 July 2024. The team provided several useful recommendations to strengthen the project implementation in Sri Lanka.

In Lao PDR, the GFRAS Team participated in a review of project implementation in Luangphabang, Xaythany, Hadxyfong and Vientiane during 15-18 November 2024. The team visited community learning centres focusing on Artificial Insemination in cattle and vegetable seed production; AgriLao, a company that procures high-quality vegetables for supply to other businesses, such as hotels (B2B); and the agricultural cooperative Thongmang Organic Agriculture Cooperatives, which has been linked to AgriLao.

In addition, Rasheed Sulaiman V, the project PI from GFRAS, met with the RATES team in Mongolia and Uzbekistan during his 2024 visits to these countries for other missions.

Year 3 (2025)

In Year 3, support continued through online consultations with project teams (Feb 2025), which mainly focused on extending support for the development of knowledge products, good practice notes, policy briefs, research papers, manuals, etc., to showcase impactful practices and results. Efforts were also made to synthesise the project's learnings and experiences. In addition to the Regional Brief Strengthening the Role of Public Extension and Advisory Services in Asia developed during year 1, the GFRAS also supported the development of a Good Practice Note on Building a Digital Future for Sri Lanka's Farmers from Sri Lanka and a Policy Brief on Strengthening Village Extension Centres from Indonesia. APIRAS published these in collaboration with AFACI and the country partners.

During 14-18 April 2025, a team comprising Mr Sunghwan Yun and Mr Sung Jun Hong from RDA, Korea, and the APIRAS team visited Bhutan to review RATES project interventions.

During the visit, they toured project sites and met with key officials, both directly and indirectly involved in implementing the RATES project. The team also visited the Agriculture Research and Development Centre, Bajo, as well as with staff at the National Plant Protection Centre (NPPC). The team also met with the Hon'ble Sonam Lyonpo, Minister for Agriculture and Livestock.

During 26-28 July 2025, the GFRAS team visited the Agricultural Learning Centre in Phrae Province, Thailand, where new technologies in chilli farming are demonstrated. The team also interacted with researchers from Kasetsart University who are developing and documenting the best practices in chilli cultivation as part of the RATES project.

4. CHALLENGES

The project teams faced several challenges during implementation. For instance, in Bhutan, the misalignment between the country's financial year (July-June) and the AFACI project year (January-December) led to administrative delays in project implementation. In Cambodia, the RATES team realised that the newly recruited Commune Agricultural Officers (CAOs) needed more training than originally planned. Relatively weak mechanisms for capacity development of extension personnel and weak research-extension linkages were recognised as important challenges by all country teams. The RATES project sought to address many of the issues flagged during the online meetings and annual workshops by taking remedial action.

Low digital literacy among farmers, especially those over 45-50 years of age, created hurdles in providing digital advisory support in Sri Lanka, Nepal, and the Philippines. As projects were implemented in provinces far from the HQ, bureaucratic delays hindered obtaining approvals on time, especially during Year 1. In general, farmers have limited knowledge and are less motivated to adopt new technologies, so continuous interventions from extension personnel are needed. In other words, while the project demonstrated the effectiveness of new technologies, sustaining and scaling them requires more effort.

With extension becoming more pluralistic, many private input companies are aggressively promoting new technologies, and state extension personnel lack adequate knowledge of them. This was clearly observed in Vietnam, and it calls for greater efforts to enhance the capacities of public-sector extension staff. Another challenge observed in Mongolia is that many existing greenhouse models and inputs are not fully adapted to Mongolia's harsh winter conditions, making them not scalable. This would need more adaptive research to design appropriate context-specific models. Despite strong training efforts, many farmers still face knowledge gaps in advanced cultivation techniques, financial management, and value addition. Moreover, investment costs for protected cultivation remain a barrier, especially for low-income farmers.

5. SUSTAINABILITY AND SCALING UP

Under the RATES initiative, all projects were implemented by national partners with a mandate to promote new technologies and enhance the capacities of both farmers and their extension personnel. So they should be able to sustain some of these initiatives, perhaps not with the same intensity as seen during the project phase, where additional support is available from the project.

The project produced several training modules and manuals that codified much of the knowledge generated during the project, which could be used and adapted in other regions to train extension agents and farmers on the respective topics (Table 3). A new section serving as a repository for all such knowledge products developed through RATES is now available on the APIRAS Site (<https://apiras.net/rates/>). As APIRAS promotes these through its websites and social media, other countries may also benefit from these knowledge products.

Sl. No	Types of Knowledge Products	Number
1	Journal Papers	4
2	Policy Briefs	4
3	Research Reports	2
4	Manuals and Guides/Guidelines	37
5	Videos	25

6. LESSONS LEARNT

The three-year implementation of the RATES project offers three important lessons on strengthening extension and advisory services, especially public extension in Asia.

Firstly, public extension in Asian countries needs more support to enhance its capacities.

Farmers face several new challenges in enhancing production and income from farming, including adapting to climate change, declining soil quality, decreasing water availability, meeting new quality standards, and securing a fair share of the price consumers pay for their produce. They need professional support to address these changes. Though a public extension infrastructure exists, its capacity to address these new challenges is limited. Baseline studies and project experience from RATES clearly reveal this.

Enhancing their technical knowledge and functional capacities to deliver support through the adoption of varied extension approaches, including digital tools, should be a priority for all those keen to enhance EAS's contribution in addressing the challenges farmers face. This is where external donor initiatives, such as AFACI-RATES projects, fit in. The RATES project not only enhanced the capacities of farmers and extension personnel but also demonstrated

how such external support, though with limited funds and duration (90,000 USD per country for 3 years), can effectively strengthen capacity. There is a need for more such initiatives in the future.

Secondly, efforts should be made to organise targeted support to help each country address its prioritised capacity needs.

For instance, one of the key priority areas identified by the RATES partners is strengthening their capacity to use protected cultivation and smart farming methods to help farmers adapt to a changing climate. Korea has strong expertise in protected cultivation and could build on this expertise to support countries in adapting and promoting the most suitable options for them. Overall, there is a need to strengthen the capacity of extension professionals to support adaptation to climate change.

Another major concern is strengthening capacities in value chain extension. This primarily involves helping extension personnel understand the basic components of value chains and how they can work with farmers and other key chain actors to target market opportunities. Extension personnel, in most cases, have a very limited understanding of these aspects. There is scope to develop training modules and organise training-of-trainers to support countries in enhancing the capacities of extension personnel in this area.

Thirdly, institutional reforms in public extension are long overdue, and this is critical to ensuring the long-term sustainability and effectiveness of extension and advisory services.

One of the most important constraints public extension faces is its weak linkages with research and other actors in the agricultural innovation system, including extension services providers in the private and civil society sectors. The RATES project sought to involve these actors in promoting new technologies and strengthening the capacities of extension providers, as the PIs realised that without engaging with lead farmers, the private sector, and the cooperatives, technology adoption and capacity strengthening couldn't be achieved. Moreover, many of the new and critical challenges farmers face, such as adapting to climate change and effectively linking with markets, can't be addressed solely by the public sector.

Institutional reforms should focus on enhancing organisational capacities for partnership building. To do this, the public sector extension in Asian countries needs help to experiment, learn and embrace new strategies. This can be facilitated with externally funded initiatives such as RATES. Regional Networks of GFRAS, such as APIRAS, can link these initiatives to the pluralistic extension country fora in these regions and provide technical oversight, knowledge management, and policy engagement support.

7. CONCLUSIONS

EAS have to provide more comprehensive support to farmers to help them address the new and increasingly complex challenges they face. Public extension alone cannot address all challenges in agriculture, and there is a need to enhance capacities of pluralistic extension services. The successful implementation of the RATES projects clearly demonstrated the value of investing in EAS in Asian countries and how such investments can enhance EAS capacities, promote partnerships, and increase farm productivity and income. It also revealed areas where more investments could be targeted. There is definitely a need to target programmes that enhance EAS's capacity to deal with protected cultivation and value chain extension. Though external funding is not a substitute for enhanced public investments in extension, regional funding, through initiatives such as RATES in partnership with GFRAS, offers opportunities to enhance EAS capacities by linking to existing sub-regional and national extension platforms and promoting cross-learning. We hope this successful RATES experience will encourage RDA-AFACI and other donors committed to strengthening agriculture in Asian countries to invest more in EAS.

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