SAFER SPICES: BOOSTING FOOD SAFETY AND MARKET ACCESS FOR THE PEPPERCORN VALUE CHAIN IN VIET NAM, LAO PDR AND CAMBODIA

STDF/PG/619

END OF PROJECT REPORT

MAY 2024

PROJECT INFORMATION

STDF/PG/619
Title Safer Spices: Boosting Food Safety and Market Access for the Peppercorn Value Chain in Viet Nam, Lao PDR and Cambodia
Implementing agency Centre of Agricultural Biosciences International (CABI)
Partners Western Highlands Agriculture & Forestry Science Institute (WASI), Viet Nam General Directorate of Agriculture (GDA), Cambodia Department of Agriculture (DOA), Lao PDR
Start date 01/10/2020
End date Initial end date: 30/09/2023 Extended until: 31/03/2024 (with grace period until 30 June 2024 to complete final report)
Beneficiaries Viet Nam, Lao PDR and Cambodia
Budget Project Total Value: 917,846 STDF contribution: 711,096 Other contribution: 206,750

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ACIAR	AUSTRALIAN CENTRE FOR INTERNATIONAL AGRICULTURE RESEARCH
ASTA	AMERICAN SEED TRADE ASSOCIATION
CABI	CENTRE FOR AGRICULTURE AND BIOSCIENCES INTERNATIONAL
CoP	CODE OF PRACTICE
CPSF	CAMBODIA PEPPER AND SPICE FEDERATION
CUSP	CONSULTANCY FOR UPLIFTING SUSTAINABILITY POLICIES
DAFO	DISTRICT AGRICULTURE AND FORESTRY OFFICE
DOA	DEPARTMENT OF AGRICULTURE
FDA	FOOD AND DRUG ADMINISTRATION
FAO	FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS
IDH	INITIATIEF DUURZAME HANDEL (THE SUSTAINABLE TRADE INITIATIVE)
IPC	INTERNATIONAL PEPPER COMMUNITY
KMT	KILO METRIC TON
KPPA	KAMPOT PEPPER PROMOTION ASSOCIATION
GDA	GENERAL DIRECTORATE OF AGRICULTURE
GAP	GOOD AGRICULTURE PRACTICES
GHP	GOOD HYGIENE PRACTICES
GMP	GOOD MANUFACTURING PRACTICES
G-PPP	GRASSROOTS PUBLIC PRIVATE PARTNERSHIPS
MAF	MINISTRY OF AGRICULTURE AND FORESTRY, LAO PDR
MAFF	MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES, CAMBODIA
MARD	MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT, VIET NAM
MRL	MAXIMUM RESIDUE LEVEL
NWG	NATIONAL WORKING GROUP
PAFO	PROVINCIAL AGRICULTURE AND FORESTRY OFFICE
PGS	PARTICIPATORY GUARANTEE SYSTEM
PPD	PLANT PROTECTION DEPARTMENT
PPP	PUBLIC PRIVATE PARTNERSHIP
PPSPSD	PLANT PROTECTION, SANITARY AND PHYTOSANITARY DEPARTMENT
SPS	SANITARY AND PHYTOSANITARY STANDARDS
STDF	STANDARDS AND TRADE DEVELOPMENT FACILITY
VIPO	VIET NAM PEPPER AND SPICE INTERNATIONAL OUTLOOK
VPSA	VIET NAM PEPPER AND SPICE ASSOCIATION
WASI	WESTERN HIGHLANDS AGRICULTURE AND FORESTRY SCIENCE INSTITUTE

1. EXECUTIVE SUMMARY

The STDF-funded project commenced on October 1, 2020, with an initial end date of September 30, 2023, but concluded on June 30, 2024, following a no-cost extension due to COVID-19 related delays.

The project aimed to improve food safety in the peppercorn industry by addressing product quality and market access issues. It focused on enhancing compliance with international standards, reducing microbial contaminants and pesticide residues, and building the capacity of smallholder farmers to produce high-quality, safe peppercorn. The project was led by the CAB International (CABI) as the implementation organisation with active involvement of country partners from public and private stakeholders across Viet Nam, Cambodia, and Lao PDR. Public stakeholders included Western Highlands Agriculture and Forestry Science Institute (WASI) in Viet Nam, who was the lead partner, the General Directorate of Agriculture (GDA) in Cambodia, and the Department of Agriculture in Lao PDR. Private sector participation included large peppercorn exporting companies: Simexco Co Ltd and Viet Pepper Co Ltd in Viet Nam, Etu Green Garden in Lao PDR, Sela Pepper Co Ltd in Cambodia, as well as various farmer groups and cooperatives across the three countries.

The project achieved significant results, starting with the development of a farm-village level Code of Practice (CoP) for pepper producers, collectors, and input providers. This CoP was based on existing national standards and harmonized regionally to address SPS issues in peppercorn production. Alongside the CoP, the project produced a range of knowledge products, including eight training modules on pepper cultivation and management, comprehensive factsheets on pests and diseases, a step-by-step handbook for Integrated Crop Management (ICM), a farmer diary for tracking daily activities, and a monitoring and evaluation (M&E) guide to assess the effectiveness of the implemented practices. The project successfully reached a total of 59 farmers, including 48 men and 11 women, with the Code of Practice, ensuring inclusive participation and knowledge dissemination across the peppercorn value chain.

To facilitate the adoption of the Code of Practice, a collaborative approach inspired by IFOAM's Participatory Guarantee System (PGS) was developed. This innovative method included a series of dialogues and workshops designed to address specific challenges in production and processing. Tools such as SWOT analysis, peer-to-peer learning, strategy sessions, and brainstorming were employed to foster collaboration among buyers, sellers, and public sector advisory/technical support.

Subsequent training emphasized setting criteria and inspection tools for peer-farm practice monitoring, electing group roles, and forming working groups. On-farm audits and crop calendar creation were conducted, along with training on record keeping. The success of the PGS approach was evident as farmers gained essential skills to work collaboratively in groups, negotiate effectively with buyers, and successfully signed contracts with national peppercorn exporters, ensuring better market access and fair pricing for their produce.

Although the approach followed the basic principles of PGS, necessary fundamental adaptations were made, leading to its renaming as the Grassroots Public-Private Partnerships (G-PPP). The G-PPP partnerships were instrumental in promoting acceptance and uptake of CoP compliance and ensuring the adoption of best practices in peppercorn production. This adaptation ensured that the approach was tailored to the specific needs and contexts of the peppercorn value chain in the participating countries.

Strategies for the wider roll-out of the PGS-based system and Code of Practice were identified, emphasizing strong relationships and information sharing among public-private partnerships (PPP). Successful PPPs facilitated scalability with other industry players and replication for other regions and commodities e.g. GIZ requested to utilise the project technical material for the EU-CAPSAFE in Cambodia, customizing them to meet their specific needs. The project also achieved significant cross-cutting impacts in gender inclusion, environmental sustainability, biodiversity, and climate change mitigation.

The project supported farmers to achieve significant improvements in financial returns, yields, and compliance with international standards. Notably, Cambodia reached a major milestone by exporting peppercorn to China, but further export is supported by a formal agreement between the Cambodian government and China to comply with SPS and regulatory measures. This initiative has strengthened Cambodia's peppercorn exports by providing a compliance guide, farm certification support, pest monitoring, and documentation training for stakeholders. The adoption of biocontrol methods significantly reduced pesticide uses and enhanced pest management. Quantitatively, the project recorded a 50% reduction in microbial contaminants and pesticide maximum residue limits (MRLs). For example, 100% of pepper samples from 10 participating farmers in Viet Nam met European export standards without any contamination or MRL issues, and there was a 12% reduction in rejections due to sanitary and phytosanitary (SPS) compliance. Additionally, peppercorn yields improved significantly across project sites.

The total project budget was USD 917,846 and included STDF contribution of USD 711,096 and other in-kind contribution of USD 206,750 by all project partners. By the end of the project, the budget was fully utilized to implement planned activities across the three countries. Some additional expenditures of USD 8,451 incurred during the no-cost extension period were absorbed as in-kind contributions by project partners to ensure the project's successful completion.

Communication and outreach efforts were robust, including the development of a project website, dissemination of materials, participation in events like the Viet Nam International Peppercorn Outlook (VIPO) in 2022 and 2024, and external engagements with key stakeholders and national programs. Three success stories were documented and published, showcasing the tangible benefits and learnings from the project.

Several challenges were encountered, including the initial impact of the COVID-19 pandemic, which necessitated remote project initiation. The pandemic underscored the importance of flexible project management and remote collaboration capabilities. Furthermore, the project highlighted the benefits of South-South collaboration, with significant knowledge and technology transfer between Viet Nam, Cambodia, and Lao PDR. This collaboration fostered a shared learning environment that enhanced capacity building across all participating countries.

The post-project sustainability plan focuses on continued training and capacity building in areas such as the CoP, supply chain and market dynamics, and strengthening institutional support for adopting and implementing CoP and G-PPP frameworks. It also emphasizes quality certification for exports and enhancing market linkages to ensure stable and profitable market access for farmers. Governments are encouraged to provide policy support to institutionalize CoP and G-PPP frameworks and to encourage financial institutions to offer tailored financial products to support farmers in adopting and maintaining these frameworks that help with Environmental, Social, and Governance (ESG) metrics and practices.

Key actionable recommendations include:

1. Collaboration between national governments and development organisations to implement the post-project sustainability plan with a focus on replicating and scaling within the peppercorn sector and other value chains. Provide policy support to institutionalise the COP and G-PPP frameworks for long-term sustainability. Evaluate the frameworks' potential to support smallholder farmers by reducing investment risks for financial institutions, thereby enhancing their participation and access to credit.
2. Strengthen South-South collaboration by sharing success stories from the project with relevant government institutes to influence regional and national policies that support collaboration (including funding mechanisms and exchange programs); and establish regional networks for regular communication and knowledge sharing.
3. Participating countries and export companies to develop approaches to enhance the capacity of organizations and institutes for effective framework delivery, ensuring sustainable adoption and integration within existing market systems.

4. Participating countries and export companies to promote continuous knowledge improvement through sound pest management, periodic CoP/GAP training including the use of hybrid e-learning mechanisms, while updating GAP and CoP interpretation guides incorporating the complexities of multi/intercropping systems.
5. Encourage company-farmer partnerships and promote farmer group registration to build a sustainable value chain, expand market reach, and facilitate wider adoption of GAP certification scheme

2. OVERVIEW

2.1 Project background and context

Spices, including peppercorn, are associated with complex and diverse supply chains with products being sourced from a variety of businesses ranging from large-scale producers to small-scale farmers from around the world. Following harvest, the product will often pass through many intermediaries from farmer, collector, to middleman before arrival at the processor/shipper. The aggregation and redistribution of the products at various stages along the supply chain contributes to a high food safety risk profile and vulnerability to a few food safety risks. These include excessive pesticide residue levels; pathogen contamination (i.e. Salmonella); adulteration and substitute. In Turkey, 3.3% of black peppercorn samples collected at retail in one study were contaminated with Salmonella (Hampikyan *et. al*., 2009), 18% in Brazil (Moreira *et. al*. 2009).

In a report published by FDA on pathogens and filth in spice, 6.7% of pepper shipments tested positive for Salmonella (FDA, 2017). Further, many spices are grown in developing countries, such as Viet Nam, by small-scale farmers under conditions where sanitation and food handling practices are sometimes inadequate exposing the product to dust, dirt, insects, and animal waste before and after harvest. Following harvest there are many opportunities for the introduction of pathogenic microorganisms and filth, during primary processing and storage.

Poor farming practices impact on the livelihoods of small-scale farmers in a number of ways, such as : (i) environment and health risks associated with the overuse of pesticides and fertilisers that pose a persistent threat; (ii) lost income resulting from threats to market access due to poor compliance of customer standards; and (iii) potential health risk to consumers (including farmers), particularly with spices such as peppercorn that are widely used in most savoury recipes. With respect to peppercorn production, risks relating to contamination and threats to productivity have been highlighted, particularly from imports into the EU and other global markets.

Based on the above background, and in the context of food safety, Viet Nam's peppercorn export industry was used to develop a code of practice that could be rolled out to other spice supply chains in the region, using a collaborative market systems approach. This regional approach was taken to include neighbouring countries such as Cambodia and Lao PDR as Viet Nam also sources a substantial amount of the production from these neighbouring countries.

The project is targeted at peppercorn supply chain destined for markets where there is increasing consumer concern. Improving the capacity of producers and traders to guarantee quality safe peppercorn that ultimately meets food safety and hygiene standards can help to boost exports, improve competitiveness and safeguard the spice industry's future. Improving food safety for exports is also expected to have a positive spillover effect on domestic public health as spices, including peppercorn, are widely consumed by the local population in these three countries.

2.2 SPS problem addressed by the project

Analysis of SPS issues in exported peppercorn suggested that all the main food safety and hygiene related non-compliances (i.e. high MRL, bacterial and physical contamination), result from either poor farm level decisions or handling practices. In all cases, food safety and hygiene non-compliances can be corrected with improved famer education and practical training, assuming a conducive environment can be created to encourage participants to adopt the improved practices. Further, analysis of the peppercorn value chain activities identified village level activities as the point of breakdown in SPS control. With respect to ensuring high levels of food safety and hygiene, it was noted that exporters and processors can control value chain participants post village level as demonstrated by some of the major firms in the target countries. However, the exporters and processors struggle to source sufficient volumes of high-quality raw material, despite having active farmer-led programmes in-place. Given the shortage of "clean" raw material, many of the local buyers (traders, processors exporters) are reluctant to differentiate on product quality, further disincentivizing adoption of quality production practices at the village level. Farmer reluctance to

implement quality systems such as good agricultural practices (GAP) and safe handling practices are, in part, due to the relatively high costs of such programmes in terms of implementation and maintaining certification. Farmers also find current options, such as national GAP, complicated to implement.

2.3 Approach taken by the project to address the problem

The project aimed to combat SPS issues related to food safety and improve the quality and traceability in the production, post-harvest, processing and trade of peppercorn. This was achieved by identifying, developing and disseminating good practices that focus on village level peppercorn production. A Code of Practice (CoP) was designed around the good agricultural practices (GAP) and codex standards and addressed identified key bottlenecks to food safety and hygiene control of peppercorn in the region. This CoP was followed by an Interpretation Guide to further explain the code and its implementation in the field. A group of national and international experts are involved to prepare and tailor these documents for the three project countries.

In addition to the CoP Interpretation Guide, various knowledge products were developed to support the implementation of best practices. Other materials such as farmer diaries, factsheets, compliance checklists, and handbooks were also developed to complement the CoP and provide practical guidance to farmers and stakeholders.

The project adopted a novel approach to facilitate the uptake of the CoP, fostering collaboration with different actors within the value chain and supporting function. The collaborative approach was inspired by IFOAMs Participatory Guarantee System (PGS), accommodating the unique challenges within a complex supply chain such as peppercorn. The approach selected builds social cohesion, peer-to-peer learning and awareness of responsibility towards the community.

The transition from PGS to Adapted-PGS and ultimately to G-PPP reflects an evolution in supporting smallholder farmers to adopt Good Agricultural Practices (GAP) standards. Through co-creation and collaboration, a five-step approach was developed to build trust, strengthen partnerships, and localize the implementation and monitoring of the Code of Practice (CoP). This approach ensured compliance with market SPS requirements while targeting specific quality and safety risks. As the model evolved during the project, it transitioned from PGS principles to Adapted-PGS, incorporating localized adjustments. By the project's conclusion, the model was renamed Grassroots Public-Private Partnerships (G-PPP) to reflect its scalability and adaptability across diverse supply chains and regions.

The collaborative efforts in this project resulted in a five-step approach that built trust, forged relationships, and empowered participants to localize the implementation, monitoring, and accountability of a Code of Practice (Figure 1). This approach specifically targeted the unique quality and safety risks while ensuring compliance with market SPS requirements.

Figure 1. A five-step approach for implementing an Adopted-PGS farmer group.

During the project, the model evolved from the original practices of PGS to Adapted-PGS, incorporating localized adjustments. During the end-project meeting held in Phnom Penh in May 2024, the model was renamed "Grassroots Public Private Partnerships", or G-PPP to reflect its scalability and adaptability across diverse supply chains and regions (Figure 2). To avoid confusion the term "G-PPP" has been used in this report.

Figure 2. The proposed logo for Grassroots Public Private Partnership (G-PPP).

The project addressed the fundamental question of "how to upgrade the basic level of safety and quality of peppercorn traded in regional markets". It is recognised that some exporters have implemented supplier control programmes. However, they still struggle with raw material supply as only a small proportion of their supply base within country is under such control and this excludes the substantial amount of pepper traded across borders. In that context, the project had pilot tested approaches to control peppercorn quality and safety so that a wider base of safe, traceable product can be created across the three countries.

A regional approach to support upgrading SPS quality of peppercorn was adopted through: (i) developing and promoting harmonized standards across the project countries as practical standard specific to peppercorn did not previously exist; (ii) leveraging WASI's position as leader in research on peppercorn production; and (iii) building on lessons learnt by Viet Nam in developing its peppercorn industry into a global leader. These project activities have strengthened linkages within the peppercorn sector across the region.

3. PROJECT IMPLEMENTATION

The STDF Safer Spices project (STDF/PG/619) was approved during the STDF Secretariat Working Group meeting from October 16-17, 2019, in Geneva. Notification of the approval was received by the project partners on November 17, 2019. Finally, the contract with CABI as implementing organisation of the project was signed on September 30, 2020. Implementation of project activities commenced on October 1, 2020, with an initial end date of September 30, 2023, but concluded on June 30, 2024, following a no-cost extension to accommodate delay in field activities mainly due to COVID-19 travel restrictions.

The project implementation involved a well-defined division of roles and responsibilities among various stakeholders. CABI, as the lead organization, was responsible for overall coordination, oversight, and reporting to STDF. Specific agreements and, in some cases, sub-contracts with detailed Terms of Reference (TORs) were developed and executed with country partners and in-country service providers.

In Viet Nam, the implementation of project activities was managed by WASI, which focused on local stakeholder engagement and reporting to CABI. In Cambodia, GDA was responsible for overseeing the project's activities, ensuring effective local engagement and regular updates to CABI. Similarly, in Lao PDR, DOA handled local implementation and communication with CABI.

Key consultants were contracted directly by CABI: Dr. Chris Oates as the International CoP expert and Mr. Grant Vinning as the International market system and PGS expert. Each were commissioned under fixed-term contracts to provide technical expertise and facilitate training sessions. Ms Mayu Ino, a National PGS expert based in Viet Nam was contracted directly by WASI. Industry partners such as Simexco and Vietpepper from Viet Nam, Sela Pepper from Cambodia, and Etu Green from Lao PDR were involved in the project along with 4 peppercorn farmer groups consisting of 59 farmers. These industry partners were not contracted formally by the project.

Additional relevant government agencies, such as the Extension and Plant Protection Departments, and National Associations like Viet Nam Pepper and Spice Association (VPSA), Kampot Pepper Promotion Association (KPPA), and Cambodia Pepper and Spice Federation (CPSF), along with international bodies and development agencies such as the Sustainable Trade Initiative (IDH) and the International Pepper Community (IPC), were also engaged at various stages of the project. IDH for example, was involved in the initial stages of CoP drafting, as many of the resource materials originated from their program "Sustainable Pepper Production in Vietnam", and it was therefore important to establish synergies, particularly in Viet Nam. All partners were kept informed about the project's progress and were invited to dissemination seminars when necessary.

Project management was structured at both the project and country levels (Figure 3). To ensure effective oversight and strategic direction, a Project Steering Committee was established. This committee comprised representatives from CABI, WASI (Viet Nam), GDA (Cambodia), DOA (Lao PDR), and STDF. The Steering Committee met annually to review project progress, provide strategic input, resolve issues, and plan for upcoming activities. The Project Management Unit (PMU) was led by CABI's Project Manager, supported by a Project Coordinator. The PMU played a crucial role in overseeing project progress, coordinating with country teams, in-country focal persons, farmer groups, and industry partners, and ensuring seamless communication and collaboration among all partners. The PMU was also supported by several international consultants on COP, PGS, Value Chain, Communication, etc., and worked with international bodies and private sectors. At the National Coordination Unit level, the National Project Coordinator led activities in each country, supported by a group of experts forming the National Working Group to prepare the COP. Additionally, a team of National Advisors, trained by the project, were involved in further training for local government staff, farmers, and company staff.

The project employed a comprehensive Monitoring and Evaluation (M&E) framework to track key indicators and assess progress. Regular monthly meetings were held to monitor progress, address challenges in activity implementation, and ensure proper budget utilization. These meetings also focused on planning upcoming activities and identifying additional support needs for specific countries among partners. Individual meetings with country partners and international consultants provided tailored support. Biannual reports from each country were compiled into a comprehensive project report and submitted to STDF, detailing achievements and addressing any challenges encountered. Reporting was also conducted via the STDF online portal, LogAlto.

Additionally, blogs and news updates on various project activities were collected from partners and posted on the project website to ensure effective communication and transparency. The participation in national and international expos and outlook by partners were aimed to enhance the wider advocacy and visibility of the project e.g. Cambodia Spice Outlook 2023, Viet Nam International Spice and Pepper Outlook 2022 and 2024. At the end of the project, Consultancy for Uplifting Sustainability Policies (CUSP), a consulting firm, was engaged to conduct the end of project assessment.

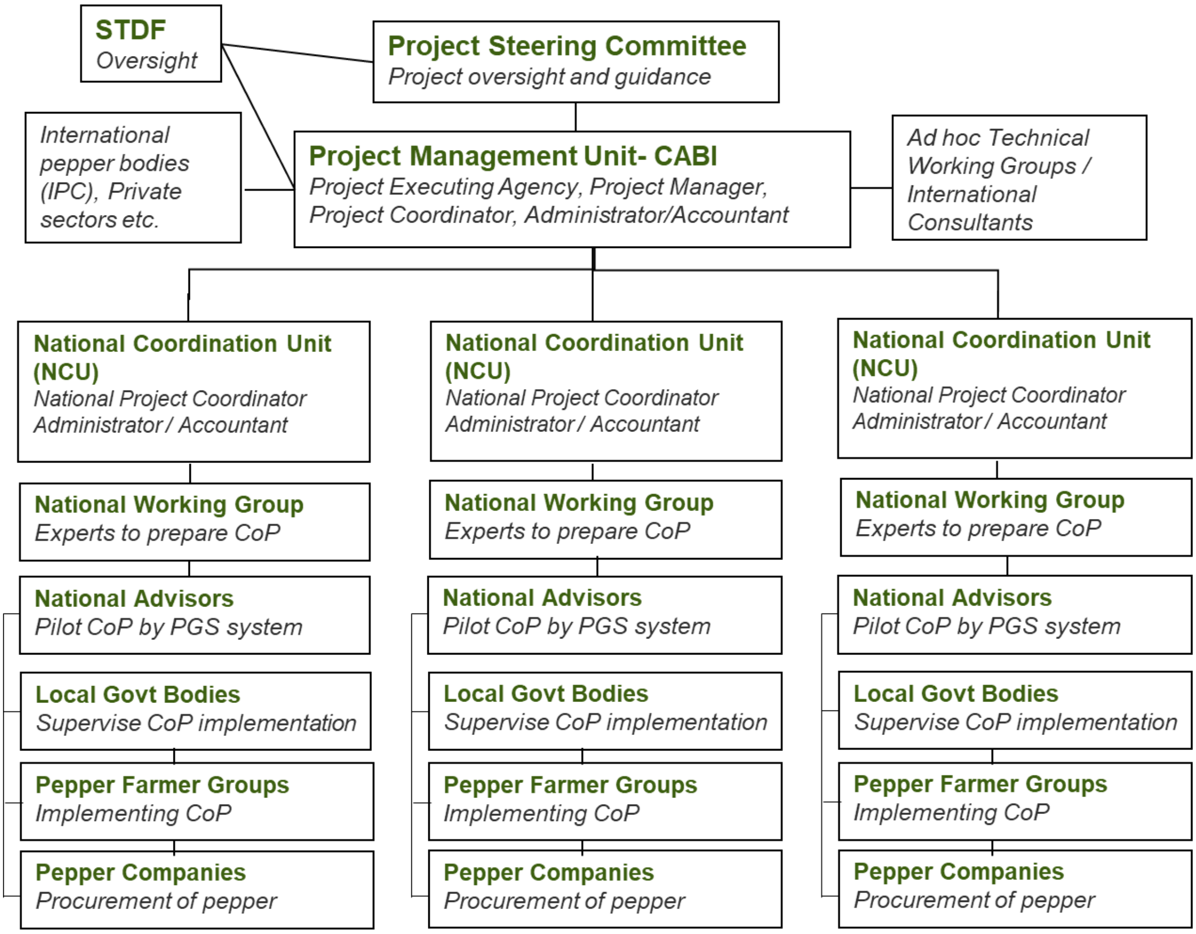


Figure 3. Project management and implementation framework.

4. ACHIEVEMENT OF RESULTS

4.1 Project goal and outcome level results

As stated in the project's Logframe (Annex 1), the project goal was to "Increased exports from project countries to premium markets (EU, Japan, US, Australia". The expected outcomes were: (1) Code of practice widely used by project beneficiaries and (2) PGS based system established and rolled out in three countries, (3) Strategies for roll-out of the CoP and PGS adopted by three countries.

During the 3.5-year project, these outcomes were achieved significantly leading to substantial improvements in value, productivity, safety, and market access for smallholder pepper growers and processors. Under Outcome-1, the implementation of the CoP by 10 smallholder farmers (30% women farmers) at their pepper production model farms in Viet Nam, with 100% of the pepper samples from participating farmers meeting European export standards. In Cambodia, 30 farmers (10% women farmers) adopted CoP on their farms, and according to Sela Pepper, there were no rejections of their produce. In Lao PDR, 19 farmers (26% women farmers) partially implemented the CoP at their model farms because of late start of CoP trainings, but their samples were not tested by the company as the produce was not exported.

Under Outcome-2, the successful establishment of safe pepper production models in Viet Nam showcased a viable strategy for broader adoption, while in Cambodia the project demonstrated a scalable approach with significant improvements in farming techniques and increased compliance with safety standards. In Lao PDR, the project surpassed initial goals by engaging 19 farmers instead of the expected 5 to 10. Through the G-PPP model, farmers were trained to make them able to connect with buyers and sellers, to follow checklist for self-monitoring peppercorn production, and improve quality.

Under Outcome-3, Vietnamese farmers like On Thanh Hoa and Nguyen Van Tien reported reducing pesticide use from 10 bottles per season to two, achieving a 30% cost reduction. Effective weed management techniques became widespread, and the understanding of proper pesticide use improved significantly from 40% to 70-80%. In addition to cost savings, this proper use has contributed to improved soil health, reduced environmental contamination, safer working conditions for farmers, and enhancing the marketability of their produce due to compliance with food safety standards. The adoption of cover crops by the Cambodian farmers increased from 40% to 90%, and efficient water management systems were implemented by 60% of farmers for enhanced soil fertility, reduced erosion, and improved water-use efficiency, aligning with the project's goals of promoting sustainable agricultural practices and ensuring long-term productivity and resilience in peppercorn farming.

Overall, the outcomes of the project underscored the effectiveness of the CoP and the project's substantial positive impact on the peppercorn industry across the participating countries. The project's success demonstrated that the collaborative approach of the G-PPP model could lead to significant improvements in value, productivity, safety, and market access for smallholder pepper growers and processors.

The above outcomes were achieved based on the following outputs-based activities:

4.2 Output 1: Farm-village level pepper producer, collector and input provider code of practice developed based on existing national good practice standards and harmonized regionally

4.2.1 Activity 1.1. Prepare appropriate CoP

A generic Code of Practice (CoP) was produced around Codex and Good Agricultural Practices (GAP) standards to help address the SPS issues identified around peppercorn. The initiative engaged multidisciplinary teams, including National Working Groups (NWGs) and experts from the public and

private sectors, in its development. This collaborative effort involved a series of activities such as desk reviews of 41 existing material, drafting, reviewing, prioritizing and finalizing the Generic COP document with the relevant project partners.

4.2.2 Activity 1.2. Tailor CoP to meet local conditions, requirements and cultural norms

Once the Generic CoP was complete, the CoP was tailored to national needs and guidelines were developed to suit specific country contexts through the development of Country-specific Interpretation Guides. These included the creation of interpretation sheets for a set of codes and the customization of guides to address various aspects of peppercorn production. The interpretation sheets were then compiled into an Interpretation Guide (Figure 4), which comprised of 10 main chapters. The documents were shared with countries to validate content with local partners and translate into respective local languages to ensure usability, accessibility and relevance.

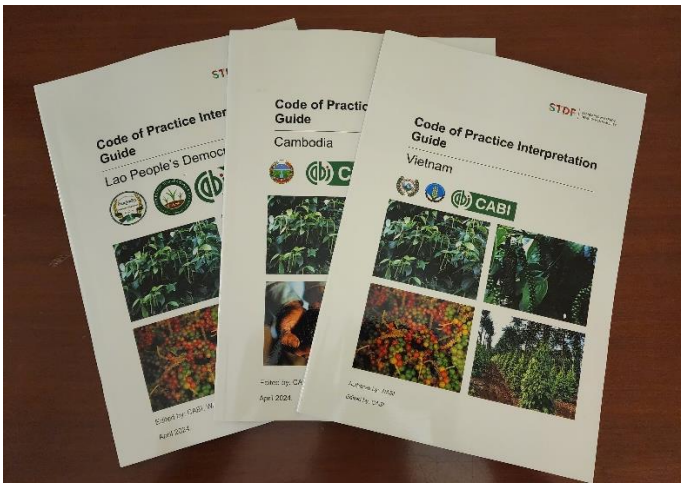


Figure 4. Interpretation Guides developed for peppercorn. (Source: https://saferspice.org/KnowledgeHub.asp)

4.2.3 Activity 1.3. Develop knowledge resources

To complement the interpretation guide, extensive knowledge resources were developed to support the implementation of the recommendations. In total, 53 different knowledge products were created and translated into local languages, see table below

Table 1. Knowledge products developed by countries.

Type	Detail	Viet Nam	Cambodia	Lao PDR
Training Material	Modules for all sections of code	8	8	8
Factsheets	Pest guides	8	7	
	GAP	4		4
Handbook	ICM step by step guide	1		
Farmer Diary	Record keeping	1		1
M&E guide	Guide for partners to monitor	1	1	
Other	National legal requirements for formation of farmer groups (PGS)			1
Total		**23**	**16**	**14**

Additionally, CABI created the G-PPP step-by-step guide and combined the CoP codes with the interpretation guide into a single document for easy reference. For a detailed list of these resources, please refer to Annex-2.

The COP training material was developed and divided into eight (8) training modules i.e.

1. Module 1: Management of black pepper variety,
2. Module 2: Management of new planting and rejuvenation,
3. Module 3: Nutrition management for black pepper,
4. Module 4: Irrigation management for black pepper,
5. Module 5: Management of pruning to create canopy,
6. Module 6: Weed and intercropping management in the black pepper garden,
7. Module 7: Pest and disease management for black pepper, and
8. Module 8: Management of harvesting and pre-processing and preservation.

4.2.4 Activity 1.4. Develop an electronic resource for all information materials

A Peppercorn Knowledge Base User-Experience workshop was conducted to guide the development of the knowledge hub section of the project website. This session focused on identifying the needs of extension and plant health advisors, who were identified as the primary user group. . Participants collaboratively listed key questions, assumptions, and required research and actions to ensure the electronic resource would be practical and user-focused. It was concluded that extension and plant health advisors should be the primary focus in developing the electronic resource.

Based on the user-experience workshop, a project website (https://www.saferspice.org) was developed to provide updates on project activities and progress, and an information repository for materials generated by the project. The website includes sections on the project's background, objectives, outputs related to the CoP, A-PGS model, and the Knowledge Hub repository (Table 2). The repository specifically housed the Code of Practice (CoP) interpretation guides for all three countries, A-PGS guide, factsheets on pests and diseases and other additional resources including booklet, success stories etc. These resources are accessible to peppercorn value chain participants and other stakeholders involved in international peppercorn trade. A search function was developed for users to locate specific sections of the CoP by country, and a country-specific headings link was provided for ease of reference.

Key pests and diseases of peppercorn, along with non-chemical management control information, were made available as reference materials to support pest and disease management in the three countries. Interviews with local stakeholders on PGS and CoP training were also made available to serve as case studies, showcasing the impact of these activities on pepper farmers.

Table 2. Project website sections including knowledge hub platform.

	Sections	Remarks
1.	Background	Project background
2.	Objective	Objectives of the project
3.	Knowledge Resources	Knowledge hub, CoP, PGS model description - CoP search tool (country, heading) - CoP heading list - Interpretation guide downloads - Concise factsheets for key pest and disease of pepper - Short interview sessions on PGS and CoP trainings
4.	Contact	Website contact details
5.	Activities	Project activities (46 project activity updates available)
6.	Downloads	Project documentation (30 documents downloaded)
7.	Search	Site search tool

4.2.5 Activity 1.5. Knowledge sharing with peppercorn value chain participants

Knowledge sharing among project partners in Viet Nam, Cambodia, and Lao PDR has been crucial in harmonizing practices and elevating the overall standards of peppercorn production across the region. By facilitating the exchange of information and best practices, the project has enabled stakeholders to learn from each other's experiences and challenges. This collaborative approach has led to the development and adoption of more effective and sustainable farming techniques, which in turn has improved the quality and safety of peppercorn produced in all three countries. This cross-border learning has also fostered a sense of community among farmers, agronomists, and industry partners, encouraging them to work together towards common goals.

Meetings were held with national stakeholders in each country to raise awareness about the CoP developed in this project. In December 2022, CoP training of trainer sessions were conducted in Cambodia and Lao PDR, led by WASI experts, with 10 participants (6 men and 4 women) in Cambodia and 15 participants (11 men and 4 women) in Lao PDR The trainings focused on integrated crop management (ICM) for black pepper, covering essential topics such as new planting, nutrient management, weed and intercropping management, and integrated pests and diseases management.

Additionally, a Peppercorn Harvest and Post-Harvest Management Training Workshop was held on March 9, 2023, via Zoom, led by WASI experts with 12 participants (8 men and 4 women) from Cambodia, Lao PDR and CABI. This workshop included sections on harvesting pepper fruits, post-harvest processing, peppercorn storage, and strategies to avoid chemical, biochemical, and physical hazards.

To further enhance the capacity for effective peppercorn production and management, WASI also shared a farmer's diary document and guidelines for compliance criteria, inspection, and monitoring tools with both Lao PDR and Cambodia. Sharing this knowledge has promoted the standardization of practices and compliance with international food safety standards, making it easier for peppercorn producers to meet export requirements. These collaborative efforts have strengthened the value chain by connecting producers with buyers and other key stakeholders, as seen in Vietnam and Cambodia, where farmers successfully signed contracts with national exporters such as Simexco Co. Ltd. and Sela Pepper, respectively. This network of support has not only increased the financial returns for smallholder farmers but also enhanced their capacity to produce high-quality peppercorn that meets global market demands. For example, 30 farmers in Cambodia and 10 in Vietnam, who adopted the CoP reported no rejection of their produce, demonstrating the effectiveness of these interventions. The project also created new market opportunities by linking smallholder farmers with buyers, including international export companies, through public-private partnerships. This strengthened value chain network—comprising farmers, buyers, extension advisors, and public-sector stakeholders—enhanced coordination and knowledge sharing. These collaborations increased financial returns for over 59 participating farmers, improved their negotiation skills, and empowered them to produce high-quality peppercorn that meets global market demands.

In addition, as part of the knowledge sharing initiative, one online and three face-to-face Project Steering Committee (PSC) meetings were organized that served as a platform to share experiences from each country on best practices and sub-regional experiences to learn from others, viz., private sector based, to adopt such best practices in the project countries. For example, during the PSC meetings, the Viet Nam team exchanged knowledge and their experiences in peppercorn cultivation with Cambodia and Lao PDR. In addition, information regarding the structure of the peppercorn value chain between Viet Nam, Lao PDR, and Cambodia was also shared during these meeting exchanges.

4.2.6 Activity 1.6. Knowledge sharing with stakeholders involved in peppercorn international trade

A workshop titled "Knowledge Sharing Workshop on the Protocol for Phytosanitary Requirements for Peppercorn Exports from Cambodia to China" was held in Mondulkiri Province, Cambodia, from March

2nd to 4th, 2023. Organized by the Plant Protection Sanitary and Phytosanitary Department (PPSPSD) under the General Directorate of Agriculture (GDA), the event attracted 56 participants, including 44 men and 12 women from local public, private and development sectors stakeholders i.e. GIZ, Fuch Cambodia etc. The workshop aimed to enhance the knowledge of growers, producers, processors, exporters, PDAFF officers, and other relevant agricultural stakeholders regarding the specific requirements for exporting peppercorns from Cambodia to China. Furthermore, it provided critical information to ensure Cambodian peppercorn production complies with international food safety standards, particularly for high-value markets such as the EU, USA, and Japan. This initiative is crucial for restoring the food manufacturing industry's confidence in peppercorn sourced from Cambodia and the broader region.

Additionally, the Cambodian project team participated in the Cambodia Pepper Outlook in December 2022, sharing insights on the Code of Practice (CoP) and phytosanitary requirements. The Cambodian Project Coordinator also served as a panellist in a workshop organized by the Cambodia Pepper and Spice Federation, focusing on trade facilitation and market development for Cambodian pepper. The Cambodia Pepper Outlook brought together local stakeholders, government representatives, smallholder farmers, agricultural associations, cooperatives, and international experts.

The WASI team from Viet Nam participated in the IDH project end meeting on "Scaling sustainable production and trade of Viet Nam pepper" in November 2023 and joined the discussion on the challenges and opportunities in sustainable production and trade of pepper. The Viet Nam Project National Coordinator was invited to the Preliminary meeting of the PPP Task Force on Pepper and Spices 2023, held by VPSA, IDH, and PPD to understand the import tolerance of Vietnamese pepper exported to the US market., It also reviewed the activities and results of the public sector and PPD task force in developing the pepper industry in 2023. This engagement aligned with the project's efforts to promote public-private partnerships (PPP) by leveraging synergies with IDH's PPP initiatives. Both PPP frameworks share a common goal of fostering collaboration between stakeholders to enhance compliance with international standards, strengthen market linkages, and support sustainable pepper production. Participation in this meeting allowed the project to align its strategies with broader industry efforts and ensure coherence in supporting the Vietnamese pepper sector.

For awareness raising, the CABI project coordinator participated in the Conference on the *Viet Nam International Pepper Outlook 2022* (VIPO 2022) in Viet Nam from Nov. 9-11,2022. About 200 participants consisted of retailers, exporters, importers, processors, ministers, NGOs, farmers and bankers. During the conference, the project brief (about 200 copies) was distributed to several pepper industry players and participants. etc.

Table 3. Knowledge sharing sessions with peppercorn stakeholders

	Project Team	Activity / Event
1.	Cambodia team	Knowledge Sharing Workshop on the Protocol for Phytosanitary Requirements for Peppercorn Exports from Cambodia to China held in Mondulkiri Province, Cambodia
2.	Cambodia team	Panel discussion in The Cambodia Pepper Outlook
3.	Viet Nam team	Inception workshop of IDH pepper project
4.	Viet Nam team	Consultation conference of IDH, VPA pepper project
5.	Viet Nam team	Project closing meeting "Scaling sustainable production and trade of Vietnamese pepper" of IDH, VPA pepper project
6.	CABI team	Viet Nam International Pepper Outlook 2022
7.	CABI and Lao team	Viet Nam International Pepper Outlook 2024

4.3 Output 2. Code of Practice pilot tested and a PGS based system developed for the pepper sector

Smallholder farmers encounter numerous obstacles in adopting Good Agricultural Practices (GAP) standards; compliance criteria are often generic and sometimes may contradict local knowledge and practices. The purpose of output 2 was to pilot a collaborative approach that would support the adoption of GAP standards by smallholder farmers, using the CoP created in the project as a case study. The G-PPP approach, evolving from PGS, was co-created to help smallholder farmers adopt GAP standards by addressing local challenges and aligning practices with market SPS requirements.

4.3.1 Activity 2.1. Undertake market to farmer visits/dialogues and farmer to market visits/dialogue; based on shared learning strategies

In 2021, PGS experts, in collaboration with local partners, initiated a comprehensive value chain analysis. This endeavour began with engaging in meaningful dialogues with stakeholders identified during the PPG scoping study. The insights gleaned from these conversations enriched our understanding of the value chain in each country, facilitated the onboarding of participants, and provided the initial level of training for our partners. Many of these partners had limited prior experience with value chain analysis and direct engagement with private sector companies.

In total, four organisations, seven different government departments, 13 farmer groups and six processing/trading companies were consulted in three countries (Figure 5).

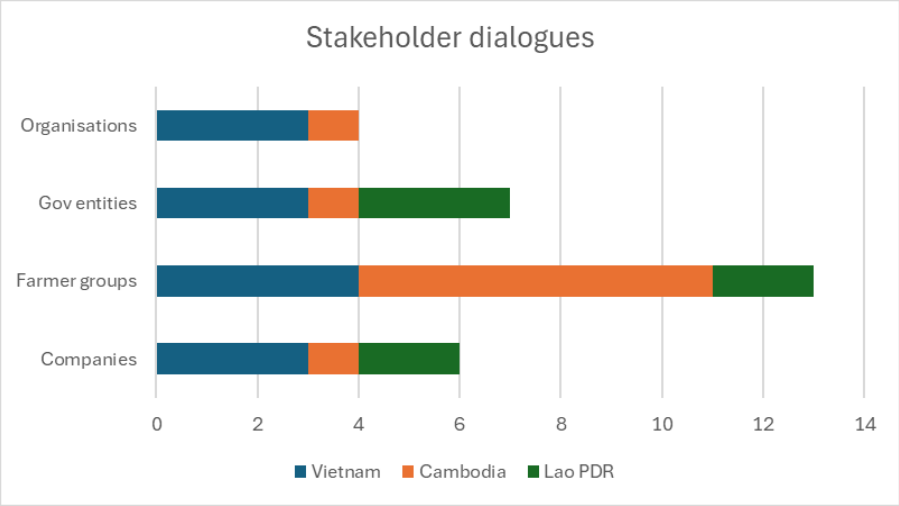


Figure 5. Details on the stakeholder dialogues in three countries.

Viet Nam key insights

- In Viet Nam, the peppercorn industry comprises both large and small businesses. The majority of peppercorn is exported as "industrial" peppercorns, with farmers primarily supplying the raw ingredient for manufacturing. Only a few companies market their own branded products, so the quality of the product does not pose a direct reputational risk. This factor proved crucial in gaining support for the idea of collaborating directly with the supply base from companies.
- Many companies in Viet Nam, including Simexco Co. Ltd. and Harris Freeman organise farmers into clusters to facilitate training and collection of products but contract the farmers individually. Farmers typically were not part of a cooperative.
- Viet Pepper Co. Ltd. is a company that markets peppercorn under its own brand. They produce both organic and conventional peppercorn, with a desire to expand their organic market. Although they work closely with their organic farmers, their number is limited. Eager

to broaden the scope and scale of their supply base, Viet Pepper Co. Ltd. enthusiastically participated in the project to explore novel approaches to facilitate their ambitious growth plans.

Cambodia key insights

- The team engaged in dialogue with Kampot Peppercorn Association. leveraging the market advantage of GIS status of Kampot Peppercorn. The association expressed satisfaction with their established quality control measures and strong market position, and therefore they decided not to pursue active participation in the project.
- Sela Pepper Co. Ltd. who had expressed a willingness to participate during the scoping study, shared additional information both about their company and the specific challenges faced working with their farmer groups. The same concerns raised by Sela company were echoed by the farmers: lack of organisation and management skills, and limited knowledge. Sela Pepper Co. Ltd. mainly market using their own brand.
- Heks eper had originally established the groups as part of an initiative to establish an organic peppercorn market. The farmers were no longer growing organic peppercorn but had retained many of the skills and infrastructure gained from that project. This provided a good foundation to build on and they became project's "willing" buyer and "willing sellers".

Lao PDR key insights

- Covid-19 had a massive impact on the peppercorn industry. The country only opened its borders in May 2022. Many of the farmers growing peppercorn were originally from Viet Nam, when the borders closed, they returned to their home country.
- The Bolaven Plateau is the main production area for pepper in Lao PDR, benefiting from its volcanic soil, which is ideal for cultivation and particularly prized for producing high-end red pepper. However, the harvesting and processing of red pepper present significant challenges for industry actors, impacting scalability and market supply. Mai Savannah Lao are a prime producer and exporter, trading under Bolaven Pepper brand. They focus on their own production (10ha planted in the last 5 years) after failing to attain the right quality from smallholder farmers. The majority of peppercorn is grown in gardens for home consumption.
- Etu Green Gardens was a small business initially growing and processing their own produce and selling at the side of the road. The owner was keen to promote agroecological practices and expand their business and involve the local farmers increasing their income opportunities. Most of their nearby farmers grew peppercorn for local consumption.
- The engagement of farmers by companies was also impeded by the chain of decision making required to get the right permissions. This provided an opportunity for the project to demonstrate the potential for collaboration between their government departments, alongside collaboration with buyers and sellers.

The approaches utilized in this activity laid the foundation for the Discovery phase in the developed model. Teams were trained to gather comprehensive information and insights from the industry, as well as specific data on the selected buyers and sellers. This dual-focus approach ensured a thorough understanding and effective engagement with key stakeholders.

Once the study was complete, companies (buyers) and farmers (sellers) were invited to join a workshop to explore the benefits of working together and participating in the project. This formed part of Step 2 in the model: Getting Buy-in. Ms. Soumaly, Etu Green Garden Director, in Lao PDR highlighted, "The G-PPP brings farmers together to teach and learn from one another, to share good practices and to learn lessons from each other's experiences". Taim Roset, a 59-years old Cambodian farmer with 9 years of experience in peppercorn said that "this project helped me build good relationship with other farmers, Sela Pepper company, and assisted me to increase my income".

Table below shows the participants who joined the project.

Table 4. Details of participants who joined the project in three countries.

Country	Companies	Farmers	Location
Viet Nam	Viet Pepper Co Ltd	1 group n=5	Vung Tau Ba Ria
	Simexco Co Ltd	1 group n = 5	Dak Lak
Cambodia	Sela Pepper Co Ltd	1 group n = 30 (comprising of representatives from three farmer Associations)	Memot
Lao PDR	Etu Green Gardens	1 group n = 19	Champassak

4.3.2 Activity 2.2: Undertake facilitated market and grower dialogues to establish quality and supply criteria based on code of practice

This activity was embedded in the tasks linked to the workshops in activity 2.3. Below highlights on action taken specifically on refining the CoP and establishing agreements between stakeholders.

4.3.2.1 Establishing agreements for ways of working

This activity formed part of Step Three: Forming a group. The approach was different in all three countries recognising the different legal structures and attitudes about forming a group. Cambodia was the only country partner that had Farmer Associations established for us to build on. For example, Sela Pepper Co. Ltd. was working with six farmer associations set up as part of a previous initiative by Heks eper. The group decided to work initially with three of those farmer groups and then expand once the systems had been tried and tested.

For Viet Nam and Lao PDR, groups needed to be established. In Viet Nam, these were established by WASI, and in Lao, by Etu Green Gardens following consultation and agreement from the district, provincial and national government bodies.

Each group comprised of "support" National and/or local government extension, "buyer", and representatives of the farmers or "sellers". Each group decided on their own set of rules and regulations for the members to adhere to, following guidance from the market system experts. Agreements were drawn up. In Cambodia and Viet Nam, this was an informal agreement defined and endorsed by those members involved. In February 2024, the "Commercial Growing and Processing Pepper Group" was officially launched in Lao PDR, endorsed by the National Government as the country's first peppercorn producer group, marking the culmination of the project's collaborative efforts in coordinating meetings and briefings with farmers and government stakeholders at all levels, effectively gaining their support and approval.

4.3.2.2 Informing Code of practice criteria

This activity was completed as part of Step Four: Reporting and Monitoring. A key aspect of the developed approach was to empower buyers and sellers to define and prioritize risk areas in the CoP that directly impacted their operations. By creating a checklist and auditing protocol around these risk areas, based on diverse perspectives, we strengthened the understanding of these risks and enhanced the motivation to adopt practices that mitigate them.

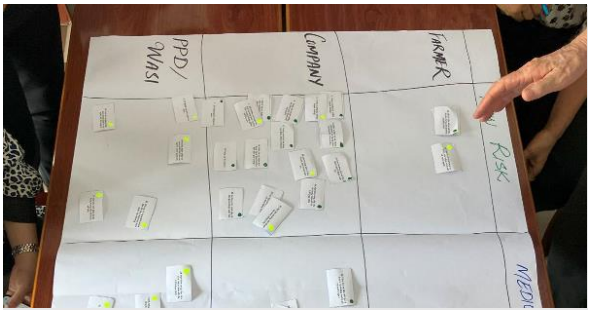


Figure 6. Card game developed to explore perception of risk based on content of CoP

This exercise also helped identify risks that had not been previously identified. In Cambodia, for example, chickens are a common feature in the peppercorn gardens. Farmers learnt from the processors perspective that this creates a high risk of contamination. It was agreed that the chickens stayed in the field until two weeks before harvest and returned once harvesting was complete. This criterion was added to the checklist and incorporated into the Code.

Additional insights from the dialogues in activity 2.1 further refined criteria in the CoP. In Cambodia, a conversation with World Wildlife Fund highlighted the urgency in addressing the issue of using wooden poles in peppercorn production. Key criteria were identified that linked with environmental stewardship within the Code. The importance of using alternatives, such as living trees as support, were actively promoted both in CoP training sessions and during peer-to-peer learning sessions to reinforce messaging.

4.3.3 Activity 2.3. Conduct PGS-linked training workshops

Throughout the project, various activities were conducted to address opportunities and challenges in peppercorn production. The course content evolved through integrating different models and learnings from each session into a comprehensive guide.

In May 2022, workshops in Viet Nam and Cambodia focused on reviewing online lessons, training Plant Protection Department staff, and conducting field visits. By August 2022, a workshop in Cambodia involved farmers and stakeholders in field visits, SWOT analyses, and strategy sessions. In October 2022, in-depth PGS training was conducted in Viet Nam, including vision exercises and guidance on managing group meetings.

Early 2023 saw further training in Cambodia and Lao PDR, focusing on peer-farm practice monitoring, group role elections, and intergroup formation (Figure 7). April 2023 included on-farm audits and training on record keeping. August 2023 workshops emphasized reporting, monitoring, and internal inspections. By late 2023, workshops developed on-farm auditing, peer learning, and finalized group regulations.

Figure 7. Farmers discussion on production practices in Memot, Cambodia (right), Lao PDR workshop participants drawing a shared vision (left).

4.3.4 Activity 2.4. Build Capacity of advisors

The project was launched during Covid-19 lockdown, and this restricted travel to deliver preliminary training to prepare the country partners for the tasks to be undertaken as part of this activity. Despite the challenges, training was later provided to the country partners in both CoP and G-PPP related activities.

4.3.4.1 Building capacity in CoP training and advisory

CoP Training of Trainers (ToT) was conducted for the advisory staff of GDA in Cambodia and DOA in Lao PDR by WASI experts on new planting, nutrient, weed and intercropping management, and integrated pests and diseases management in 2022, and harvest and post-harvest management in 2023. WASI experts also conducted ToT sessions for 3 WASI, 4 PPD Xuyen Moc and 3 technical staffs of 2 companies.

The trained staff of each country further organised CoP training sessions to complete all 8 training modules for their farmer groups and company staff based on the crop stages in all three countries (see details in Annex 3, Figure 8).

Figure 8. Code of Practice (CoP) training activities in countries i.e. in Cambodia (top right and left), in Lao PDR (bottom left), in Viet Nam (bottom right).

4.3.4.2 Building capacity in supporting G-PPP related activities.

To address challenges posed by the Covid-19 lockdown in November and December 2021, a PGS champion online training course was developed using CABI Academy's e-learning platform for participants from three country partners. Follow-up Zoom sessions were conducted to review learning and discuss specific topics. These sessions introduced the principles of IFOAM's PGS and included case studies illustrating successful adoption of this approach.

In May 2022, in-person workshops were successfully held in Viet Nam and Cambodia, followed by sessions in Lao PDR in March 2023. These workshops were designed to train both country partners and participants simultaneously, using participant sessions as demonstrations and practice opportunities.

Responding to a specific request from GDA to enhance the skills of their entire team, a tailored course was created to strengthen their capabilities as trainers and facilitators. These sessions were aligned with planned field workshops in Memot. In Cambodia, seven GDA staff members received certificates upon completing Adapted-PGS training. Elements of this training were subsequently implemented in Viet Nam. Due to logistical constraints, the decision was made to not deliver the training in Lao PDR, focusing instead on addressing initial challenges in establishing the group. Later, these trainings were completed in Lao PDR. The detail of key persons involved in the project from the implementing organization, other partners, beneficiary organizations were given in Annex 4.

Furthermore, advisory staff and Adapted-PGS champions conducted trainings in the field with farmer groups and pepper companies involving 13 participants in Vietnam, 38 participants in Cambodia, and 25 participants in Lao PDR. CABI experts and international PGS experts collaborated to create essential documents for Adapted- PGS implementation, including the agreement document, rules and regulations, and the Farmer-led field checklist (See Annex 5, Figure 9).

Figure 9. PGS trainings activities in countries i.e. in Cambodia (top right and left), in Viet Nam (bottom left), in Lao PDR (bottom right).

4.3.5 Activity 2.5. Support pilot trial participants to implement the Code of Practice

In Cambodia, the GDA organized a training to monitor and support PGS farmers in Memot district from September 26th to 28th, 2023. This activity involved inspecting PGS peppercorn farms on how CoP works and improving production practices at different peppercorn growth stages. It also inspected how farmers keep their records. The GDA team recommended that the overall leader of the intergroup will keep in touch with other leaders (inspection, technical, and planning etc.) and PGS members to share knowledge and skills from farmer to farmer, advised farmers to inspect their peppercorn farms regularly, use natural pesticides, conserve beneficial insects to reduce expenses, and maintain a low maximum residue level in peppercorns. The GDA team ensured their support to PGS farmers through technical knowledge, including pests and disease management, fertilizer application, post-harvest handling, and other good agricultural practices.

In Viet Nam, a regular monitoring and support system has already been implemented by the advisory experts on a monthly/bi-monthly basis.

In Lao PDR, CABI experts, in coordination with DOA Lao PDR, held a few meetings with local authorities, Provincial and District Agriculture and Forestry Office (PAFO and DAFO) to establish the PGS farmer group and link them with market buyers, such as Etu Green. They were also invited to the PGS workshop to provide an introduction about PGS, its 5-step process, intergroup formation, etc. DAFO at the district level can support Etu Green and farmer groups in setting up the PGS group and processing approval for the official "Commercial Pepper growing and processing group" (CGP). All possible efforts were made by CABI, DOA, and farmers to convince the DAFO and PAFO so that they can approve the first Commercial Pepper growing and processing group in the Champassak province, which spans 20 farmer members from 5 villages. The necessary documentation was submitted and officially approved.

4.4 Output 3: Strategies for wider rollout of the PGS based system and code of conduct identified

4.4.1 Activity 3.1. Document success stories

During the second PSC meeting in Viet Nam in October 2022, CABI and the WASI team facilitated an STDF communication expert to record farmer interviews from the Dak Lak PGS group and other stakeholders, aiming to develop a success story on their linkages for quality produce and the market for their peppercorn. This initiative was undertaken by STDF for editing and publishing. However, the video story could not be finalized due to poor picture quality.

The CABI team discussed with country partners for planned interviews with project stakeholders in the three project countries; questionnaires for success story interviews were finalized for project stakeholders such as: farmers, company and country partners. Interviews from 20 project stakeholders were completed for Viet Nam, Cambodia and Lao PDR, while translation and transcribing of audio recordings are being carried out by the Project Coordinator and national teams.

Based on the interviews, three success stories were published to cover key aspects of the project and showcased its success through stories from the three countries: Stories from Cambodia and Lao PDR were on Grassroots – Public Private Partnerships (G-PPP), Viet Nam on design and implementation of the CoP and interpretation guides; and an overall project success story covering both CoP and PPP. The success stories highlighted key reflections from participants of the projects, sharing their experience in their own words (see Annex 6 for final stories).

4.4.2 Activity 3.2. Assessment of the suitability of the CoP, PGS, supporting documents and training material and identify roll out strategies

An assessment study was initiated to evaluate the suitability of Codes of Practice (CoP), Adapted-PGS, G-PPP, training materials, and other project components among selected respondents. The results are based on various studies conducted across the project countries, including inspection and monitoring visits, training feedback, and interviews to record success stories. The findings are categorized into five main sections, detailed below. The detailed reports of Cambodia, Lao PDR and Viet Nam are attached as Annex 7.

4.4.2.1 Usefulness of the Code and Suggestions for Improvement:

The Code of Practice (CoP) has proven to be a valuable tool in Viet Nam, Cambodia, and Lao PDR, enabling farmers to manage their farms more efficiently, improve farming practices, and ensure the production of high-quality, safe peppercorns. In Viet Nam, the CoP implementation resulted in the establishment of 10 safe pepper model farms, with 100% of the pepper samples from 10 participating farmers meeting European export standards. In Cambodia, 30 farmers significantly enhanced their practices following CoP training, with the adoption of cover crops increasing from 40% to 90% and efficient water management systems from 60% to 100%. In Lao PDR, the CoP facilitated extensive knowledge sharing and capacity building among farmers, with participation of 19 farmers exceeding initial expectations of 10 farmers. However, farmers also identified time and resource constraints, as well as other responsibilities, as major challenges in fully applying the CoP.

Suggestions for Improvement:

- Further refinement of the CoP to incorporate more localized practices and conditions could enhance its applicability and effectiveness, particularly by addressing nuances such as intercropping practices and geographical variations within each country.
- The CoP guidelines must simplify and offer additional support through hands-on practices, such as practical demonstrations of pest management techniques, fertilizer application or composting etc.
- Regular updates and revisions based on feedback from farmers and other stakeholders are essential to keep the CoP relevant and practical.

4.4.2.2 Suitability of the Code for Food Safety and Product Quality:

The results of farmers adopting the CoP has demonstrated its suitability as a tool to ensuring food safety and high product quality. Viet Pepper agreed that the CoPs assisted local farmers produce peppercorn that meets international export requirements. Cambodian farmers improved their pest and disease control knowledge, leading to high-quality peppercorns that passed laboratory tests with no rejections. Significantly, the Sela Pepper company reported that farmers produced better quality peppercorn and reduced issues with foreign matters and pesticide residues in Cambodia. In Lao PDR, the CoP facilitated the production of peppercorns according to market demands, enhancing both volume and quality.

4.4.2.3 Benefits and Disadvantages for Participants:

Remarkably, farmers agreed on both the advantages and disadvantages that occur from the peppercorn project in all three countries.

Benefits:

- Farmers reported that their current peppercorn crops are healthier and yield better prices. For instance, farmers saw an increase in income after selling their products to companies like Simexco in Viet Nam and Sela Pepper in Cambodia.
- In Viet Nam, farmers such as On Thanh Hoa and Nguyen Van Tien reported cost savings by reducing pesticide use from 10 bottles per season to two, resulting in a 30% cost reduction.

- In Cambodia, farmers experienced a 10% increase in yield and a 30% increase in income. Companies like Sela Pepper noted a decrease in rejection rates from 7-10% to 1.5-2%.
- In Lao PDR, the project enabled farmers to produce peppercorns that met international market standards, thereby enhancing their income and market access.

Disadvantages:

- The initial steep learning curve and adaptation period for farmers new to the CoP and G-PPP approach could be challenging.
- Some farmers may require additional support and resources to fully implement the recommended practices.
- Some processors maintain purely transactional relationships with their supply base, relying heavily on collectors and traders. This can result in a reluctance to invest time in working directly with farmers to improve practices. However, support from buyers and access to reliable information play a pivotal role for enhancing quality from smallholders. The project's approach hinges on the collaboration of willing buyers, sellers, and support networks to achieve successful outcomes.

4.4.3 Activity 3.3. Dissemination seminar for pepper industry stakeholders & donor representatives

The project participated in the Viet Nam Pepper and Spice International Outlook (VIPO) conference in 2022 and 2024 to showcase STDF Safer Spice project activities. Cambodia also organized a seminar on Cambodian pepper export to China, and the project team met with the Viet Nam Pepper and Spice Association (VPSA) to update them on the latest project progress.

In Cambodia, the GDA team organized a dissemination seminar for stakeholders in the pepper industry on April 22-23, 2024, at Sunway Hotel. Attendees included representatives from the Cambodia Pepper Association, Sela Pepper Company, various international agencies such as USAID and the EU, and 40 exporters. The seminar aimed to empower participants with critical knowledge and skills, enabling them to navigate the complexities of export procedures and markets. Topics covered included international market trends, regulatory compliance, quality standards, and strategies for enhancing market competitiveness. The event also provided a platform for networking and collaboration, fostering stronger partnerships within the industry. USAID underscored the potential of Cambodian pepper in the global market and emphasized the importance of building supply chains and fostering public-private partnerships for long-term industry growth.

In Viet Nam, on May 17, 2024, the WASI team held a dissemination seminar to discuss the STDF Safer Spice project. Dr. Phan Viet Ha, Deputy Director of WASI, welcomed participants, followed by Dr. Muhammad Faheem, ICM Advisor from CABI, who outlined the project objectives. The CABI Project Coordinator in Viet Nam, Kim Nguyen, provided an overview of the project's key results, lessons learned, and future opportunities, while Dr. Nguyen Xuan Hoa from WASI detailed the project’s journey in Viet Nam. Industry insights were shared by Simexco Dak Lak Co., highlighting their expectations, experiences, and successes from partnering with the project. The seminar included a discussion session where Dr. Hang emphasized the practical benefits of the project and advocated for its expansion. Mr. Thanh from the Provincial Agricultural Extension Centre sought clarification on the project's unique aspects and effectiveness compared to other initiatives. Recommendations included building standard farming models, updating guidance documents, and organizing study tours for farmers to enhance the sustainability and long-term impact of the project's achievements.

In Lao PDR, on June 21, 2024, a dissemination workshop was held, attended by the Deputy Director of DOA, the PGS pepper group, National Project Coordinator Mr Souliya Souvandouane, the Lao project teams, and 36 pepper industry stakeholders and donor representatives. The seminar focused on presenting the outcomes of the project, detailing the activities and lessons learned from the PGS pepper group, and discussing strategies for wider roll-out and scaling across other value chains.

Acknowledgements from the DOA, private industry, and farmers highlighted the impactful achievements of the project. Commitments from the DOA and Etu Green were made to sustain and expand the project in the country, seeking support from development sectors and national programs.

4.5 Other unexpected results

4.5.1 Knowledge spillovers

The project generated substantial knowledge spillovers on food safety hazards, their incidence, and detection. Farmers and stakeholders in Viet Nam, Cambodia, and Lao PDR gained in-depth knowledge of (cost-) effective technologies and best practices for managing food safety risks. This increased awareness led to better pest and disease management, with Cambodian farmers adopting biocontrol methods and Laotian farmers effectively monitoring and ensuring the quality of their peppercorns.

4.5.2 Standards compliance spillovers

The trade-associated practices encouraged by the project, such as more rational and discriminate use of pesticides, and fertilizers, influenced other farmers and firms. In Viet Nam, the reduction in pesticide uses not only cut costs but also reduced environmental pollution. This pragmatic and prudent approach to agriculture has the potential to spread to other sectors, fostering a culture of sustainability and responsible farming practices. In Cambodia, project farmers also learned about the Cambodian GAP (CamGAP). Since most of the practices outlined in the CoP and G-PPP align closely with CamGAP standards, farmers found it easier to comply. Capitalizing on this opportunity, 15 farmers achieved CamGAP certification by the end of the project and others are in process.

4.5.3 Market expansion spillovers

The project participation in the Viet Nam International Peppercorn Outlook (VIPO) events in 2022 and 2024 created significant awareness about the CoP and G-PPP to many stakeholders and industry sectors. At VIPO 2024, Etu Green Garden from Lao PDR showcased its products in Hanoi, met with various international traders, and secured markets for peppercorn and other products like turmeric, ginger powder, green tea and coffee etc., further expanding its business opportunities. Similarly, Cambodia achieved a milestone by successfully exporting its first batch of peppercorn to China.

4.5.4 Other institutional spillovers

The project significantly strengthened industry capacities and linkages with farmer groups. The collaboration between Vietnamese farmers and Simexco and Viet Pepper Co Ltd, the increased technical knowledge among Cambodian farmers, and the establishment of effective farmer groups in Lao PDR all contributed to building robust models for product traceability and public-private partnerships. In addition, the project facilitated valuable interactions among public sector experts from the three countries, CABI, and international consultants, further enhancing regional collaboration and knowledge sharing. These successful track records serve as models for future projects and initiatives in the region.

5. CROSS-CUTTING

5.1 Gender

Throughout the project, gender mainstreaming was a fundamental aspect, ensuring that gender equality was promoted at every stage. The project actively incorporated gender considerations into its design and implementation, recognizing the crucial role that women play in the spice value chain.

One of the primary strategies was to ensure equal participation of women in all project activities given their engagement in planting, drying and sorting peppercorn. Targeted efforts were made to

include women in training sessions, workshops, and decision-making processes. In Cambodia, 22% of the country partner staff (n=18) engaged in training and project activities were women. In Lao PDR, the figure was 18% (n=11), and in Vietnam, it was 57% (n=7). This focus on involving women ensured that female perspectives and contributions were integral to the project's success.

Among farmers, the percentage of women engaged in field CoP and PGS trainings from June to December 2023 was 30% in Viet Nam (n=10), 10% in Cambodia (n=30), and 26% in Lao PDR (n=19). Some training sessions saw even higher participation rates, such as the TOT training in Vung Tau, Vietnam, which had 50% women participants. In Cambodia, although all registered farmers were male, about 10% women participation was recorded as the farmers' wives attended sessions when their husbands were unable to participate, ensuring the training lessons were not missed. These efforts provided women with greater exposure to best practices and technical knowledge and enhanced the women's skills

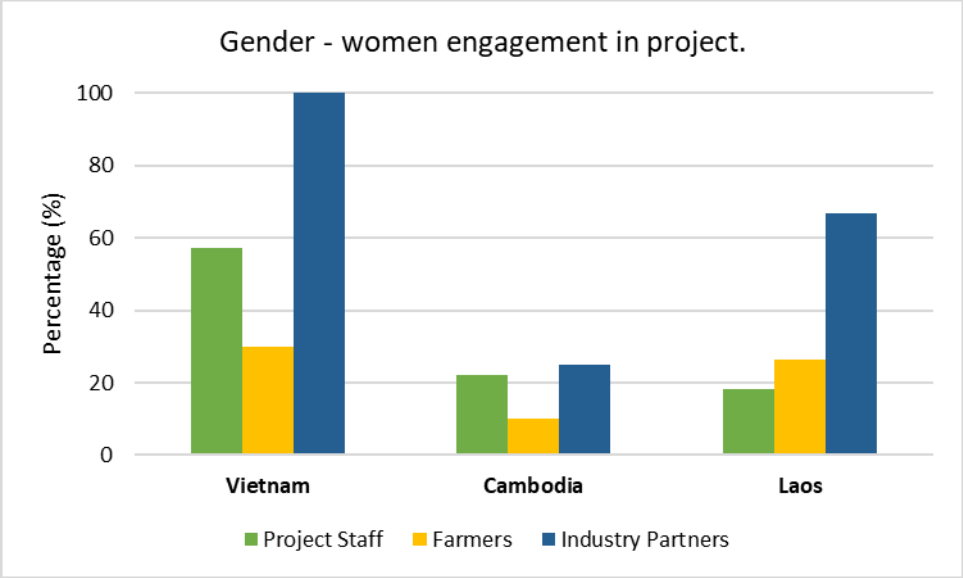


Figure 10. Gender - women engagement in the project.

The project also promoted gender equality by facilitating their access to project resources and working opportunities for women from industry partners i.e. the women staff engaged in project activities were 100% in Viet Nam (n=4), 25% in Cambodia (n=8), and 67% in Lao PDR (n=6). Furthermore, two of industry partners were women-owned companies: Vietpepper in Viet Nam and Etu Green in Lao PDR. These companies have ambitious goals to market safer spices, and the project supported them by introducing CoP and G-PPP approaches and linking them with farmer groups as a way forward to further their growth.

By implementing these gender-sensitive strategies, the project ensured that women also benefitted from its outcomes. The emphasis on gender equality also contributed to the overall sustainability of the project, as it encouraged more inclusive and equitable participation across the spice value chain.

In summary, the STDF Safer Spice project successfully mainstreamed gender by promoting equal participation and ensuring that women had access to resources and opportunities. This approach not only supported gender equality but also enhanced the project's impact and sustainability.

5.2 Environment, biodiversity and climate change

The project prioritized environmental, biodiversity, and climate change considerations by developing and implementing a Code of Practice (CoP) based on good agricultural practices (GAP) for pepper garden management and sustainable production. This CoP aimed to enhance farmers' capacity in

pest and disease management, improve crop health, and promote the rational use of chemical fertilizers and pesticides. It also actively promoted the use of living poles instead of wooden ones, thereby contributing to deforestation mitigation. The CoP drew on advancements made in Vietnam, where the promotion of living poles has successfully reduced deforestation.

Training sessions on the CoP were pivotal in equipping farmers with the skills to adopt sustainable agricultural practices. By reducing reliance on chemical inputs, the project aimed to minimize environmental impacts such as the release of toxic substances into water, air, and soil. This approach also contributed to lower carbon emissions and greenhouse gases through reduced agricultural inputs and production runs.

Furthermore, the adoption of the CoP addressed safety risks to human health by promoting the judicious use of chemical pesticides, thereby mitigating pesticide residue issues and ensuring compliance with Maximum Residue Limits (MRL) and Sanitary and Phytosanitary (SPS) standards for exported peppercorn. A specific module within the CoP focused on improving harvest, post-harvest management, and field-level processing practices to reduce contamination and aflatoxin risks. These efforts not only enhanced food safety but also contributed to environmental sustainability by minimizing pollutants in the food production chain.

In summary, the project's integration of the CoP and training initiatives underscored its commitment to environmental sustainability, biodiversity conservation, and climate change adaptation. By promoting sustainable agricultural practices and enhancing farmers' skills, the project safeguarded environmental resources and human health while ensuring the competitiveness of peppercorn exports in global markets.

6. FINANCIAL OVERVIEW

The initial budget for the project was designed to cover all planned activities, including training, resource development, and stakeholder engagement across Cambodia, Vietnam, and Lao PDR. By the end of the project, prudent financial management ensured the completion of all major deliverables within the budget. However, due to unforeseen challenges such as the COVID-19 pandemic, a six-month no-cost extension was necessary to accommodate delays. This extension was not without cost; for example, we had initially recruited Project Coordinator from the outset and later had to cover her cost with other CABI funds. Additionally, travel restrictions required separate missions and additional costs, such as a dedicated mission to Lao PDR, which incurred extra logistical and time costs (i.e. extra days for quarantine purpose as requested by local authority).

There was overspending of USD8,451, which has been reflected as an additional in-kind contribution from all project partners as co-funding support ensured the successful completion of the project, demonstrating the commitment of all partners to achieving the project's objectives and sustaining its impact.

In-kind contributions played a significant role in the success of the project. Various stakeholders, including local governments, agricultural extension services, and industry partners, provided substantial support in the form of personnel time, venue use, and logistical assistance. These contributions greatly enhanced the project's capacity to reach and train a larger number of farmers effectively. Despite the challenges and additional costs incurred, the commitment of all partners ensured that the project objectives were successfully achieved, and its impact sustained.

The overall summary of the project financials is given in the below tables (Table 5 and 6):

Table 5. Overall summary of the project financials.

Description	Budget (USD)	Actual Spent (USD)	Variance (USD)
A- STDF Budget			
Outcome 1 Develop code of practice	223,687	227,934	-4,247
Outcome 2: Code of practice piloted	339,328	336,717	2,611
Outcome 3: Strategies wider roll-out	30,862	31,165	-303
Coordination	52,574	50,635	1,939
Total	646,451	646,451	0
Indirect costs (10%)	64,645	64,645	0
A- Total STDF Budget Expenditure	**711,096**	**711,096**	**0**
B- In-Kind Contribution			
Administration	92,130	93,204	-1,074
Consultant charges	85,440	90,651	-5,211
Workshops	12,180	12,530	-350
CABI infrastructure Costs	17,000	18,815	-1,815
B- Total	**206,750**	**215,201**	**-8,451**
A+B GRAND TOTAL	**917,846**	**926,297**	**-8,451**

Table 6. Overall summary of the financial contributions.

Contributor	Budgeted (USD)	Actual Spent (USD)	Variance (USD)
A. STDF	**711,096**	**711,096**	**0.00**
(i) Viet Nam	135,378	135,378	0.00
(ii) Cambodia	78,476	78,476	0.00
(iii) Lao PDR	60,375	60.384	-9
(iv) Tech Experts	131,299	132,510	-1,211
(iv) CABI	240,923	239,703	1,220
(v) Indirect cost	64,645	64,645	0.00
B. In-Kind Contribution:	**206,750**	**215,201**	**-8,451**
(i) Viet Nam	29,690	29,990	-300
(ii) Cambodia	28,500	29,600	-1,100
(iii) Lao PDR	25,030	25,374	-344
(iv) CABI	123,530	130,237	-6,707
A+B GRAND TOTAL	**917,846**	**926,297**	**-8,451**

7. CHALLENGES, RISKS & MITIGATION

During the project implementation phase, several anticipated risks were identified and effectively managed to ensure project success. One of the primary challenges encountered was the global COVID-19 pandemic, which led to significant travel restrictions and operational limitations. This risk was anticipated due to the widespread impact of the pandemic. To mitigate some of these effects, we recruited a project coordinator stationed in Viet Nam who facilitated activities locally until we could travel to Cambodia and Lao PDR, although restrictions remained in place.

Additionally, the project swiftly adapted by leveraging online platforms for virtual meetings, progress tracking, e-learning tools, and collaborative document sharing. These measures allowed the project to continue some activities, compensating for the constraints imposed by travel restrictions, and expedited progress once the restrictions were lifted.

Another critical challenge identified was developing a Code of Practice (CoP) for peppercorn production that could effectively suit the diverse contexts of three countries. This challenge required a meticulous approach to ensure alignment with local agricultural practices and regulatory frameworks. To address this, a comprehensive strategy was implemented under the guidance of the International CoP Consultant, involving multidisciplinary teams from National Technical Working Groups and both public and private sectors. Starting with extensive desk reviews and iterative drafting, reviewing, and prioritizing the Generic CoP document based on GAP and CODEX standards, the initiative ensured robust guidelines aligned with international best practices. The focus then shifted to tailoring these guidelines for specific agricultural contexts in Vietnam, Lao PDR, and Cambodia through Country Interpretation Guides. These guides were translated into local languages and widely disseminated to stakeholders, ensuring broad accessibility and facilitating effective implementation of the CoP across the regions.

The acceptance of the CoP and its implementation through the G-PPP framework posed a notable challenge due to the anticipated low level of awareness and adoption among farming communities across the three countries. To mitigate this, substantial efforts were undertaken to educate and encourage farmers to adopt the CoP. Farmers received regular technical training on Good Agricultural Practices (GAP), alongside social, marketing, and negotiation skills necessary for participation. They actively participated in field demonstrations, engaged in meetings with industry partners, and facilitated agreements between farmers and companies.

Strategic partnerships were also formed with private sector entities to provide incentives for farmers adopting CoP practices. These initiatives significantly contributed to increasing farmer participation and compliance throughout the project lifecycle. Continuous coordination and motivational efforts were maintained to sustain engagement with market stakeholders. Active involvement in project activities from inception to completion ensured ongoing commitment and support from key industry players, thereby promoting wider acceptance of CoP and PGS within the agricultural sector.

Lastly, to mitigate the risk posed by peppercorn price fluctuations impacting farmer decisions, the project implemented proactive strategies aimed at maintaining stable farmer investment behaviours and ensuring quality produce without incurring excessive costs. Close coordination and motivational initiatives were prioritized to keep farmers engaged and committed despite market uncertainties. Furthermore, collaborative efforts with market entities were strengthened to provide incentives and support, thereby stabilizing farmer decisions and aligning them effectively with project objectives. These measures aimed to promote judicious use of inputs, control investment levels, and enhance overall produce quality, reducing the potential impact of price fluctuations on project outcomes.

8. COMMUNICATIONS AND OUTREACH

Throughout the Safer Spices project, comprehensive communications and outreach strategies were employed to enhance project visibility, engage stakeholders, and disseminate project outcomes effectively.

8.1 Project website and knowledge hub

CABI developed and maintains the project's dedicated website, Safer Spice Project Website. The website features sections on project background, objectives, outputs, and latest activities. It serves as a central hub for stakeholders to access project information, download resources, and stay updated on ongoing activities. Key project partners and implementing agencies are highlighted with links to their respective websites, ensuring transparency and accessibility of project-related information.

8.2 News and updates

Regular updates and news on project milestones, activities, and achievements were posted on the project website's news section. This ongoing communication strategy kept stakeholders informed of progress and fostered transparency in project implementation. Notable updates include publications on CABI's platforms.

8.3 E-Newsletters

CABI facilitated communication among project partners through e-newsletters, disseminating updates, new downloads, and other relevant project information via email. This direct communication channel ensured that all stakeholders remained informed and engaged throughout the project lifecycle. The newsletters were sent out every quarter roughly and were synced with project activities news cycle i.e. where reporting frequency was high enough for information dissemination.

8.4 External engagements

The project actively participated in external events to promote its objectives and engage with key stakeholders:

- The Participation in the Viet Nam International Pepper Outlook 2022 and 2024 (VIPO 2022, 2024), engaging with various industry players and distributing project briefs to stakeholders including farmers, retailers, exporters, and government officials.
- The Cambodian Project National Coordinator contributed as a panellist in the Cambodia Pepper Outlook organized by the Cambodia Pepper and Spice Federation (CPSF). They discussed trade facilitation and market development for pepper, highlighting the Safer Spice project's impact in Cambodia, Vietnam, and Lao PDR.
- The WASI representative showcased the project at a STDF SPS Workshop in Geneva on Mar 21, 2023, highlighting its impact on training small-scale farmers in Good Agriculture Practices, establishing and public-private partnerships, thereby enhancing socio-economic livelihoods.
- The Project Manager participated as a panellist in WTO panel discussion describing the Safer Spice project contributing to agriculture value chain development and market access on June 27, 2023

8.5 Testimonials and case studies

Short case studies and testimonials from project beneficiaries showcased how the project has positively impacted local communities and enhanced food safety within the peppercorn value chain. These stories underscored the project's success in improving livelihoods and promoting sustainable agricultural practices.

Ms. Soumaly, *from Etu Green Company Laos expressed her gratitude for the learning opportunities provided by the project. She highlighted new market access opportunities in Viet Nam through connections made with Simexco and Vietpepper, enabling her to supply lemongrass and other products.*

Mr. Chhun Hy Heng, *Deputy Director of PPSPSD-GDA, Ministry of Agriculture, Forestry and Fisheries in Cambodia, commented that farmers are now producing better quality peppercorn, leading to increased exports to the EU and looking forward for expanding the market to China.*

Taim Roset, Cambodia

My name is Taim Roset, a 59-year-old farmer from Memot, Cambodia, and I've been growing peppercorn for nine years on 1.25 hectares. Before participating in this project, I struggled with applying fertilizers and pesticides properly, which led to low output and high input costs. Through the project, I've learned technical knowledge, market price information, and built good relationships with fellow farmers and Sela company. The quality of my peppercorn has improved significantly, resulting in higher prices, and secured contract with buyer.

Ms. Lê Thị Lục from Bau Lam commune, Vietnam.

As a peppercorn farmer with 1.5 hectares, I used to rely heavily on pesticides, often not using them properly. Through the CoP training, I gained invaluable knowledge about judicious pesticide use, significantly improving my practices. The most important lesson I've learned is the impact on human health. Under this project for the first time, I conducted an MRL test, thanks to the CoP guidelines. Now, I can sell my peppercorn directly to companies rather than collectors, securing a better price. Sharing experiences with fellow farmers has also been incredibly enriching.

8.6 Links to publications and resources:

For further information, please explore the following links:

- Safer Spices Project on CABI Website
- Safer spice project on STDF website
- CABI Blog on Safer Spices
- WTO Panel Discussion on Agriculture Value Chains
- Project flyer
- Success story – Sowing the seeds of change in South East Asia's peppercorn industry
- Success story - Collaborative efforts lead to increased peppercorn exports and improved quality
- Success story- Vietnam leads the way in developing a Code of Practice for the peppercorn industry in South East Asia
- Practitioner Guide for G-PPP, a collaborative market systems framework.
- Country-specific Interpretation Guides.

9. SUSTAINABILITY & FOLLOW-UP

The efforts and discussions with various stakeholders were made focusing on securing follow-up actions to sustain and scale-up project achievements. Key activities included:

9.1 Capacity building

Efforts were made to build the capacity of local partners and stakeholders to independently manage and replicate project outputs or interventions in other locations. Training sessions and workshops were conducted to transfer knowledge on implementing the Code of Practice (CoP), Participatory Guarantee System (PGS), Grassroot-PPP and other project methodologies that were relatively newer concepts or approaches for peppercorn farmers and other stakeholders.

9.2 Knowledge sharing

To ensure sustainability, trained and experienced staff will continue to share knowledge and skills with farmers seeking information and advice as part of their regular activities, such as farmer training sessions and on-site visits. The skills and knowledge gained through the project are a lifelong asset for these staff members, enabling them to support ongoing dissemination. Furthermore, online platforms, including the project website and social media groups, will remain active to share updates and engage with a wide audience. Trained farmers and company staff will also serve as ambassadors, advising and spreading information to more farmers, thereby extending the reach and impact of the project.

9.3 Scaling and replication

In the project-end meeting and country dissemination seminars, discussions were held for scaling project activities among different public, private and development sector stakeholders with a focus on replicating successful interventions in new geographic areas or sectors. Successes and lessons learned from the project were shared with interested stakeholders to facilitate replication and adaptation in similar contexts. Discussions were initiated with potential funding sources and investors to explore opportunities for financial sustainability beyond project funding, especially for agreed post-project follow-up activities. For instance, GIZ, through the EU-CAPSAFE Project in Cambodia, expressed interest in utilizing project training materials developed. These materials will be adapted into shorter training modules covering 6-8 topics for GAP training sessions in Tboung Khmum and Kampot provinces.

In a recent study conducted by CABI as part of its Plantwise Plus programme, the adoption of National Good Agricultural Practices (GAP) standards was identified as posing significant challenges, a concern shared by various stakeholders. However, the innovative approach piloted in this project has shown promise in overcoming these hurdles. By fostering collaboration and providing accessible, relevant information, the project has succeeded in motivating and incentivizing farmers to adopt GAP standards. This not only facilitates compliance with National GAP and third-party certification schemes but also enhances market opportunities for farmers. Through these efforts, farmers are better positioned to meet formal standards, thereby improving their competitive edge in the market.

The piloted operational and organizational structure also holds promise in catalysing investments in small-scale production. By pooling resources and aligning investments to meet collective needs, the structure not only mitigates risks and challenges for individual farmers but also provides financial institutions i.e. banks with a feasible structured framework for assessing the group's creditworthiness. While this potential remains to be fully validated, initial indicators are positive.

During the project's concluding workshop, there was notable interest in the methodology used to develop a localized interpretation guide for standards. This methodology is anticipated to have broad applicability across various third-party voluntary standards and national schemes, potentially enhancing adoption and compliance.

9.4 Engagement with stakeholders

Some stakeholders, including government agencies, industry partners, development agencies and community groups, identified to discuss the continuation and scaling of project activities beyond the project duration. Further meetings will be planned to assess the feasibility of integrating project outcomes into ongoing national programs and initiatives.

By fostering collective efforts and maintaining collaborative relationships with stakeholders, the project ensured that its achievements in enhancing food safety, promoting sustainable agricultural practices, and improving livelihoods would endure beyond its lifespan. This approach contributes to long-term sustainability and impact, especially in countries like Cambodia and Lao PDR, where the peppercorn industry is still in its infancy compared to the more established industry in Vietnam.

9.5 Relevance for SPS stakeholders elsewhere

The experiences and learnings offer valuable insights for SPS stakeholders in other regions. The tailored use of CoP and G-PPP, leading to the establishment of local PPPs, can serve as models for similar initiatives in different regions and value chains. The project's approach to enhancing farmer knowledge, building local capacity, and fostering inclusive partnerships provides a framework for addressing SPS challenges in various contexts.

10. LESSONS LEARNED

10.1 Innovative approaches piloted and their learnings

The project successfully piloted the development and implementation of a CoP along with localized resources to support its adoption. Tailored Country Interpretation Guides translated into local languages significantly enhanced farmers' willingness and ability to adopt GAP. These strategies effectively built farmer capacity and improved crop health, leading to reduced use of chemical fertilizers and pesticides, benefiting the environment and producing safer peppercorns for the market. A collaborative approach (G-PPP) motivated farmers and empowered them to engage actively with other value chain actors as business partners. This fostered local ownership and accountability, demonstrating that inclusive, collaborative strategies can significantly enhance GAP adoption.

10.2 Synergies and collaborations developed

The project fostered strong synergies and collaborations between public and private sectors. Public-private partnerships established between farmers, industry partners, and country teams resulted in successful engagement and commitment to GAP practices. These collaborations provided incentives for farmers and strengthened supply chains, highlighting the importance of inclusive partnerships and collective efforts in enhancing agricultural practices and market access.

10.3 Learnings on sustainability

Financial and institutional sustainability were key learnings. Establishing farmer groups and engaging with local government and industry partners built local capacity and institutional support for long-term sustainability. Integrating District Extension and Plant Protection Officers ensured ongoing support beyond the project duration. Continued funding and resource allocation are crucial, emphasizing the role of government, donor support, and private sector investments in sustaining project achievements.

10.4 Additional experiences and lessons

Effective project management, coordination, and information sharing among country teams and partners were critical to success. Flexible planning and communication strategies, especially during

the Covid-19 pandemic, ensured project continuity. Addressing cross-cutting issues such as gender equality and environmental sustainability was integral. Regional cooperation, including collaboration among Vietnam, Cambodia, and Lao PDR, demonstrated the benefits of regional efforts in tackling common agricultural challenges. The transfer of knowledge and technology exemplified the value of South-South collaboration in sustainable agricultural development.

10.5 Constraints faced and areas for improvement

Enhancing farmers' knowledge of pests and post-harvest management is crucial to dispel misconceptions about GAP and buyer standards. Budgeting based on accurate assumptions is key, as miscalculations can lead to additional costs and activities. This was particularly evident in Vietnam and Lao PDR, where embedding G-PPP concepts required addressing local regulations and perceptions about farmer groups. The challenges faced during the Covid-19 lockdown underline the need for contingency plans to maintain project reach and support despite external disruptions. Furthermore, expanding the CoP to include GAP guidelines for intercropping practices can enhance its applicability and relevance. Overall, these lessons demonstrate the importance of adaptability, targeted capacity building, and collaborative approaches in achieving sustainable outcomes in agricultural projects.

11. RECOMMENDATIONS

The project has demonstrated success in promoting sustainable agricultural practices and improving the peppercorn value chain. To ensure these achievements are sustained and scaled, a comprehensive post-project sustainability plan should be implemented, focusing on replicating and expanding the project's successes within the peppercorn sector and other value chains by the project national public and private sector stakeholders. Providing policy support to institutionalize the CoP and G-PPP frameworks is crucial for long-term sustainability.

11.1 Strengthening South-South collaboration

Sharing success stories from the project with government institutes of other countries can influence regional and national policies that support collaboration, including funding mechanisms and exchange programs. Establishing regional networks on common interest topics will facilitate regular communication and knowledge sharing, further enhancing collaborative efforts.

11.2 Strengthening local organisations and institutes

To ensure the effective delivery and implementation of the frameworks at scale, it is essential to develop approaches that strengthen the capacity of organizations and institutes. This will support the sustainable adoption and integration of these frameworks within existing market systems. Additionally, evaluating the frameworks' potential to reduce investment risks for financial institutions will enhance smallholder farmers' participation and access to credit.

11.3 Mechanism for continuous improvement of knowledge

This can be achieved through sound pest management and periodic technical training on CoP for farmers and extension agents, aligned with their needs and schedules. Hybrid use of e-learning resources will play a key role. Developing new CoP interpretation guides that address the complexities of multi/intercropping systems.

Continuing to update knowledge products tailored to local contexts and exploring long-term hosting for an electronic knowledge repository will ensure ongoing support and visibility for project partners and stakeholders.

11.4 Promoting collaboration

Building a sustainable value chain that brings economic, environmental, and social benefits is also crucial. Ensuring harmonious benefits among producers, collectors, and companies will secure long-term sustainability. Encouraging companies to continue connecting with partners to promote safe and sustainable peppercorn production and trade is essential.

Enhancing farmer group engagement by promoting farmer group registration would increase opportunities for scaling and collaboration.

11.5 Scaling opportunities

Integrating the CoP and G-PPP approaches into broader national initiatives will enhance best practices across various value chains and facilitate the wide adoption of GAP certification schemes. Engaging with the international development sector and donor agencies to scale up activities will extend the project's benefits to more farmers and ensure the sustainability of efforts.

Collaboration opportunities with organizations like the EU, GIZ, and FAO in Cambodia, and similar agencies in Viet Nam and Lao PDR, should be explored. Leveraging the success of the current project to extend practices to other crops, such as coffee, lemongrass, ginger, turmeric, and galangal, will enhance food safety and market access across the agricultural sector.

Evaluating the frameworks' potential to support smallholder farmers by reducing investment risks for financial institutions, will enhance sustainability and participation of stakeholders.

12. ANNEXES

Attach additional relevant information/documents to be uploaded as a .zip file, including:

1. Updated logical framework matrix with actual results achieved for each project indicators
2. List of key documents produced under the project (e.g. training manuals, codes of good practice, etc.).
3. List of key training workshops, outreach events, study tours, etc. organized under the project (including dates, location, number of persons (M/F) benefitting
4. List of key persons involved in the project from the implementing organization, other partners, beneficiary organizations, etc.
5. Essential documents for Adapted- PGS implementation
6. Published success stories
7. Inspection and assessment reports from countries
8. Final signed financial report

12.1 ANNEXE 1: Logical Framework

Project Description	Measurable Indicators / Targets,	Actual Results
Goal	Increased value per KMT of peppercorn produced by the groups targeted by the STDF project.	Achieved increase in value per KMT of peppercorn due to improvements in farming practices e.g. In Cambodia, 10% increase in yield and a 30% increase in income for farmers was reported. In Vietnam, 30% cost reduction was reported due to judicious use of inputs especially fertiliser and pesticides.
	Demonstrable roll-out strategy for the model.	Roll-out strategy developed and documented, with key steps for scaling up identified.
Immediate objective (purpose) Increased financial returns, yields, quality/safety and market access for smallholder pepper growers and grower groups.	Within 3 years, at least 50% of the groups targeted by the STDF project record:	3 out of 4 of targeted farmer groups (2 groups from Viet Nam and 1 from Cambodia) recorded. One group from Lao PDR did not has record for quality measures i.e. MRL, contamination or rejections.
	At least a 45% reduction in detection of microbial contaminants and excess pesticide MRLs	100% no detection of microbial contaminants and pesticide MRLs from samples of 40 participating farmers from Viet Nam and Cambodia, as per MRL reports from Simexco Co. Ltd. in Viet Nam and Sela Pepper in Cambodia.
	Rejection percentages / values due to SPS compliance reduced by 10%.	Overall, 0% rejection of peppercorn produced by 40 participating farmers from Vietnam and Cambodia. As per Sela Pepper in Cambodia, the rejection percentages reduced from 7-10% in 2022 to just 1.5-2% in 2023 due to SPS compliance.

Description	Measurable indicators / Targets	Actual Results
Outcome 1: Farm-village level pepper producer, collector and input provider code of practice based on existing national good practice standards and harmonized regionally		
1.1 Prepare appropriate code of practice	Generic code of practice for village level activities (farmer, collector, & input provider) prepared and draft available by Q3	Generic code of practice prepared after desk review of 41 documents and series of expert meetings. Additionally, Interpretation Guide for this code was also developed.
1.2 Tailor code of practice to meet local conditions, requirements and cultural norms	Code of practice for village level activities (farmer, collector, & input provider) tailored to national needs and draft version completed in each of the 3 countries, by Q4	CoP Interpretation Guides tailored for three countries i.e. Vietnam, Cambodia and Lao PDR.

Description	Measurable indicators / Targets	Actual Results
	Implementation guide and guidelines for developing compliance criteria and inspection & monitoring instruments completed for each of the 3 countries by Q4	Implementation guide and inspection/monitoring guidelines developed and implemented in three countries.
1.3 Develop knowledge resources	Factsheets and guides developed by Q5	51 knowledge products (factsheets, guides, handbook, training modules, etc.) developed in three countries (for more details, refer Annex-2)
1.4 Develop an electronic resource of all information /materials generated by the project with global access	Activity will be ongoing with full e- resource of English versions of the code of practice and	E-resource developed and available at www.saferspices.org
	all supporting documents/tools available in electronic format by Q12	All knowledge resources available on the e-resource website
1.5 Knowledge sharing with peppercorn value chain participants in Cambodia, Lao PDR and Viet Nam	One (1) regional workshop held each year, with the host country rotating through the 3 project countries.	Three regional Project Steering Committee meetings held physically, one in Viet Nam and two in Cambodia.
	Activity will be ongoing with full e- resource of English and national language versions of the industry and government guidance documents and communication tools available by Q10	All information material is available in English and local languages.
	Activity will be ongoing with at least 2 real examples of implementing the code of practice identified and documented by Q11	40 model farms (10 model farms in Vietnam, 30 in Cambodia) fully implemented the CoP. 15 farmers in Cambodia also got CamGAP certification as it is very much aligned with the CoP. 19 model farms in Lao PDR also partially implemented the CoP because of late start of CoP trainings.
1.6 Knowledge sharing with stakeholders involved in peppercorn international trade	Quality requirements for export market workshops held in each of the project countries by Q11	7 sessions/events were conducted for knowledge sharing with peppercorn stakeholders i.e. 2 events by Cambodia team, 3 by Viet Nam team and 2 by CABI and Lao team.
	Strategy for building awareness of the code of practice with international buyers identified and documented by Q10	Strategy for awareness-building documented

Description	Measurable indicators / Targets	Actual Results
Outcome 2. Code of Practice pilot tested and a PGS based system developed for the pepper sector		
2.1Undertake market to farmer visits/dialogues and farmer to market visits/dialogue; based on shared learning strategies	Lead firms and farmer groups identified and demonstrating their commitment by Q8	Step 1: Discovery phase 13 farmer groups, 6 processing/trading companies and 10 organisation/Govt entities were engaged in dialogues.
	For each value chain, village level participants (growers, collectors and input suppliers) identified and profiled by Q8	Vietnam: WASI, PPD Xuyen Moc, Simexco, Vietpepper and Harris Freeman and farmers Cambodia: GDA, Kampot pepper producers Association, Sela pepper, farmer in Memot Lao PDR: DoA, Mai Savanh Laos, Etu Green Garden
2.2 Undertake facilitated market and grower dialogues to establish quality and supply criteria based on code of practice and establish agreements for ways of working together. Including supporting the establishment of farmer groups	Participants for the pilot scheme identified and workshop at all pilot sites completed	Vietnam: 1 group in Dak Lak, 1 group in Xuyen Moc with total 10 farmers Cambodia: 1 group in Memot with 30 farmers Lao PDR: 1 group at Etu Green Garden with 19 farmers
	Assessment of the feasibility of starting a PGS in each area by Q9	Understanding the market Understanding the company interests and visions Understanding the farmers strengths and weaknesses to identify activities to include in sessions with farmers
2.3 Conduct PGS-linked training workshops	Briefing and training completed at each pilot site	Farmer to farmer sharing Buyer and seller understanding Structure and organisation of adapted-PGS and why it will benefit the buyer and seller Vision for future
	Agreement on the general direction and purpose of the PGS in each area by Q9	Forming an intergroup; Selecting roles; Agreeing structure and getting commitment
2.4 Build capacity of advisors	Extensions staff trained and advisory centres established by Q9	7 PGS champion got certificate from GDA staffs in Cambodia. Total 17 GDA Staff 20 staff trained on PGS in Viet Nam and Lao, 40 staff trained on CoP in Vietnam, Cambodia and Lao PDR

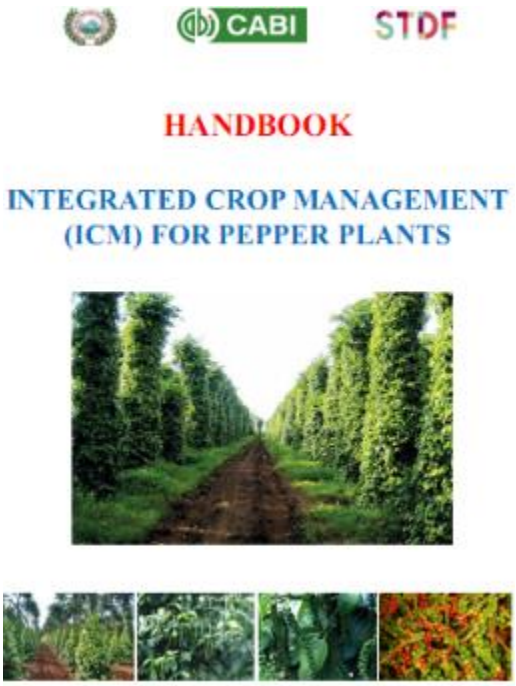
Description	Measurable indicators / Targets	Actual Results
2.5 Support pilot trial participants to implement the code of practice	Piloting of code of practice and PGS by selected groups & finalization of code of practice by end of Q12	Setting criteria for checklist, based on risk Importance of reporting keeping Dealing with non-compliance Planning internal audits for a-PGS group 10 farmers in Viet Nam and 30 in Cambodia completely followed the CoP but 19 farmers in Lao partially followed CoP as training started late.
	Interim modification of the code of practice based on smallholder & industry feedback from piloting in Viet Nam and Cambodia by end of Q9	Farmer to farmer sharing Planning and monitoring Audits and recommendations
Outcome 3: Strategies for wider roll-out of the PGS based system and code of conduct identified		
3.1 Document success stories	Activity will be ongoing with at least 4 success stories identified and documented by Q11	3 success stories documented; Several news and blogs on project activities were published on project website.
3.2 Assessment of the suitability of the code of practice, PGS, supporting documents and training material and identify roll-out strategies	Success factors and lessons learnt from the pilot synthesized and documented for each country by Q11	Success factors and lessons documented. In Cambodia: adoption of cover crops increased from 40% to 90%; efficient water management from 60% to 100%; right pesticide use from 40% to 70-80%; Vietnamese farmers improved their weed, shade tree, and pest management practices, with 100% compliance resulting in a 30% cost reduction.
	Rollout strategies identified and documented for each country by Q11	focuses on replicating and scaling these frameworks within the peppercorn sector and potentially other value chains, supported by policy integration to ensure long-term sustainability
3.3Dissemination seminar for pepper industry stakeholders & donor representatives	Seminar held in each of the 3 countries by Q12	Seminars held in each country

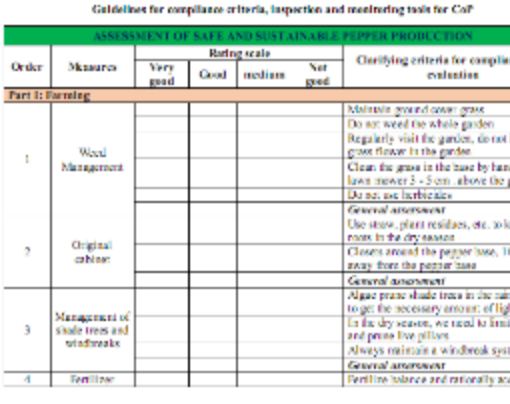
12.2 ANNEX 2 List of key documents produced under the project

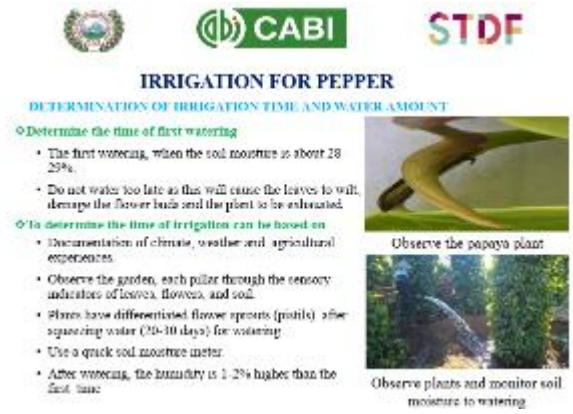
VIET NAM (https://saferspice.org/KnowledgeHub.asp)

No.	Documents	Title	Language
1	CoP Interpretation Guide	Code of Practice Interpretation Guide	English, Vietnamese
2	Handbook	Integrated crop management (ICM) for pepper Plants	English
3	Factsheet	Anthracnose disease	English, Vietnamese
4		Quick wilt disease	English, Vietnamese
5		Red algae disease	English, Vietnamese
6		Slow decline	English, Vietnamese
7		Mealy bug	English, Vietnamese
8		Stem borer	English, Vietnamese
9		Stunted disease (virus)	English, Vietnamese
10		Tingid bug	English, Vietnamese
11		Fertilizer	English, Vietnamese
12		Weed management	English, Vietnamese
13		Irrigation management	English, Vietnamese
14		Harvesting, processing, storage	English, Vietnamese
15	Training material	Introduction. Black pepper and pepper production in Vietnam	English, Vietnamese
16		Section 1. Management of pepper plant propagation	English, Vietnamese
17		Section 2. New planting and replanting management	English, Vietnamese
18		Section 3. Nutrient management for black pepper	English, Vietnamese
19		Section 4. Irrigation management for pepper plants	English, Vietnamese
20		Section 5. Management of pruning, creating canopy for pepper trees	English, Vietnamese
21		Section 6 Weed and intercropping management in black pepper garden	English, Vietnamese
22		Section 7 Pest and disease management for black pepper	English, Vietnamese
23		Section.8 Management of harvesting, preliminary processing and preservation	English, Vietnamese

24	Farmer's diary	Farmer's diary – Recording farm practices	English, Vietnamese
25	Monitoring tools	Guidelines for compliance criteria, inspection and monitoring tools	English, Vietnamese

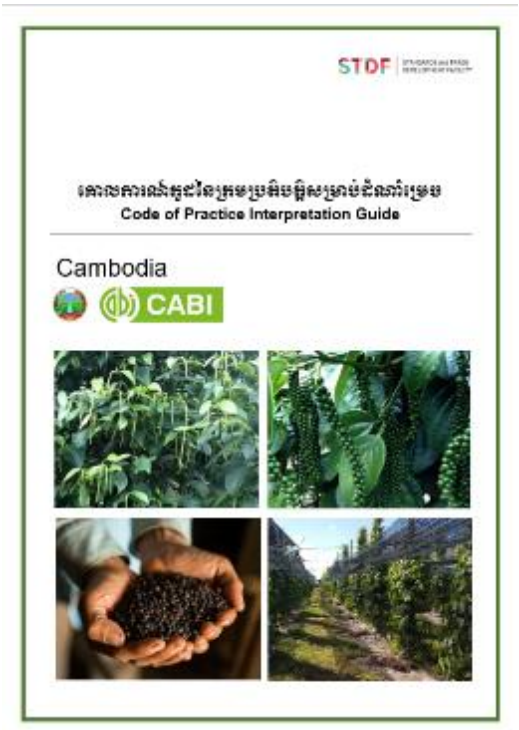


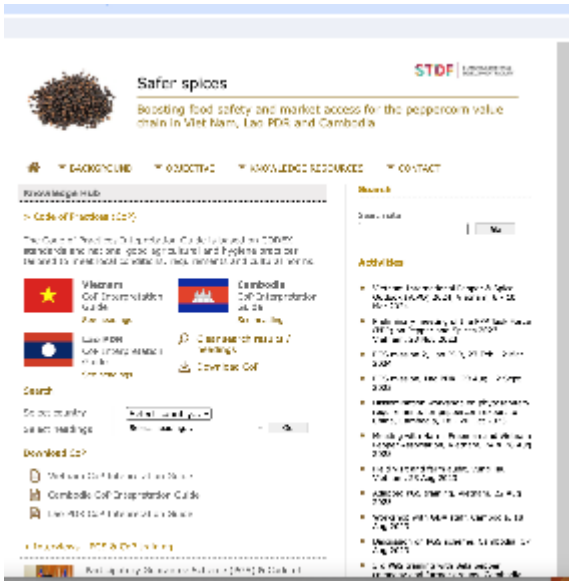




CAMBODIA

No.	Documents	Title	Language
1	CoP Interpretation Guide	Code of Practice Interpretation Guide	English, Kh'mer
2	Factsheet	Leaflet of Foot Rot V2 1	Kh'mer
3		Leaflet of Mealybug V2-Cambodia	Kh'mer
4		Tingid Bug	Kh'mer
5		Pesticide Safe Use	Kh'mer
6		Pesticide Storage	Kh'mer
7	Training material	Section 1. Management of pepper plant propagation	Kh'mer
8		Section 2. New planting and replanting management	Kh'mer
9		Section 3. Nutrient management for black pepper	Kh'mer
10		Section 4. Irrigation management for pepper plants	Kh'mer
11		Section 5. Management of pruning, creating canopy for pepper trees	Kh'mer
12		Section 6 Weed and intercropping management in black pepper garden	Kh'mer
13		Section 7 Pest and disease management for black pepper	Kh'mer
14		Section.8 Management of harvesting, preliminary processing and preservation	Kh'mer





ព្រះរាជាណាចក្រកម្ពុជា

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ដោយមានការចូលរួម (PGS)

រវាង

សហគមន៍កសិកម្មដំណាំម្រេចធម្មជាតិស្រែគរមង់

និង

ក្រុមហ៊ុនសិលា ផិបភើរ ខូអិលធីឌី

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LAO PDR

No.	Documents	Title	Language
1	CoP Interpretation Guide	Code of Practice Interpretation Guide	English and Laos
2	Training material	Section 1. Management of pepper plant propagation	Laos
3		Section 2. New planting and replanting management	Laos
4		Section 3. Nutrient management for black pepper	Laos
5		Section 4. Irrigation management for pepper plants	Laos
6		Section 6 Weed and intercropping management in black pepper garden	Laos
7		Section 7 Pest and disease management for black pepper	Laos
8	Additional training material	Safe use of pesticides, Alternative low risk biopesticide, Composting, Record keeping, Risk of the contamination of agricultural production, National legal requirements for formation of farmer groups (PGS) in addition to customising and translating all CoP training modules documents.	Laos
11-13	Factsheets	3 factsheets on peppercorn pests	Laos
14-15	Poster	2 posters	Laos
16	Brochure	Brochure to promote pepper of Etu Green Garden	English


STDF
CABI


We serve Green in the heart of the Bolaven Plateau.
Coffee beans
Herbal tea
Nuts
Support local
Spices


Who we are
We serve Green in the heart of the Bolaven Plateau
Visit us!
Dried products
Fresh products


STDF
CABI


Phytophthora capsica

12.3 ANNEX 3. List of key trainings and workshops in the project

VIET NAM

#	Training workshop	Date	Location	Number of person (M/F)
1	CoP training for farmers to produce safe pepper products, guidelines for apply CoP on the farms with farmers.	27th April 2022	in Cukuin district Dak Lak province	9 (8/1)
2	Introduction to PGS training for WASI Team	16th - 18th May 2022	Dak Lak province	6 (4/2)
3	Conducted PGS champions training (farmer groups organisation, farmer-farmer learning and seller-buyer understanding), with PPD and Harris Freeman staff, GDA, WASI representatives in Vung Tau.	21st - 26th May 2022	in Xuyen Moc, Ba Ria – Vung Tau province	30 (25/5)
4	Field Visit: Vegetable PGS Ben Tre Visiting. The participants of the TOT training class visited the PGS model on vegetables	27th – 28th May 2022	In An Thanh commune, Mo Cay Nam district, Ben Tre province	13 (5/7)
5	Training on pest-disease, pruning branches, living tree pillars, fertilizers, weeding	4th July 2022	in Xuyen Moc, Ba Ria – Vung Tau province	14 (8/6)
6	PGS training: Introduced 6 stages to do for applying PGS, who must have and nice to have, purpose, key roles, and structure of intergroup.	13rd - 14th October 2022	Ea Ning commune, Cukuin district, Daklak province	12
7	PGS training: Introduced 6 stages to do for applying PGS, who must have and nice to have, purpose, key roles, and structure of intergroup	20th - 21st October 2022	Bau Lam commune, Xuyen Moc district, Ba Ria – Vung Tau province	33 (27/6)
8	The first project steering committee meeting	26th - 28th October 2022	the Highland Agriculture and Forestry Science Institute (WASI), Dak Lak Viet Nam	16 (11/5)
9	CoP training for farmers to produce safe pepper products on weed management and intercropping in pepper model; management of harvesting, preliminary	20th December 2022	Bau Lam commune, Xuyen Moc district, Ba Ria – Vung Tau province	13 (9/4)

	processing and preservation of pepper			
10	CoP training of trainers for GDA Staff in Cambodia	26th - 28th December 2022	GDA office in Phnom Penh and Memot district, Tbong Khmum province	15 (13/2)
11	CoP training of trainers for DOA, PAFO Staff in Lao PDR	28th - 30th December 2022	PAFO office in Pakse	15 (12/3)
12	CoP training for farmers to produce safe pepper products on weed management and intercropping in pepper	January 2023	Ea Ning commune, Cukuin district, Daklak province	12
13	Zoom workshop on the harvest and post-harvest management of pepper for participants from STDF Safer Spice partner countries (Cambodia and Lao PDR)	9th March 2023	Highland Agriculture and Forestry Science Institute (WASI), Dak Lak Viet Nam	11 (7/4)
14	The Adapted PGS training for WASI, Xuyen Moc PPD, Simexco, Vietpep staffs, farmer groups	21st – 25th August 2023	Bau Lam commune, Xuyen Moc district, Ba Ria – Vung Tau province	14 (10/4)
15	WASI Team organized the national dissemination seminar with local PP sectors	17th June 2024	Highland Agriculture and Forestry Science Institute (WASI), Dak Lak Viet Nam	16 (12/4)

CAMBODIA

	Training workshop	Date	Location	Number of person (M/F)
1	Two physical training courses to peppercorn value chain and pepper industry in Cambodia introduce about CoP link to PGS	April 4th-5th, 2022	Memot district, Tbong Khmum province and Kampot Province	40 (34/6)
2	Training: Introduction to PGS. Building on the experiences gained from the field visits	11th – 15th May 2022	Memot district, Tbong Khmum province	10 (7/3)
3	Conducted intensive training workshop for the PGS training to trainers (ToT) to GDA officers.	11th-12th August, 2022	GDA office Phnom Penh Cambodia	15 (10/5)
4	Conducted PGS training workshop for Sela company, farmer groups.	16th-18th August, 2022	Memot district, Tbong Khmum province	18 (14/4)
5	GDA Team have joined as a panellist in the intensive workshop on Cambodia	23rd December 2022	Phnom Penh Cambodia	1(1/0)

	Pepper Outlook which is organized by Cambodia Pepper and Spice Federation discussing trade facilitation and market development for pepper			
6	CoP training of trainers (TOT) for GDA Staff	26th - 28th December 2022	GDA office in Phnom Penh and Memot district, Tbong Khmum province	15 (13/2)
7	GDA organized the training on the Code of Practice (CoP)	7th - 8th February 2023	Memot district, Tbong Khmum province	22
8	PGS training workshop for GDA staffs, Sela company, farmer groups.	21st – 23rd February 2023	Memot district, Tbong Khmum province	27 (23/4)
9	Dissemination Workshop of Protocol on Phytosanitary Requirement for Export Peppercorn from Cambodia to China	2nd – 4th March 2023	at Mondulkiri Province, Cambodia	56 (53/3)
10	Zoom TOT workshop on the harvest and post-harvest management of pepper for Cambodia and Lao PDR team	9th March 2023	Highland Agriculture and Forestry Science Institute (WASI), Dak Lak Viet Nam	11 (7/4)
11	GDA team conducted the training on Harvest and Post-harvest Technology for Peppercorn	13th -14th March 2023	Memot district, Tbong Khmum province	16
12	GDA team conducted the assessment and created a crop calendar for PGS group leaders and Sela staff	6th – 7th April 2023	Memot district, Tbong Khmum province	7
13	The second Project Steering Committee Meeting in Phnom Penh, Cambodia	3rd – 5th May 2023	Sunway Hotel Phnom Penh Cambodia, Field visit to Memot for meeting farmers and Sela Company.	14 (10/4)
14	CABI experts conducted training on 3rd PGS champion to GDA staff	14th – 15th August, 2023	GDA office Phnom Penh Cambodia	10 (6/4)
15	Conducted training workshop on internal inspection and record keeping for Sela and farmers	16th – 18th August, 2023	Memot district, Tbong Khmum province	25 (20/5)
16	CoP training, implement the code of practice (support, monitoring)	26-28 September, 2023	Memot district, Tbong Khmum province	17 (15/2)

17	Training on Adapted PGS Approach Cambodia Field Audit, Farmer Sharing Activities	18th – 20th October, 2023	Memot district, Tbong Khmum province	41 (35/6)
18	Project Steering Committee and Project-end Meeting	20 - 21 May 2024	Himawari Hotel Apartments, 313 Sisowath Quay, Phnom Penh, Cambodia	45 (28/17)

LAO PDR

	Training workshop	Date	Location	Number of person (M/F)
1	CoP training of trainers for DOA, PAFO Staff in Lao PDR	28th - 30th December 2022	PAFO office in Pakse	15 (12/3)
2	PGS training workshop for DOA staff, E Tu Green and farmers in Lao PDR	5th - 10th March, 2023	E Tu Green Garden Champasak Province - Lao PDR	16 (11/5)
3	Zoom TOT workshop on the harvest and post-harvest management of pepper for Cambodia and Lao PDR team	9th March 2023	WASI Expert (online)	11 (7/4)
4	Conducted CoP training on Record Keeping for 2 DAFO staffs, 1 Extension Staff, 4 farmers and 5 E Tu Green staffs	26th April 2023	E Tu Green Garden Champasak Province - Lao PDR	12 (7/5)
5	Conducted CoP training on pest management, Weed and ICM in pepper farm for DAFO, Extension Staff, farmers and E Tu Green	19th – 21st June 2023	E Tu Green Garden Champasak Province - Lao PDR	12 (7/5)
6	Delivered training workshop to brief about PGS, SWOT, Risk, PGS field checklist and Farmer and farmer knowledge sharing and keep communicating	29th Aug - 2nd Sept 2023	E Tu Green Garden Champasak Province - Lao PDR	11 (8/3)
7	Present the draft of regulation of PGS group with all the members and finalise the PGS group documents. CoP Training on nutrition and pest management	16th-18th Nov 2023	E Tu Green Garden Champasak Province - Lao PDR	20 (13/7)
8	Workshop for announcement of establishment of Commercial Pepper	29th February, 2024	E Tu Green Garden Champasak Province - Lao PDR	31 (21/10)

	Growing and Processing Group			
9	Attended Viet Nam International Pepper and Spice Outlook 2024 (VIPO-2024) in Hanoi, Vietnam	8th - 10th March 2024	Hanoi, Viet Nam (DOA and Etu Green Garden representatives)	2 (1/1)
10	CoP training for PAFO, DAFO, Etu Green Co. and pepper farmers	10th – 11th May 2024	E Tu Green Garden Champasak Province - Lao PDR	20 (13/7)
11	Lao PDR Team organized the national dissemination seminar with pepper industry stakeholders & donor representatives	21st June 2024	DOA, Vientiane	36(22/14)

12.4 ANNEX 5. List of key persons involved in the project

VIET NAM

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16	Nguyen Van Tam	Farmer	Village 24, Ea Ning commune, Cu Kuin district, Dak Lak province
17	Cao Van Phuong	Farmer	Village 23, Ea Ning commune, Cu Kuin district, Dak Lak province
18	Nguyen Manh The	Farmer	Village 23, Ea Ning commune, Cu Kuin district, Dak Lak province
19	Le Thi Luc	Farmer	Village 2 Tay, Bau Lam commune, Xuyen Moc district, BRVT
20	Nguyen Van Tien	Farmer	Village 2 Tay, Bau Lam commune, Xuyen Moc district, BRVT

21	Pham Thi Voc	Farmer	Village 2 Tay, Bau Lam commune, Xuyen Moc district, BRVT
22	On Thanh Hoa	Farmer	Village 2 Tay, Bau Lam commune, Xuyen Moc district, BRVT
23	Hoang Thi Tinh	Farmer	Village 2 Tay, Bau Lam commune, Xuyen Moc district, BRVT
24	Ngo Duy Dung	Farmers' Association	Farmers' Association of Ea Ning commune, Cu Kuin district, Dak Lak province
25	Le Thi Nam Xinh	Farmers' Association	
26	Nguyen Thanh Son	Farmers' Association	Farmers' Association of Bau Lam commune, Xuyen Moc district, BR-VT province
27	Le Chi Tuong	Farmers' Association	

CAMBODIA

	Name	Organization	Contact details
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22	SUM SAOSORY		
23	HON LIHONG		
24	NUTH CHHAYVAN		
25	SOK KOEMSEANG		
26	THY KEB		
27	HON SIHONG		
28	Lim Leang	Farmer	Memot District, Tbong Khmum Province
29	Leang Sokna		
30	Saing Thorn		
31	Ouk Sonny		
32	Say Sophan		
33	Dith Wa		
34	Li Xiangwu		
35	Sous Chhuon		
36	Sous Chi		
37	Nut Phi		
38	Kov Chhean		
39	Sam Theara		
40	Sar Then		
41	Pov Seiha		
42	Sam Samnang		
43	Puth Yeng		
44	Phin Phang		
45	Rith Ranet		
46	Tam Rosset		
47	Vat Vichet		
48	Lim Chanthol		

49	Hean Oun Ry		
50	Chhuon Sokheang		
51	Chut Choeun		
52	Chut Man		
53	Heng Mab		
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LAO PDR

	Name	Organization	Contact details
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16	Jobsamone		
17	Jouey Phonephasith		
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21	Tien phoutienchay		
22	Say boutdala		
23	Outhai nim a sa		
24	Pa nome		
25	Khamla		
26	Khet		
27	Ngou chan		
28	Sisay chamsay		
29	Sonexay lounthaphanya		
30	Khemphone xaysongkham		
31	Bounnam		
32	khammany nandavong		
33	Vanhnasin bounlert		
34	Phet bounlert		
35	Yong sitthisay		
36	kham nging		

12.5 ANNEXE 5: Essential documents for Adapted- PGS implementation

12.5.2 Guidelines on setting rules and regulations for PGS group

Introduction

For a PGS group to be well-managed, general regulations and rules must be developed to give directions on what to do. For PGS, the overall management and operational regulations include three sets of documents:

1. Introduction to the system,
2. organizational structure and roles and responsibilities,
3. requirements, rights and obligations of members

1. Introduction to the system

This section provides the general information about a particular group and forms the basis of the group's policy. It contains all the information used to help inform new members.

Name of group: The selection of a name for the group should convey the specific characteristics: type of product, location.

Share vision: The shared vision is what a PGS plans to achieve and its desired goals. The content of this is created during the two training sessions where groups are asked to draw their vision. The vision of the company, and the vision of the farmers is then combined to make one shared vision for the PGS group.

Mission of group: This described the activities that a PGS needs to conduct to achieve its vision. What must the group do to reach their goal?

Background: The background comprises information about the context and factors that led to the creation of a PGS. It helps make the process transparent, showing the history behind the PGS. The background of a PGS often builds on:

- The desire of producers to better connect their products to the market.
- The need to enhance the agricultural production and livelihoods of local people and the government.
- Initiatives from local partners, NGOs, development organisations, and/or companies, and
- The integration of all the factors above.

Scope of operations: The scope of operations refers to the operational limits of a PGS. It can be determined through a series of factors amongst which:

- The characteristics of farming households, production groups, and inter-groups (for example: small scale production households, number of production groups, production scale of the cooperatives).
- Geographical limits of the production area or intergroup (for instance: commune, village, group of villages).
- Product characteristics

Rights and obligations of PGS: The rights of a PGS always come together with its obligations. When identifying the rights and obligations of a PGS group, one must take the following factors into account:

- Scope of operations of the PGS
- Scope of business operations, organisational structure, functions and operations
- The resources and materials needed
- The procedures and documentations related to PGS operations and establishment

2. Organisational structure and roles and responsibilities

The main structure of the PGS is centred around the formation of an intergroup. A group that represented all stakeholders involved in the PGS activities. There are a number of roles held within the intergroup that ensure it is able to undertake its responsibilities to all its members.

The table below lists the roles and the responsibility of each role. People who put themselves forwards to fulfil these roles should have the necessary skills to do the tasks. In an ideal situation the person in each role should be rotated at least every two years, so that everyone can get exposure to the group activities. The Chairman role could be selected from a different representative group each time. So maybe the first year it is the company representative, then farmer, and then GDA.

3. Requirements, rights and obligations of members

Meetings

Regular meetings need to be held by the intergroup. These are can decided by the group but should include the following:

- Plenary general assembly usually taking place every 3 or 5 years, and open to all members
- Annual general meeting
- Regular meetings to discuss issues and planning
- Subgroup meetings for inspection scheduling, and planning.
- Ad hoc meetings (unexpected meetings) are held when required or when urgent issues must be addressed such as complaints from customers, and violations of production standards

Rules and regulations

Rules and regulations are agreed by the intergroup. These should be a set of guiding principles about conduct to ensure that orderly functioning of the group. There will be some rules that the group agrees must be included and those they will be nice to have.

During the first intergroup meeting, a set of guiding rules both covering behaviour of members and operation of the group should be decided on. The follow table could be completed during this session.

The group also needs to decide what action will be taken if violation of the rules happens.

12.5.3 Commitment Form for joining PGS

Group name: _____

Code of the group						

Commitment for joining PGS

Name:					
I am a farmer	☐	I am a member of government	☐	I am a member of the company	☐
Address:					
Contact number					

I ……..…….. would like to join ……..…… PGS group
(name of member) (Name of group)

I promise to commit to conditions as follows:

1. I will cooperate with other members of the group and fully participate the meetings and trainings which are organized by PGS.	☐
2. I will keep records in accordance with PGS rules. I agree that other members of PGS can check my records.	☐
3. I will follow rules of PGS.	☐
4. I will respect the efforts and decisions made by the intergroup	☐

I am **a farmer and I** promise to commit to conditions as follows:

5. I will grow my crop in accordance with Good Agriculture practice guidelines.	☒
6. I will follow rules of the farmer's group.	☐
7. I agree that other members come to my farm for inspection with advance notice.	☐
8. I will inform the intergroup of any changes to my production practices that are contrary to GAP guidelines and may affect quantity or quality of product.	☐
9. I will be open and honest about any problems on my farm and seek help or advice before using any product that may risk quality and safety of the product and environment.	☐
10. I will accept the decision related to the compliance which is made by the group.	☐

I confirm that the information I provided in this commitment is correct. And I will provide information continuously when any changes happen.

Date ……	Date…….
Name of **member**	Name of Chairman of PGS Group
……	……..
Sign and write down the name	Sign and write down the name

Date…….

Name of Village head

……..

Sign and write down the name

12.5.4 Adopted PGS field checklist (Guide for Auditor)

Check records	Check in field	Check before, during and after harvesting

Order	Measures	High Risk	Non-Harvest period	Criteria			Explanation notes Recommendations to farmer
					YES	NO	
1	Monitoring and records		X	Records of all farm activities should be kept up to date			Records include most recent activities. Check dates of entry in record books
			X	Does the farm undertake regular inspection of the gardens to detect pests and disease early and enable timely decision making, do they keep records of those inspections?			
			X	Does the farm have spray records for all pesticides (herbicides, insecticides, fungicides) that include: • Date of spraying • Pesticide name (active ingredient – must, trade name – nice to have) • Rate and area sprayed			
			X	Does the farm have application records for fertilizers (both organic and inorganic)?			
			X	Does the farm have records of fertilizer and pesticide stock?			

				Does the farm have records of harvesting?			
			X	Is each pepper block clearly identified according to guidelines: date of planting, variety, and area.			
2	Farm Hygiene		X	Is the farm tidy, and kept in a good order?			Look for evidence that the farm is clear of waste, unused tools and equipment stored properly, any pepper harvested it properly stored, obstacles that people could trip over, any electrics or irrigation in good repair
			X	Use safe water sources (well water, treated pond water) for irrigation, pesticide and fertilizer applications, cleaning equipment, washing of peppercorn and personnel.			Look at where water is coming from, make observations on what is around the water.
3	production		X	Do the Pepper gardens have a suitable and maintained drainage system?			
4	Safe of use and storage of pesticides		X	All pesticides must be used in a safe and correct manner as described in the national guide.			Ask the farmer whether he has a copy of the National guide. If he does, ask him several questions about what is in the guide.
			X	Washing facilities should be available for washing and cleaning containers, equipment, PPE, and personnel			
			X	Are pesticides stored according to National Pesticide Use Policy?			

			X	Empty pesticide containers should be stored and disposed of according to guidelines			Look around the farm for signs of empty containers on the ground. Look into the store to see how the pesticides are stacked.
			X	Personal protection clothing must be used in accordance with label instructions			Look at PPE farmers are using, do they have suitable gloves, boots, overalls, masks. Are they in good condition.
			X	Only pesticides specifically stated on the national Approved Pesticide List(s) may be used.			Check the store to make sure only pesticides that are on the list are present.
5	Crop protection			Adhere to re-entry and pre-harvest intervals			Look at spray records and harvest records
			X	As a priority, integrated pest management practices should be adopted by applying the principles of prevention, maintenance and management			Observe what practices the farmer is adopting to discourage pests. Is the farmer making botanical sprays? Ask what IPM practices are being adopted on the farm
6	Crop nutrition		X	Use of untreated human sewage sludge is not permitted.			
			X	Are solid fertilizers (both inorganic and organic) applied according to interpretation guide? i.e. correct rate, applied when soil is moist, raked into top layer of soil, along the edge of the canopy.			Recommendation to use organic fertilizer in place of or in addition to inorganic fertilizer
7	Harvest		X	Use clean tools when harvesting			
			X	Livestock excluded from the pepper gardens one week before and during harvesting.			

			X	Are un-contaminated bags being used for harvest and store pepper?			Check bags and make sure they are not previously used for chemical fertilizers, pesticides or other materials
			X	Are guidelines for harvesting being followed correctly?			Prepare equipment for harvesting - tarpaulin, bags, ladders, chairs, and machines chairs, and thresher. Inspect and clean the field in the area to be harvested. Take care to remove any dead pepper shoots from the ground that are rotten and mouldy. Spread a tarpaulin in the rows and around the pepper base to avoid berries dropping on the soil and becoming contaminated.
			X	Peppercorn supplied to the factory contain a maximum of 0.5% foreign matter.			
8	Post-harvest washing			Only white and red pepper should be washed			
				Is boiled and clean water used for cleaning red and white pepper?			
	Post harvest - drying			Does the farmer dry pepper according to guidelines from company, and not use mechanical during?			
				The drying area, should be clean and kept free of any source of contamination.			
				Are guidelines for drying pepper followed correctly?			a. The drying area, should be cleaned and covered with tarpaulin. b. The drying yard should not be damp and should

							not be any pools of stagnant water. c. The tarpaulin must be clean and free from any possible contaminants. d. The drying area should be protected from any pests or farm animals. e. Pepper should be placed on clean drying platforms raised above the ground. f. Care must be taken to ensure that pepper is adequately dried and to prevent spoilage from mould or other contaminants. g. Clean pepper can be soaked for between 1 to 2 minutes in water of 80° to 90° C to reduce contaminants, facilitate drying and improve appearance of the dried pepper.
	Post-harvest storage			Only store packed pepper in a safe condition			
				Dried pepper must be packed in clean, dry bags free from any material that may contaminate the pepper			

12.6 ANNEX 6: Published success stories

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Vietnam leads the way in developing a Code of Practice for the peppercorn industry in South East Asia

Addressing challenges in meeting Sanitary and Phytosanitary (SPS) standards

The peppercorn industry in Vietnam and other South East Asian countries has faced challenges in meeting SPS standards on smallholder farms. Non-compliance with these standards threatens exports to high-value international markets due to food safety concerns. To address this issue, the **'Safer Spices: Boosting Food Safety and Market Access for the Peppercorn Value Chain in South East Asia'** project, funded by the Standards and Trade Development Facility (STDF) and implemented by CABI in partnership with local institutions, developed a Code of Practice (CoP) and interpretation guides for peppercorn production in Vietnam, Cambodia and Laos.

Leading the development of the CoP

Vietnam's Western Highlands Agriculture and Forestry Science Institute (WASI) took the lead in developing a CoP and a supporting interpretation guide, drawing from Vietnam's extensive experience as a major global producer and exporter of peppercorn. With support from an international CoP expert, this South–South collaboration began with an extensive desk study, interviews with key industry actors, and meetings with stakeholders across the three partner countries: Vietnam, Cambodia and Laos. This resulted in a generic draft CoP, that aligned with Good Agricultural Practice standards, CODEX standards and key international buyer programmes.

Two key challenges identified by peppercorn farmers were lack of localized knowledge resources and issues with conflicting messaging. To address these, the project teams collaborated with stakeholders to create country-level interpretation guides that considered different growing conditions and practices. These were translated into local languages to increase accessibility. In 2022, WASI experts conducted training of trainers on the CoP for local partners in Vietnam, Cambodia and Laos, who then carried out national trainings with farmers and private companies.

Pilot tests were carried out on selected farms in each country to identify the need for adaptation to the CoP, considering the diverse farm management practices. To support the adoption of the CoP, a collaborative public-private sector approach was adopted, inspired by IFOAM – Organics International's Participatory Guarantee System (PGS). Using this "Grassroots Public Private Partnerships", or G-PPP approach, two groups of five farmer members were set up in Vietnam's Cu Kuin district (Dak Lak province) and Xuyen Moc district (Ba Ria-Vung Tau province). In Cambodia, one group of 30 farmers was set up in Memot (Tbong Khmum province), while one group of 19 farmers was set up in Pakse (Champasak province) in Laos. Various private companies, including Simexco Daklak Ltd and Viet Pepper Co Ltd in Vietnam, Sela Pepper Co Ltd in Cambodia and Etu Green Garden in Laos, were also involved in the project. Each group received technical training developed by WASI, and the feedback from the field was incorporated into revised interpretation guides.

Positive impacts on yield, income and pesticide reduction

The development and implementation of the CoP have yielded positive results, as evidenced by farmers and stakeholders involved in the project.

For example, Vietnamese farmers On Thanh Hoa and Nguyen Van Tien (below) highlighted the cost savings achieved through the adoption of good pesticide management practices, reducing pesticide use from 10 bottles per season to just two bottles, resulting in a 30% cost reduction.

While Suos Chhuon, a 60-year-old Cambodian farmer with 12 years' experience growing peppercorn, reported a 10% increase in yield and a 30% increase in income after adopting good pesticide management practices. "*The additional income will be utilized to expand the farm and plant more peppercorn trees,*" Chhuon stated.

Le Tjo Haoi Thuong, Director of Viet Pepper Co Ltd, emphasized the company's commitment to working with farmers to ensure the production of quality peppercorns through the adoption of the CoP and the sharing of knowledge and skills between the technical expertise of farmers, Viet Pepper Co Ltd, WASI and the Plant Protection Department.

Promoting food safety and market access across South East Asia

Vietnam's support in creating a CoP and interpretation guide has set a strong precedent for regional collaboration to address a common challenge. The country not only focused on improving its own peppercorn industry but also shared its expertise with Cambodia and Laos as they developed their country-specific guides. The collaborative approach facilitated by the **'Safer Spices: Boosting Food Safety and Market Access for the Peppercorn Value Chain in South East Asia'** project has laid the foundation for a safer, more sustainable and competitive peppercorn industry across South East Asia.

On Thanh Hoa (right) and Nguyen Van Tien (left) inspecting a pepper plant

Project partners

The project was funded by the Standards and Trade Development Facility (STDF).
To deliver the project, CABI worked in partnership with:

Western Highlands Agriculture & Forestry Science Institute (WASI), Vietnam

Department of Agriculture, Lao PDR

General Directorate of Agriculture, Cambodia

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Collaborative efforts lead to increased peppercorn exports and improved quality

Peppercorn is a key agricultural crop contributing significantly to the economies of Vietnam, Cambodia and Laos. However, non-compliance with Sanitary and Phytosanitary (SPS) standards on smallholder farms has threatened exports to high-value international markets due to food safety concerns.

The **'Safer Spices: Boosting Food Safety and Market Access for the Peppercorn Value Chain in South East Asia'** project, funded by the Standards and Trade Development Facility (STDF) and implemented by CABI in collaboration with local organizations and private companies, aimed to support the adoption of a Code of Practice (CoP) developed by the project. This initiative developed a collaborative public-private sector approach, inspired by IFOAM – Organics International's Participatory Guarantee System (PGS), later named "Grassroots Public Private Partnerships", or G-PPP.

Targeting village-level activities through collaborative partnerships

Smallholder farmers encounter numerous obstacles in adopting Good Agricultural Practices (GAP) standards – compliance criteria are often generic and sometimes may contradict local knowledge and practices. This project aimed to address these challenges by helping smallholder farmers adopt GAP standards, changing perspectives to view standards as a tool to reduce risk and improve efficiencies, and creating an enabling environment to motivate farmers to enhance their practices.

Inspired by the replicability of the PGS for direct sourcing of organic products in local markets, the project co-created a collaborative public-private partnership model applicable to a wide range of supply chains and situations. CABI, with support from international market system experts, collaborated with ministry departments in Vietnam, Cambodia, and Laos. The project also worked with various private companies including Simexco Co Ltd and Viet Pepper Co Ltd in Vietnam, Sela Pepper Co Ltd in Cambodia, Etu Green Garden in Laos, and four different farmer groups.

The collaboration resulted in a five-step approach that built trust, forged relationships and empowered participants to localize the implementation, monitoring, and accountability of a CoP. This approach specifically addressed local quality and safety risks while ensuring compliance with market SPS requirements.

Farmer group in Laos

Significant improvements in quality and export volumes

Thanks to the project, Thy Keb, Operations Manager at Sela Pepper, in Cambodia, reported a decrease in the rejection rate of peppercorn bought from farmers from 7–10% in 2022 to just 1.5–2% in 2023. Keb has also seen improvements in technical knowledge among farmers, gained through the adoption of the CoP, helped by the increased collaboration and understanding between him and his farmer group. The G-PPP farmer group has begun producing high-quality peppercorn that meets international market standards. This has contributed to Cambodia successfully exporting the first 30 tonnes of black peppercorn from the country to China, demonstrating the capability of Cambodian farmers to produce peppercorn that fulfils international market requirements. Moreover, Sela Pepper has also increased its exports to the EU, due to its sourcing of higher-quality produce from G-PPP farmers in Memot.

The Deputy Director of the Plant Protection Sanitary and Phytosanitary Department, General Directorate of Agriculture in Cambodia, Chhun Hy Heng, commented that the farmers are now producing better quality peppercorn that is translating into increased exports to the EU.

Taim Roset, a 59-year-old Cambodian farmer with nine years of experience in peppercorn, highlighted the project's role in fostering collaboration and building relationships. *"This project helped me build good relationships with other farmers, with Sela Pepper and other stakeholders, and assisted me to increase my income"*, Roset stated.

The power of the G-PPP

Soumaly Phommahuk, Etu Green Garden's Director, in Laos, highlighted the company's role in understanding market demand and translating it into on-the-ground production by building farmers' capacity in peppercorn processing. *"The G-PPP brings farmers together to teach and learn from one another, to share good practices and to learn lessons from each other's experiences,"* Soumaly said. *"Initially, I did not expect many farmers to join this project. We aimed for five to 10 farmers but were pleasantly surprised when 19 decided to join us."*

Souliya Souvandouane and Phoumee Kanya both from Lao PDR's Department of Agriculture praised the G-PPP model as *"an excellent way to connect buyers and sellers"*, while also teaching farmers to self-monitor peppercorn production and quality. They emphasize the collaborative work between farmers and Etu Green Garden in sharing experiences and challenges related to peppercorn farming.

Sipachanh Sengpathip, a farmer from Laos, whose farm was chosen as the model for the project, expressed her appreciation for the project's demonstration of teamwork among farmers. *"Through collective teamwork, farmers can produce peppercorn according to market demand. This translates into higher volume, which in turn leads to higher income"*, Sipachanh stated. She also values the opportunity to share information on peppercorn production and management with other farmers.

Lao PDR's Department of Agriculture and Etu Green Garden aim to sell Champasak peppercorn under the 'One District One Product' brand, showcasing the positive impact of the project. Additionally, the project has supported Etu Green Garden in establishing an international presence by facilitating connections with regional and international buyers and promoting Laotian peppercorn on the global stage.

Empowering farmers and promoting local products

The successful pilot of the G-PPP approach marks a significant step towards empowering small-scale peppercorn farmers, enabling them to meet quality standards, access new markets, and improve their livelihoods through collaborative efforts. The project demonstrated the potential of public-private partnerships to foster a more inclusive, sustainable, and quality-driven peppercorn industry. By empowering communities to collaborate, the initiative supports small-scale farmers and promotes local products on the global stage.

Project partners

The project was funded by the Standards and Trade Development Facility (STDF).
To deliver the project, CABI worked in partnership with:

Western Highlands Agriculture & Forestry Science Institute (WASI), Vietnam

Department of Agriculture, Lao PDR

General Directorate of Agriculture, Cambodia

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Sowing the seeds of change in South East Asia's peppercorn industry

Peppercorn is a key agricultural crop contributing significantly to the economies of Vietnam, Cambodia and Laos. However, non-compliance with Sanitary and Phytosanitary (SPS) standards on smallholder farms has threatened exports to high-value international markets due to food safety concerns. The **'Safer Spices: Boosting Food Safety and Market Access for the Peppercorn Value Chain in South East Asia'** project, funded by the Standards and Trade Development Facility (STDF) and implemented by CABI in partnership with local organizations, aimed to address these challenges through two key objectives:

1. To restore the confidence of the food manufacturing industry in peppercorn sourced from the South East Asia region; and
2. To support the consistent supply of high-quality, safe peppercorn from small-scale value chains.

To achieve these objectives, the project focused on improving quality and traceability in the production, post-harvest handling and processing of peppercorn by developing a Code of Practice (CoP) and locally adapted interpretation guides for peppercorn production in Vietnam, Cambodia and Laos. The project aimed to support the adoption of the CoP through a collaborative public-private sector approach, inspired by IFOAM – Organics International's Participatory Guarantee System (PGS).

Leading the development of the CoP

Vietnam's Western Highlands Agriculture and Forestry Science Institute (WASI) took the lead in developing a CoP and a supporting interpretation guide, drawing from extensive experience as a major global producer and exporter of peppercorn. With support from an international CoP expert, this South–South collaboration began with an extensive desk study, interviews with key industry actors, and meetings with stakeholders across the three partner countries: Vietnam, Cambodia and Laos. This resulted in a generic draft CoP, that aligned with Good Agricultural Practice standards, CODEX standards and key international buyer programmes.

The project teams collaborated with stakeholders to create country-level interpretation guides that considered different geographies. These were translated into local languages to increase accessibility. WASI experts conducted training of trainers to deliver knowledge to farmers and supported the implementation of the CoP with pilot groups. Two groups, each involving five farmer members, were set up in Vietnam's Cu Kuin district (Dak Lak province) and Xuyen Moc district (Ba Ria-Vung Tau province). One group of 30 farmers in Memot (Tbong Khmum province) was set up in Cambodia, and one group of 19 farmers in Pakse (Champasak province) in Laos.

Various private companies, including Simexco Co Ltd and Viet Pepper Co Ltd in Vietnam, Sela Pepper Co Ltd in Cambodia, and Etu Green Garden in Laos, were also involved in the project. Each group received the training modules developed by WASI and the feedback from the field was incorporated into revised interpretation guides.

Vietnamese farmers On Thanh Hoa and Nguyen Van Tien highlighted the cost savings achieved through the adoption of good pesticide management practices via the CoP, reducing pesticide use from 10 bottles per season to just two bottles, resulting in a 30% cost reduction.

Empowering farmers through collaborative efforts at the village-level

The project co-created a collaborative public-private partnership model applicable to a wide range of supply chains and situations, inspired by the replicability of the PGS for direct sourcing of organic products in local markets. CABI, with support from international market system experts, collaborated with ministry departments in Vietnam, Cambodia and Laos, as well as participating private companies, and four different farmer groups, designing an approach that was later named "Grassroots Public Private Partnership", or G-PPP.

The collaboration resulted in a five-step approach that built trust, forged relationships, and empowered participants to localize the implementation, monitoring, and accountability of a CoP. This approach specifically addressed local quality and safety risks while ensuring compliance with market SPS requirements.

Farmer group in Laos

Success in Laos

Soumaly Phommahuk, Etu Green Garden's Director, in Laos, stated, *"the G-PPP brings farmers together to share good practices and to learn lessons from each other's experiences"*. This collaboration has empowered Soumaly and her newly formed farmer group.

Sipachanh Sengpathip, whose farm was chosen as the model for the project, expressed her appreciation for the project's demonstration of teamwork among farmers. *"Through collective teamwork, farmers can produce according to market demand. This translates into higher volume, which in turn leads to higher income"*. She also values the opportunity to share information on peppercorn production and management with other farmers.

Souliya Souvandouane and Phoumee Kanya both from Lao PDR's Department of Agriculture, praised the G-PPP model as *"an excellent way to connect buyers and sellers"*, while also teaching farmers to self-monitor peppercorn production and quality. They emphasize the collaborative work between farmers and Etu Green Garden in sharing experiences and challenges related to peppercorn farming.

As a direct result of the project, Lao PDR's Department of Agriculture and Etu Green Garden aim to sell Champasak peppercorn under the 'One District One Product' brand, showcasing the positive impact of the project. Additionally, the project has supported Etu Green Garden in establishing an international presence by facilitating connections with regional and international buyers and promoting Laotian peppercorn on the global stage.

Success in Cambodia

In Cambodia, the project focused on village-level activities in Memot, Tbong Khmum province, which accounts for about 90% of the country's pepper production. CABI partnered with the General Directorate of Agriculture (GDA) and Sela Pepper Co Ltd, a private company that sources its peppercorn from 400 smallholder farmers in Memot, created a G-PPP group and established quality and supply criteria based on the CoP and agreements to further collaboration and achieve results.

Thy Keb, Operations Manager at Sela Pepper Co Ltd reported a decrease in the rejection rate of peppercorn bought from farmers from 7–10% in 2022 to 1.5–2% in 2023. Thanks to the project, Keb has seen improvements in technical knowledge among farmers, gained through the adoption of the CoP, helped by the increased collaboration and understanding between him and his farmer group. The G-PPP farmer group has begun producing high-quality peppercorn that meets international market standards. This has contributed to Cambodia successfully exporting the first 30 tonnes of black peppercorn from the country to China in May 2024. Sela Pepper Co Ltd is also looking to increase its exports to the EU from 60 tonnes in 2022 to 100 tonnes in 2024.

Empowering farmers, enhancing livelihoods and ensuring food safety

The **'Safer Spices: Boosting Food Safety and Market Access for the Peppercorn Value Chain in South East Asia'** project has successfully restored confidence in peppercorn sourced from the region and supported the consistent supply of high-quality, safe peppercorn from small-scale producers to regional and international markets. By promoting food safety, market access and sustainable practices across the region, the project has enhanced the peppercorn value chain and improved the livelihoods of smallholder farmers in Vietnam, Cambodia and Laos. The collaborative approach and successful interventions serve as a model for future initiatives aimed at promoting sustainable and inclusive growth in agricultural value chains across South East Asia.

GDA's Rambo Mao (left) Thy Keb from Sela Pepper (next to him) and members of their farmer group on the right.

Project partners

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To deliver the project, CABI worked in partnership with:

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Department of Agriculture, Lao PDR

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12.7 ANNEX 7: Inspection and assessment reports from countries

Findings from Vietnam

The project successfully built 10 safe pepper production models in Dak Lak and Ba Ria Vung Tau provinces. The analysis of pepper samples from these models showed that all samples met the EC 396/2005 export standards for the European market, indicating the effectiveness of the safe pepper production models. Monitoring the implementation of CoP standards revealed significant improvements across several areas:

1. **Weed Management**: Initially, farmers had a basic understanding of weed management but lacked the techniques to maintain grass beds effectively. After a year of CoP training, 100% of model households managed weeds very well.
2. **Covering the Base of the Plant**: Initially, 30% of farmers did not practice covering the base of the plant, and 70% did so incorrectly. Post-training, all farmers adopted proper techniques for covering the base of the plant.
3. **Shade and Windbreak Tree Management**: Initially, only 50% managed shade trees well. After training, 100% of farmers managed these trees well, with 26.67% managing them very well.
4. **Fertilizer Management**: Initially, 47.5% of farmers managed fertilizer effectively. Post-training, 100% managed fertilization well, with 30% managing it very well.
5. **Water Management**: Initially, 73.33% of farmers managed watering well. Post-training, all farmers managed it well.
6. **Pest and Disease Management**: Over 50% of farmers initially lacked proper pest and disease management. After training, all farmers knew how to manage pests and diseases effectively and complied with quarantine periods before harvesting.
7. **Harvest and Processing Management**: Initially, over 75% managed this well. Post-training, 100% of farmers performed these tasks well.
8. **Environmental Protection**: Farmers showed an increased understanding and implementation of environmental protection measures.
9. **Record Production Diary**: Initially, no farmer kept a production diary. Post-training, all farmers understood the importance and maintained detailed production diaries.

Vietnamese farmers, such as On Thanh Hoa and Nguyen Van Tien, highlighted cost savings through better pesticide management, reducing usage from 10 bottles per season to two, resulting in a 30% cost reduction. Le Tjo Haoi Thuong, Director of Viet Pepper Co Ltd, emphasized the company's commitment to quality peppercorn production through the adoption of CoP and collaboration with WASI and the Plant Protection Department.

The results demonstrate the effectiveness of the CoP and PGS in improving agricultural practices and the potential for scaling up these models for broader adoption.

Findings from Cambodia

The GDA team's training for PGS farmer groups in Cambodia, based on comprehensive Code of Practice (CoP) interpretation guidelines, significantly improved various farming practices. The training covered management of black pepper variety, new planting and rejuvenation, nutrition, irrigation, pruning, canopy, weed, pests and diseases, and pre-and post-harvest management. Key improvements included:

1. **Weed Management**: Post-training, all farmers applied effective weed management techniques such as hand weeding and organic mulch, up from 60% before the training.
2. **Cover Crops**: Adoption of cover crops like legumes increased from 40% to 90%, enhancing soil moisture and nitrogen content.
3. **Chemical Control**: Understanding proper pesticide use rose from 40% to 70-80%, with farmers adhering to label recommendations and considering environmental impacts.

4. **Biological Control**: Adoption of biocontrol methods like Trichoderma for disease management increased, minimizing chemical fungicide use.
5. **Shade Management**: Usage of plastic nets for controlling sunlight exposure became universal among PGS farmers.
6. **Fertilizer Application**: About 80% of farmers mastered the timing and placement of fertilizer applications.
7. **Water Management**: Adoption of efficient systems like drip irrigation was used by 60% of farmers, enhancing water usage efficiency.
8. **Pest and Disease Control**: Knowledge of Integrated Pest Management (IPM) techniques reached 70% of farmers, improving early detection and control of pests and diseases.
9. **Pre- and Post-harvest Management**: About 90% of farmers became proficient in optimal harvesting times and post-harvest processes, ensuring quality preservation of peppercorns.
10. **Record Keeping**: About 70% of farmers were capable of maintaining accurate daily records of their farming activities.

These improvements indicate that the CoP, PGS approach, supporting documents, and training materials are well-suited, clear, comprehensive, practical, and scalable. Although peppercorn yields increased slightly, the more significant impact was on farmers' income through enhanced pest and disease control knowledge. Farmers can now identify pests themselves and make biopesticides, saving money and time by avoiding incorrect inputs. Their improved understanding of pre- and post-harvest management enables them to produce high-quality peppercorns with good density, low foreign matter, and low moisture. As a result, all PGS farmers receive premium prices for their produce and additional bonuses if they meet the requirements set by the Sela company.

For instance, Suos Chhuon, a 60-year-old Cambodian farmer with 12 years of experience growing peppercorn, reported a 10% increase in yield and a 30% increase in income after adopting good pesticide management practices. "The additional income will be utilized to expand the farm and plant more peppercorn trees," Chhuon stated.

Thy Keb, Operations Manager at Sela Pepper, reported a decrease in the rejection rate of peppercorn bought from farmers from 7-10% in 2022 to just 1.5-2% in 2023. Keb has also seen improvements in technical knowledge among farmers, gained through the adoption of the CoP, which has been facilitated by increased collaboration and understanding between him and his farmer group. The G-PPP farmer group began producing high-quality peppercorn that meets international market standards. Following the development of the export protocol, Cambodia successfully exported the first 30 tonnes of black peppercorn to China, demonstrating the capability of Cambodian farmers to meet international market requirements. Moreover, Sela increased its exports to the EU by sourcing higher quality produce from G-PPP farmers in Memot.

Chhun Hy Heng, Deputy Director of PPSPSD, the General Directorate of Agriculture, Ministry of Agriculture, Forestry and Fisheries in Cambodia, commented that farmers are now producing better quality peppercorn, leading to increased exports to the EU.

Taim Roset, a 59-year-old Cambodian farmer with nine years of experience in peppercorn cultivation, highlighted the project's role in fostering collaboration and building relationships. "This project helped me build good relationships with other farmers, with Sela Pepper and other stakeholders, and assisted me in increasing my income," Roset stated.

Findings from Lao PDR:

In Lao PDR, Soumaly Phommahuk, Director of Etu Green Garden, highlighted the company's role in understanding market demand and translating it into on-the-ground production by building farmers' capacity in peppercorn processing. "The G-PPP brings farmers together to teach and learn from one another, to share good practices and learn lessons from each other's experiences," Soumaly said. Initially, the project aimed to engage five to ten farmers but exceeded expectations with 19 farmers joining.

Souliya Souvandouane and Phoumee Kanya from the Department of Agriculture praised the G-PPP model as "an excellent way to connect buyers and sellers," while also teaching farmers to self-monitor peppercorn production and quality. They emphasized the collaborative efforts between farmers and Etu Green Garden in sharing experiences and addressing challenges related to peppercorn farming.

Sipachanh Sengpathip, whose farm was chosen as the model for the project, appreciated the demonstration of teamwork among farmers. "Through collective teamwork, farmers can produce peppercorn according to market demand. This translates into higher volume, which in turn leads to higher income," Sipachanh stated. She valued the opportunity to share information on peppercorn production and management with other farmers.

The Department of Agriculture in Lao PDR and Etu Green Garden aim to sell Champasak peppercorn under the 'One District One Product' brand, showcasing the positive impact of the project. Additionally, the project supported Etu Green Garden in establishing an international presence by facilitating connections with regional and international buyers and promoting Laotian peppercorn on the global stage.

This approach underscores the effectiveness of the CoP, PGS, supporting documents, and training materials in Lao PDR, demonstrating their suitability and scalability. Farmers not only improved their production practices but also built strong networks and collaborations, leading to higher income and enhanced market access.

12.8 ANNEX 8: Final signed financial report