AN ASSESSMENT REPORT ON

The Impacts of Heat on Women and The Role of Gender Within the Peppercorn Value Chain, Opportunities for Gender Mainstreaming, And Small Pepper Farm Owner and Companies' Adaptation to Climate Change in Kampong Trach and Chhouk District of Kampot, And Other Areas of Kep Provinces

March 2025

Implemented by:

People in Need

FAIR FARMS

SOGE SOLAR GREEN ENERGY CAMBODIA

This project is supported by the Asian Development Bank (ADB) through the Innovation Hub and High-Level Technology (HLT) Fund.

CONTENTS

1 INTRODUCTION

Kampot pepper is well known and used for various cuisines in the EU, western countries, Japan and Korea.[1] It has been granted 'geographic indication' (GI) by the Cambodian Ministry of Commerce since 2010, and registered as a foreign GI in the European Union (EU), and Vietnam in 2016 and Thailand in 2017.[2] The GI award was granted based on the unique quality, agro-environment such as 'weather', 'coastal climate', and 'soil conditions'. The GI for Kampot peppercorns covers white, red and black peppercorn,[3] which can only be grown in designated areas of 264 hectares located in Kampong Trach district, Chhouk district, Toeuk Chhou district, Dan Tong district, and Kampot city in Kampot province, and Damnak Chang Aeur district in Kep province.[4] Additionally, the pepper plant must be two types of two varieties, Kamchay and Lampong, originating and grown in the designated areas.[5]

The export price per ton varies depending on types: black - $15,000, white - $28,000, and red - $25,000.[6] In the Kampot Pepper Promotion Association, there are 352 small pepper farm owner (without registration with the Ministry of Commerce), and 25 companies (with registration with the Ministry of Commerce) that make income from their peppercorn.[7] The peppercorn farming skills in Kampong Trach and Chhouk districts of Kampot and other areas of Kep are passed down from one generation to the next. They choose to grow peppercorn because the geography is suitable for this type of plant.[8]

In 2023, Cambodia exported 103 tons of Kampot pepper, which decreased by 11% compared to 2022, caused by the lower peppercorn production.[9] Most of the peppercorn small pepper farm owners in Kampong Trach and Chhouk district of Kampot and other areas of Kep mentioned the impacts of the extreme heat in their pepper farming areas in 2024, causing the death of pepper plants and lower productivity. The same year, a pepper company lost around 5,000 poles of peppercorn plants.[10] Small pepper farm owners encountered six or seven months of draught, causing lots of peppercorn plants

[1] Bo Tree. (n.d.). *About Kampot pepper*. Retrieved from https://www.botree.asia/about-kampot-pepper/

[2] Food and Agriculture Organization of the United Nations. (2023). *Regional knowledge platform on one country one priority product (OCOP) in Asia and the Pacific,* para.9. Retrieved from https://www.fao.org/one-country-one-priority-product/asia-pacific/good-practices/detail/cambodia-GI-registration-kampot-pepper-benefits-producers-and-community/en

[3] Food and Agricultural Organization of the United Nations. (2023). *Cambodia: Geographical indication registration of Kampot pepper builds brand recognition, raising producers' income and spurring local development*. Retrieved from https://openknowledge.fao.org/server/api/core/bitstreams/144f90a8-d25c-4021-ad22-eec650d7831b/content

[4] Ibid.

[5] European Commission. (n.d.). *Product specification of the protected geographical indication*, p.7. Retrieved from https://ec.europa.eu/geographical-indications-register/eambrosia-public-api/api/v1/attachments/60018#:~:text=It%20is%20worth%20mentioning%20that%2C%20likewise%2C%20in%20the%20original%20Book,product%20of%20fully%20ripe%20berries

[6] Khmer Times. (2024). *Cambodia exports over 100 tonnes of Kampot pepper*, para.1. Retrieved from https://www.khmertimeskh.com/501420426/cambodia-exports-over-100-tonnes-of-kampot-pepper/

[7] Ibid.

[8] According to responses from 54 women small pepper farm holders and 43 men small pepper farm holders of the peppercorn farms interviewed in this gender assessment.

[9] Khmer Times. (2024). *Cambodia exports over 100 tonnes of Kampot pepper*, para.2. Retrieved from https://www.khmertimeskh.com/501420426/cambodia-exports-over-100-tonnes-of-kampot-pepper/

[10] According to a response from a company interviewed in this gender assessment.

die.[11] Before 2024, a small pepper farm owner could harvest around 8 tons yearly, but it decreased to less than 200 kg in 2024.[12]

Heat not only impacts the pepper productivity, but also those working on the farms, including women who constitute a major part of the workforce in the agricultural sector in Cambodia and who are found to be more vulnerable to the impacts of heat compared to men.[13]

2 PURPOSE OF THE ASSESSMENT

In the context of the project entitled 'Rising Above the Heat: Innovative Cooling Solutions for Rural Women in Asia', implemented in Cambodia between January and December 2025 by a Consortium of international and national NGOs led by PIN UK and funded by the Asian Development Bank, this assessment was undertaken by Consortium partner Banteay Srei to understand: the impact of heat on women small pepper farm owners and workers; differences in the impact of the heat between women and men; and how the impact of the heat on women hinders their involvement in the pepper farms. The assessment included studying current gender roles, work responsibilities, and decision-making at home and on the pepper farms. The study of gender also included seeking information on the extent to which gender concepts have been integrated into the pepper farms. Moreover, the assessment aimed to gather some information on the current practice of climate change adaptation used by women and men in the peppercorn value chain.

The assessment report will also be used to raise awareness, with the aim of increasing consideration and action in addressing the impact of heat on women from international non-governmental organizations, local non-governmental organizations, profit organizations, stakeholder involved in peppercorn production, and the government. It also aims to improve gender roles and women's empowerment in the pepper value chain, and foster the readiness of farm management and stakeholders to adapt to climate change, which is negatively impacting the workforce notably women. This is essential for their well-being, the sustainability of Cambodian pepper production in the global market, and the incomes of relevant stakeholders.

Additionally, the results of the assessment will inform the upcoming provision of capacity building through training as a deliverable of the project. This includes, but is not limited to: leadership training, gender mainstreaming in organizations or pepper farms, gender equality, climate resilience, financial literacy, communication skills, teamwork, and problem-solving trainings. The activities will ensure that women's voices are heard and will help them understand their rights, gain skills to increase family income, and become leaders in their communities.

3 METHODS

The whole assessment process started from 13 February to 20 March 2025 led by Banteay Srei Organization. The assessment tools were created by its management team: SDEUNG Phearong (Executive Director - woman), Nicolai Grossherr (Organizational Advisor - man), and SREY Nak (Gender and Advocacy Coordinator - woman). The data collection was conducted between 21 and 27 February

[11] The Phnom Penh Post. (2024). *Pepper exports to China show promise, even a drought rocks industry*. Retrieved from https://www.phnompenhpost.com/business/pepper-exports-to-china-show-promise-even-as-drought-rocks-industry
[12] Ibid.
[13] World Bank. (2024). *Heat and gender: Enhancing her resilience to rising temperature*, para.2. Retrieved from https://blogs.worldbank.org/en/endpovertyinsouthasia/heat-and-gender--enhancing-her-resilience-to-rising-temperatures

2025 by the programme team: CHHIT Sokhach (Programme Officer - woman), TOUCH Siya (Programme Officer - man), PRAM Sidara (Programme Officer -Woman), and SREY Nak (Gender and Advocacy Coordination - woman), which were assisted in administration by MEN Boroeun (Admin and Finance Coordinator - woman) and by ORK Chetra (M&E Coordinator - man). The assessment was analyzed and written by SREY Nak.

The assessment used mixed methods for the data collection. The list of questions was created to gather qualitative information primarily, relying on Focus Group Discussions (FGDs), but was complemented by Key Informant Interviews (KIIs). A list of open and close questions was used, which allowed the facilitators to collect and analyze qualitative data whilst also showing quantitative data as for some closed questions interviewees were systematically asked for their individual feedback including in the FGDs. The FGDs were split into small pepper farm owner and worker groups; each of these groups were also divided further during the interview, between men and women groups.

All of the interviewees were introduced to Banteay Srei, NGO partners, the donor, the purpose of the assessment, and were informed that they had the right to withdraw from the interview whenever they wished to. All interviewees were requested to sign consent forms for their participation and processing of the data collected. For those who could not read, the interviewers read the consent form to them and also asked people they trust and know to read it to them to make sure they understood before signing or giving a thumbprint.

Across the KIIs and FGDs, there was a total of 150 interviewees, of which 89 were women. To note, women and men small pepper farm owners in Kampong Trach and Chhouk District of Kampot and other locations in Kep provinces are not from the same families or farms.

Individual interviews with Key Informants included:

- Representatives of the Kampot Pepper Promotion Association: 3 (Women:1)
- Small pepper farm owners: 19 (Women:7)
- Small pepper farm workers: 9 (Women:3)
- Company representatives: 2 (Women:0); Banteay Srei approached three companies, but one of them did not submit a response.

Focus Groups Discussions included:

- Small pepper farm workers: 39 (Women:31)
- Small pepper farm owners: 78 (Women:47)

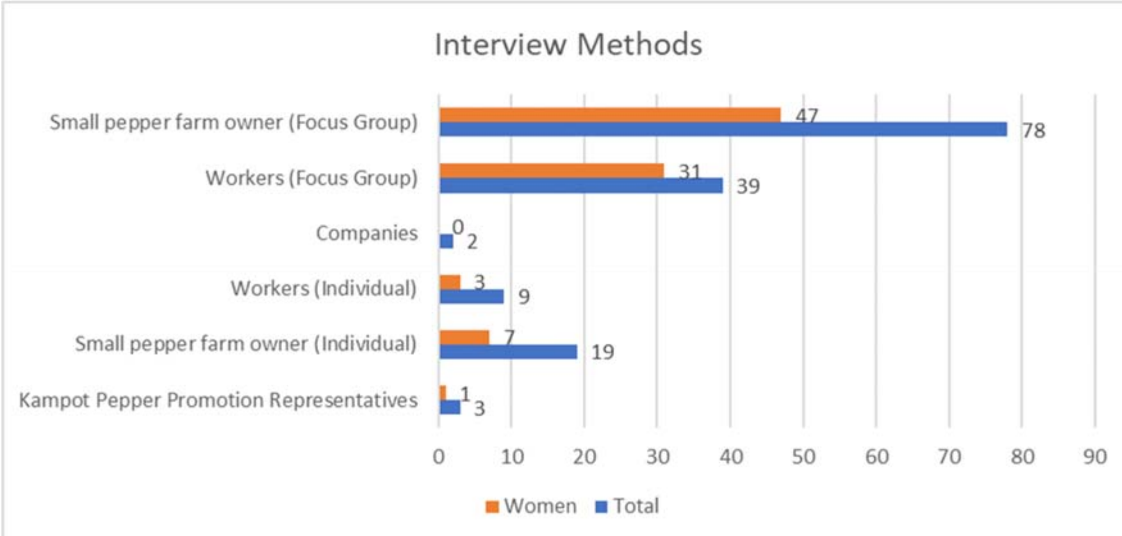

Figure 1. Interview Methods

To identify small farm owners to interview, the assessment relied on a list provided by the Kampot Pepper Promotion Association. The farm owners were selected based on the size of the farm and their willingness to participate in the assessment. The majority of listed farm owners were men, but Banteay Srei invited their wives who co-own the farms to join the interviews. Men whose wives accepted the invitation for the interview were not themselves invited for the interview to avoid redundant of data. All the men owners who participated in the interviews were married, while most of the women who participated in the interviews were also married (one woman reported being single and another one divorced).

The farm owners and company representatives were from Kampong Trach and Chhouk districts of Kampot provinces and other areas of Kep provinces. With regards to key information related to their profiles as farm owners, they reported the distance from their farms to their houses to be between 0.5 and 8 kilometers. The majority of them hired seasonal and part-time workers, and they mostly hired workers during harvesting. The farm sizes of women small pepper farm owners were reported to be between 0.5 and 2.5 ha. Men small pepper farm owners reported bigger size of farms from 0.5 to 20 ha. The small farm owners were also workers on their own farms and sometimes part-time workers on other farms for additional income.

To identify the farm workers, the assessment team asked local companies for the permission to interview their workers as well as them for the purpose of this assessment. Two large companies agreed to take part in the assessment (Fair Farm and Sothy's Fair) although only Fair Farm invited a large number of workers to take part in the assessment. In total, in the farm workers interviewed 40 worked with Fair Farm, 4 with Sothy's Farm and 4 with small pepper farm owners locally.

Picture 1. Focus Group Discussion with women farmers

4 LIMITATIONS

Due to the time constraints, the assessment does not focus on differences in impacts on women from different age groups, economic, educational, and family backgrounds. Due to the lack of scientific knowledge on the impact of heat on women's health, the assessment does not study this in detail but gathers information about the overall impact described by interviewees. The assessment is not elaborated and linked to gender theories or women's rights principles since it focuses on factual findings gathered from the farm owners and workers. However, during the assessment, the authors imply gender concepts and women's rights.

The interviewees could have included those quitting the peppercorn farming and a larger number of small pepper farm owners who are not members of the Kampot Pepper Promotion Association so that the outcome of the effects of the heat can be more identifiable and variable. The authors were not able to do so due to time constraints on the assessment. Additionally, due to time constraints on the assessment, some of the tools were adjusted while KIIs had already started, allowing only partial data collection on a couple elements. Finally, climate change adaptation is focused on pepper workers and small pepper farm owners since they are the targeted beneficiaries of the ADB-funded project.

5 FINDING: IMPACTS OF HEAT AND ROLE OF GENDER WITHIN THE PEPPERCORN VALUE CHAIN

5.1 GENERAL IMPACTS OF HEAT ON THE PEPPER FARMS

This section focuses on the impacts of heat on the small pepper farms in general, with a focus on the productivity of the farms and quality of the peppercorn. Data was collected with farm owners.

In the FGDs and individual interviews combined, 37 out of 54 women small pepper farm owners of peppercorn (69%) observed that from year to year, it was getting hotter, and all 43 men small pepper farm owners (100%) stressed that it was ‘much’ hotter, not just ‘hotter’. This becomes a concern for their livelihood. It impacted the amount of water for watering peppercorn plants, the expense of peppercorn production, the health and growth of the peppercorn plants, the peppercorn productivity and quality, and the small pepper farm owners' and workers' health.

There were many challenges and issues caused by the heat and the lack of water. Only 8 out of 54 women small pepper farm owners (15%) reported that they had enough water, while the rest of the women mentioned that they did not have sufficient water for their pepper plants. Similarly, only 5 out of 43 interviewed men small pepper farm owners (12%) had sufficient water to use for their peppercorn plants whilst the rest (88%) had insufficient water. However, those who had sufficient water still had concerns over the lack of rain and the lack of water quality from their wells.

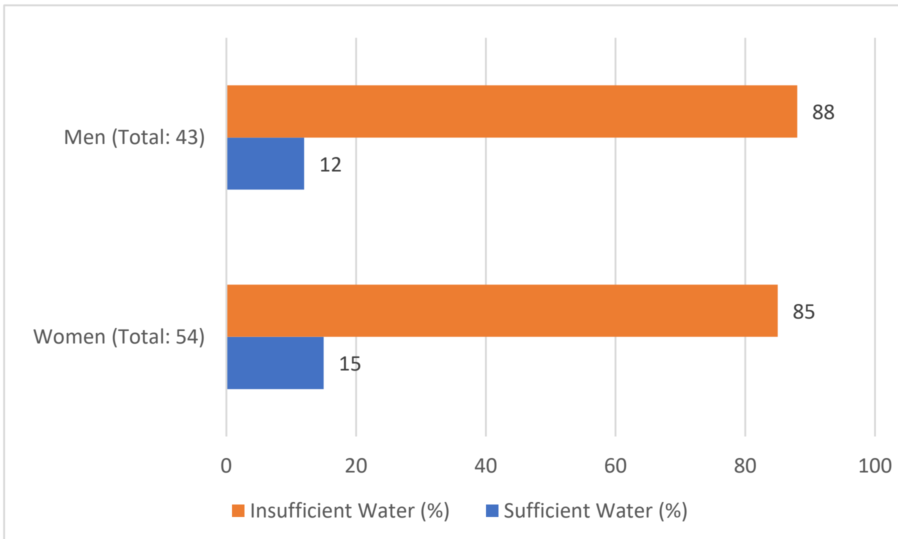

Figure 2. Water Availability Among Small Pepper Farm Owners

Some 85% of women and 100% of men small pepper farm owners who were interviewed raised the issue that their current tools for watering their pepper plants were not sufficient for the highest quality and productivity of the peppercorn. The issues both men and women small pepper farm owners faced in watering plants are the same, such as low quality of the water pump leading to taking a long time to water their plants, there being too little rain, their wells getting dry, lack of places or equipment to store water, taking water from other places, lack of technical skills in the pepper plant production, and costs of watering the plant leading to very high expenses. Further, they reported that it is most challenging when there is insufficient water as it is hard to find available water for sale and they are worried that the water is not good for their pepper plants.

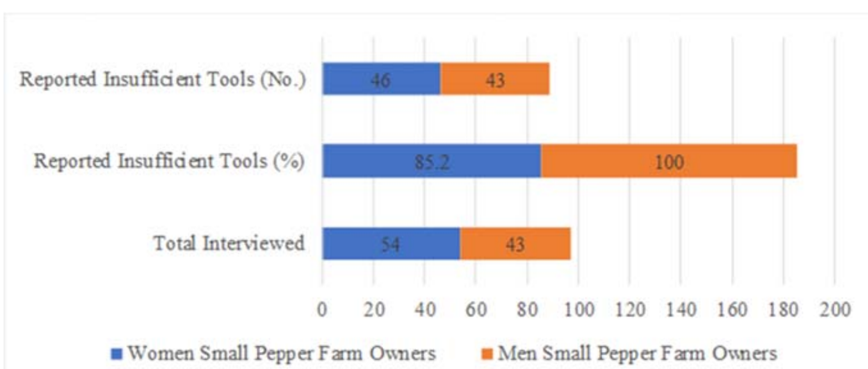

Figure 3. Farmers reporting insufficient watering tools

The farm owners reported that the heat caused lower quality and productivity of the peppercorn because when it was too hot, it lost humidity, the flowers and young peppercorns fell, the peppercorns were smaller and/or half spoiled and did not meet the standard required, and its plants died due to insufficient supply of the water on the plants. This was widely reported in the FGDs with both men and women farm owners. In some cases, interviewees reported that their peppercorn could not grow big enough, leading to lower price and productivity. Specifically, the 43 men small pepper farm owners interviewed in the FGDs and individual interviews volunteered data about the lower productivity and quality of the peppercorn caused by the heat, reporting that it impacted up to 30 or 40 % of small pepper farm owners' income.

Even though water access is a critical component impacting the pepper plants during the dry season, there are other factors reported by women and men small pepper farmer owners which are contributing to the productivity and quality of the peppercorn, including: general weather conditions, level of care and performance of labor, fertilizer used (e.g. organic fertilizer from cow manure and bats' droppings), added new soil, grass removal, canals for reducing too much water during the rainy season, insects, net for protecting the pepper plants and soil from the extreme heat. To note, more than 95 percent of women and 100 percent of men small pepper farm owners used machines consuming fossil fuel on their farms. Very few women and men small pepper farm owners reported access to electricity at the farm for watering their peppercorn plants. This makes it difficult for them to use modern irrigation systems without solar panel technology.

5.2 IMPACTS OF HEAT ON WOMEN AND MEN IN THE PEPPERCORN VALUE CHAIN

Picture 2. Women working on the small pepper farms drying peppercorn

This section focuses on the impacts of heat on those working in the peppercorn value chain, both farm owners and workers. Data was collected with both groups, however as most workers interviewed in this assessment are new to this type of work and/or part-time workers they had less reflections on the impact of the heat than the owners. Additionally, as the workers interviewed worked for companies with better facilities, including for heat protection, than small farm owners, their feedback related to the impact of heat on their health and working conditions is more limited.

In the FGDs and KIIs with 54 women small pepper farm owners, it was reported that the heat impacted small pepper farm owners and workers overall, but that it is worse for women, especially during pregnancy. Women farm owners reported that the heat affected their health: they had difficulty breathing, lacked oxygen when working, had headaches and dizziness, and found it difficult to cope with the heat. Men farm owners, in the FGDs and individual interviews, also reported being aware that women felt pain in their arms and legs, had dark spots on their faces, aged more quickly, became dehydrated, had trouble sleeping, and lost their appetite.

The women small pepper farm owners and workers reported having experienced themselves or seen someone getting sick or have the following symptoms: shivering, fever, dizziness, dry eyes, exhaustion, thirst, grumpiness, and catching a cold caused by the heat. Most of the women small pepper farm owners (96%) reported working between 6 and 9 months during their pregnancy. Farm workers did not reflect on the impact of the heat on their pregnancies since they do not normally work during pregnancy. 47 out of 54 women reported that the types of impacts on unpregnant and pregnant women small pepper farm owners were the same, but they were more affected during their pregnancy.

Women small pepper farm owners were unsure whether their husbands were also impacted by the heat. However, 42 of the interviewed men small pepper farm owners reported that the heat affected their families. All 43 men small pepper farm owners reported that the heat impacted their health making them catch a cold, be exhausted, limited their capacity to fully concentrate on their work, and resulted in them spending more money on watering the peppercorn plants, lower productivity, and peppercorn plants dying.

Around 50% of workers (out of the 48 women and men workers interviewed) said the heat did not impact their work productivity based on the responses from workers, however, their workplaces have lots of shade, most of the women workers worked part-time for certain types of tasks at the pepper farms and they were new workers.

5.3 TOOLS FOR PROTECTION FROM THE HEAT

For the purpose of understanding what tools and facilities are available to those working on pepper farms, data was collected with small farm owners (men and women), workers (men and women) and companies.

When asked about tools and facilities to protect themselves from the heat, women and men small pepper farm owners reported similar access. Interestingly, workers, who tend to work for larger companies, reported more access to facilities than small farm owners.

At the farm, women small pepper farm owners of the peppercorn farms mostly had shaders or shelter, water and showering. However, they did not have toilets, shower rooms, and fans. The majority of the men small pepper farm owners reported access to a shader and water for showering. On the other hand, most workers reported that they could access the toilets, fan, and shower rooms. This is likely to be because workers mostly worked for companies with higher capital and better facilities.

Sunblock and light colors shirts were not widely used among small pepper farm owners and workers in the pepper farms, but they wore long sleeves and hats. Only 8 women out of the 54 interviewed women small pepper farm owners (15%) and 8 out of the 43 men small pepper farm owners (19%) know that light or white colors absorb less heat. Nevertheless, all of the women wore long sleeves and hats when they went to the farms. A lit bit more than half of men small pepper farm owners wore long sleeves (26 out of 43) and a hundred percent of men wore hats when they worked at the farms.

Only 1 out of 54 interviewed women and 1 out of 43 interviewed man small pepper farm owners used sunblock; some said it was required by purchasers to not use any perfume or lotion because it could affect the peppercorn production quality, and some said they never used it and thought it would damage their skin instead.

Workers interviewed, who were predominantly women (34 out of 48), were provided with tools such as hats, gloves, and shirts. None of the workers were provided sun blocks but three reported using it. Two out of 48 workers knew about the importance of using light colors shirt to less absorb the heat, but the rest did not. All but one of the interviewed workers wore long sleeves. All of them wore hats when they were exposed to the sun or heat.

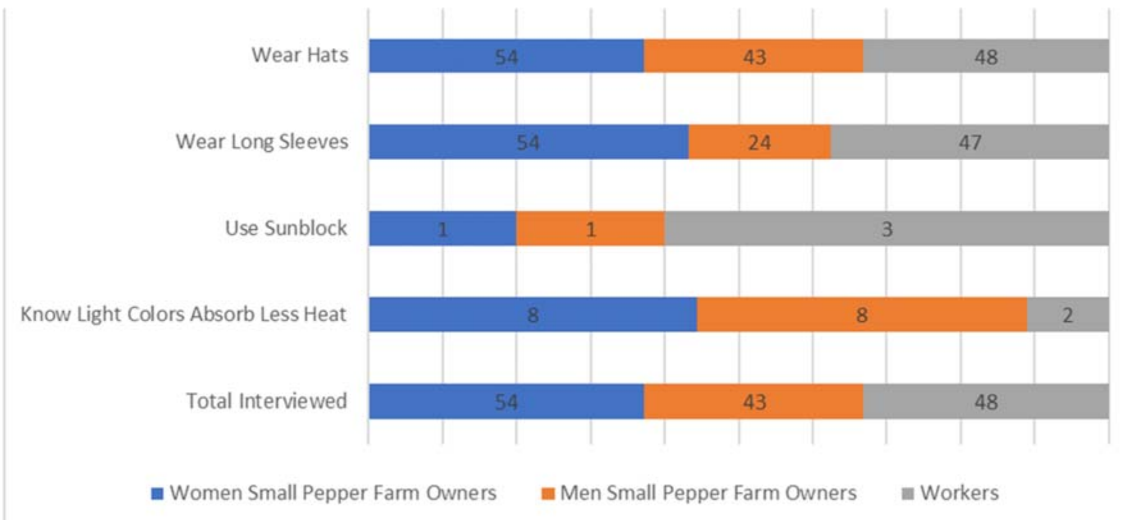

Figure 4. Sun protection practices among small pepper farm owners and workers

All workers in the peppercorn farm received mechanisms protecting them from the heat. There were provided places for children to play whilst their parents were working, clean water, access to the shader, using a net at the peppercorn farms, and allowed to have the flexibility of working hours. According to the workers, only one of the companies who took part in the assessment – Fair Farm, where 40 of the worker respondents were interviewed (including 31 women) - provided mechanisms supporting women when they got pregnant, including with regards to heat and sun protection.

Fair Farm representative who participated in the assessment also reported that the company altered the types of work for women workers when they were pregnant. Full-time women employees were provided insurance and national security fund cards and places to stay, according to Fair Farm.

5.4 ROLE OF GENDER IN THE PEPPERCORN VALUE CHAIN

Data related to the role of gender and understanding of gender in the peppercorn value chain was collected with farm owners (primarily women, but also men), with companies, and with workers on the farms.

Out of the 54 women small pepper farm owners interviewed, around 90% had never heard of 'gender', and approximately only 18% of them could choose or guess the right answers on the meaning of gender equality. Likewise, 3 out of 43 interviewed men small pepper farm owner (less than 7%) could describe accurately the meaning of gender equality. Only two workers (women) had heard the word 'gender', and none of them knew what 'gender' referred to.

From the data collected with farm owners, there appears to be a lack of gender equality in responsibility division at home and on the farms, as well as in decision-making. All but one of the interviewed women small pepper farm owners (53 out of 54) were responsible for both the work at the farm and at home, with one woman small pepper farm owner who only assisted her family by taking care of the house and cooking. Conversely, only about 14 % of men small pepper farm owners (6 out of 43) did both work at the peppercorn farms and at home; the rest were responsible for all of the pepper farm work but less or no household work.

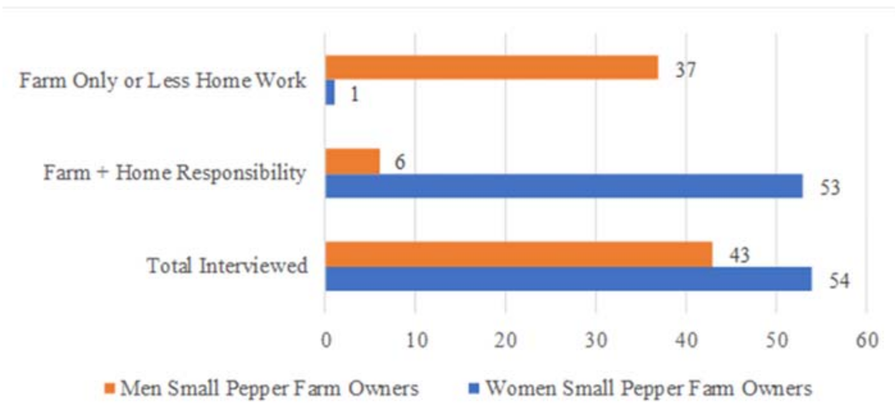

Figure 5. Home and farm work responsibilities for women and men small pepper farm owners

For respondents who were single, there was a mixture of women and men family members who made more decisions about peppercorn farms. However, among the 52 women small pepper farm owners having partners, there were 25 who responded that the people making decisions about the farm are both wives and husbands, there were 26 who responded only husbands whilst there is only a woman small pepper farm owner, a widow, who solely made decisions about the farm.

Additionally, according to men small pepper farm owners' responses, about 67% of interviewed men small pepper farm owners (30 out of 43) were the decision makers about the farms instead of their wives. Even though the rest (13 out 43) responded that they jointly decided on the farm with their wives, men small pepper farm owners or husbands were still reported widely amongst the FGDs as making most decisions about the farm.

On the other hand, 98% of women small pepper farm owners were the deciders on household issues (e.g. housework, budgeting, household spending for shared needs and other relevant decisions involved in family management) according to interviewed women small pepper farm owners and 95% of interviewed men small pepper farm owners' wives decided the household work.

With regards to the differences between men and women in the peppercorn value chain, respondents provided feedback regarding farm work. It was widely reported by women respondents that the extreme heat made women less productive compared to men. Under the same level of heat, men were believed to be more productive than women because women got tired more easily when it was hot. All women farm owners interviewed (54) agreed that it is because men are more energetic than women and more resilient to the heat. About 98% of women workers also agreed with this statement (47 out of 48 workers interviewed). On the other hand, some groups of men small pepper farm owners (2 out of 4 FGDs) pointed out that men and women are not different in term of productivity. However, most men small pepper farm owners in FGDs observed that their wives who are women small pepper farm owners rested more often in the shelter or shader.

A number of interviewed women small pepper farm owners (12) mentioned that the most challenging issue hindering them from being fully involved with the peppercorn farm is the heat because they had little energy and found it hard to adapt to the heat. At the community level, all 12 women small pepper farm owners who were asked if they believe that women and men have the same responsibilities and rights agreed with that statement. Overall, it appeared that among the women farm owner respondents in the assessment there was an understanding that, in terms of access to information and training, women and men were entitled to these equally. However, authors noted reports that women often let their husbands join trainings alone or joined together with their husbands instead of only them.

When asked about the importance of gender integration in farm work and production, only one woman respondent highlighted that she knew about the importance gender integration in her farm. However, most women interviewed agreed that it was important for men and women to be involved so as to increase the labor force and push the pepper industry growth. However, respondents did not have much knowledge related to gender concepts and did not reflect on the responsibilities they may have as a farm owner for their workers in term of gender equality. Many women respondents remarked that women small pepper farm owners should be more involved in pepper farm production because women small pepper farm owners can remove grasses, pick and separate the peppercorns, and sweep the leaves.

Interestingly, a company representative highlighted that women's skills in pepper production were already limited by gender roles as their parents mostly entrusted their sons with the pepper farming tasks and their daughters with chores.

From the workers' perspective, none of the workers asked understood the word 'gender equality' (out of 48). Men workers reported that they were all responsible for the work at the farm, but less at home whilst women workers were responsible for both the work at the farm and at home. Most pepper workers chose to work in this sector because they thought it was suitable for their energy level as it is not a heavy job, and they said they do not know about other types of jobs. Some workers saw more men workers whilst others saw more women workers in the industry, but workers saw that there were more men employees than women employees (referring to full-time staff). Regarding this, one of the companies explained that it is due to the lack of skills or knowledge in the full process of peppercorn production by women workers, making it more challenging for the farm to hire full-time employees who are women. Additionally, according to the company representative, due to household responsibilities, most women preferred part-time. None of the workers were provided training on gender by companies or farms based on the interview. Despite that, workers understood that men and women have the same rights and responsibilities in the communities and they reported that women were given the same opportunities to receive the same information and training as men. They believe women should be more engaged in peppercorn farms because there are some light tasks for women, women can make income, and women have good communication and listening skills. Some said women should be more engaged so women can know how to grow and cut peppercorn plants, and the more women are engaged in the community, the better for the community and farms.

6. PRACTICES RELATED TO CLIMATE CHANGE ADAPTATION

The assessment collected data with farm owners and farm workers related to adjustments or adaptation they had done to their farms or to their ways of working, as a result of the heat and broader climate change.

For context, the interviewed men and women reported a distance between their farms and their houses between 0.5 and 8 kilometers. The majority of the farm owners (men and women combined) hired seasonal and part-time workers, and they mostly hired workers during harvesting. The farm sizes of women small pepper farm owners were reported to be between 0.5 and 2.5 ha. Men small pepper farm owners reported larger size of farms from 0.5 to 20 ha.

On adaptation to their working conditions, the women small pepper farm owners reported working at the farm between four and eight hours per day. As small pepper farm owners, they reported having more adaptability in choosing when to go to the pepper farm to avoid being negatively impacted by the heat. Overall, they reported resting at least once per day during lunch time, which would last between one to three hours.

Peppercorn farms' workers reported working, and were reported by owners as working, between seven and eight hours per day. A company representative highlighted that most women workers worked part-time because they wanted to have some time to take care of their children and chose the location of farms that were close to their houses. The workers reported that they were allowed to rest for around an hour to two hours during lunchtime and take several other short-time rests.

On a daily basis, all women and men small pepper farm owners and workers who were asked this question reported needing to drink between 1.5 and 3 liters of water per day. Those who only drank 1.5 liters of water realized that it was not enough for their bodies to cope with the heat.

With regards to the fertilizers used on the farms, none of the interviewed women small pepper farm owners reported using chemical fertilizer, preferring cow manure instead and highlighting that the Kampot Pepper Promotion Association recommended to not use chemical fertilizer. Around 19% of men farm owners (8 out of 43) reported using chemical fertilizer.

Around half of the men farm owners interviewed had thought of using compost fertilizers, but some men in the FGDs highlighted that they are concerned that creating their own compost fertilizers would result in damages to their plants. Several men owners reported that purchasers only allowed them to use cow or bat manure. On the other hand, less than 8% of interview women farm owners had thought about using compost fertilizer.

Women and men small pepper farm owners used similar techniques for broader climate change adaptation in their farms. On the topic of climate change adaptation, women small pepper farm owners only mentioned the practices that have been conducted so far such as: putting nets around and on the top of the peppercorn plants, adding new soil to the plants, watering them, digging the canal to prevent them from receiving too much water during the rainy season, and adding more fertilizer to help the plants be healthier. In the meantime, 2 of out 54 interviewed women small pepper farm owners did not know that the current practices that they had conducted so far are part of climate change adaptation practices. Men small pepper farm owners' point of view and practices were reported as being the same as women small pepper farm owners', but they added that there should be a better irrigation system and use of coconut leaves to help protect the plants from the heat.

7. OPPORTUNITIES FOR GENDER MAINSTREAMING

Before farming the peppercorn, the majority of women small pepper farm owners studied in primary and secondary schools. A few of them studied in high school while one respondent did not study at all. Around half of the respondent women small pepper farm owners were never involved with social activities or social work (e.g. volunteering in their community).

When interviewed women small pepper farm owners heard the term ‘leadership’, some did not know what it meant while some said that refers to those who are highly educated and are able to analyze and lead. None of them understood the term ‘leadership’ to refer to an ‘initiative’.

In terms of financial management, 5 out of 54 interviewed women small pepper farm owners knew how to calculate and manage their expense and income, whilst the rest never calculated expenses and did not know if they received profits from their pepper farming.

To help women small pepper farm owners identify skills development of relevance to them, a multi-choice question was asked in the interviews with regards to trainings of interest: financial management, adaptation to climate change, leadership, and decision making, women’s health, how to address and prevent gender-based violence, ecological pepper farming, and others. According to the responses from interviewed women small pepper farm owners, 53 women out of 54 interviewed women small pepper farm owners want to learn more about financial management and climate change adaptation.

Men small pepper farm owners reflected further on the specific skills they see women or their wives need for pepper production. Men small pepper farm owners mentioned that their wives or women small pepper farm owners should be trained in technical skills related to growing and taking care of the peppercorn plants, techniques of processing peppercorn production, skills in killing insects and making fertilizer, and marketing skills. They also highlighted that they would welcome their wives or women farm owners being more involved in social activities to change their conventional thinking.

Workers on the farm reported having gone to primary, secondary, and high school. They all reported having worked in a team before. Around half of the interviewed workers felt comfortable initiating new actions if they thought those to be necessary for career and social development. On the topic of skills development for women workers, common training topics that were shared by workers included: skills in pepper farming, foreign language, and effective and peaceful communication. A company representative highlighted, however, that their workers need to be skilled in making compost fertilizer made of available materials in their communities: “bananas”, “fruits”, “wood”, “cow manure”, “chicken droppings”, how to use the compost fertilizer, how to apply it, skills to identify diseases, how to manage the disease of the peppercorn plants, and financial literacy due to debt with banks.

In terms of scheduling for trainings, all of the interviewed women small pepper farm owners highlighted that they could join trainings but would prefer a half-day training as they are unable to join full-day trainings. Workers answered that they could join a full-day training. Considering that the assessment was able to collect data from several workers in one company only, this might not be the case in other companies if financial support is not provided to compensate for the income loss of joining a training rather than working on the farms.

8. CONCLUSION

Women and men small pepper farm owners recognize the challenges caused by the increase in heat on their farms. The increase in heat impacted the amount of available and accessible water for watering their peppercorn plants, the expense of growing or producing peppercorn, and their quality and productivity. Additionally, the hotter it is, the higher the reported expenses of purchasing gasoline for watering the plans. Other challenges that small pepper farm owners reported facing in drier times included inefficient and insufficient equipment or tools for watering the plants (lower quality of water pump), not enough sources of water (too little rain, dry wells, low quality of the water available for purchase), lack of equipment or places to store water, and lack of technical skills for taking care of their plants. With consideration for all these factors, some farm owners reported a decrease in their income by up to 30 or 40 percent due to recent hotter and drier weather conditions.

Critically, respondents in the assessment reported significant health impacts from the heat for both men and women working on the farms. Women small pepper farm owners and workers were more affected by the heat than men small pepper farm owners and workers. They reported finding it hard to breathe, lacking oxygen, suffering from headaches and dizziness, and finding it hard to cope with the heat. Moreover, several women small pepper farm owners felt pain in their arms and legs, had dark spots on their faces and reported feeling like they got old more quickly, got dehydrated, found it hard to sleep, and lost their appetite. Men small pepper farm owners also reported catching colds, feeling exhausted, and having difficulties in concentrating on their work due to the heat.

The extreme heat was perceived, particularly by women respondents, to cause women to be less productive compared to men, hindering them from performing certain tasks at the peppercorn farm. The physical challenges faced in performing tasks were compounded by a reported lack of training on the whole processes of the pepper production, with feedback from a company representative that gender roles on the farm are taught by parents to their children, with boys and men being trained in performing more tasks than girls and women.

Only one woman respondent highlighted that she knew about the importance gender integration in the peppercorn value chain. Most women interviewed agreed that it was important for men and women to be involved so as to increase the labor force and push the pepper industry growth, However, respondents did not have much knowledge related to gender concepts and did not reflect on the responsibilities they may have as a farm owner for their workers in term of gender equality. Many women respondents remarked that women small pepper farm owners should be more involved in pepper farm production because women small pepper farm owners can remove grasses, pick and separate the peppercorns, and sweep the leaves.

It was reported by both men and women respondents that men small pepper farm owners are generally the decision makers when it comes to the farm, while women have decision-making power for households issues. Similarly, women carried the additional responsibilities of household work on top of working at the farm, when men focused on the farm work most often. Despite these established gender roles, women small pepper farm owners understood that women and men have the same responsibilities and rights. They reported that there was available information and training for both women and men small pepper farm owners, but women themselves highlighted that they often let their husbands join (alone or together with them) instead of joining themselves.

At companies, there was no training on gender provided to workers. However, adaptations were made for pregnant workers and it seemed that generally workers at companies had access to more tools and facilities to cope with the heat and sun than small pepper farm owners.

With regards to farming practices and adaptation to climate change, the following was reported by the respondents. Almost all interviewed small pepper farm owners did not use chemical fertilizer. They often used organic fertilizers like cow manure and bats' droppings. Small pepper farm owners also used nets to cover their peppercorn plants, added new soil, watered the plants, dug the canals for when there was too much water, and added fertilizer to care for their plants. Respondents were not necessarily aware that some of these practices are adaptations to changing weather and climate conditions.

On the opportunities for gender mainstreaming, respondents reflected on the necessity for trainings and their willingness to participate in trainings. Men small pepper farm owners wanted women small pepper farm owners to be trained on technical skills relevant to taking care of the pepper farms, whilst women were not so sure unless provided with options to choose from such as financial literacy and climate change adaptation for their farm. For sustainable pepper farming, pepper companies want their workers to be trained on how to make and use compost fertilizer, and how to identify and treat diseases of the pepper plants, as well as financial literacy. Farm workers wanted skills that can improve their lives beyond being workers at the pepper companies or pepper farms.

In light of the above, Banteay Srei has drafted a Gender Action Plan with the following components for the ADB-funded project:

- **Trainings on leadership skills, decision-making skills and the integration of gender policies** in the peppercorn value chain for women small pepper farm owners and women leaders in the Kampot Pepper Promotion Association. There will be a total of 3 training modules, each lasting 3 days benefitting a total of 75 women. The activity will take place in June 2025.
- **Trainings on gender equality, climate change adaptation, and financial literacy** to women small pepper farm owners. There will be 3 training modules, each lasting three days benefitting a total of 90 women. The activity will take place in July 2025.
- **Introduction of a savings group modality to the female trainees**, with a particular focus on smallholder farmers and individual workers and association representatives. There will be 3 trainings, with each module lasting 3 days. 90 women will benefit from this activity, which will take place in July 2025.
- **Training sessions on soft skills** will be delivered to farm workers. Topics covered will include essential skills such as communication, teamwork, and problem-solving, transformative masculinity, and financial literary. The training will include role-playing, group activities, and practical exercises to help participants develop and practice these skills in a supportive environment. There will be 3 training modules, each lasting two days benefitting a total of 90 women. The activity will take place in August 2025.

- **Semi-annual reflection and learning** among target groups and stakeholders. 1 workshop (2 days) for semi-annual reflection, with 40 expected participants. The activity will take place in August 2025.
- **Training of Trainers sessions** to outstanding trainees who participated in the other activities, to support them in becoming trainers themselves. Additional modules related to leadership and community mobilization will be covered in two trainings, with each training lasting 1 day. 30 women will benefit from this activity, which will take place in August 2025.
- **Ongoing coaching and mentoring** to 15 champions (with half expected to be participants in the ToT). There will be 4 days of coaching and mentoring in October 2025.
- **Annual reflection and learning** among target groups and stakeholders. 1 workshop (2 days) for annual reflection, with 40 expected participants. The activity will take place at the end of the project.