

Appendix 2: The narrative from individual structured interviews and debates

15.11.2023	Code: IWPM1
Mongu – project base	
Project manager	

EH: How does the training address individual challenges, mainly when farmers need clarification about determining the right time for harvest?

PM: There are individual challenges. If three farmers mentioned that they do not understand how to do the harvest or identify it, the hand is ready; we need to harvest. Also, there is a language barrier. Most of the farmers do not understand English, spoken or written, so wherever we go with an expert, we need a translator.

EH: What specific issues have farmers identified that they need help with, especially regarding harvest timing and readiness?

PM: Some farmers still need help learning the appropriate times for gathering and preparation. Ensuring they openly communicate their needs, like specific challenges, will enable the identification of requirements, such as six out of ten farmers needing one type of assistance and two needing another. This approach will facilitate the preparation and provision of a necessary help.

EH: How do beekeepers manage the placement of beehives to ensure safety and productivity, and what are the recommended strategies for harvesting to mitigate risks and losses?

PM: We can have an example from Senanga; beekeepers supported about 44 beehives, with one individual harvesting up to 20 to 25 kilograms of honey. Unfortunately, due to the beehives' remote placement for safety, incidents occurred where people carried away the beehives, harvested the honey, and left the structures destroyed, leaving the farmer to discover only the remains. Planning for the next harvest, the farmer considered strategies for future success.

To balance community safety and address safety concerns, the advice is to position beehives at least 100 to 200 meters away from households, with an optimal recommendation of 500 meters. Managing this distance presents challenges within the community, but efforts focus on achieving a 200-meter distance. Additionally, the expert advised farmers to harvest honey at night or early in the morning when bees are less active, minimising the risk of disturbance and ensuring safer harvesting conditions.

EH: What challenges do farmers face? Do the farmers need to learn the basics of beekeeping or the use of tools?

PM: A few farmers understand beekeeping, yet most are new. Approximately 15 farmers require more profound assistance and help. Consequently, the team informed the field officers about the necessity of visiting already occupied bee hives, which are facing challenges with bee hives such as bee swarming. Empty beehives and swarming represent the most significant challenges encountered in suitable locations.

EH: What are the possible impacts on the beehive environment?

PM: The challenge mentioned involves bees abandoning the beehives after harvesting. During the last field visit, a farmer was observed improperly cutting through a comb while harvesting, accidentally severing a bee in half, including its abdomen. With the highest chance, it was the queen bee. The killing of the queen bee released a scent or smell, alarming other bees, which might have been perceived as a threat, leading to their higher activity. Pests are another factor.

EH: Besides pests, do farmers face any other challenges?

PM: Pests present a significant challenge and are ubiquitous. Unlike typical pests, these predators, especially ants and insects, pose a considerable threat. Recommendations on overcoming these challenges, including the abandoning of beehives by bees and issues with predators, are forthcoming.

However, fire revealed that farmers carelessly burn shrubs, the environment, and the grass. This carelessness decreased honey production and the bee population, as the fire harmed some bee colonies. Such incidents have diminished, although a few farmers continue to burn. The practice is partially under control, but fewer farmers engage in it.

EH: How does the approach to honey collection, involving farmers cutting every bar without regard for the presence of honey or nectar, need improvement?

PM: Some farmers need help to separate honey and boil the comb, while only a few can properly separate it. It poses a challenge for many farmers. We recommend leaving at least two combs with capped honey during harvest. However, the issue arises when farmers remove all honeycombs, leading to bees leaving due to the emptiness. Additionally, removing all combs can result in worker bees dying, affecting the hive's productivity. Consequently, the removal and disposal of these combs waste potential bee labour. Our expert employed a harvesting method that, unfortunately, led to the accidental cutting of combs in half. However, sometimes, the farmers cut not only honeycombs but also combs with brood, which leads to the weakening of the bee colony.

EH: How does the data collection process evolve?

PM: An observation concerning the data takes place in the morning. Collecting all data, such as the kilograms of harvest, is still underway. Focusing on specific groups necessitates an intensification of data collection methods. Direct engagement with these groups will enable recording the farmers' challenges. Familiarity with the farmers often leads them to conceal some obstacles. Nevertheless, introducing a new person prompts them to reveal all challenges. This disclosure, occurring during field visits, assists in uncovering even the concealed challenges. There are several bee colonies in hives, yet not all bees have settled, with only a small percentage showing occupancy. Thursday's field visit target includes 20 occupied beehives in two places.

EH: How big is the beehive?

PM: Eighty centimetres, and here it is 80 centimetres. Twenty-five centimetres, 25 millimetres. On top of that, we have 21 bars; some have 20, and some 19. The maximum is 20.

EH: Moreover, what is the thickness of the bars? Like 3 cm or more?

PM: The other day, the measurement was not maintained; therefore, the joiner made the top bars for different intermittent needs.

EH: Are there any challenges from the office side? What are the challenges that may be slowing down this project?

PM: A challenge exists in finalising the bee calendar, particularly detailing bee activities for January and corresponding farmer actions during the rainy season. The goal involves comprehending the local environment, field characteristics, tree types, and flowering patterns to compile essential beekeeping information for the calendar. We do not have the process itself. We know the time of the day when the bees are actively collecting pollen and nectar; however, we need to know what happens throughout the months. What is the best time for the farmers to harvest? What would be the signs for them to do without opening their bees? Because our bees, the mother bees, are aggressive. The bees, therefore, attack the people.

Secondly, farmers recently questioned the variance in honey colours, ranging from white to dark brown and light brown, expressing confusion and preferences, notably for white honey. The explanation highlighted that flower types dictate the honey colour and pollen characteristics. With this understanding, farmers now grasp that the available flora limits their control over honey colour. However, by selecting viable trees, they can influence their beehive environment.

EH: Are there any actions that should change?

PM: However, we must train the farmers and ensure accurate checking. That provides the answer.

16.11.2023	Code: IWPM2
Mongu – project base	
Project manager	

EH: What kind of project is this?

PM: The Integrated Farming Project III project started in 2022 and ended in 2024, next year. It is a continuation of the Integrated Farming Project II, which began in 2019 and lasted until 2021 and is financially supported by the Czech Republic Development Cooperation.

EH: What is the main goal?

PM: The main goal of this project is to support farmers' production, increase their income, and help them develop skills. Additionally, it builds a resilient landscape and conducts agroforestry activities, creating three value chains: animal production, fish production, and agroforestry products.

EH: What group is the target?

PM: We target small and medium farmers, but our scope includes processing groups, cooperatives, and holistic groups.

EH: What is meant by holistic groups?

PM: Holistic refers to building a resilient landscape and managing natural resources to ensure environmental safety. This includes agroforestry activities and holistic land and livestock management, where farmers group for planting, grazing, and crop shifting to utilise livestock effectively.

EH: Besides direct support in beekeeping, what other forms of assistance are provided to farmers to enhance their overall business and income from beekeeping?

PM: Besides beekeeping, we are building free value chains to ensure that farmers can produce honey and sell it at a reasonable price, thereby increasing their income. We impart business skills to help them find a good market for their processed products, adding value to their offerings.

EH: What is the rationale behind emphasising product processing before sale?

PM: Processing products before sale adds value, leading to better earnings than selling unprocessed products. Agroforestry, integrating crop cultivation with forest products, is part of this strategy.

EH: What are the primary benefits of engaging in agroforestry?

PM: When harvesting vegetables, participants dry them, gather fruits and mushrooms, and extract oil as part of the forest products.

EH: What additional initiatives are being undertaken with farmers to improve productivity and income?

PM: In this project, we conduct several activities to increase production and income. The activities we want to do are fish farming, where we need to work on the fishponds, and when we have fishponds, farmers will be able to sell the fish.

PM: The other aspect is to work on the livestock, which we circulate to the farmers; they have vaccinations to prevent the animals from getting diseases. We teach them to manage accessible, safe veterinary practices.

The other aspect is agroforestry, where we plant 10,000 trees to help the landscape. Trees will add manure, which may be used for medicinal purposes, to attract bees. We have a target for these tree farmers to be able to plant trees.

EH: What objectives does the tree-planting initiative aim to achieve among agroforestry farmers?

PM: We have a target for these tree farmers to be able to plant trees. We divide it into four districts. We work in Mongu, Senanga, Nalolo, and Limulunga. We have a total of nine communities where we are working. However, the direct number that we are working with is one hundred. So, we have 25 farmers in each district.

The other significant activity we are conducting is beekeeping. We are doing the beekeeping activities based on essential knowledge. Farmers should be able to understand the level of the market they have.

EH: Can the knowledge base of beekeeping among the farmers be described?

PM: They possess the skills to manage beekeeping effectively. Questions arise, such as, "What actions are necessary in certain situations?" and "What materials are essential for a beekeeper?" Our training ensures they grasp the fundamentals of beekeeping, including handling bee attacks with appropriate protective measures, managing bee colonies, and executing harvests.

Topics extend to the environmental and ecological aspects of beekeeping. We provide them with the necessary equipment and materials to support their learning.

EH: What equipment and materials does the organisation provide to support farmers in beekeeping?

PM: We provide smokers with protective clothes, beehive tools, gloves, knives, buckets, brushes, and beehives. We supply beehives as a material. Additionally, we supply them with buckets, beehive tools, and hive knives for use during the harvest. We offer materials related to soft wires for hanging, packaging for storage, and scaling so they can measure the harvest weight in kilograms. We also provide recording materials, such as hardcover books.

EH: How many farmers are actively participating in the beekeeping program?

PM: This year, the program targets 30 farmers, building on the 15 farmers from last year. Currently, the beekeeping initiative involves 45 farmers. Including some old farmers from integrated farming, the total potentially reaches 50. We additionally worked with our honey processing groups, establishing four groups to process honey.

EH: What is the target number of beekeepers?

PM: 60 beekeepers. Once we reach 60 beekeepers, we can spread the knowledge to others.

EH: In which districts have honey production commenced, and how does this influence the focus of fieldwork?

PM: Honey production is underway in two districts: Nalolo and Senanga. Thus, fieldwork concentrates on these districts, where the project's primary activities are focused.

EH: What is the overarching goal for beekeeping farmers regarding honey production and market access?

PM: Our primary goal here or plan is to make sure they bulk the honey and put them where these four groups are. Therefore, we can look for bulk buyers or aggregators who can buy the bulk of honey together. We do not want them buying bulks individually, but at least as a whole. That is the reason we have the groups. The groups can collect all the money and the bulk and then involve a buyer from a reputable company or a business to buy the honey. We have two active groups, one in Senanga and one in Litoya. Hopefully, the other two groups will be involved next year.

EH: How are farmers trained in beekeeping, and what strategies are employed to enhance honey production?

PM: Local experts deliver training, with additional insights from Holistic Solution in the Czech Republic on value chain analysis, aiming to navigate market stages efficiently and establish productive categories for farmers.

EH: What market access strategies have been developed for the farmers?

PM: The plan is to ensure the farmers get a process with two categories. To guide the farmers through the stages and show them how they can best do the production and reach the market. There is one option where we can link them to bulk buyers or companies that can purchase raw honey as it is, allowing them to enter markets such as ShopRite. However, for them to enter that market, they need to be registered, they need to be certified, and they need to have their products labelled and appropriately packaged.

Two categories exist for farmers' action: selling to bulk buyers and packaging. The goal is to link farmers to these two types of markets by the project's end. Achieving this link signifies reaching the goal.

EH: What market access strategies have been developed for the farmers?

PM: This project provides monitoring and technical support to the farmers to see if they are doing the correct things if the beehives are producing honey, and if there are challenges where we can help, especially at the technical level. We have trained local experts and consultants who can provide technical support, focusing on beehive productivity and addressing challenges.

EH: Can you elaborate on the collaboration between the project and governmental stakeholders?

PM: The collaboration spans multiple ministries, including Agriculture, Green Economy and Environment, Small and Medium Enterprise Development, and Community Development and Social Welfare, fostering an integrated project implementation and focus approach.

EH: What initiatives are included under the extension within this project, and what are the goals related to landscape resilience?

PM: Under this project, we are also doing the extension of agroforestry projects and the processing and the building resilience, landscape resilience, which is the one I mentioned before, where we are training stakeholders in natural resource management, how to do natural resource management, and how to do mapping using the geographical information system.

EH: How does data collection contribute to project evaluation and outcomes?

PM: The data we are collecting is to check if the project is having some results with the farmer we are supporting. Just have that evaluation to know if you are doing something or not doing anything. It helps us; it guides us.

EH: Can you describe the structure and focus of holistic land and livestock management groups?

PM: We have 10 of them scattered in the four districts. These groups concentrate on landscape management and environmental protection through controlled grazing, reduction of unnecessary burning, and cutting of trees, integrating agroforestry principles. We also share experiences with them, and they learn from one another. Holistic land and livestock management is more on the landscape, more on the environment, to safeguard the environment.

EH: How do the land and livestock management groups contribute to environmental protection and agroforestry?

PM: Community tree nurseries contribute to environmental enhancement and landscape resilience, providing seedlings for strategic planting to attract bees and restore dry streams, aligning with broader project objectives.

EH: How does strategic tree planting benefit beekeeping efforts and overall project goals?

PM: Farmers plant in abandoned crop fields or bare land so that something can be there to contribute to the environment. Strategic planting aims to reduce bee foraging distances, increase honey production efficiency, and contribute to the project's environmental restoration goals and enhanced agricultural productivity.

EH: What are the expected outcomes of reducing the foraging distance for bees and the project's impact on natural water bodies?

PM: Strategic planting aims to reduce bee foraging distances, increase honey production efficiency, and contribute to the project's environmental restoration goals and enhanced agricultural productivity.

17.11.2023	Code: IWPM3
Mongu – project base	
Project manager	

EH: What criteria did you use to select farmers for the beekeeping project, and how did you assess their engagement and environmental suitability?

PM: The selection process for farmers participating in our beekeeping project relied on specific criteria we established to ensure the environment's suitability and the farmers' active involvement. We sought farmers who demonstrated a high level of engagement with the project, evidenced by their attendance at training sessions, meeting participation, and related activities. To assess this, we scored farmers on a scale from 0 to 10, with higher scores indicating more significant activity and commitment to beekeeping and its integration with other farm practices.

EH: How do you evaluate the environmental conditions for beekeeping at a farmer's location, including water source proximity and flowering plants?

PM: We also evaluated the potential for successful beekeeping based on the environmental conditions of each farmer's location. Key factors included the proximity of water sources and the availability of flowering plants and trees that provide essential resources for bees. We measured the distance to the nearest water source in meters. We assessed the abundance of suitable flowering trees and agroforestry practices, favouring farmers willing to plant trees that support bee health and attract bees with their flowers.

EH: What factors did you consider in determining a farmer's suitability for beekeeping, including their willingness to participate and integrate beekeeping with other farm activities?

PM: Furthermore, we considered the farmers' willingness to embrace beekeeping and their ability to integrate it into their existing farming operations. This included an assessment of their attitudes towards trees and bees, recognising the symbiotic relationship between these elements. We inquired about each farmer's past beekeeping experience, training from other organisations, and willingness to engage in beekeeping. Through these questions, we aimed to gauge their interest in honey production and their reasons for wanting to participate in the project.

EH: How do you support farmers starting and sustaining their beekeeping activities, and what does the training program entail?

PM: In the beekeeping project, we provided the farmers with buckets to store honey until bulk buyers purchased it. Recognising their initial challenges in sourcing beeswax to start their operations, we supplied each farmer with one kilogram for each baiting session. This beeswax serves as an attractant for bees, facilitating the start of their beekeeping endeavours. Farmers are expected to produce their beeswax for subsequent baiting sessions as they progress, especially if they encounter issues with the initial bees attracted or need to expand. Additionally, we provide a comprehensive training program for beekeepers, which is integral to the project. This training covers various aspects of beekeeping and requires resources such as stationery and work materials, with a specific budget allocation dedicated to these educational efforts.

EH: Could you elaborate on the training and resources provided to farmers to enhance honey production and its impact?

PM: We have trained farmers in honey production, processing, storage, marketing, sales, and packaging and have awarded them microgrants to boost honey production. They have received materials and equipment, including honey pressers, storage buckets, packaging packs, scales, and more, following the project's support, consultations, and technical recommendations, making honey production manageable.

EH: What are the key components and topics covered in your beekeeping training manual, and how does it serve as a comprehensive guide for beekeepers?

PM: Our training manual covers a wide array of topics essential for beekeeping, starting with the ecological importance of bees to our environment. We emphasise the multifaceted role of bees, including their contribution to pollination and ecosystem balance, which underscores their value beyond honey production. The manual details the nutritional and medicinal benefits of honey, propolis, and bee venom. It highlights their market value and the potential for bee products like beeswax to be transformed into saleable items. We delve into the biology of honeybees, explaining the roles of workers, drones, and the queen, which is crucial for understanding bee colony dynamics.

Health and safety practices in handling African bees are thoroughly addressed, equipping farmers with knowledge on managing the different bee types and using the Kenyan Top Bar beehive. The process of baiting and swarming, vital for colony establishment, is identified as a top priority. Our manual guides farmers through the stages of harvesting, with a focus on improving and meeting the requirements for top-bar beekeeping. However, we acknowledge the need to expand our coverage to include grading and processing honey in future sessions.

The manual provides practical advice on using honey pressers, which we have purchased for groups to facilitate honey extraction. Marketing and sales strategies are also covered to empower farmers to market their bee products successfully. However, we recognise a gap in our manual regarding the beekeeping calendar, a crucial tool for timing beekeeping activities throughout the year. We plan to request additional information to complete our manual, ensuring it is a comprehensive resource for beekeepers.

Additionally, the manual touches on the importance of proper baiting techniques and packaging, which are essential skills for beekeepers to master. Through this comprehensive approach, our training manual serves not only as a guide to beekeeping but also as a resource for understanding the broader impact of beekeeping on income, nutrition, and environmental sustainability.

EH: What is the distribution range of beehives among the farmers, and how do you categorise farmers based on the number of beehives they own?

PM: If we categorise farmers by the number of beehives they own, I can provide a range. A farmer's maximum number of beehives is seven, with quantities ranging from one to seven. Many farmers, particularly those from the old project, own just one beehive, while others have a spread of three, four, five, or seven beehives. However, only a few farmers own a maximum of seven beehives, with the majority owning between three and four.

EH: How does your budget allocation plan support farmers expand their beekeeping operations?

PM: We aim to allocate the budget to beekeeping activities, providing farmers with essential materials to increase beehive numbers. This includes supplying simple equipment such as protective clothing, knives, and additional small items to enhance their beekeeping operations. We also plan to support farmers with honey presses, machines designed to extract honey, which we will distribute to processing groups. Furthermore, we intend to purchase packaging materials for these groups, enabling them to process and package honey for sale in various markets, including bulk purchases.

EH: How does the budget allocation for beekeeping materials contribute to the project's success, and how have farmers' perceptions of beekeeping changed over time?

PM: A significant portion of our budget focuses on beekeeping materials, acknowledging their importance in successfully implementing our project. Initially, many potential beekeepers expressed fear of bee stings and the associated risks, discouraging them from pursuing beekeeping. However, with the inclusion of 15 new farmers in 2022, interest in beekeeping surged. By 2023, even more farmers expressed a willingness to participate. Despite this enthusiasm, we must remind interested parties

that our project has a target limit; we aim to incorporate 30 farmers to ensure manageable and practical support.

EH: What are the goals and challenges of scaling the number of beekeepers in your project, and how do you plan to address discrepancies in reporting to donors and stakeholders?

PM: Our project aims to expand from supporting 50 to 30 farmers and include 60 beekeepers in our integrated farming project. However, in our reporting and planning, we face a unique challenge. Next year, when we include previous participants, our total will reach 65, exceeding our initial target. This discrepancy arises because we aim to support a specific group of five beekeepers without counting them towards our overall goal of 60, as they participate in different capacities. This strategy seeks clarity for donors and stakeholders, ensuring our project targets remain transparent and achievable.

EH: What preferences do farmers have regarding the production of honey, wax, or both, and how does this influence buyer engagement and product focus?

PM: We aim to understand whether farmers prefer to produce honey, wax, or both. This knowledge is crucial, especially when engaging buyers. We recognise that some farmers can produce wax, which directs buyers towards specific preferences. For instance, one farmer may focus exclusively on wax production, another on honey and wax, and a third solely on honey. Understanding these preferences allows us to tailor our approach to buyers, highlighting the varied product offerings.

EH: A comparison indicates Senanga has superior performance despite the potential in both areas. Moreover, is there any identifiable reason for this difference?

PM: The Zambezi River contributes to Senanga's better performance than others. The Zambezi River, hosting three species more attractive to bees, is a significant advantage for Senanga. One key factor observed is the interest of farmers in Senanga, marking my first encounter with beekeeping there. The beekeeping tradition from their fathers and modern improvements may have facilitated their more significant advancement in beekeeping compared to Nauru.

EH: Does the collection of data still need to occur?

PM: Progress in terms of one product reveals that comparing Senanga and Nalolo shows Senanga leading. Senanga produces reasonable amounts of honey in contrast to Nalolo.

17.11.2023	Code: IWFF1
Nalolo	
Farmer with previous beekeeping experience	

EH: Why did you start beekeeping?

Farmer: For the health benefits found in honey and money.

EH: Have you been beekeeping ever before this project? Or were you a honey hunter, or had nothing to do with bees?

Farmer: I was beekeeping from 1986 until 2006 in a bark hive but started with the Kenyan top bar hive only in 2021.

EH: How many beehives do you have, and when did you get them?

Farmer: I have four since 2021.

EH: How many of them are occupied?

Farmer: Only one. However, two weeks ago, I had two occupied hives, but the bees left.

EH: Do you know how to catch a swarm and extend the number of beehives?

Farmer: I know how to do it but never succeeded.

EH: What tools do you have?

Farmer: I have a hive tool, smoker, bucket, protective clothing, gloves and a small brush.

EH: Have you planted specific plants or crops around your apiary to support bee activity?

Farmer: The project of MENDELU planted crops, flowers, and trees near beehives, but they are too young to have enough pollen for all the bees in this community.

EH: How often do you check on your bees?

Farmer: Once a month.

EH: What does the process of honey harvest look like? From beehive to jar?

Farmer: We cut combs from the bar, put them in a bucket, smash them, and then heat them so the combs and beeswax float on top and separate them from the honey.

EH: What do you collect while harvesting honey?

Farmer: I cut all the combs with honey, capped, uncapped, and sometimes with brood.

EH: What challenges do you face?

Farmer: Lack of trees and plants with nectar and pollen for farmers, not enough trees to hang beehives on, ants and primarily absconding bees.

EH: Any challenges, additions, or comments to this project? What to change?

Farmer: Not enough equipment. It is hard to check on bees when you are doing it all by yourself.

17.11.2023	Code: IWFF2
Nalolo	
Farmer with seven beehives occupied	

EH: Why did you start beekeeping?

Farmer: For selling honey and other by-products.

EH: Have you been beekeeping ever before this project? Or were you a honey hunter, or had nothing to do with bees?

Farmer: No, until I learned about the beekeeping project from MENDELU in 2021

EH: How many beehives do you have, and when did you get them?

Farmer: I got 3 in 2019 and 4 in July 2023.

EH: How many of them are occupied?

Farmer: All seven of them.

EH: Do you know how to catch a swarm and extend the number of beehives?

Farmer: I know how to do it, but succeeding is hard.

EH: What tools do you have?

Farmer: I have buckets, only one protective cloak, gloves, a smoker and a hive tool

EH: Have you planted specific plants or crops around your apiary to support bee activity?

Farmer: No, I have a lot of trees and plants around me, so bees have enough of a source.

EH: How often do you check on your bees?

Farmer: Once or twice a week.

EH: What does the process of honey harvest look like? From beehive to jar?

Farmer: I check the hives in April and November and take a bucket. If honey is capped in combs, I take it, smash it in a bucket, then let it sit and separate from the combs.

EH: What do you collect while harvesting honey?

Farmer: I cut all the combs with capped honey, sometimes uncapped and leave some uncapped ones.

EH: What challenges do you face?

Farmer: The trees have too high branches, and it is not easy to climb and reach them that often.

EH: Any challenges, additions, or comments to this project? What to change?

Farmer: I need more protective clothing. I gave mine to my daughter, put on my trousers and a jacket, and dealt with the stings.

20.11.2023	Code: DWFIN
Nalolo	
Discussion with farmers in Nalolo	

EH: Why did you start beekeeping?

Farmers: To have honey as a source of income and food and sell wax.

EH: Have you been beekeeping ever before this project? Or were you a honey hunter, or had nothing to do with bees?

EH: How many beehives do you have, and when did you get them? How many of them are occupied?

Farmer 1: I received three hives in July 2023, and none are occupied.

Farmer 2: I have had three hives since July 2023, and none are occupied.

Farmer 3: Same here. I received three hives in July 2023, and none are occupied.

Farmer 4: I received two hives in July 2023; two are occupied.

Farmer 5: I received three hives in July 2023, and none are occupied.

Farmer 6: I received three hives in July 2023, and they are not occupied.

Farmer 7: I received one hive in July 2023, which is not occupied.

Farmer 8: I received two hives in July 2023, which are occupied.

Farmer 9: I received two hives in July 2023, which are occupied.

Farmer 10: I received four hives in 2021, and only one is occupied.

Farmer 11: I received four hives in 2021 and 3 in July 2023, all occupied.

EH: Do you know how to catch a swarm and extend the number of beehives?

Farmers: We know how, but most of the time, it is unsuccessful.

EH: What tools do you have?

Farmers: Protective clothing, gloves, smokers, hive tools, buckets and small brush.

EH: Have you planted specific plants or crops around your apiary to support bee activity?

Farmers: Not us, but the Field officers provided seedlings during the previous part of the MENDELU agroforestry project.

EH: How often do you check on your bees?

Farmers: It depends on how we are, but it is mostly twice a month up to once every two months.

EH: What does the process of honey harvest look like? From beehive to jar?

Farmers: We cut the combs from bars and leave some. We take capped and uncapped honey as well. When there is honey and brood, we take it as well. We smash it in the bucket and heat the honey, dividing it from the wax.

EH: What do you collect while harvesting honey?

Farmers: We collect most of the combs, leaving them the empty ones and the ones in the front of the hive.

EH: What challenges do you face?

Farmers: Absconding of bees and ants, almost no plants with pollen or nectar, wrong placement of beehives on trees and wrong time of receiving hives because the bees are no longer active in July. The noise from kids playing around and throwing stones at hives might be a problem. There are no water sources, and the water is too far away.

EH: Any challenges, additions, or comments to this project? What to change?

Farmers: There is scarce protective clothing, and it is hard to check the hives myself.

21.11.2023	Code: DWFIL
Litoya	
Discussion with farmers in Litoya	

EH: Why did you start beekeeping?

Farmers: To have honey as a source of income and food and sell wax.

EH: Have you been beekeeping ever before this project? Or were you a honey hunter, or had nothing to do with bees?

Farmers: None of us had any previous experience keeping bees.

EH: How many beehives do you have, and when did you get them? How many of them are occupied?

Farmer 1: I received three hives in July 2023, and none are occupied.

Farmer 2: I received three hives in July 2023, and none are occupied.

Farmer 3: I received three hives in July 2023, and none are occupied.

Farmer 4: I received one hive in 2021, which is not occupied.

Farmer 5: I received three hives in July 2023, and one is occupied.

Farmer 6: I received four hives in 2021, and none are occupied.

Farmer 7: I received one hive in 2021, which is not occupied.

Farmer 8: I received one hive in 2021, three in July 2023, and two occupied.

Farmer 9: I received one hive in 2021 and one in July 2023, and none are occupied.

Farmer 10: I received one hive in 2021, three hives in 2022 and one in July 2023, and none are occupied.

EH: Do you know how to catch a swarm and extend the number of beehives?

Farmers: Most of us know only the theory of catching swarms, but none of us tried to because we are unsure about the steps.

EH: What tools do you have?

Farmers: Protective clothing, gloves, smokers, hive tools, buckets and small brush.

EH: Have you planted specific plants or crops around your apiary to support bee activity?

Farmers: Not really, due to the water near us. The bees have many plants around them that are blooming and providing pollen.

EH: How often do you check on your bees?

Farmers: Once a month or once in two months, we go inside, but sometimes, we go around them to see if any bees are flying in and out.

EH: What does the process of honey harvest look like? From beehive to jar?

Farmers: Most of us did not have a chance to harvest honey, but we were taught the process of it. Cut the combs, smash hit, let it sit and separate honey from wax.

EH: What do you collect while harvesting honey?

Farmers: During harvest, we are supposed to take the combs with something in them. If you try to cut it, it should not be white inside, but we should see honey. We are not sure about the differences in capped things on combs.

EH: What challenges do you face?

Farmers: We received hives, and after two weeks or so, we received wax to prepare the hives for bees, but it was too late. Also, the hives have holes in them, mainly in the roof. Swarming and absconding occur often; the bees are in the hive for three weeks and then leave. Ants are also a problem, but we received grease from putting on hooks on which hives hung, and after application on occupied hives, the bees left the hive, mainly due to the grease. Cobwebs are also in hives, and bees do not want to settle in. We do not have enough pollen to have a set sowing plan, but we do not think the bees will pollinate our crops as a primary source for them. Also, how do I recognise the worker bee, drone or queen?

EH: Any challenges, additions, or comments to this project? What to change?

Farmers: We think the hives were given at the wrong time during the year. It was too late, and we had to wait months to have bees around again. Also, we do not have enough protective clothing and additional tools if something breaks; without them, we do not want to risk going into beehives.

22.11.2023	Code: DWFIS
Senanga	
Discussion with farmers in Senanga	

EH: Why did you start beekeeping?

Farmers: To have bees pollinate our crops and have them as a side income and for health benefits.

EH: Have you been beekeeping ever before this project? Or were you a honey hunter, or had nothing to do with bees?

Farmers: None of us had any previous experience keeping bees.

EH: How many beehives do you have, and when did you get them? How many of them are occupied?

Farmer 1: I received three hives in 2021, and one is occupied.

Farmer 2: I received four hives in 2021, and none are occupied.

Farmer 3: I received three hives in October 2023, and two are occupied.

Farmer 4: I received three hives in October 2023, and one is occupied.

Farmer 5: I received four hives in 2021, and two are occupied.

Farmer 6: I received four hives in 2021, and one is occupied.

Farmer 7: I received three hives in July 2023, and one is occupied.

Farmer 8: I received three hives in July 2023, and none are occupied.

Farmer 9: I received two hives in July 2023, and none are occupied.

EH: Do you know how to catch a swarm and extend the number of beehives?

Farmers: We know how but did not see many swarms to catch them.

EH: What tools do you have?

Farmers: We have brushes, hive tools, smokers, buckets, gloves and protective clothing.

EH: Have you planted specific plants or crops around your apiary to support bee activity?

Farmers: Yes, we did, but a long time before receiving hives. The planting was part of the agroforestry project.

EH: How often do you check on your bees?

Farmers: We try to check them at least twice or once a month.

EH: What does the process of honey harvest look like? From beehive to jar?

Farmers: We collect the combs with capped and uncapped honey, sometimes with a small quantity of brood if it is with honey on the same combs. Then we put it in a bucket, smash it, let it sit, pick out the combs, warm up the combs, and the rest of the honey left inside them separates from it.

EH: What do you collect while harvesting honey?

Farmers: As said, comb with honey and sometimes with brood, leaving empty combs inside.

EH: What challenges do you face?

Farmers: Many bees abscond the hives. It might be due to holes in the hives and, while raining, leaking inside them. In many hives, there are ants; even after we applied the grease, they still got in, and bees left. Not only ants but also termites, spiders and larvae are found in empty beehives, and we leave them in because we do not know how to get rid of them.

EH: Any challenges, additions, or comments to this project? What to change?

Farmers: We think the hives were given when bees were not looking for homes. Also, we need more help with the bees and more practical training than theoretical training, for example, what to do with an absconded beehive.