



Cambodia Mission Reports

Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience
(Technical Assistance 6539)

February 2024



Dontret Community Forest. Group photos of the participants at Dontret demonstration site, Samlout district, Battambang province, Cambodia (photo by Porny You, ICEM).





Disclaimer

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Prepared by	ICEM and ICRAF
Prepared for	ADB
Suggested citation	ICEM and ICRAF. 2023. <i>Cambodia Mission Reports</i> . Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience (Technical Assistance 6539). Prepared for Asian Development Bank. Hanoi.
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ABBREVIATIONS

ADB	Asian Development Bank
CFs	Communities Forests
CPA	Communities Protected Areas
DOE	Department of Environment
FA	Forest Administrative
FGD	Focus Group Discussion
GIS	Geography Information System
GPS	Geography Positioning System
ICEM	International Centre for Environment Management
ICRAF	International Centre for Environmental Management and World Agroforestry
KII	Key Informants Interview
MJP	Maddox Jolie-Pitt Foundation
MoE	Ministry of Environment
MJP	Maddox Jolie-Pitt Foundation
MUA	Municipal Utility Authority
PA	Protected Area
PDoE	Provincial Department of Environment
PDoWRAM	Provincial Department of Water Resource and Meteorology
PVC	Polyvinyl Chloride
REG	Regional
RS	Remote Sensing
SMUA	Samlout Multiple Use Area
TA	Technical Assistant
TBD	To be developed
TBI	To be information
TWG	Technical Working Group
UN	United Nation

WEIGHTS AND MEASURES

Ha	Hectare
%	Percentage
cm	Centimeter
m	Meter
km	Kilometer



First Cambodia National Field Mission Report



Meeting with Samlot Deyka Community Forestry Management Committee. Samlaut district, Battambang province, Cambodia (photo by Porny You, ICEM).



TA REG 6539: Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

First Cambodia National Field Mission Report

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1 Objectives of The Mission

To assess current land uses, land tenure/ownership, and stakeholder involvement for the (i) Sangker river basin and (ii) target landscape of the Samlaut MUA. In addition, identify the types of ecosystems that need to be restored, their status and any disruptive pressures. The factors to be covered in this baseline assessment of the Sanker River Basin and the Samlaut MUA include:

- Ecosystems and biodiversity assets and trends;
- Climate change, climate threats, and climate change vulnerability;
- Physical site conditions in need of repair;
- Stressors in need of regulation;
- Biotic interventions that are needed;
- Landscape restrictions, for example, the presence of dams, drainage and irrigation projects; and
- Diversions of runoff caused by roads and other public works.

2 Mission Activities

The first field mission will take place between May 8th and 22nd. As part of the mission, the team will identify two demonstration sites within the Samlaut Municipal Utility Authority (MUA) and four other sites situated in the buffer areas. The activities include:

- Define the four to six sites in detail – and if possible, define their boundaries (with GPS coordinates or GIS layers). Each selected site should be only a few hectares, but the site network should reflect different ecosystems and restoration needs;
- Identify potential climate hazards faced by the communities and their historical occurrences (exposure, sensitivities, and impacts);
- Examine the community knowledge, practices, and experiences in responding climate threats/disasters;
- Describe each site in terms of current status of forests and other land cover/uses – through interviews and discussions with MJP, rangers, and local communities;
- Identify specifically and describe in detail the communities MJP/ICEM will work with;
- Define existing nurseries that will be the source of seedlings – their current status and management;
- Working with rangers to identify the locations of one or two nurseries that could be established within Samlaut. In addition, discuss the potential management arrangements with rangers;
- Define initial restoration needs for each of the six sites;
- Define potential livelihood activities linked to each site;
- Define subsidiary work programs – e.g., agroforestry activities; involvement of school kids in plantings; and
- Define the monitoring and reporting program – what, where, who, how often. How will communities be involved.

3 Location

11 communities' forests (CFs), 9 villages, and Samlaut MUA, Samlaut district, Battambang Province, Cambodia.

4 Participants

- Bunnath Khun - Forest and Landscape Restoration Specialist

- Dr. Lay Chanthy - Community-based Climate Change Adaptation Specialist (Agroecology/ Agroforestry)
- Mr. Heng Bauran - Geographical Information Systems (GIS) Specialist
- Ms. Tous Sophorn - Gender Specialist
- Ms. Porny You – National Knowledge Management Specialist
- Mr. Munichan Kung - Country Director, Maddox Jolie-Pitt Foundation (MJP) and other MJP field staff.

5 Field Mission Agenda for Assessment Team (MJP to Coordinate)

Table 1. The Field Mission Workplan

Date		Place	Activities
May 09	full day	MJP office-Battambang	<ul style="list-style-type: none"> • Orientation meeting between mission team and MJP staff • Review and discuss on-field mission program, methods, responsibility of individual team, and • Desk-based research.
May 10	full day	MJP office-Battambang	<ul style="list-style-type: none"> • Finalize and agree on field mission program, methods, responsibility of the individual team, • Discuss assessment questionnaires, • Prepare field survey questionnaire using Kobotoolbox, Transect/survey map, participatory mapping-data collection method • Identify the Key informant Interviewees • Prepare itinerary and interviews with other agencies and stakeholders • MJP staff inform those community forest management committees and local authorities. • Follow for the meeting with line provincial departments
May 11	Morning 8:30-10:00	PDoE of Battambang	Meeting with PDoE director and staff Individual meeting with Gener focal person
	Mornig 10:30 - 11:30	PDoA of Battambang	Meeting with PDoA director and staff Individual meeting with Gener focal person
	Afternoon 2:00-3:00	PDoWRAM of Battambang	Meeting with PDoWRAM director and staff Individual meeting with Gener focal person
May 11	Afternoon 3:30-5:00	Battambang	<ul style="list-style-type: none"> • Field preparation and logistic arrangement at MJP office. • Finalize mobile field data collection question in Kobo collect application and communities map production in Avenza Map Application. • GIS mapping preparation in A3 paper size for field work • Train MJP technical staff how to collect mark location and information using both field survey questionnaire in Kobo Collect App and Avenza Map App.

	Date	Place	Activities
May 12	Morning 8:30 – 11:30	Takie Samlout-CF Kantout village	Meeting with FA, local authorities, and community leaders and their members in Kantout village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councillors),
	Afternoon 1:00-5:00		Sites visit <ul style="list-style-type: none"> TBD with MJP on May 09 about what and where to visit Request two community people to accompany team to the site and team members can ask questions during site visitation.
May 13	Morning 8:30 – 11:30	TaKie Samlout-CF Bueng Run village	Meeting with FA, local authorities, and community leaders and their members in Bueng Run village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councillors).
	Afternoon 1:00-5:00	Nursery site in Pailin	Team visit to nurseries site in Pailin
May 14	Morning 8:30 – 11:30	Deka Mountain -CF Samlout village	Meeting with FA, local authorities, and community leaders and their members in Samlout village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councilors), ..
	Afternoon 1:00-5:00		Sites visit <ul style="list-style-type: none"> TBD with MJP on May 09 about what and where to visit Request two community people to accompany the team to the site and team members can ask questions during site visitation.
May 15	Morning 8:30 – 11:30.	Deka Mountain -CF Bueng Run village	Meeting with FA, local authorities, and community leaders and their members in Bueng Run village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councillors)
	Afternoon 1:00-5:00		Sites visit <ul style="list-style-type: none"> TBD with MJP on May 09 about what and where to visit Request two community people to accompany the team to the site and team members can ask questions during site visitation.

	Date	Place	Activities
May 16	Morning 8:30 – 11:30	Samaki Ou chrab-CF Ou Chrab village	Meeting with FA, local authorities, and community leaders and their members in Ou Chrab village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councillors),
	Afternoon 1:00-5:00		Sites visit <ul style="list-style-type: none"> TBD with MJP on May 09 about what and where to visit Request two community people to accompany the team to the site and team members can ask questions during site visitation.
May 17	Morning 8:30 – 11:30.	Takie Mean chey- CF Tanon village	Meeting with FA, local authorities, and community leaders and their members in Tanon village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councillors),
	Afternoon 1:00-5:00		Sites visit <ul style="list-style-type: none"> TBD with MJP on May 09 about what and where to visit Request two community people to accompany the team to the site and team members can ask questions during site visitation.
May 18	Morning 8:30 – 11:30	Takie Mean chey – CF Kompong Touk	Meeting with FA, local authorities, and community leaders and their members in Kampong Touk village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councillors)
	Afternoon 1:00-5:00		Sites visit <ul style="list-style-type: none"> TBD with MJP on May 09 about what and where to visit Request two community people to accompany the team to the site and team members can ask questions during site visitation.
May 19	Morning 8:30 – 11:30	Chrab Krohorm Samaki- CF, Ampip village	Meeting with FA, local authorities, and community leaders and their members Ampip village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councillors),
	Morning 08:30-10:30am	Chrab Krohorm Samaki- CF, Ampip village	Conduct Gender FGD with a male and female social enterprise groups (Vegetable, honey, vegetable) at Kanchaing Commune.

	Date	Place	Activities
	Morning 11:00-12:00		Conduct Interview with Head of Livelihood/Saving Group
	Afternoon 1:00-5:00	Chrab Krohorm Samaki- CF, Ampip village	Sites visit <ul style="list-style-type: none"> TBD with MJP on May 09 about what and where to visit Request two community people to accompany the team to the site and team members can ask questions during site visitation.
	Afternoon 1:30-03:30	Same or community nearby	Conduct Gender FGD with a female and male group of Deka CF in Samlout Commune.
	Afternoon 03:30-04:15		Conduct KII with women commune councillors and commune chief in local commune
May 20	Morning 8:30 – 11:30	Anakot koma Samaki-CF, Sre Sdoa village	Meeting with FA, local authorities, and community leaders and their members in Sre Sdoa village <ul style="list-style-type: none"> Meeting venue: TBI in meeting with MJP on May 09 Number of people: 10-12 (50% men and 50% women) including community leaders, informative community people, local authorities (village chief, commune councillors),
	Morning 08:30-10:30am	Anakot koma Samaki-CF, Sre Sdoa village	Conduct Gender FGD with a male group of CF/CPA and Mean Chey AC Committee/members at Chung Commune.
	Morning 11:00-12:00		Conduct Interview with Head of Livelihood/Saving Group
	Afternoon 1:00-5:00	Anakot koma Samaki-CF, Sre Sdoa village	Sites visit <ul style="list-style-type: none"> TBD with MJP on May 09 about what and where to visit Request two community people to accompany the team to the site and team members can ask questions during site visitation.
	Afternoon 1:30-03:30	Same or community nearby	Conduct a gender FGD with a female and male group with 3 CFs Committee members in Kanchaing Commune
	Afternoon 03:30-04:15		Conduct KII with nurseries groups
May 21	Full day	MJP office- Battambang	Presentation and discussion on preliminary findings of the field baseline assessment in Samlout

6 Detailed Activities Undertaken Based on Mission Milestone

6.1. Demonstration sites

Task 1: Define the four to six sites in detail – and if possible, define their boundaries (with GPS coordinates or GIS layers). Each selected site should be only a few hectares, but the site network should reflect different ecosystems and restoration needs.

Expected output: Six sites, which are suitable for restoration, will be identified and mapped. The maps will be included in the baseline assessment report

Finding:

- Samlout is a mountainous-highland district located in Southwestern Battambang Province and shares borders with Thailand and Pailin province. Samlout is the main upstream catchment of Sangkae River.
- As reported by community people and noted in Taingaun (2021)¹, Samlout territory was mainly covered by forest and green space before 1998. And then since 1998, the conversion of forest land to cropland (local people refer to Chamkar) by local people and outsiders has occurred dramatically until 2008. As a result, forest cover in the area has rapidly decreased and has been replaced by Chamkar (plantation) of Dorean, longan, mango, cashew, rubber, cassava, corn, rice, soybean, and sugarcane. To protect forests that mainly remained in some mountains, the forest administration of Battambang has established community forests to protect their forest mountains. Community forests majority established in 2008-2010. In addition, part of Samlout district, where good forest coverages remain, is next to the Samlout Multiple Use Area, where they have better protection from local rangers under MOE.
- In conjunction with the MJP, the team assesses 11 community forests (CF) in Samlout. Among these CFs, 6 sites in 6 different CFs stand out as the most suitable area for restoration activities. The maps of the selected sites can be found in section 10 “Field assessment images”

6.2. Potential climate hazards

Task 2: Identify potential climate hazards faced by the communities and their historical occurrences (exposure, sensitivities, and impacts)

Expected output: Climate hazards faced by the communities and their historical occurrences (exposure, sensitivities, and impacts) to be include in the baseline assessment report

Finding:

- Samlout district experience heavy rainfalls in wet reason and the temperatures remain high year-round due to the effect of the monsoon. The average daily temperature is about 30°C in the wet season and 31°C in the dry season with maximum temperatures sometimes rise above 38°C. The weather conditions in this region are favorable for agriculture, especially crop cultivation. Annual rainfall is projected to increase from 1350 mm in wet season and 351 mm in dry season to 1411mm and 441mm in 2050 in respectively (ICEM, 2022)². Seasonally, by 2050, Samlout is expected to experience a significant rainfall increase in the wet season, and a rainfall decrease in the dry season. Average temperatures are expected to grow in both wet and dry seasons. This change in weather patterns results in higher rainfall intensity and amount. These projected changes will lead Samlout to increase in the frequency of flooding in wet seasons and drought in the dry season.

¹ Taingaun S., Sophak P., Phanith C., Nareth N., Dany T., Phana R., Mael R.R., (2021). Evaluation of Land use and Land Cover Change and Its Drivers in Battambang Province, Cambodia from 1998-2018. Journal of Sustainability 2021.

² ICEM (2022): Cambodia Climate Change Toolbox. Accessed at: <https://dss.icem.com.au/CambodiaDSS/>.

- At the community level, members refer to climate change as the shift in rainfall, floods, droughts, and storm patterns. They recognized that the rainy season in their communities is delayed and irregular. There are also changes in temperature as an overall increase in temperature is observed in this area. Besides climate change, the communities link the changes in precipitation and temperature to the depletion of forest cover in areas.
- The communities identify droughts, floods, and storms as the major climate hazards in the area. Drought mainly impacts crop production since the majority of croplands in these communities are rainfed. Communities that are located closer to the Sangkae river, such as Deka community, rely on river water for mainly domestic use. In 2016, communities encountered a serious drought period. Surface water bodies, including Sangkae river, had quickly evaporated and dried up early. River floods, flashfloods, and intense rainfall are also encountered by these communities. For example, Deka and Daun Tret is a community located closer to the river where it faces frequent flashfloods and river floods which cause severe damage. The recently completed and operated Saksak mass irrigation dam further contributes to the Daun Tret river flood problem as it is located in the buffer zone of the Saksak reservoir. A previous flooding event affected hundreds of houses and a pagoda in the village. However, river flood is not a concern for community forests since they are located in elevated, mountainous areas. Storm and strong wind are other climate hazards encountered by communities. They destroy buildings, kills animals, and damage crop. Strong wind can reduce crop yield by removing the pollen of the crop trees.

6.3. Community knowledge and practices in response to climate threats/disasters

Task 3: Examine the community knowledge, practices, and experiences in responding climate threats/disasters.

Expected output: Identify the community knowledge, practices, and experiences in responding climate threats/disasters.

Finding:

- All communities consider drought a climate hazard as drought destroys crops and causes domestic water shortage. In addition, drought raises the risk of forest fire in the community forests. However, communities reported that they are not highly vulnerable to drought. People prepared to adapt to live with drought situations through:
- Increasing capacity of rainwater harvesting and water storage for agriculture and domestic use.
- Digging wells is another alternative to avail water for domestic use during drought periods.
- Some farms have adopted drip irrigation technology, which saves water by increasing water use efficiency.
- The farmers also apply polyculture using drought-resistant and drought-tolerant crops.
- Samlout agriculture soil is very fertile, and favorable for all kinds of crops, including seasonal and year-round crops. The soil composition of CFs is mainly laterite soil mixed with small crack stones. However, Samlout, especially agricultural land and steep areas, is experiencing land degradation and decreasing soil quality.
- Community people believed that the while land degradation was cause by deforestation, decrease in soil quality in area is caused by multiple factors including: (i) climate change, (ii) clearance of forest cover at upland areas, and (iii) increasing use of chemical pesticides and fertilizers in the area. For example, under climate change, specifically in wet season, increase precipitation amount and intensity lead to increase the likelihood of flashflood which caused erosion of topsoil of agriculture land in both upland and lowland. Soil erosion in these areas decreases soil quality of farmland and contribute to pollute surface water bodies. Sangkae

river in Samlout is considered to be heavily polluted caused by soil erosion and river bank collapse.

- Socially, men and women use natural resources differently. As a result, they are affected differently by changes to these resources. Since women have access to different resources, their knowledge of natural resources differs from men. Women usually engage their knowledge and time allocation for family-caring roles and contribute to income earning. With limited resources and capacity to adapt to climate change impacts, including the lack of preparedness to cope with climate risks and hazards, women and children are the most vulnerable to climate change impacts (high dependence on agriculture and natural resources, diseases, lack of access to water resources, etc.).
- There is still inequality between men and women as women are, most of the time, under-represented in decision-making processes that shape their societies and their own lives. And gender inequality and social exclusion remarkably increase the negative effects of environmental degradation on women and girls as they are constrained from contributing their inputs. This means that the community might lose half of the population's resources in the community development process (community forestry management, nursery activities/agroforestry, etc.). There is a need to address gender issues through different ecosystems and restoration and conservation activities.

6.4. Site description

Task 4: Describe each site in terms of current status of forests and other land cover/uses – through interviews and discussions with MJP, rangers, and local communities.

Expected output: A description of each site's current forest condition and other land cover/use is to be included in the baseline assessment.

Finding:

- The forests are degraded in those 11 forest communities, but they are rich in construction dominant species. The vast majority of these forests are regenerating after extensive degradation from illegal activities such as logging and clearing for agricultural conversion. Since those communities are located in the same geographical area, most forest conditions are similar, such as climate, species, soil, and landscape.

6.5. Proposed communities to join the project

Task 5: Identify specifically and describe in detail the communities MJP/ICEM will work with.

Expected output: The list of communities to join the project will be identified in detail and included in the demonstration work plan (which is MJP responsibility with support from ICEM team).

Finding:

- People's livelihood in Samlout mainly relies on agriculture, crop cultivation (perennial crops and annual crops), and livestock. These crops include longan, mango, durian, cashew, rubber, pepper, and seasonal crops including cassava, corn, sugar can, soybean, rice, and vegetables. Besides Chamkar, some people also earn income from animal raising, collecting NTFP and wild vegetables, bee farming, employment, paid labor, and remittances.
- During the field investigation and discussion with the community management committees, local FA Triage, MoE officers, local authorities, and MJP management teams, 11 community forests were identified and assessed. As a result, several forest communities, nurseries, and restoration sites were identified as a principal in the preliminary finding on May 21, 2022. Details will be discussed in the next session.

6.6. Status of current nurseries

Task 6: Define existing nurseries which will be the source of seedlings – their current status and management.

Expected output: The team will list the current nurseries that will supply seedlings, including their present status and management, and include the information in the baseline assessment and work plan.

Finding:

- There were 2 community nurseries, 1 MJP nursery, 3 FA Canton nurseries and 2 PA nurseries visited. There are hundreds of tree seedlings available from those nurseries. Usually, the nurseries also employ a few community women to work at the nursery.
- The team studies the nursery management structure, level of technical and financial support, and how to obtain the tree seeds for seedlings production. The long-term and sustainable nursery business was also discussed. The FA nurseries and PA nurseries are indicated to be more sustainable and self-sufficient, while community nurseries rely on MJP support in both financial and seeds distribution.

6.7. Selected nurseries

Task 7: Working with rangers to identify the locations of one or two nurseries that could be established within Samlaut. In addition, discuss the potential management arrangements with rangers.

Expected output: The team discussed with rangers the possibility of establishing and management arrangements for one or two nurseries within Samlaut MUA. The information will be included in the work plan.

Finding:

The team was discussed with 2 PA rangers of 2 sites that are supported by MJP. There was noted that the PA nursery site at Samlaut is more suitable than the other at Pailin due to a few factors, including the management structure and the geographical distribution. The PA nursery at Pailin is under the management of the PDoE, which means MJP has limited influence over that nursery. The nursery is located far from all those 11 community forests at Samlaut. The locations of the nurseries are not very far from the villages, which allows community members, including women, to reach out or support the nursery activities.

6.8. Restoration needs for the selected sites

Task 8: Define initial restoration needs for each of the six sites.

Expected output: Initial restoration needs for each of the six sites will be discussed and agreed upon. The restoration needs will be included in the baseline assessment.

Finding:

- The initial restoration needs for each identified site were discussed and agreed upon by the communities, local FA, MoE, local authorities, and MJP management team including the restoration sites, tree species, planting season, and labor forces.
- Learned from the focus group discussion with the communities that promote women's participation in the initial restoration. Those activities include encouraging women to engage in and benefit from the community nursery, agroforestry, and community patrol. In addition, the division of role of women and men in the community forestry and nursery should be discussed, including the understanding of women's timing which the CF can allow more women to benefit from those activities.

6.9. Potential livelihood activities in each site

Task 9: Define potential livelihood activities linked to each site.

Expected output: The potential livelihood options and activities linked to each site will be identified and included in the baseline assessment.

Task 10: Define subsidiary work programs – e.g., agroforestry activities; involvement of school kids in plantings.

Expected output: The team and MJP will define subsidiary work programs - for example, agroforestry activities; school students' involvement in plantings. These activities will be included in the work plan.

Finding of Task 9 and 10:

Subsidiary Works

- i. Planting sweet bamboo as community forest boundary demarcation
 - Land encroachment of surrounding farms into community forests remains a critical issue for the community committee. The boundaries of community forests absent markable poles at most boundary sections. As the table below indicates, only a few boundary poles have been placed on boundary demarcation. Hard land titles are not available for CF land and surrounding farmlands yet. The absence and inadequate CF boundary poles can motivate bordering farms to encroach on the CFs.

Table 2. CF Size and Number of Boundary Poles Placed

No.	CF	CF Size (ha)	Poles
1	Samaki Ouchrab	94	4
2	Deka Somlout	664	-
3	Takhe Somlout	563	19
4	Takhe Meanchey	1453	26
5	Chrab Krahorn Samaki	n/a	62.7
6	Anakot Koma	93	11
7	Daun Tret	137	15
8	Kanhchagn	401	82
9	Tasagn Tbound	46	71

- As a problem-solving to this issue and as a local practice, sweet bamboo should be introduced and planted along the community forest land boundaries to be the boundary pole of the CF lands. Planting sweet bamboo along the boundary provides a strong boundary demarcation. It can also be a potential source of income generation for the community by selling bamboo shoots and bamboo trees. Sweet bamboo shoots have a good market in Cambodia. Sweet bamboo tree is easy to grow, and the bamboo shoots can quickly generate within 2-3 years after planting.
- ii. Promoting wild vegetables, horticulture and, livestock.
 - In general, most of the wild vegetable collecting activities and horticulture activities were mostly performed by women accounting for 70-80% of the total labour.

- Wild vegetables are also an excellent commercial product. People know that wild vegetables are natural and have no chemical contamination compared to farm vegetables. Wild vegetables can be introduced and regenerated in CFs. As the wild vegetable market expands, it brings more villagers to go into CF to collect wild vegetables. This will help promote conservation ideas to villagers to protect the CF as their income resource. Thus, seedling selection for planting at the restoration sites should be multiple-use trees that can provide vegetables for villagers.
 - For vegetable planting, most of the smallholders plant the vegetable at home for household consumption or food reservation, and the remaining vegetable will be sold for income. Water source is the main issue for smallholders when initiating planting activities, especially during the dry season. For a few smallholders who were supported by ASPIRE project, they have attained vegetable planting techniques, agricultural inputs and supplied with half of the funds contributed by the ASPIRE project. In addition, 70-80 % of households in Samlout raise chickens for home consumption. The chicken also has a fair price and high demand at the market. Yet, people from the communities weren't able to scale up their chicken productions.
- iii. Beekeeping
- Beekeeping was initially supported by ASPIRE project by piloting 18 HHs in Kanchaing and Romchek communities. The activities continue to receive support from MJP. However, besides the technique of beekeeping, it requires attention, time, and intensive care following the flow of bees day by day. This activity has high potential in generating income, allowing the household members (both husband and wife or adult siblings) to support the beekeeping activities. Presently, there are around 10 households still involved in beekeeping for livelihood and income generation activities.
 - Beekeeping in CF, especially at the demonstration sites, would benefit forest restoration activities as people from the communities will engage more in the process. Therefore, seedling selection for the demonstration should include tree species that generate good pollen for bees, such as Kepok tree (ឆៃមគិរី).
- iv. Engagement of school and pagoda
- Communities have engaged local schools (teachers and students) in tree planting activities such as planting new trees along roads, at community forests, in school, and in public spaces. Thus, it would be advantageous to improve school teachers' and students' understanding of landscape restoration concepts and activities through school training programs.
 - In addition, monks in Cambodia also play a crucial role in educating and providing good messages to people. There should be a program to engage monks in natural restoration. Monks can mainstream forest preservation and conservation concepts in any Buddhist events and festivals.
- v. Awareness raising program
- As discussed with communities' men and women, the team found that not all households in the villages thought that the CFs were useful and necessary for them. Some villagers may think only about short-term benefits, they want to own forest land by converting it to other land use types. In addition, some villagers may not be fully aware of the illegality and punishment of land encroachment into CFs, land grabbing, and tree cutting. As a result, several land encroachment cases in each CF have been reported. Thus, public campaigns and awareness raising should be compulsory for this landscape and forest restoration program in Samlout district.

vi. Suggestions for Improving women representation and equitable economic benefit of the community:

- To improve more female representation in community and community enterprise group (honey, vegetable and chicken).
- As the CF communities have high potential in plantation and crop farming, the project/MJP could help identify the needs for income generating skills among women, support communities on sustainable livelihood approaches, and create market linkages with private sector actors.
- Addressing the barrier of gender stereotypes by utilizing gender impacted-activities and results from implementing project capacity building activities.
- Build gender awareness among relevant implementation and coordination partners (MoE, MJP, PDoWA, especially influential community persons) in transforming attitude and behavior into more affirmative actions, building mutual trust and empowering more women to join the environmental conservation and income generation activities.

6.10. Monitoring and reporting program

Task 11: Define the monitoring and reporting program – what, where, who, how often. How will communities be involved.

Expected output: The monitoring and reporting program will be defined by the team and MJP. Within the monitoring framework, the communities involved will be identified. The final program will be included in the work plan.

Finding:

The community forest restoration is challenged by illegal activities caused by people outside the community and addicts as they cut valuable trees at night. Therefore the monitoring and reporting program should utilize:

- Existing communication platform:
 - Public talk during key events within the communities, pagodas, schools
 - Community Forestry and commune council meeting with monks and teachers to request their support to promote messages to villagers and students
 - Tree planting day
 - IEC materials are very limited in the communities
 - Lack of available materials to remind/repeat the message at the household level.
- Proposed communication tools/platform:
 - Billboard/more signs
 - Poster and leaflet (reduce texts and focus more on pictures or illustrations as it could allow people to understand visually, especially for those who are not able to read and write)
 - Booklets (should use more pictures and message as they are the key awareness messages to kids, youth and public audience)
 - Video for social media, particularly Facebook and Tik Tok to raise awareness of youth group. And it is more convenience if the MJP or community would like to use them for the roadshow campaign.
 - Slide presentation in Khmer
 - Re-install more billboards with clearer/nicer colors and messages around the boundaries and entrances to community protected forests
 - Produce more available awareness materials with various messages to disseminate within communities

- Organize regular community campaign with loudspeakers in collaboration with the commune council and community forestry
- Recommendations for additional tools:
 - Install more billboards with clearer/nicer colors and messages around the boundaries and entrance to community protected forest
 - Produce more awareness materials with various messages to disseminate within communities for free (suggest to use more visual tools than texts which allows none writer and reader could access to the key messages)
 - Organize regular community campaign with loudspeakers in collaboration with the commune council and community forestry (The printed banners of the project or awareness messages will use to hang at the meeting place of the community).
- Existing Message:
 - The importance of forest and biodiversity
 - Preserve our forest
 - Call for participation in conservation.
 - Our forests, our livelihoods
 - Climate resilience agriculture
 - Natural resources management and conservation
- Proposed additional messages:
 - Climate change (mitigation, adaptation)
 - Enforcement of law on forestry.
- Other Recommendations:
 - Provide nursery service free of charge for social mobilization events to grow more trees
 - Motivate to plant trees at individual homes, community, and protected community forest
 - Raise awareness about the benefit of using natural compost rather than chemical fertilizer for agriculture purposes.
 - Raise awareness about the negative impact of chemical fertilizer on the community's health. For example, the majority of farmers are using excessive amounts of fertilizer for their crops which pollutes the soil and water, particularly in Dei Ka and O Torteng communities.
- Suggestions for Gender responsive in education, advocacy, communication and networking:
 - Identify appropriate information, visual awareness tools, supporting awareness learning materials, ice-breakers and guide for promoting learning which are applicable for illiterate and low literacy groups and address cultural barriers in the community including where IP people are living in Samlout.
 - Via MJP collaboration activities, gender awareness sessions can be integrated into community engagement activities to help men and women understand about gender challenges in environmental conservation and management including nursery activities and community enterprise.
 - Build on existing and established women's group in the CF area to allow more room for the community to promote women's initiative, confidence and knowledge. This activity will build a voice for women and potentially identify females' leaders in the community.
 - The TA team is working closely with MJP to develop the concept and materials for sharing with the commune council and community forestry, who will disseminate them within the community. In terms of monitoring the demonstration's effectiveness, the drone and satellite images are important to attach with various knowledge products to show and track the progress. Details of Final Deliverables

The following deliverables were produced:

6.11. Nurseries

Two nurseries were identified and agreed upon by the MJP management team, local FA, and MoE. Those nurseries are:

Figure 1. PA/ Samlaut nursery, which is under development



Figure 2. Community nursery of Prey Kanchang



6.12. Restoration Sites

Six forest community sites were identified and agreed upon by MJP

- Crab Krohomsamki Community Forest, 1 hectare

Figure 3. Demonstration site at Crab Krohomsamki Community Forest



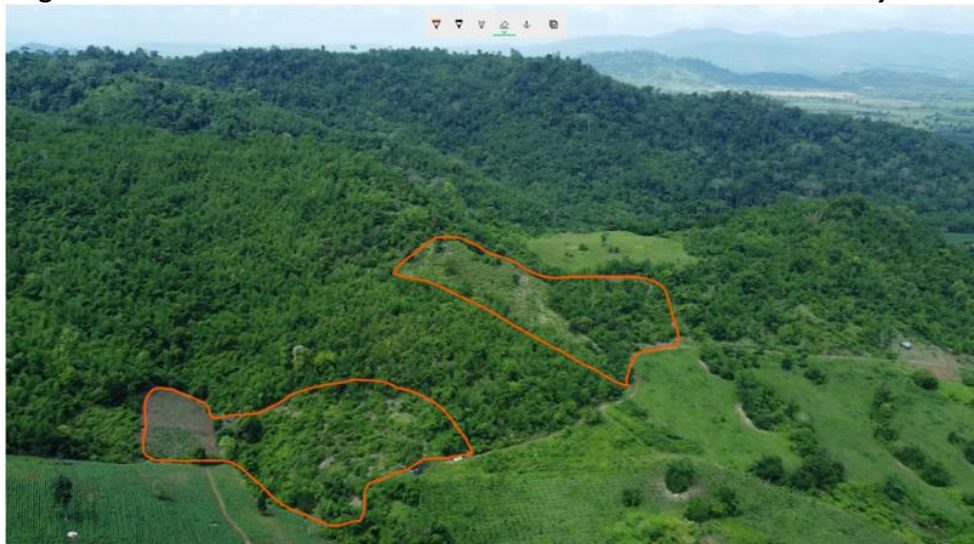
- Anakoth Kumarsamki Community Forest, 1.9 Hectares

Figure 4. Demonstration site at Anakoth Kumarsamki Community Forest



- Takhe Meanchey Community Forestry, 4 hectares

Figure 5. Demonstration site at Takhe Anakoth Kumarsamki Community Forest



- Daun Trit Community Forest, 2.18 hectares

Figure 6. Demonstration site at Daun Trit Community Forest



- Prey Kanchang Community Forest (Sachm), 1 hectare

Figure 7. Demonstration site at Prey Kanchang Community Forest



- Ta Sanh Tbong Village Forest Community, 1 hectare

Figure 8. Demonstration site at Ta Sanh Tbong Village Community Forest



Total 11.08 hectares.

7. Follow-up Actions

7.1. The nurseries' investment

The nurseries' investment should includes:

- Improving the irrigation system
- Install an 8,000-liter water tank
- Renovation of subsystem
- Supply of nursery materials, roasting, soil mixing, soil packing, and bagging, such as plastic shovels, soil carts, etc.
- Wear technical training such as seed collection, selection, storage and transportation, seed reaction, sowing, planting, etc.
- Compost production, husk charcoal production, and soil treatment (boiling)
- Business plan, nursery, and distribution enterprise.

7.2. Restoration activities recomendation

We recommended applying the enrichment planting method for the restoration activities in those six identified areas. New tree seedlings will be planted into the degraded natural forest.

7.3. Nursery and Restoration Activity Calendar

Table 3. Nursery and Restoration Activity Calendar

Activity - 2022	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1. Restoration-tree planting							
2. Nursery- tree seedlings production							
3. Survival survey- tree planted							
4. Nursery tree seedlings maintenance							

8. Final Mission Briefing

The first mission of feasibly study to those 11 forest communities was a great success in corresponding to the mission objectives. The number of nurseries and restoration sites and hectares were identified and agreed upon with MJP. Furthermore, all relevant stakeholders, including provincial FA Canton, PDoE, local FA Triage, PA rangers, local authorities, and community forest management committees, strongly indicated their close collaboration and support during the assessment period and beyond.

9. Field Assessment Images

Figure 9. First day meeting with MJP management team



Figure 10. Meeting with Deputy Director of PMoE



Figure 11. Meeting with Chief of Provincial Forest Administration



Figure 12. Meeting with Samaki Ochrap Community Forest Management Committee



Figure 13. Samaki Ochrap Community Forest Restoration MAP

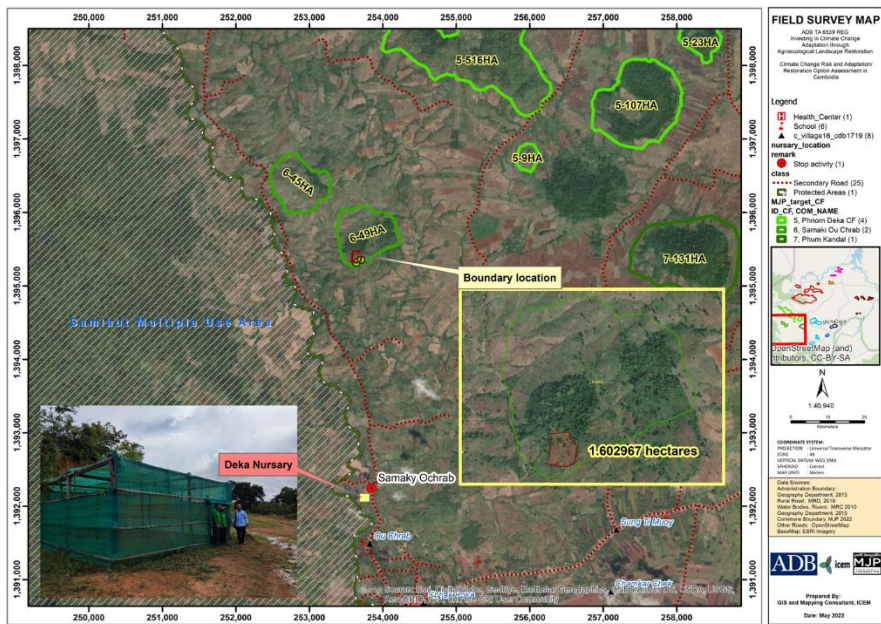


Figure 14. Meeting with Samlot Deyka Community Forestry Management Committee

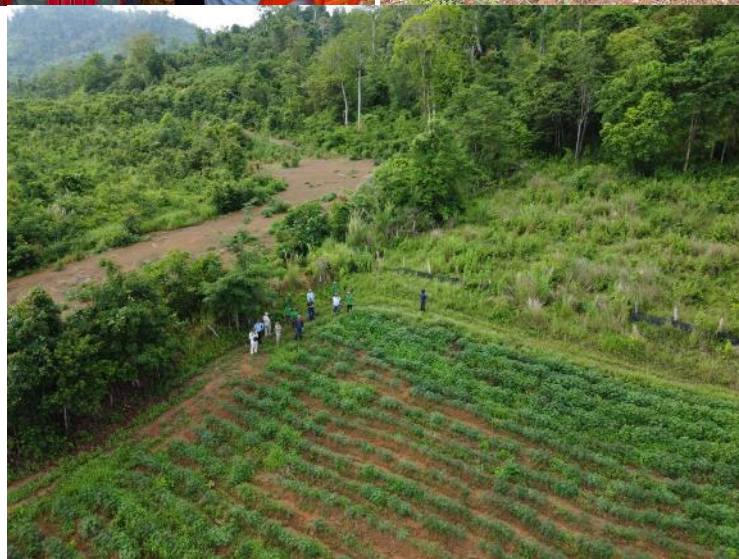


Figure 15. Samlot Deyka Community Forestry Restoration Map

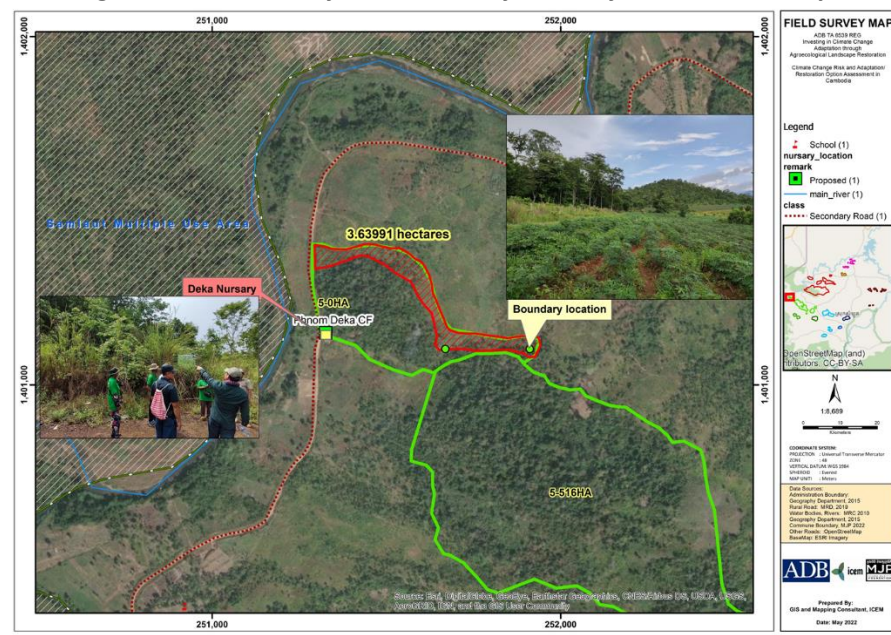


Figure 16. Meeting with PA ranger at Pailin



Figure 17. Visit MJP nursery



Figure 18. Meeting with Ta Khes Samlot Community Forest Management Committee



Figure 19. Meeting with Takhe Meanchey Community Forestry Management Committee



Figure 20. Takhe Meanchey Community Forestry Restoration Map

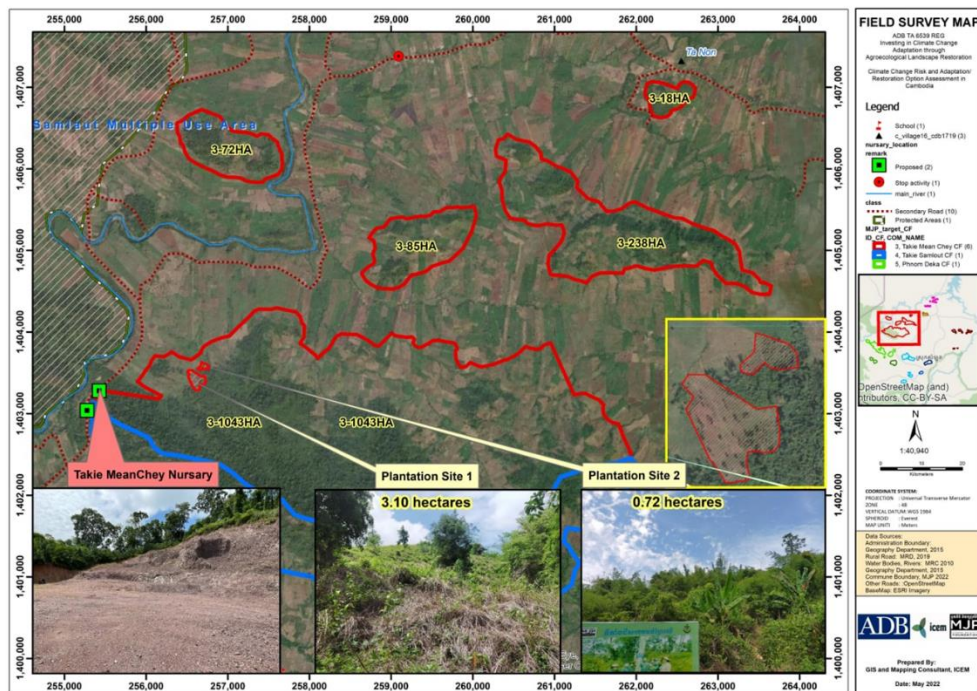


Figure 21. Meeting with Crab Krohom Samki Community Forest Management Committee



Figure 22. Crab Krohom Samki Restoration Map

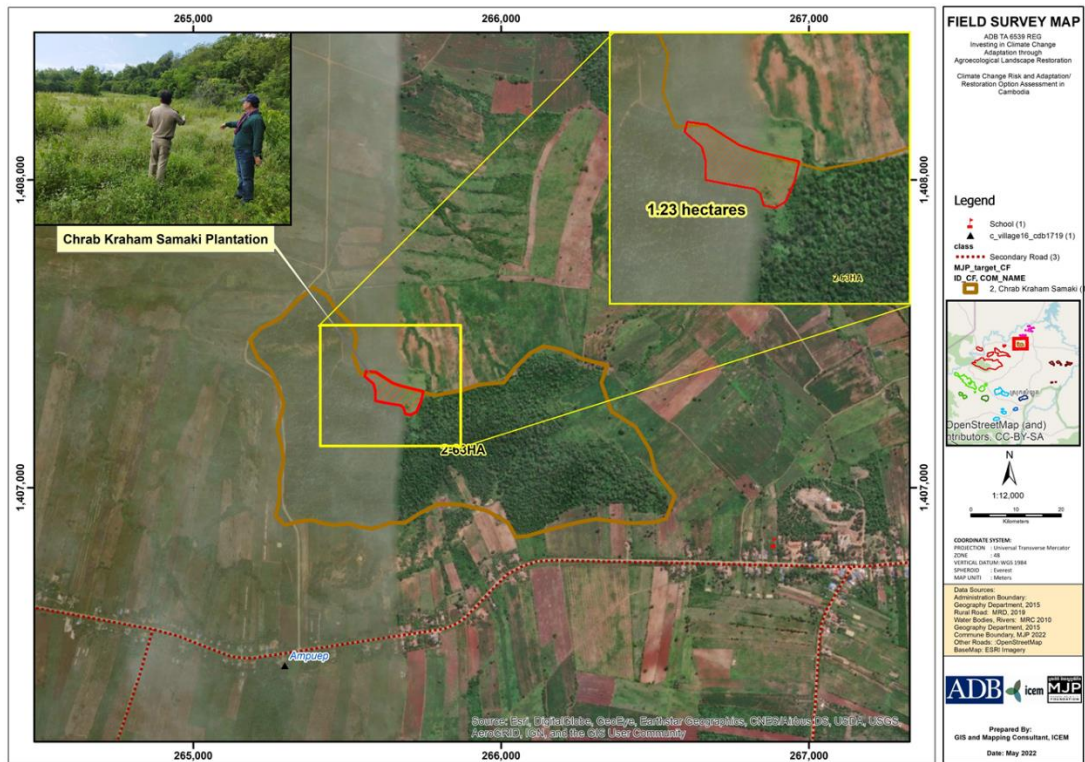


Figure 23. Meeting with Anakoth Kuma Community Forest Management Committee



Figure 24. Anakot Kuma Samki Community Forestry Restoration Map

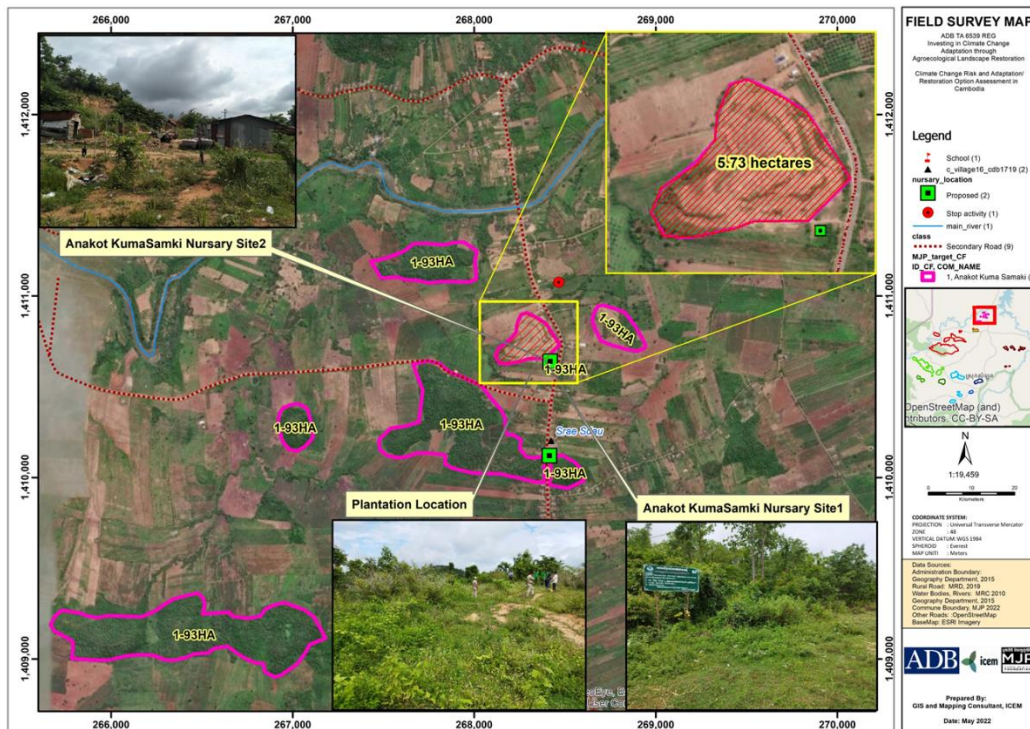


Figure 25. Meeting with Daun Trit Community Forest Management Committee



Figure 26. Daun Trit Community Forest Restoration Map

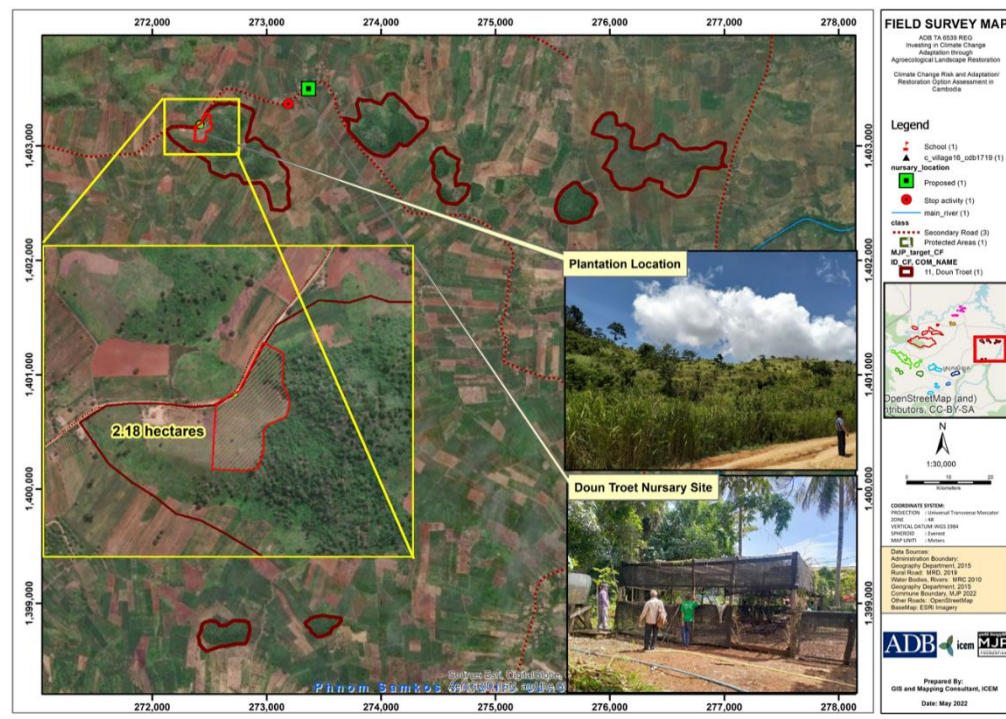


Figure 27. Meeting with Prey Kanchang Community Forest (Sachm) Management Committee



Figure 28. Prey Kanchang Community Forest (Sachm) Restoration Map

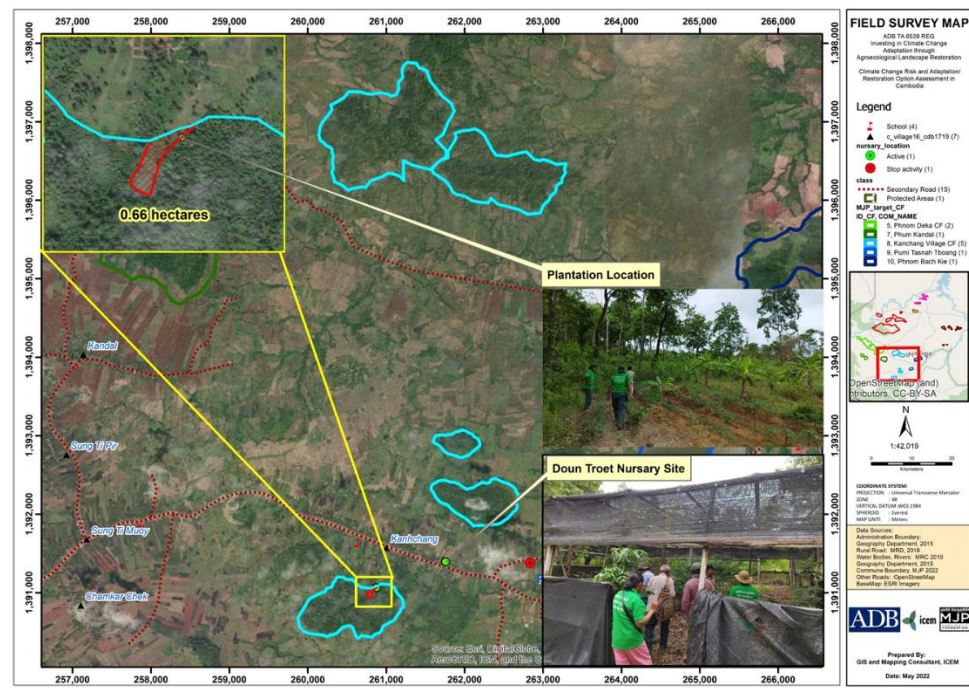
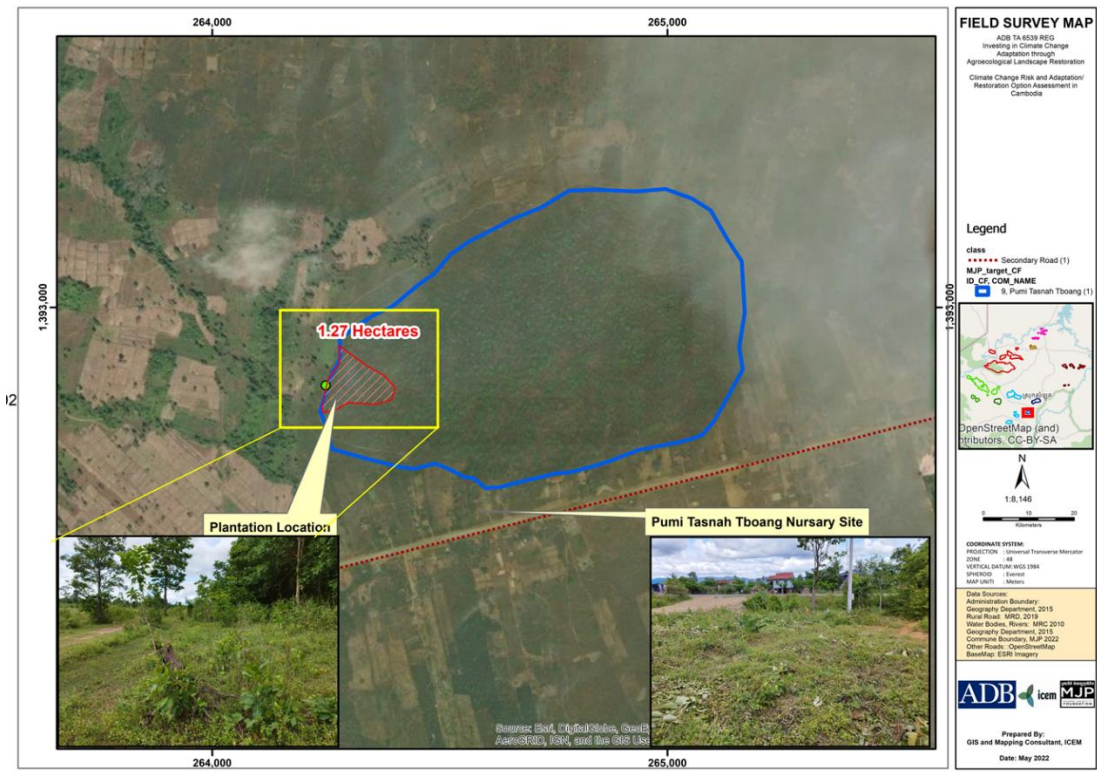


Figure 29. Meeting with Ta Sanh Tboang Village Community Forest Community Management Committee



Figure 30. Ta Sanh Tboang Village Community Forest Community Restoration Map



10. Data Collection and Map Production

10.1. Field Data Collection

Using Kobo toolbox to support the field data collection is key for quicker, more accessible, more precise, and more accurate compared with handheld GPS. Kobo Toolbox allows data collection in both online and offline. The tool can run on mobile phones, tablets, or any browser. The data is immediately available right after it is collected, and can visualize the information within the analysis report and maps in the kobo dashboard.

Figure 31. Kobo Toolbox Web Browser (left) and Mobile App (right)

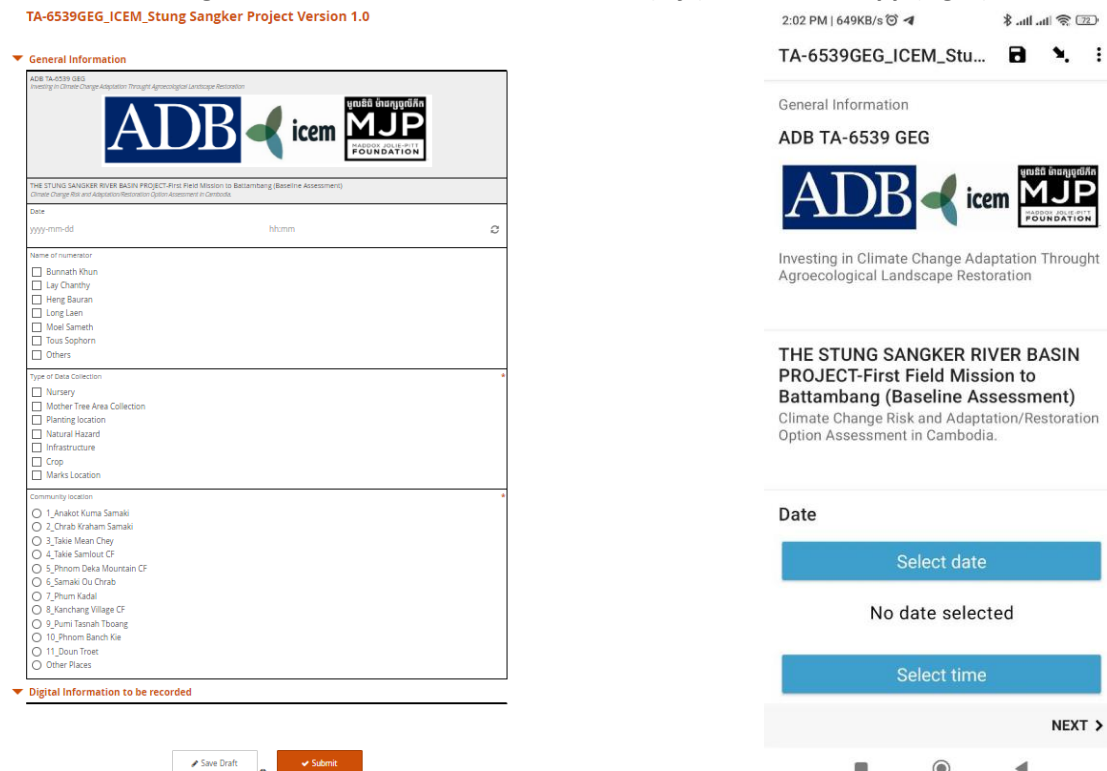


Figure 32. Kobo Toolbox user interface

The screenshot shows the Kobo Toolbox user interface with a data table. The table has columns for 'Validation', 'start', 'end', 'General Inf...', and 'General In...'. The table contains 41 rows of data, each representing a data collection entry. The table is displayed in a web browser interface with a sidebar on the left containing navigation options like 'Table', 'Reports', 'Gallery', 'Downloads', and 'Map'. The table data is as follows:

Validation	start	end	General Inf...	General In...
—	May 20, 2022	May 20, 2022	2022-05-20T10:57...	Long Laen
—	May 20, 2022	May 20, 2022	2022-05-20T15:06...	Moel Sameth
—	May 19, 2022	May 19, 2022	2022-05-19T15:24...	Moel Sameth
—	May 19, 2022	May 19, 2022	2022-05-19T09:22...	Moel Sameth
—	May 19, 2022	May 19, 2022	2022-05-19T15:37...	Long Laen
—	May 19, 2022	May 19, 2022	2022-05-19T14:55...	Long Laen
—	May 19, 2022	May 19, 2022	2022-05-19T12:03...	Long Laen
—	May 19, 2022	May 19, 2022	2022-05-19T10:59...	Long Laen
—	May 19, 2022	May 19, 2022	2022-05-19T10:16...	Long Laen
—	May 18, 2022	May 18, 2022	2022-05-18T10:52...	Moel Sameth
—	May 18, 2022	May 18, 2022	2022-05-18T10:13...	Moel Sameth
—	May 18, 2022	May 18, 2022	2022-05-18T09:14...	Moel Sameth
—	May 18, 2022	May 18, 2022	2022-05-18T11:03...	Lay Chanthly
—	May 18, 2022	May 18, 2022	2022-05-18T10:15...	Lay Chanthly
—	May 17, 2022	May 17, 2022	2022-05-17T09:31...	Lay Chanthly
—	May 17, 2022	May 17, 2022	2022-05-17T09:23...	Lay Chanthly
—	May 17, 2022	May 17, 2022	2022-05-17T09:29...	Long Laen

Figure 33. Kobo Dashboard

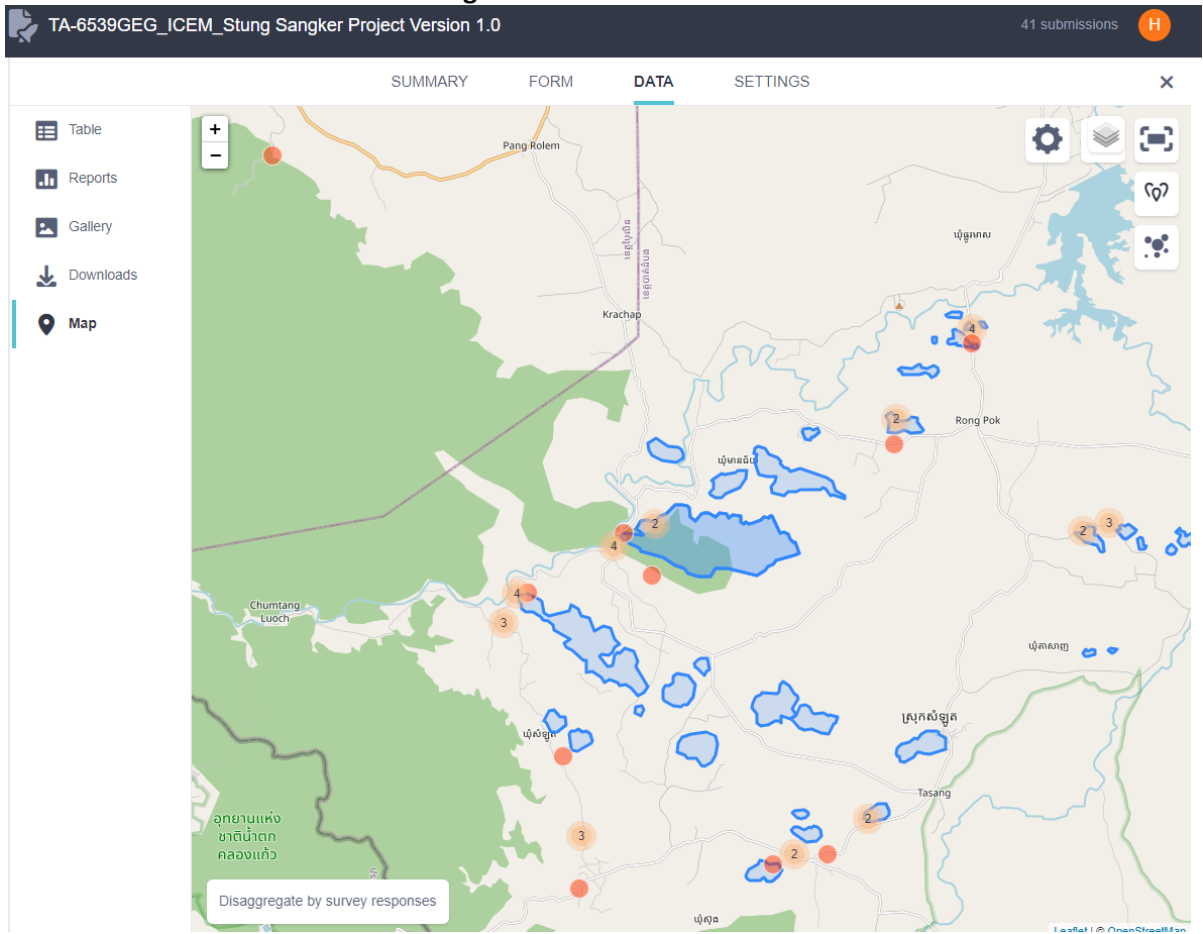
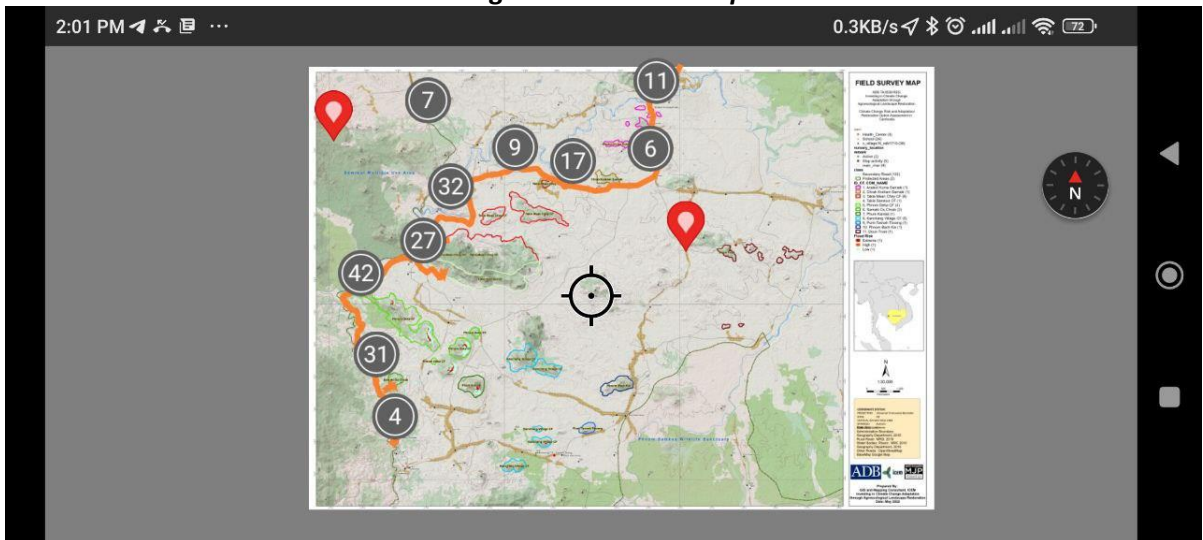


Figure 34. Avenza Map



10.2. Map Production

Based on collaboration, the TA GIS and Mapping specialists work closely with MJP technical staff to prepare field survey maps. MJP provides the spatial communities boundary content of 11 communities' forest locations. Eleven PDFs were prepared and used for field data collection in AVANZA Mapping Application. Physical sets for map were printed and shared with MJP technical team and PoMoE staff.

Figure 35. Map of MJP target CF sites in Samlaut

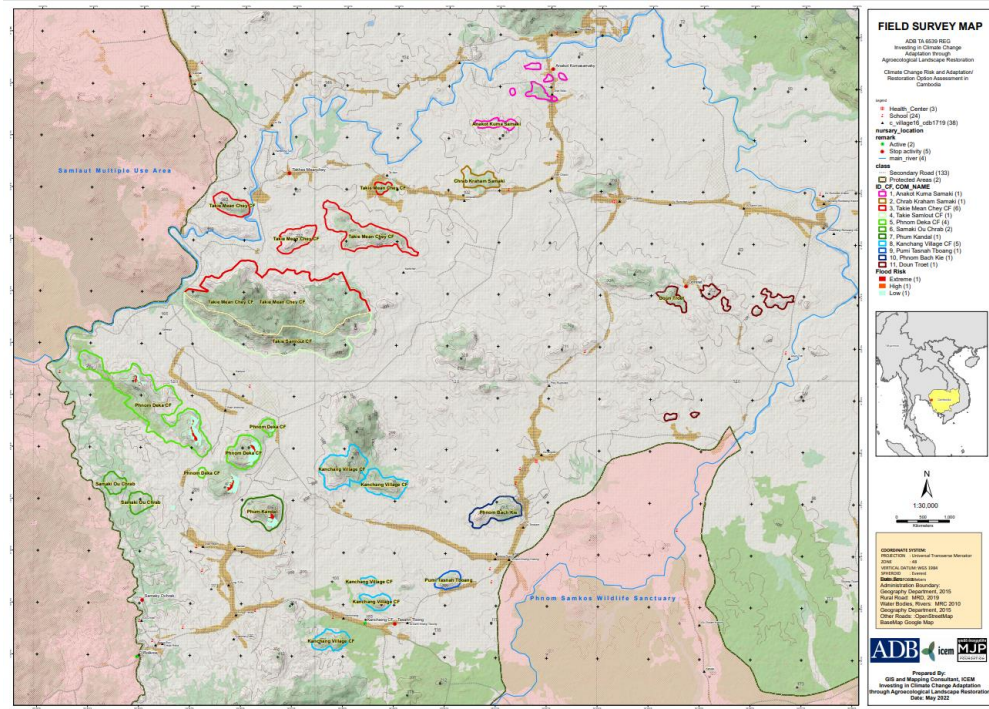


Figure 36. Ariel photo of Anakot Komasmaky CF

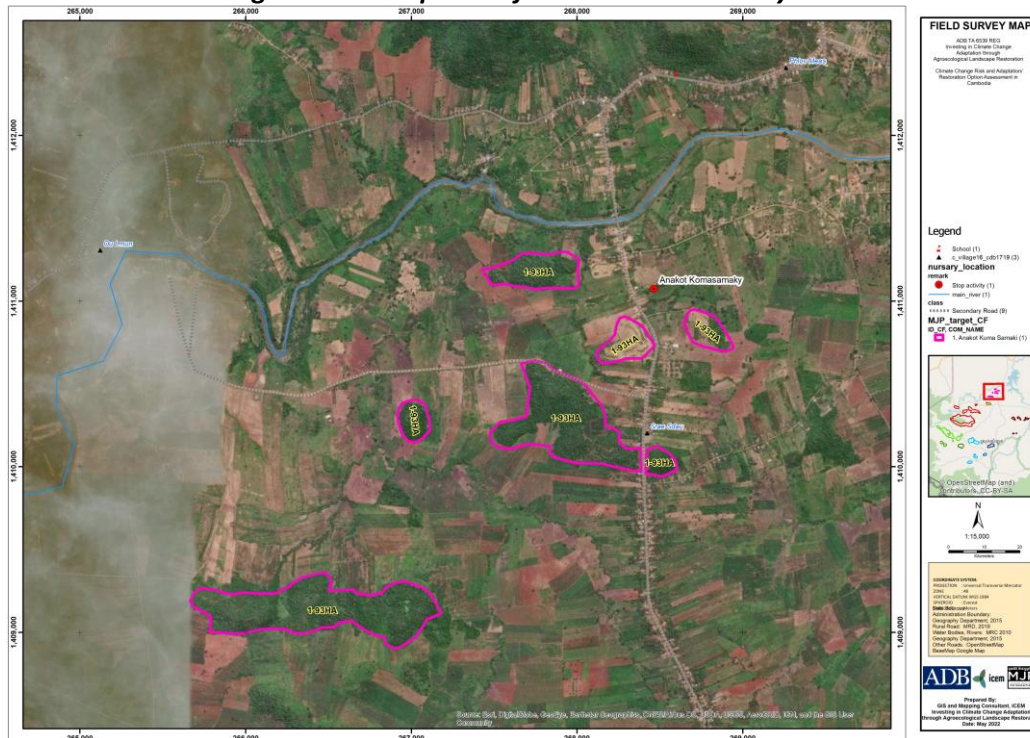


Figure 37. Ariel photo of Chrab Khohom Samaky CF



Figure 38. Ariel photo of Takhes Meanchey CF and Takhes Samlaut CF

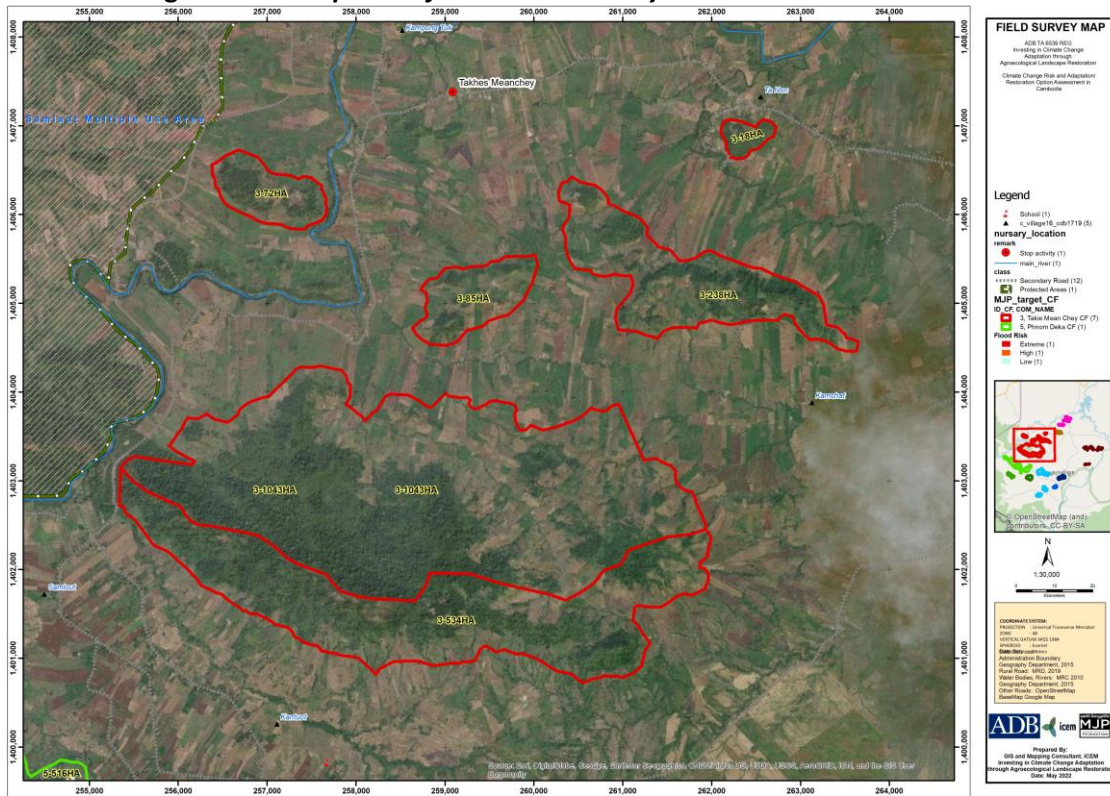


Figure 39. Ariel photo of Takhes Meanchey CF (red) and Takhes Samlaut CF (beige)

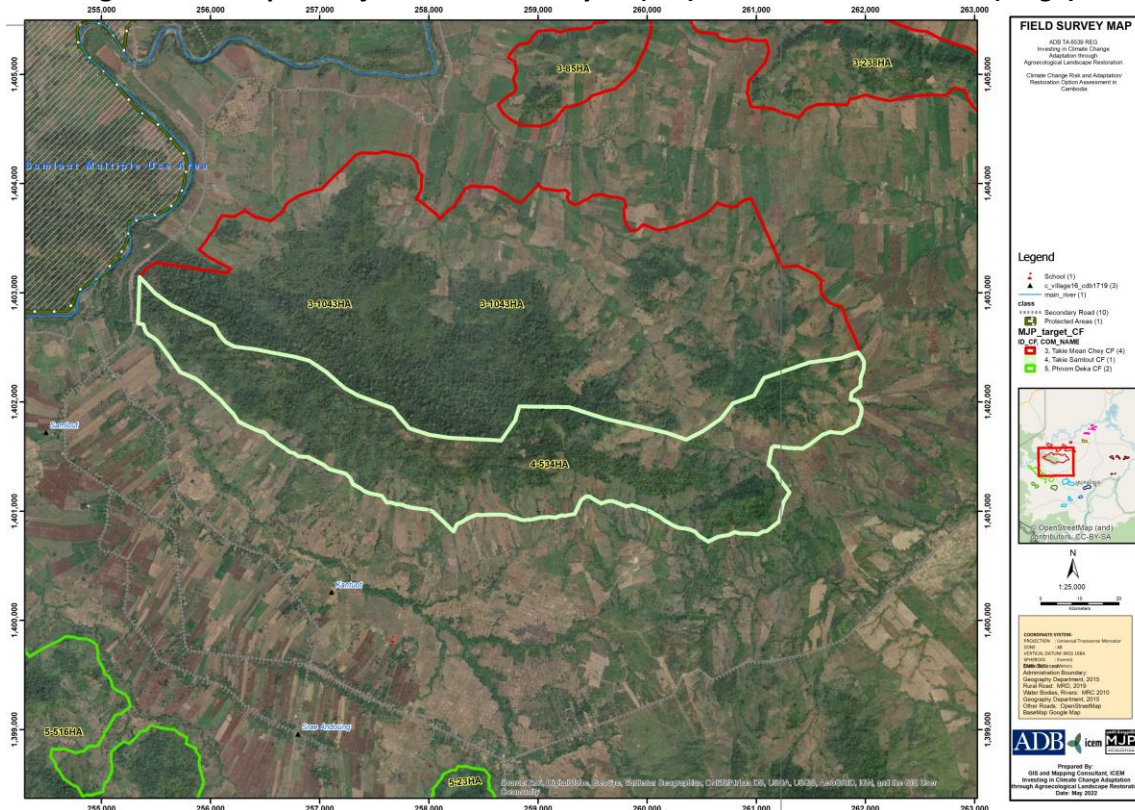


Figure 40. Ariel photo of Deka CF (green) and Ou Chrab CF (dark green)



Figure 41. Ariel photo of Ou Chrab CF



Figure 42. Ariel photo of Phum Kandal CF

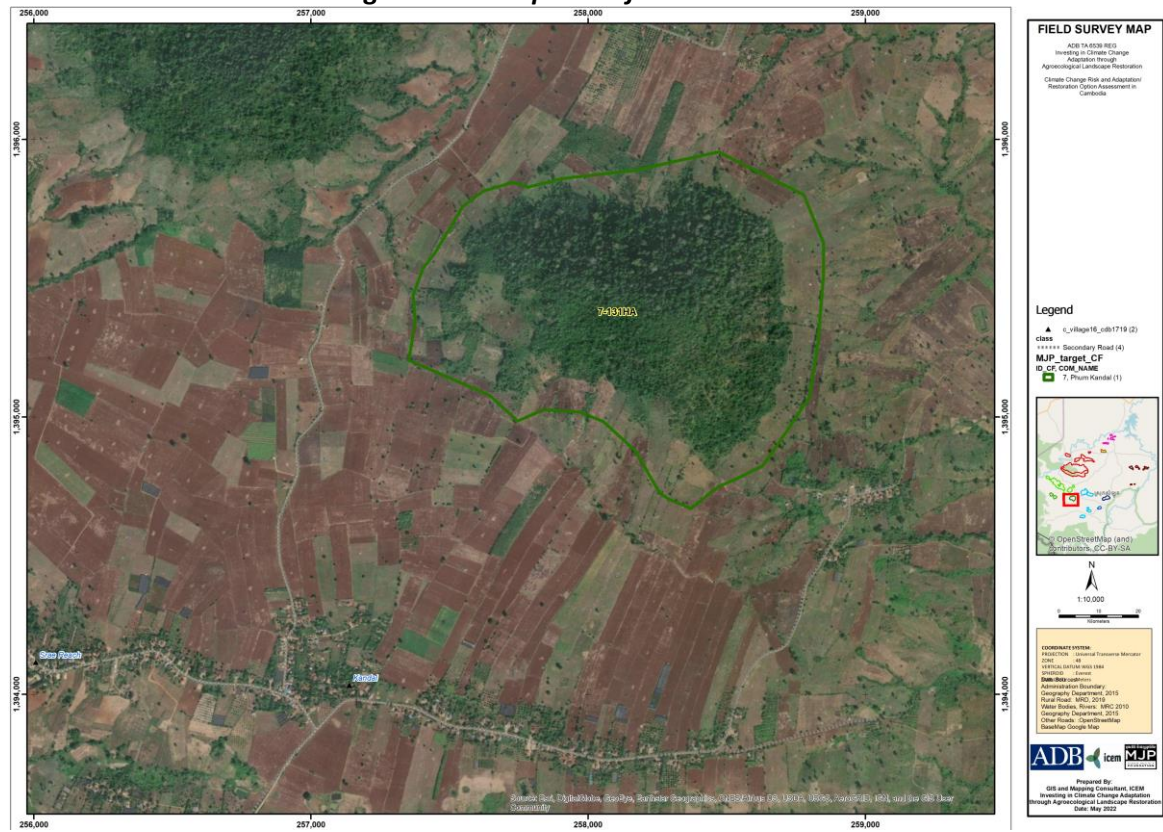


Figure 43. Ariel photo of Kanchaing CF (cyan)



Figure 44. Ariel photo of Tansah Thboing CF



Figure 45. Ariel photo of Backes CF



Figure 46. Ariel photo of Dontret CF



Figure 47. Other Pictures









Second Cambodia National Field Mission Report



Demonstration site at Takhe Anakoth Kumarsamki Community Forest. Samlaut district, Battambang province, Cambodia (photo by Porny You, ICEM).



TA REG 6539: Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

Second Cambodia National Field Mission Report

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1 Introduction

This report on the second mission to the Samlaut demonstration sites in Cambodia provides i) a brief description and objectives of the mission; ii) the mission composition and duration; iii) mission outcomes and lessons; and iv) definition of next steps.

1.1. Objectives of the Mission

The field mission aimed to:

- Consult with stakeholders in the target watershed and field sites;
- Conduct participatory mapping of the selected demonstration sites;
- Conduct drone survey of the selected sites and the wider landscape;
- Provide technical support to guide the restoration activities in the selected sites; and
- Conduct a training workshop on methods and tools for restoration and resilience building.

1.2. Summary of Mission Activities

The field mission took place between July 18th and 24th. As part of the mission, the team conducted field survey of the selected demonstration sites with one site in the protected area and three other community forests (CFs). Maddox Jolie-Pitt Foundation (MJP) provided facilitation support to the Technical Assistance (TA) team in organizing the meetings and focal group discussion with local government and villagers and in hosting the participatory mapping workshop in its field office.

In summary, the field mission activities included:

- Surveying the selected demonstration sites in detail – and defining their boundaries (with GPS coordinates or GIS layers). Each selected site is only a few hectares, but the site network reflects different ecosystems and restoration needs;
- Describing each site in terms of current status of forests and other land cover/uses – through interviews, discussions, and participatory mapping with MJP, local government, stakeholders and communities;
- Defining initial restoration needs for each of the selected sites;
- Defining potential livelihood activities linked to each site;
- Defining subsidiary work programs – e.g., forestry and agroforestry activities; involvement of school children in plantings and maintenance program;
- Defining the monitoring and reporting program – what, where, who, how often. Determining how local governments and communities will be involved;
- Conducting a half-day Participatory Mapping Workshop; and
- Training MJP staff, rangers, and communities on methods and tools for restoration and resilience building.

1.3. Location

This mission included a half day roundtable meeting in Battambang with the Provincial Deputy Governor and representatives of provincial departments. Most of the mission had involved field activities in the Samlaut Multiple Use Area (SMUA) and its buffer zone.

1.4. Participants

The mission team included international and national members of the project technical team, International Centre for Environmental Management (ICEM) technical and management support staff and members of the Cambodia NGO partner, the Maddox Jolie-Pitt Foundation (MJP).

International team

- Jeremy Carew-Reid, Climate Change Adaptation and Disaster Risk Management Specialist;
- Trond Norheim, Forest and Landscape Restoration Specialist;
- Rachmat Mulia, Community-based Climate Change Adaptation Specialist;
- Mark Hopkin, Erosion Control Specialist;
- Quang Phung, Project Manager and drone operator/trainer.

National team

- Bunnath Khun, National Landscape Restoration Specialist;
- Lay Chanthy, National Community-based Climate Change Adaptation Specialist;
- Porny You, National Knowledge Management, and Monitoring and Reporting Specialist.

MJP

- Munichan Kung, Country Director, MJP; and
- MJP field staff.

1.5. Field Mission Agenda for Assessment Team

Table 4. The Field Mission Workplan

Date	Time	Place	Activities
17 Jul 2022 (Sunday)	Full day	International travel	
18 Jul 2022 (Monday)	Morning 8:00–9:00	Phnom Penh	Project and MJP team meeting
	Morning 10:00	Travel to Battambang	
19 Jul 2022 (Tuesday)	Morning	MJP office- Battambang	<ul style="list-style-type: none"> • Review and discuss on-field mission program, methods, and responsibility of the individual team members
	Afternoon	PDoE of Battambang	Round table meeting with PDoE, PDoWRAM, FA, PDoA <ul style="list-style-type: none"> • Overall briefing on the project progress • Briefing on the 1st field mission • Briefing on this field mission objective, activities including planned training workshop, and next steps
20 Jul 2022 (Wednesday)	Morning	Samlaut, Battambang	Round table on objective and methodology with community representatives, rangers, and MJP staff
	Afternoon		Field survey with MJP and local stakeholders (Dontrit)
21 Jul 2022 (Thursday)	Full day	Samlaut, Battambang	Field survey with MJP and local stakeholders (Takhes Meanchey morning, afternoon)
22 Jul 2022 (Friday)	Morning	Samlaut, Battambang	Training workshop (framework: participatory mapping)
	13:00 - 15:00		Training MJP staff, rangers, and communities on methods and tools for restoration and resilience building
	15:00 – 17:00		Field survey with MJP and local stakeholders (Oslev)
23 Jul 2022 (Saturday)	Full-day	Travel to Phnom Penh	
24 Jul 2022 (Sunday)	Early morning	Travel to Manila	

2. Participatory Field Survey of the Demonstration Sites

Based on the first field mission survey of options for restoration, extensive discussion with local communities, and advice from MJP, 4 demonstration sites were identified for in depth assessment,

and further discussions with the respective CF committees, local government representatives and Samlaut rangers.

Three of the sites are community forests (CFs), and one site is within the Samlaut MUA. The three CF sites are Dontret, Anakot Komasmak, Takhes Meanchey, and the demonstration site in the Samlaut MUA is Oslev (Figure 48 to Figure 52). Photos of field mission activities appear as Figure 53.

MJP has been working with these communities and the Ministry of Environment (MoE) rangers for well over a decade so is a trusted partner with deep working relationships and a long record of forest restoration and ecological agriculture linked to the target sites.

The field survey conducted with the CF committee members and representatives of local government confirmed the suitability of the sites for restoration and defined the boundaries of the sites. The meetings and discussions with the communities/landowners and local government agencies confirmed their commitment to participating in the project.

The demonstration sites are representative of the diversity of land management and tenure arrangements across the Samlaut MUA and buffer landscape.

The survey teams (i) used satellite image maps of the sites to support the field assessments, (ii) conducted systematic drone survey following transects and (iii) conducted interviews with local farmers and government representatives recorded on video. Detailed video and photographic records were compiled for each site.

Figure 48. Basemap of the Samlaut Area and the Position of the Selected Community Forests

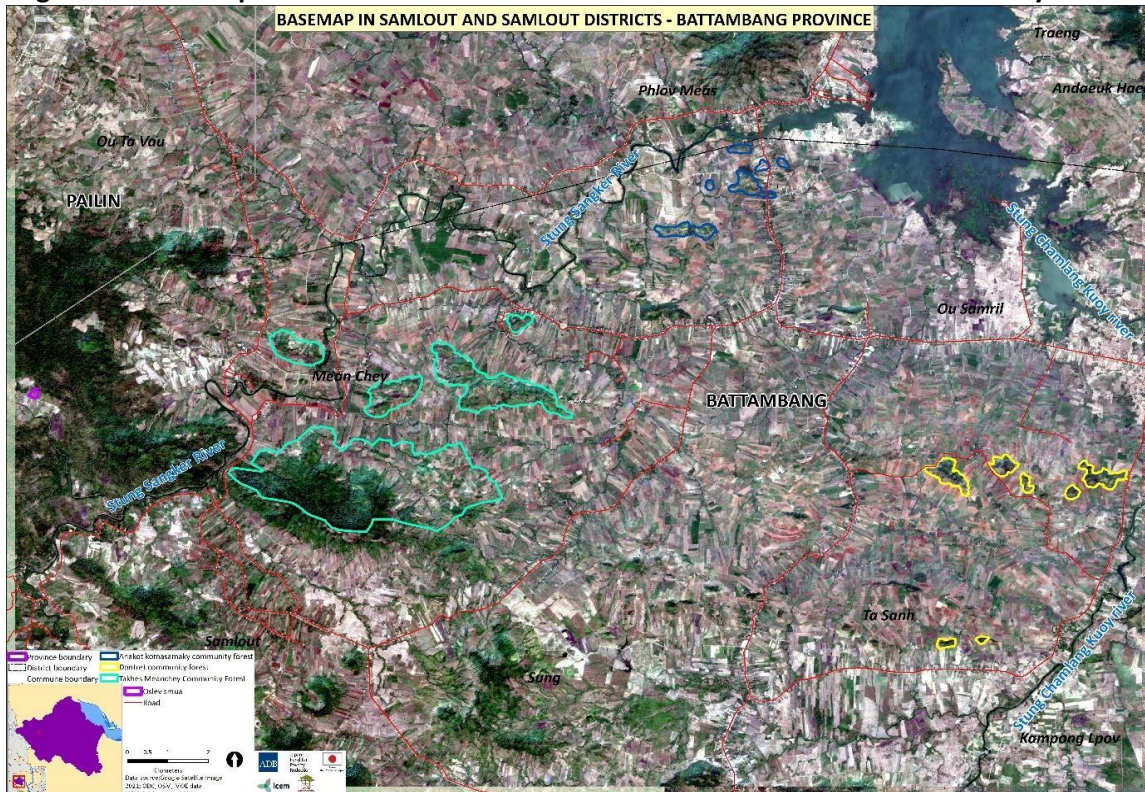


Figure 49. The Selected Site for the Demonstration Activities within the Dontret Community Forest

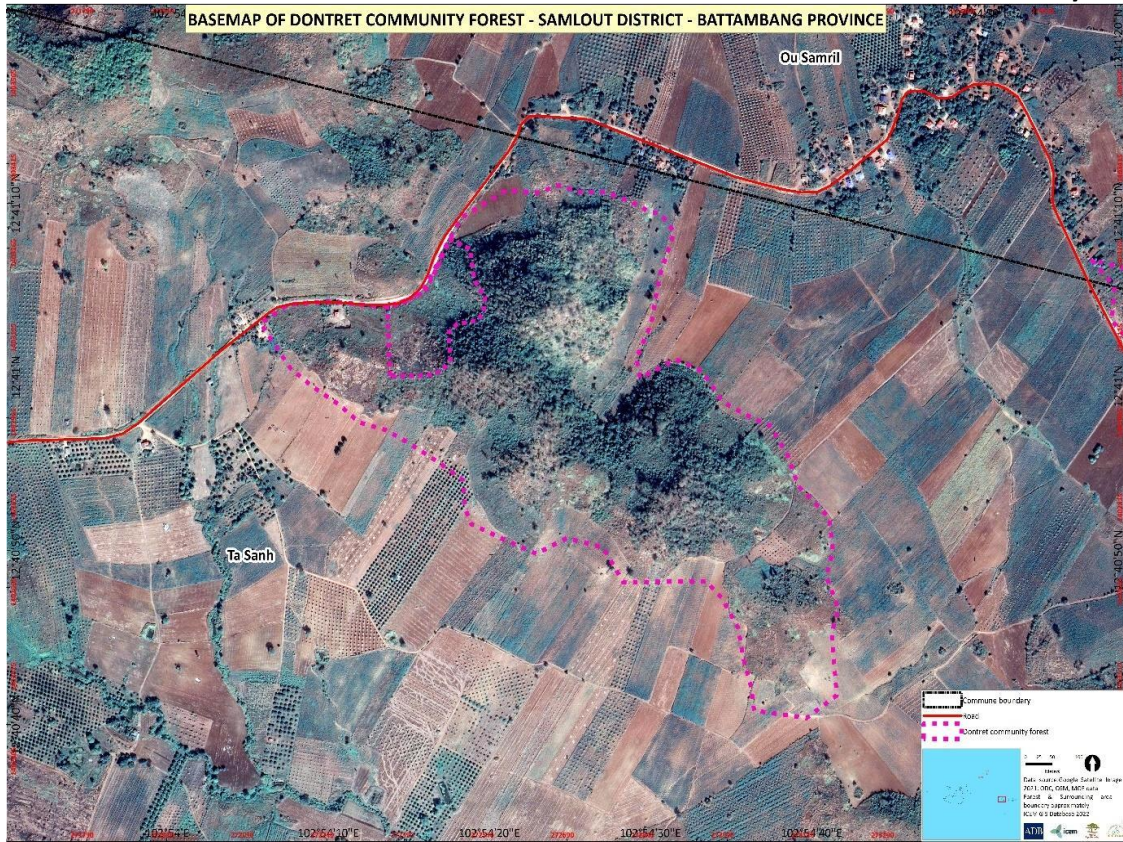


Figure 50. The Selected Site for the Demonstration Activities within the Anakot Komasmaky Community Forest



Figure 51. The Selected Site for the Demonstration Activities within the Takhes Meanchey Community Forest

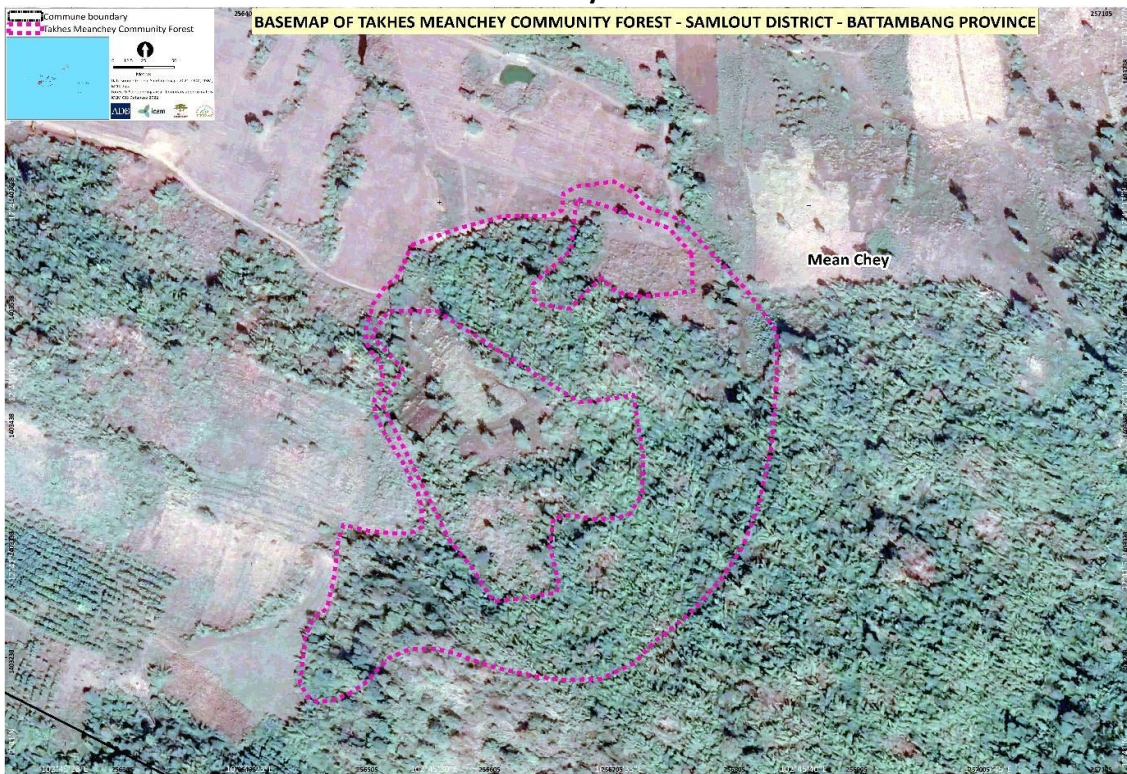


Figure 52. The Selected Site for the Demonstration Activities within the Oslev SMUA

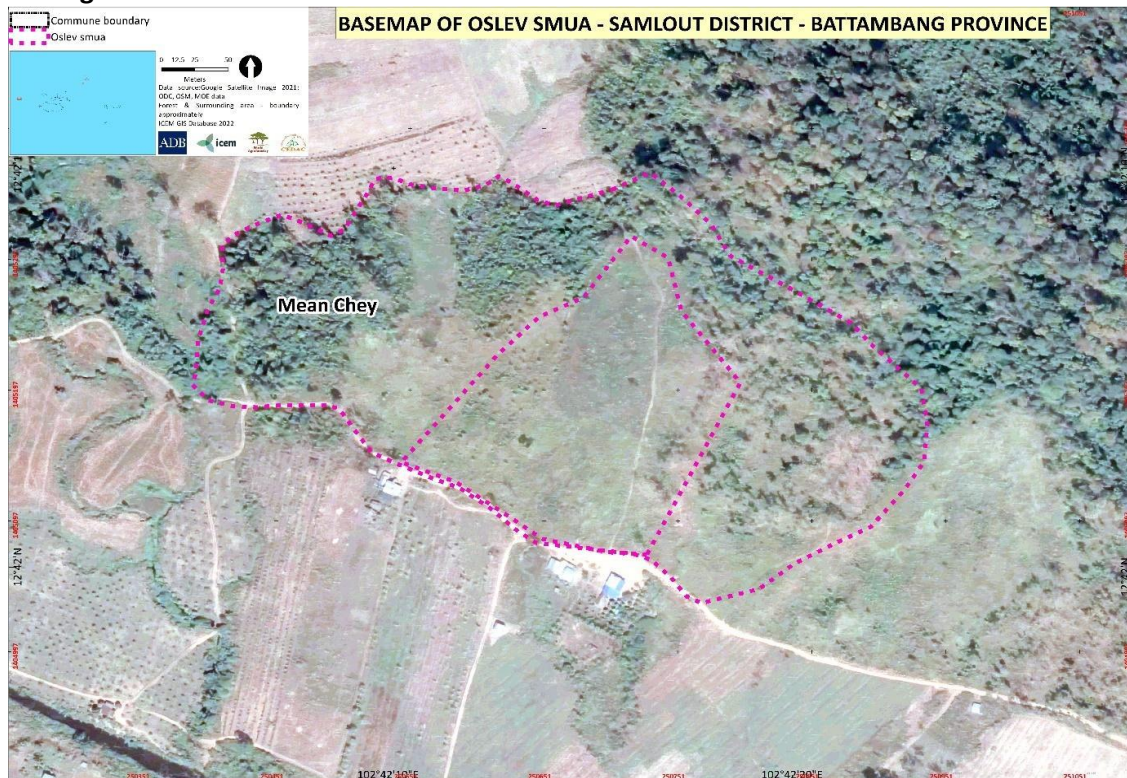


Figure 53. Mission Field Activities and Meetings with Community Forest Members



3. Participatory Mapping Workshop

The participatory field survey was followed by a participatory mapping workshop to capture and document the survey findings and jointly define existing and proposed land cover/uses (Figure 54).

Nineteen participants joined the workshop representing the Forestry Administration from Provincial Department of Agriculture Forestry and Fisheries, Provincial Department of Environment, Samlaut Law Enforcement and Conservation Team, and the communities of Dontret CF, Anakot Komamaky CF, and Takhes Meanchey CF, and Kanhchang CF, in addition to five MJP staff and the ICEM technical team – 30 participants in all.

The participatory mapping workshop aimed to gather stakeholders' inputs in defining land uses, delineating degraded areas, and identifying restoration measures for each site.

The participants were divided into groups to cover each site led by the CF committee members for their respective areas. Each group was provided with reporting templates and large A0 satellite images of their site on which to draw detailed boundaries, zones and restoration guidance. Participants were guided by the field notes, sketch maps and other information gathering during the field survey of demonstration sites, combined with local knowledge. The session began with viewing of edited versions of the drone survey.

Participants prepared maps, detailed keys, and explanatory notes for each site, then presented the results to plenary for discussion. A broad range of landscape restoration measures were identified and discussed, emphasizing nature-based solutions to forest rehabilitation, erosion control, drainage corridor management, forestry and agroforestry approaches for biodiversity conservation and livelihood improvement.

Following the mission and based on the outputs of the field survey and workshop, a detailed guidance was discussed and completed by the TA team preparation of (i) species lists and use descriptions, (ii) site restoration plans and (iii) planting regimes.

Figure 54. Participatory Mapping Workshop



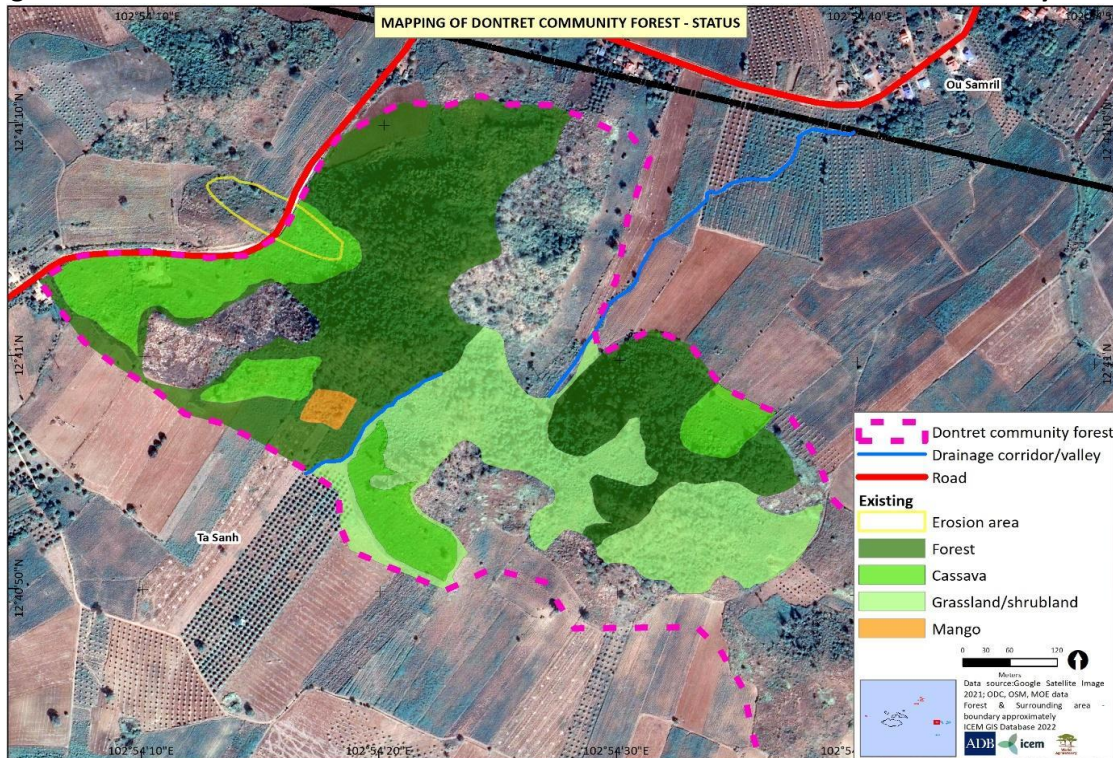


4. Site Descriptions

4.1. Dontret Community Forest

The site is a ridge of hills running ENE-WSW just over a km in length and varying between 180-510 m in width. The hills sit in a flat to gently undulating landscape of agricultural land dominated by cassava cultivation interspersed with fruit tree plantations of mango, cashew and longan. The CF has pockets of remaining natives forest which provide the basis for progressive restoration to its original boundary. Some areas which have encroached on the CF can be converted from cassava to agroforestry with a mix of useful exotic and native species.

Figure 55. The Current Site Condition of the Demonstration Area in Dontret Community Forest



4.2. Anakot Komasamaky Community Forest

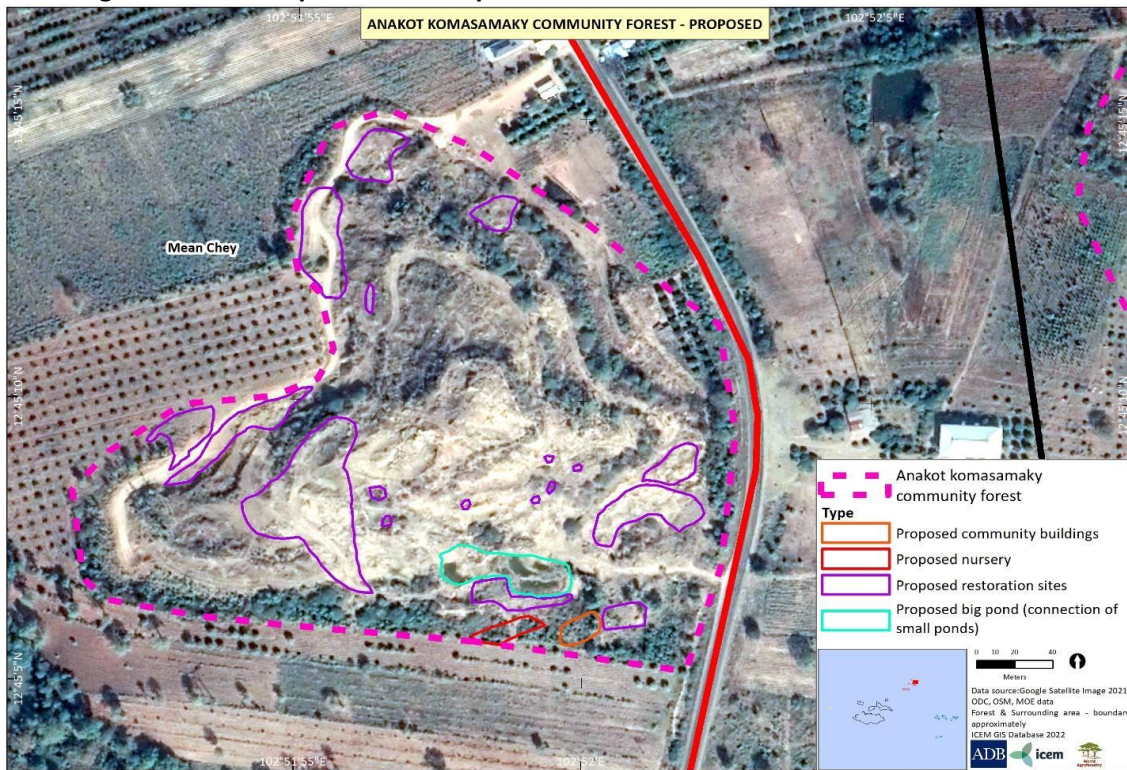
The site is a small, previously wooded hill, sitting in a landscape of agricultural land with other still wooded small hills that are part of the same community forests surrounding the site, at a distance of

a few hundred metres to several km away. The agricultural land around the site is on a flat to gently undulating plain and is a mixture of annual cultivation of maize and cassava with fruit tree plantations of mango, cashew and longan. The site was fully cleared of vegetation and converted to a quarry for lignite by a road construction company which left the site degraded. Since then, some natural revegetation has occurred along contours and wetlands have established in some of the quarried depressions.

Figure 56. The Current Site Condition of the Demonstration Area in Anakot Komasamaky Community Forest



Figure 57. The Proposed Landscape Restoration Activities in Anakot KomaSamaki

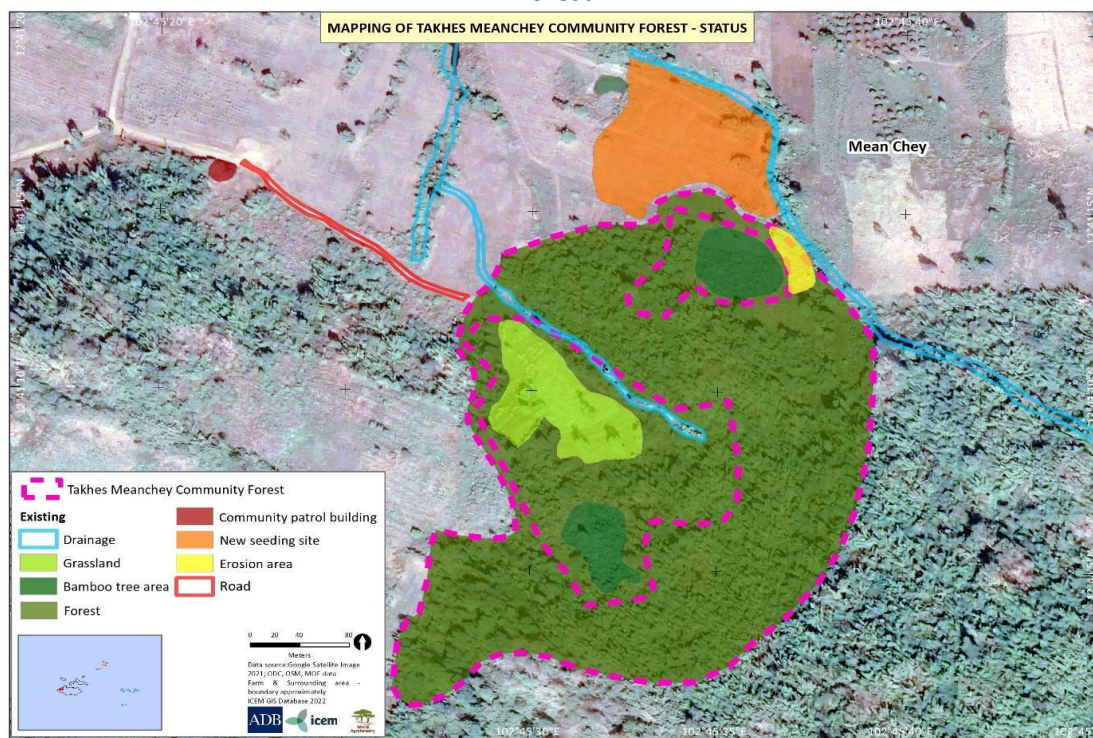


4.3. Takhe Meanchey Community Forest

The site forms part of a ridge of hills running ENE-WSW for about 5 km east of the Sanker river that is the boundary of the Samlout Multiple Use Protected Area, and an important extension of the protected area forest in the form of a wildlife corridor. This CF is especially important for biodiversity and demonstration of a corridor and stepping stone approach to conservation across agricultural landscapes.

The ridge has been encroached by cultivation along its length, and the remaining forest cover now varies in width between 450 m and 1.7 km and heavily dominated by climax bamboo. The hills sit in a flat to gently undulating landscape of agricultural land dominated by cassava cultivation interspersed with some fruit tree plantations of mango, cashew and longan.

Figure 58. The Current Site Condition of the Demonstration Area in Takhes Meanchey Community Forest



4.4. Oslev, SMUA Site

The site is part of a cleared area of land within the Samlaut Multiple Use Area. It slopes gently from the intact forest in the north towards a track and illegal settlements that form the southern boundary.

The area has been deforested by the illegal settlers and converted to cassava and some mango plantations. There are signs of very recent forest clearing and destruction of the natural drainage corridors. This site needs to be restored with native species consistent with the Samlaut MUA forest assemblage.

Figure 59. The Current Site Condition of the Demonstration Area in Oslev, SMUA



5. Interviews with Local Community and Local Government Representatives

To enrich understanding on livelihood and environmental issues and possible solutions to mitigate the issues, the team interviewed local stakeholders. The team had prepared a set of questions for the interviews (Annex). For Dontret, the team interviewed four people (2 men and 2 women): the vice chief of Tashan commune, the chief of Forestry Administration of Samlaut district, and two female villagers.

On the Anakot Community Forest site, the team interviewed six people (4 men and 2 women): 1 member of the commune's council, 1 police officer of Samlaut district, 1 member of community forestry, 1 leader of community forestry, 1 female villager, and 1 female village leader. The team video-recorded the interviews.

Key issues and possible solutions identified by the local stakeholders include:

- Around twenty years ago (2002), the area (i.e., the demonstration site and its surrounding) was still covered by natural forests and there were no farm activities inside the area. However, since 2016, because of more expansive forest clearing for farms and other purposes, the villagers have noticed an occurrence of flash flooding, soil erosion, and warmer and longer dry season, that substantially affect local livelihoods.
- There is an urgent need to restore the forests, and local authorities and organizations such as MJP have been providing some capacity development activities on forest protection and conservation, and seedlings for tree planting, and have delivered several campaigns to increase local awareness on the importance of restoring and protecting the community forest.
- The local stakeholders see the need for such campaigns to be conducted in several communes. Campaigns that only involve one commune, for example with the closest proximity to the community forests, are not effective because villagers from other communes, driven by their low awareness on the importance of restoring and protecting forests, will keep trying to illegally extract available resources from the community forests.
- The campaigns and other efforts have so far resulted in some positive impacts. For example, more recently, local villagers who wanted to cut some trees for non-commercial purposes e.g., for house construction, consulted commune leaders and forest rangers to obtain guidance. However, some illegal yet small-scale logging still occurs, especially at night when forest patrolling is not really active. Local stakeholders emphasized the need for more resources to buy seedlings, do tree planting, and strengthen forest patrolling activities.
- Women in the local communities have participated in co-promoting forest restoration and protection and reporting cases of forest encroachment or illegal logging to relevant authorities.
- Tree species recommended for forest restorations include Bamboo, *Dalbergia oliveri*, *Dalbergia cochinchinensis*, *Pterocarpus macrocarpus* Kurz, *Azelia xylocarpa* (Kurz)craib, Fabaceae (*xylia xylocarpa*), Lecythidaceae (*Barringtonia acutangula*), Dipterocarpaceae (*Shorea obtuse* Wall. Ex Blume), other local species, fruit which communities can benefit from.

On Meanchey, key issues and possible solutions identified by the local stakeholders include: the site is more often challenged with less water for agriculture cultivation and yields becomes less and less. Most communities adapt to digging wells for domestic use. Also, sometimes there are floods from neighbouring countries and too much rainwater which destroys the roots of crops and causes soil erosion at some places. Due to these challenges of the last five years, community people migrated to work in the city or border of Thailand.

At Oslev, the mission members interviewed two forest rangers (1 man, 1 woman). Key issues and possible solutions identified by the local stakeholders include:

- Livelihood needs and growing family members have driven the local communities surrounding the SMUA to encroach forest lands and do illegal logging for settlement and crop cultivations.
- More recently, thanks to a strengthened forest patrolling, no more land encroachment has taken place, but the local authorities cannot easily ‘take back’ and restore the lands that have been grabbed by the local communities. The authorities therefore for the moment allow the local communities to continue using some land for crop cultivation.
- Local authorities, including forest rangers, have been trying to approach and communicate, including with respected elders in the community, to emphasize the importance of restoring and protecting the remaining forests. However, more efforts and an innovative approach are still needed to arrive at a ‘win-win situation’ without increasing tension between the local authorities and communities.
- The protection of the remaining forests now relies on law enforcement, because of the lack of awareness from the local communities. Forest restoration with tree planting and nursery development has been possible thanks to support from the Ministry of Environment.

6. Potential Livelihood and Sub-Activities in Each Community Forest Site

The overall goal of the project is to support communities in restoration of their community forests and linked protected area. It is also intended to take pressure of native forests by supporting innovative livelihood opportunities through agro-forestry in appropriate areas. Some of the potential livelihood enhancement activities identified with communities are listed here. The project is only working in community forests – with one site entirely within the Samlaut MUA. Therefore, the livelihood opportunities in the CFs are limited to NTFPs and agroforestry in limited zones. Any site within the MUA will need to be rehabilitated to native forest and only subject to NTFP gathering once the area has regained its health and can sustain some forms of use. While in the process of restoring the MUA site, access should be restricted.

6.1. Planting Native and Fruit Trees

- Fruit trees such as mango and longan, nut trees such as cashew, bamboo, and native trees provide farmers with a regular source of income (timber, fruits, etc.), improve water quality and protect soil and land from erosion, and provide other cultural and aesthetic benefits.
- At the landscape level, the trees increase biological connectivity, provide a habitat for birds and bees, store carbon, and help to regulate the hydrological cycle.

6.2. Beekeeping

- Beekeeping in CF, especially at the demonstration sites, would benefit forest restoration activities as people from the communities will engage more in the process. Therefore, seedling selection for the demonstration should include tree species that generate good pollen for bees, such as Kepok tree (កៀមកៀវ).
- During the meetings, some beekeepers indicated that they are willing to pay the community to let their bees collect nectar in the CF.

6.3. Crop Diversity and Rotation

In agriculture areas around the CFs, ecological agricultural practices will be encouraged.

- In general, crop diversity on the farm level provides multiple benefits including improving soil health and quality, decreasing pest populations, encouraging beneficial organisms, and improving the economic resilience of farms. A farm that grows a wide variety of crops will

have a resilient and healthier ecosystem which able to prevent and withstand adverse conditions that can result in crop loss and will be less dependent on synthetic fertilizers and pesticides. By growing more than one crop, farms will be better able to withstand the economic consequences of crop-specific failures or market fluctuations.

- Crop rotation has several benefits for soil and crop systems. Crop rotation can serve as a pest management tool that lower the incidence of weeds, insects, and plant diseases. The management practice can also improve soil's physical, chemical, and biological properties such as better water holding capacity and aggregate stability, increase organic matter, and replenish soil nitrogen (N) and carbon. Crops grown in rotation reduce greenhouse gas emissions because of the lower amount of N fertilizer added. In addition, labour needs are spread out over the year with more diverse crop rotations increasing employment opportunities in the area.
- In Anakot, the opportunities for local income-generating activities will depend on the community members' own initiatives but could include e.g. (i) entrance fee and parking fee; (ii) guide with knowledge of local flora and fauna; (iii) locally made souvenirs; and (iv) sale of fruit, water, and snacks as the demonstration site turned into ecotourism spot.

7. Key Outcomes and Lessons from the Mission

(i) The demonstration sites

- Three community forest demonstration sites confirmed, boundaries defined and farmers committed to participating in the project;
- One restoration site within the Samlaut MUA defined with rangers, military and forestry staff
- Demonstration sites representative of the diversity of land management and tenure arrangements across the Samlaut MUA and buffer landscape;
- The Community Forest Committee members and local government representatives engaged in field survey of the CFs to define (i) existing cropping patterns, (ii) land and water management challenges, and (iii) initial restoration activities;
- Similarly, the Samlaut MUA site was surveyed with rangers and other government staff.

(ii) Monitoring program

The framework for a monitoring program using drones and field survey was defined and understandings established with CF committees of their ongoing role in monitoring of the sites and preventing further encroachment within the CF boundaries.

(iii) Community Forest Committees

The CF Committees for three sites expressed full commitment to actively participate in the restoration work and its monitoring and maintenance.

(iv) Establishment of new ranger field station in Oslev

The Samlaut Director and his staff under MoE expressed deep commitment to protecting and restoring the area. Replanting and management of the site will be conducted by the Samlaut MUA rangers with support from the MJP team. Unlike the community forest restoration in the other three sites, the work will not be conducted with the illegal settlement communities.

In response to the risk of continued cultivation and clearing by the illegal settlement at the restoration site – it was agreed that MoE, with support from MJP, will build a permanent ranger station on the site – one of a number established through the protected area. The station will be manned 24 hours by several rangers who will also implement and manage the restoration work. The medium-term goal

is to halt any further forest destruction within Samlaut and to resolve the settlement issue peacefully over time.

(v) Participatory Mapping

- Maps, detailed keys, and explanatory notes prepared, presented, and discussed for four demonstration sites by workshop participants through the half-day participatory mapping sessions
- A broad range of landscape restoration measures identified and discussed emphasizing nature-based solutions to forest rehabilitation, erosion control, drainage corridor management and agroforestry approaches for biodiversity conservation and livelihood improvement.
- Detailed guidance for preparation of (i) species lists and use descriptions, (ii) site restoration plans and (iii) planting regimes discussed and completed by the TA team.

(vi) Lesson learned

- The definition of descriptive lists of native and exotic species should be used in discussions with the CF committees on the most appropriate mix for the CF given the restoration and livelihoods objectives.
- For the Samlaut site, it was agreed that only native species similar to the mix found in the Samlaut MUA would be used in the restoration work.
- Local communities were familiar with exotic species which are available from commercial nurseries but had less awareness of the benefits and attributes of native species.
- Capacity building in nursery establishment and management for diverse native species – from gathering of seeds to nurturing and planting out of seedlings will need to be an important part of future technical support missions.
- Need to establish permanent Community Forest and Protected Area (PA) markers to discourage encroachment.
- The next two field missions by the national team will need to guide and support the implementation of site-specific restoration plans including nursery management. It would be best if most mission time was spent on one of the restoration sites – for example Meanchey which is closest to the MJP field office and nursery.
- The technical team can continue to provide support to MJP for implementation of the restoration plans for each site. But ultimately it will be up to MJP to continue and expand the methods for restoration across all sites – as intended under the ICEM-MJP contract. MJP has full time staff on location and is fully committed to providing that ongoing support to communities and MoE staff.

8. Follow-up Actions to the Mission

- Completing the MJP-ICEM contract
- Preparing the draft restoration plans for each of the four sites for MJP and the team to discuss and finalise with CF committees and other local stakeholders, and with rangers and local government technical staff.
- The next field mission to be conducted by the Cambodian team, scheduled for first two weeks in September to provide MJP with full technical support in implementing the restoration plans in the four demonstration sites.
- Providing MoE with a briefing on the mission and next steps including close involvement of MoE staff through the rangers and provincial Department of Environment (DoE).

- Define next steps for the hydrological modelling of the watershed, gather needed data. Build and calibrate the model, then run according to several watershed management plan scenarios.
- The monitoring and reporting program will be defined by the team and MJP in consultation with communities and MoE staff. Within the monitoring framework, community roles will be identified.
- Restoration measures: Discuss with MJP, the level of support needed in working with CFs in implementing the restoration plans, sourcing of plants and seeds and the management of nurseries.
- Prepare a details guidance to native species including photos and planting requirements.
- Prepare a generic guidance to approach to planting.
- Translate the restoration plans into Khmer for use with communities and MoE staff.
- Make all arrangements for the September mission of the national team.

Annex: Interview Questions for Landowners of Demonstration Sites and Other Local Community Members

The field mission involved survey and mapping of demonstration field sites. During that process, interviews with landowners and other community members were conducted on an opportunistic basis. The aim was to add detail to the baseline assessments already conducted by the national teams. The interviews were videoed with consent of participants. Also, the interviewer made detailed notes in the form here for each of the listed questions. Other free form questions were used as the opportunity arose and tailored to the interviewees.

No.	Interview question	Responses/notes
1	What are the main livelihoods in this area/watershed?	
2	What are the main environmental problems in the watershed?	
3	What are the main causes of the environmental problems?	
4	Are those problems affecting local livelihoods?	
5	What measures have been taken by local stakeholders to address the problems?	
6	Are there other actions needed to address the environmental problems?	
7	What are potential constraints in implementing the needed actions?	
8	What should this project demonstrate to help enhance local awareness on feasible solutions to local livelihood and environmental problems?	
9	Other questions	

Other Information

- E. Borrowed from lending in Lantapan (250 k – borrowed; pay 8.7/month for 36 months)
- F. Planted lutia, corn, banana, camoteng kahoy – when in drought; no harvest (personal consumption) to avoid hunger
- G. Price information is not provided to the farmers – when they arrive in BULWA – BAGSAKAN; no bargaining power to dictate price;
- H. High prices of inputs;



Third Cambodia National Field Mission Report



Restoration activities at Oslev Community Forest. Samlout district, Battambang province, Cambodia
(photo by Porny You, ICEM).



TA REG 6539: Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

Third Cambodia National Field Mission Report

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1. Background and Objectives of the Mission

This third national mission builds on the work of the previous two missions, which took place in May and July 2022.

In the first mission the national team, in collaboration with the Maddox Jolie-Pitt Foundation (MJP)³ met with local communities – many of whom have already worked with MJP for many years on various aspects of ecological agriculture and agroforestry – and visited community forest sites of concern to the communities. The sites are relatively distinctive in Cambodia as they are community forests owned collectively by the target communities, except for the Samlout Multiple Use Area (SMUA) site which is the responsibility of the Ministry of the Environment (MOE) and the local Department of the Environment (DOE).

In the second mission the international and national teams and MJP were joined by community forest committee members and rangers, forestry officers and military representatives to conduct detailed surveys of the identified sites. The information collected was then fed into a participatory mapping workshop in which a broad range of landscape restoration measures were identified. These emphasized nature-based solutions to forest rehabilitation, erosion control, drainage corridor management, and agroforestry approaches for biodiversity conservation and livelihood improvement. The team then used the maps to produce site restoration plans and priority tasks for each site along with detailed guidance for the preparation of species lists and use descriptions, and planting regimes.

This third national field mission to Samlout commenced implementation of the restoration plans for the three community forest sites and one site in SMUA. The team also worked through the draft restoration plans with communities to determine if any adjustments were required. International Centre for Environmental Management (ICEM) and MJP organized the mission, and field planting activities were coordinated and facilitated by MJP.

Mission objectives

The field mission set out to provide technical support to guide restoration activities by communities and local government representatives in the four selected demonstration sites: Dontret Community Forest, Anakot Komasamak Community Forest, Takhes Meanchey Community Forest, and Oslev, a site in the SMUA. The restoration activities followed the restoration plans that the team developed based on the information obtained in the second field mission to Samlout.

Participants

Around 35 participants attended each site visit, of which approximately twenty percent were women. The participants included members of the local community, community committee members, local authority representatives, commune councilors, commune police, forest administration officers and rangers from the Ministry of the Environment.

National team of ICEM and team of MJP

The ICEM national team comprised of:

- Mr. Khun Bunnath, Forest and Landscape Restoration Specialist
- Dr. Lay Chanthy, Community-based Climate Change Adaptation Specialist (Agroecology/ Agroforestry)

³ The Maddox Jolie-Pitt Foundation is the project's partner NGO. MJP has worked in the Samlout area since 2003 in forest restoration and conservation, agriculture, and education. Through its work it has developed strong and productive relationships with local communities and local government in the target demonstration areas, which proved invaluable throughout the mission.

- Ms. Porny You – National Knowledge Management Specialist

The MJP team included eight staff and MJP’s Country Director, Munichan Kung.

Duration and sites of the mission

The mission took place between 4-10 September 2022. Field training and planting activities at four sites were conducted between 5-9 September 2022. Prior to the site visits the team met at the MJP office to discuss and finalize the field mission program, methods, and team responsibilities. During the session the team:

- Reviewed restoration plans and identified aspects of restoration plans that needed further discussion with communities;
- Identified technical support and guidance for each community;
- Discussed challenges to implementing the restoration plans and ways of addressing them;
- Finalized logistics arrangements including seedlings, planting equipment, and people gathering;
- Provided MJP staff with technical orientation on restoration techniques;
- Finalized tree seedlings and equipment requirements for each restoration site; and
- Prepared community field day training.

As part of the preparation for the field mission, MJP had purchased seedlings from local nurseries and adequate equipment. At each site the team outlined the initial planting program, and then provided training of participants in planting techniques and methods. Following the planting of the tree seedlings the team provided further training and led a discussion on maintenance of the seedlings. The team then presented the restoration plans in an interactive session, inviting discussion and views. Finally, the team worked with participants to develop a community work plan for the effective long-term maintenance and restoration activities at the site.

2. Field Training Activities

The ICEM and MJP teams worked closely with the communities of Dontret, Anakot Komasmaki, and Takhes Meanchey and the rangers of SMUA to conduct field training and seedling planting at the four sites. Field training and planting activities included: (i) setting up camp, (ii) introductions to the day’s activities, (iii) an introductory speech, (iv) a training session on planting methods and techniques, (v) onsite seedling planting, (vi) a plenary discussion on planning further planting and maintenance, and (vii) an overview of the restoration plan of the site. Below provides some elaboration on each field activity.

- (i) **Setting camp:** At each site a 70m² camp was installed to conduct training activities and enable participants to take rests and have lunch. Training materials included a white board, posters, maps, and flipcharts.

Figure 60. Photos of Camp Settings at Anakot Komasmaky (Left) and Oslev (Right)



(ii) **Introduction to field activities:** At the beginning of each session Mr. Bunnath, the team’s Forest and Landscape Restoration Specialist, provided a short introduction to the mission objectives and activities to be conducted during the day. He also discussed the benefits and advantages of participating in tree planting and site restoration.

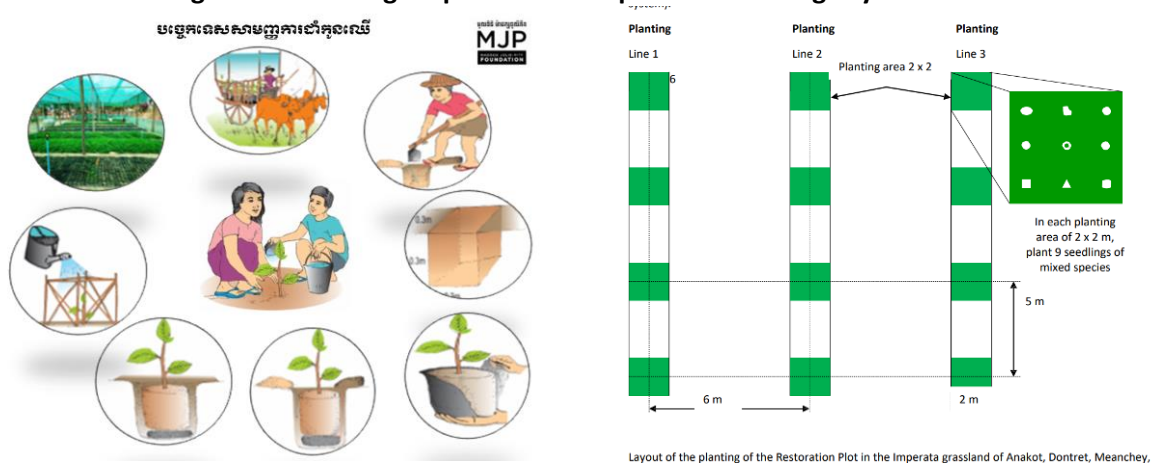
Figure 61. Photos of Starting Event



(iii) **Opening speech:** Following the introduction to field mission and activities, the Commune Chief at each site gave a short opening speech, in which he committed to engage, motivate, and support the community in their efforts to plant new trees and further maintain, protection and enrich the natural forest in the commune.

(iv) **Training planting methods and technique:** In this session, posters explaining the planting process and techniques were used to explain to participants the stages of planting including: seedling preparation at nurseries, seedling selection, seedling transportation, ground preparation for planting, planting, and maintenance. Mr. Bunnath, a Samlout forest administration officer, and an MJP technical staff facilitated the session. Figure 62 below presents the planting process and planting layout discussed in the session.

Figure 62. Planting Steps and Techniques and Planting Layouts



Layout of the planting of the Restoration Plot in the Imperata grassland of Anakot, Dontret, Meanchey.

Mr. Bunnath then provided guidance on planting methods and the advantages of the chosen approach for each of the sites. A relatively simple method of cluster planting with a mix of native and exotic species was recommended for Dauntret, Anakut Koma Samaki, and Tekhe Meanchey community forests which are outside the multiple use area and include open planting areas containing only grass and some crops.

According to the method participants were instructed to dig nine holes within a cluster of 2m x 2m to plant nine mixed seedling species. Each seedling was planted one meter apart. The distance between clusters was four meters. The aim is for plants to rapidly establish in the planting area and create a microclimate that shades out the weeds within the cluster, in turn ensuring the survival of the planted seedlings. Over time and once mature, the plants can flower and seed, colonizing nearby areas. The space between the clusters can be used to plant agricultural crops (in the form of an agroforestry system), although this would inhibit the spread of native species and increased biodiversity in the community forest.

In the Oslev planting site, which is located within the SMUA, a simpler planting technique was applied, in which only native species were planted at a distance of three meters apart. Due to Protect Area laws and guidelines, only dominant construction and luxury timber tree seedlings can be planted in the area.

(v) Seedling planting at the sites: After the planting session, the team helped participants to plant 500 seedlings at sites identified by the communities. Grass had already been cut in preparation. Participants - especially community committee members and local people - were very active in planting including clearing ground, digging ground, carrying seedlings, and planting seedling as trained. A total of 500 mixed seedling species were planted in each of Dontret, Anakut Koma Samaki, and Takhe Meanchey communities. Although only 220 native species were planted at Oslev the remainder will be planted before the end of the rainy season. Annex 3.2 lists the seedling species planted at each site.

At each site members of the local communities continued to plant seeds after the team had left, and will continue to do so under the guidance and with the support of MJP.

(vi) Plenary discussion on planning to continue seedling and maintenance: After planting, participants returned to the field camp to discuss the planning process including planning for continued planting, maintenance and watering and preparing fire paths to protect planted seedlings during the dry season. The final plan was signed by community forest committee representatives, local authorities, and a forest administration officer.

Figure 63. The Post Planning Session in Dontret



(vii) Overview of restoration plan: Dr. Chanthy provided an overview of the prepared restoration plan for each site. Summaries of each plan were prepared in Khmer so that communities and MJP could commence implementation before the whole plan was translated into Khmer. The presentation and following discussion helped to deepen the participants understanding of the plan to restore local forests, biodiversity and ecosystems.

Equipment for the day had been purchased by MJP. After the training and planting, the equipment was delivered to communities so that they could continue the planting and maintenance regimes as planned. Annex 3.3 lists equipment delivered to each community and to the ranger team.

3. Mission Outcomes

Participants engaged enthusiastically in all the organized activities. Informal and formal feedback (summarized in Annex 3.7) confirmed that participants benefitted from the training sessions and presentation of the restoration plans. Giving participants the opportunity to better understand, discuss and fine tune the restoration plans with facilitators also helped to reinforce local support for the project.

It was also observed that the communities continued to work at each site after the team had departed, providing further evidence that the program is valued by local people.

Positive feedback was received from the community forestry management committees, local authorities, and PA rangers concerning the training on restoration site preparation, weed clearing, ground preparation, tree seedling plastic bag removal, tree seedling positioning, soil filling, how to support tree seedlings, different tree planting layouts and techniques and how to tailor them to site objectives and the landscape context (Annex 3.7). Participants also appreciated learning how to effectively manage and maintain seedlings and protect against soil erosion. They also welcomed learning techniques and strategies to mitigate against climate change.

Seedlings were planted in all sites as planned and planting and maintenance plans to ensure their survival were defined and agreed.

4. Issues identified in the mission

The team identified a number of issues that will require resolution.

Water Sources: Not every site has an adequate supply of water to take it through the dry season. The MJP/ICEM team have committed to exploring potential solutions, with specific actions agreed as follows:

- Building a pond at the Oslev site to take advantage of a natural spring.
- Placing a water tank at the Dontret site. The site's steep slope and lack of natural water source means seedlings may be vulnerable in the dry season.
- Expanding the existing pond at Anakot.

Community Nurseries: The team observed that the ambitions of the project will be more likely to be realized if each community had a nursery to provide an ongoing supply of seedlings for the restoration work and eventually to operate commercially. The project will work to establish a nursery at each site, to provide training in its management and to support its effective operation throughout the project working for sustainability.

Projection of planting at the Oslev site: The issue of illegal settlements and forest encroachment in the Somlout MUA is still to be resolved. The MoE Samlout MUA staff have a ranger station a short distance from the restoration area and will conduct regular monitoring of the site. Also, they are committed to establishing a ranger sub-station on site to provide more effective protection and restoration activities.

5. Action Plan and Next Steps

Continued support: The restoration program managed through MJP will continue to provide the communities with seedlings and technical support between the formal missions by the team, with an emphasis on continued planting, maintenance and weed control.

Monitoring: The national team will make regular visits to monitor and report on progress at each site, the next mission planned for November.

Training: The next mission will include training in nursery establishment and management at or close to the four sites. Training will also be provided in site and seedling maintenance and in agroforestry and agroecology methodologies.

Communication: The team have successfully established a social media presence in Cambodia on the project utilizing Telegram and Facebook with several hundred users. Following the success of the mission the team will post new content and look to increase the number of people following the project's progress.

Seedling production: The November mission will focus on seedling production at site nurseries to ensure there are sufficient seedlings for the next rainy season.

Water sources: The team will establish a plan to extend the provision of water at each site during the dry season.

Nurseries: The team will explore the possibility of reviving an unused nursery at Dontret. They will produce a short report outlining why it fell into disuse and assess the potential to bring it back to life. They will also define plans for establishing nurseries at the other sites.

Protecting Oslev: MJP will support the construction of a ranger sub-station and work with rangers to conduct regular monitoring of the restoration site.

Suggested activities

No.	Specific Activity	Schedule	Responsibility
1	Communication – Post new content on social media; expand audience.	Ongoing	TA team
2	Nurseries – Report on potential revival of Dontret site, and begin to explore potential at other three sites.	November – December 2022	TA team and MJP
3	Water Sources – Establish and implement plan to ensure water provision at each site	November – December 2022	TA team and MJP
4	Oslev – Assess risk of community encroachment on forest land and project site and propose possible responses.	November – December 2022	TA team and MJP
5	Nursery technical management – prepare and implement a detailed training plan including the need to service the requirements of each site(as workshop and field training) - 4 days	November 2022	TA team and MJP
6	Introduction of site maintenance methods and agroforestry and agroecology methodologies (in class and field day training) - 5 days	November 2022	TA team and MJP
7	Implement monitoring and seedling survival field survey including definition of site specific monitoring plans	November 2022 and May 2023	TA team and MJP
8	Regular monitoring and support visits	December 2022 to May 2023	TA team and MJP

Annexs

Annex 3. 1. List of Attendees by Site

Dontret Community

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អង្គប្រជុំស្តីពី: ការងារស្រាវជ្រាវ និង ការងារអនុវត្ត របស់ ICEM..... ទីកន្លែង: សាលាស្រូវ ភ្នំពេញ
 កាលបរិច្ឆេទ: ០៦-០១-២០២២.....

លរ	ឈ្មោះអ្នកចូលរួម	តួនាទី	ហត្ថលេខា	ផ្សេងៗ
1	ស្រី ឈីម (ប)	សមាជិកសមាគម		
2	ហ៊ុន ស៊ុន (ប)	អគ្គ. គ្រូបង្រៀន		
3	ហ៊ុន ហ៊ុន (ប)	ប្រធានសមាគម		
4	ស្រី ឈីម (ប)	សមាជិកសមាគម		
5	ស្រី ឈីម (ប)	សមាជិកសមាគម		
6	ស្រី ឈីម (ប)	សមាជិកសមាគម		
7	ស្រី ឈីម (ប)	សមាជិកសមាគម		
8	ស្រី ឈីម (ប)	សមាជិកសមាគម		
9	ស្រី ឈីម (ប)	សមាជិកសមាគម		
10	ស្រី ឈីម (ប)	NRM Assistant		
11	ស្រី ឈីម (ប)	សមាជិកសមាគម		
12	ស្រី ឈីម (ប)	សមាជិកសមាគម		
13	ស្រី ឈីម (ប)	សមាជិកសមាគម		
14	ស្រី ឈីម (ប)	សមាជិកសមាគម		
15	ស្រី ឈីម (ប)	សមាជិកសមាគម		
16	ស្រី ឈីម (ប)	សមាជិកសមាគម		
17	ស្រី ឈីម (ប)	សមាជិកសមាគម		
18	ស្រី ឈីម (ប)	សមាជិកសមាគម		
19	ស្រី ឈីម (ប)	សមាជិកសមាគម		
20	ស្រី ឈីម (ប)	សមាជិកសមាគម		
21	ស្រី ឈីម (ប)	NRM-PO		
22	ស្រី ឈីម (ប)	សមាជិកសមាគម		
23	ស្រី ឈីម (ប)	សមាជិកសមាគម		
24	ស្រី ឈីម (ប)	សមាជិកសមាគម		
25	ស្រី ឈីម (ប)	សមាជិកសមាគម		

លរ	ឈ្មោះអ្នកចូលរួម	តួនាទី	ហត្ថលេខា	ផ្សេងៗ
26	ស្រី ឈីម (ប)	សមាជិកសមាគម		012514867
27	ស្រី ឈីម (ប)	សមាជិកសមាគម		
28	ស្រី ឈីម (ប)	ICBM		012617092
29	ស្រី ឈីម (ប)	សមាជិកសមាគម		093987060
30	ស្រី ឈីម (ប)	សមាជិកសមាគម		
31				

Anakut Koma Samaki Community

មូលនិធិ ម៉ាដុកជូលី-ប៊ីត
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បញ្ជីបុគ្គលិកមូលដ្ឋាន

អង្គប្រជុំស្តីពី: គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ ២០២២/២០២៣ គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ ២០២២/២០២៣
 ទីកន្លែង: ភ្នំពេញ កម្ពុជា
 កាលបរិច្ឆេទ: ០៧/០៧/២០២២

លរ	ឈ្មោះ: អ្នកចូលរួម	តួនាទី	ហត្ថលេខា	ផ្សេងៗ
1	ស៊ីម ហ៊ុន (ស)	Ranger	SM	093727873
2	ស៊ីម ហ៊ុន (ស)	Ranger	SM	092332570
3	ស៊ីម ហ៊ុន (ស)	Ranger	SM	069775806
4	ស៊ីម ហ៊ុន (ស)	Ranger	SM	0963219500
5	ស៊ីម ហ៊ុន (ស)	NRM Assister	SM	0962923823
6	ស៊ីម ហ៊ុន (ស)	SELECT	SM	012336024
7	ស៊ីម ហ៊ុន (ស)	NRM PO	SM	04626358
8	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	086220072
9	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	081287863
10	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	010404419
11	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	0964271376
12	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	070208537
13	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	0
14	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	069773402
15	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	0
16	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	0976492367
17	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	0884019285
18	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	012816867
19	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	0719372558
20	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	0
21	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	0964662507
22	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	0969000414
23	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	012623316
24	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	0973988962
25	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	0973535934

លរ	ឈ្មោះ: អ្នកចូលរួម	តួនាទី	ហត្ថលេខា	ផ្សេងៗ
26	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ ICEM		Kbunetta
27	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ ICEM	089793307	SM
28	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម		Assistance
29	ស៊ីម ហ៊ុន (ស)	ICEM	012612092	SM
30	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ MTP	012818584	Assistance
31	ស៊ីម ហ៊ុន (ស)	M/O MTP		SM
32	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	012999557
33	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	012263303
34	ស៊ីម ហ៊ុន (ស)	គណៈកម្មាធិការប្រតិបត្តិការប្រចាំខែ/ឆ្នាំ	SM	
35	ស៊ីម ហ៊ុន (ស)	អ្នកចូលរួម	SM	0964169590
36				

Takhe Meanchey Community

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អង្គប្រជុំស្តីពី... កាលបរិច្ឆេទ: ០៩.០៧.២០២២.....

លរ	ឈ្មោះ: អ្នកចូលរួម	តួនាទី	ហត្ថលេខា	ផ្សេងៗ
1	សោយ ស្រីសោយ (ស)	ប្រធាន.ស.គម្រោង យកសែ		0717841164
2	ស្រី សុខ្យាត (ប)	សមាជិក.ស.គ		
3	សាវ សំណាម (ប)	សមាជិក.ស.គ	M/A	
4	សោយ សុខ្យាត (ប)	នាយ.សមា.សមា		01233257
5	សោយ សុខាត (ប)	សមាជិក.ស.គ		011215540
6	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
7	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
8	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
9	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		0717841166
10	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
11	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
12	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		089980001
13	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		017540990
14	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
15	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
16	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		089993309
17	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
18	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		092479898
19	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		011440368
20	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		02 812184
21	សោយ សុខ្យាត (ប)	M/E MJP		
22	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		
23	សោយ សុខ្យាត (ប)	Finance		
24	សោយ សុខ្យាត (ប)	Advocatisation		
25	សោយ សុខ្យាត (ប)	NRH.PO		011636355

លរ	ឈ្មោះ: អ្នកចូលរួម	តួនាទី	ហត្ថលេខា	ផ្សេងៗ
26	សោយ សុខ្យាត (ប)	ប្រធានគម្រោង SLECT		012336000
27	សោយ សុខ្យាត (ប)	NRH Assistant		0962723823
28	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		069972626
29	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		012382846
30	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		012314867
31	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		0973889236
32	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		0714421107
33	សោយ សុខ្យាត (ប)	សមាជិក.ស.គ		011999998
34				

Oslev Area

មូលនិធិ ម៉ាកដូលីត
MJP
 MADDOX JOLIE-PITT
 FOUNDATION

បណ្តឹងត្រួតពិនិត្យការងារអន្តរជាតិ

អង្គប្រជុំស្តីពី: ការងារត្រួតពិនិត្យការងារអន្តរជាតិ ថ្ងៃទី ០១ ខែ វិច្ឆិកា ឆ្នាំ ២០១៦.....

កាលបរិច្ឆេទ: ០១ ខែ ១១ ឆ្នាំ ២០១៦.....

លរ	ឈ្មោះអ្នកចូលរួម	តួនាទី	ហត្ថលេខា	ផ្សេងៗ
1	លី ណាណា	អគ្គនាយក	[Signature]	0893764617
2	លី ណាណា	អគ្គនាយក	[Signature]	0893764617
3	លី ណាណា	អគ្គនាយក	[Signature]	077018330
4	លី ណាណា	អគ្គនាយក	[Signature]	093727873
5	លី ណាណា	អគ្គនាយក	[Signature]	0963219500
6	លី ណាណា	អគ្គនាយក	[Signature]	0897785106
7	លី ណាណា	អគ្គនាយក	[Signature]	012512315
8	លី ណាណា	អគ្គនាយក	[Signature]	0772410400
9	លី ណាណា	NRM Assistant	[Signature]	0962723823
10	លី ណាណា	អគ្គនាយក MJP	[Signature]	012 878584
11	លី ណាណា	NRM PO	[Signature]	01636355
12	លី ណាណា	លេខាធិការ SLECT	[Signature]	012 336074
13	លី ណាណា	លេខាធិការ ICEH	[Signature]	
14	លី ណាណា	លេខាធិការ ICEH	[Signature]	089793907
15	លី ណាណា	ICEH	[Signature]	012617097
16	លី ណាណា	លេខាធិការ	[Signature]	088960164
17	លី ណាណា	លេខាធិការ	[Signature]	0976454999
18	លី ណាណា	លេខាធិការ	[Signature]	0886611677
19	លី ណាណា	លេខាធិការ	[Signature]	066756178
20	លី ណាណា	លេខាធិការ	[Signature]	097 9376277
21	លី ណាណា	លេខាធិការ	[Signature]	011589442
22	លី ណាណា	លេខាធិការ	[Signature]	061233360
23	លី ណាណា	លេខាធិការ	[Signature]	0125 1186
24	លី ណាណា	លេខាធិការ	[Signature]	
25	លី ណាណា	លេខាធិការ	[Signature]	012-382846

លរ	ឈ្មោះអ្នកចូលរួម	តួនាទី	ហត្ថលេខា	ផ្សេងៗ
26	លី ណាណា	លេខាធិការ	[Signature]	089 1188 17
27	លី ណាណា	លេខាធិការ	[Signature]	011446848
28	លី ណាណា	លេខាធិការ	[Signature]	017 891670
29	លី ណាណា	លេខាធិការ	[Signature]	0976996862
30				

Annex 3. 2. List of Planted Seedlings by Site

No.	Name of planting site	participant			Seedling	
		Male	Female	Total	Name	Number
១	Dautret community (០6.០9.2022)	23	7	30	Wild guava	50
					Pteroncarpus Macrocarpus	100
					Cassia Fistula	100
					Afzelia xylocarpa	100
					Caesalpinia pulcherrima	150
					Total seedling	500
២	Anakut Komasmaki Community (០7.០9.2022)	26	9	35	Afzelia xylocarpa	150
					Dalbergia Cochinchinensis	20
					Dalbergia oliveri	65
					Pteroncarpus Macrocarpus	150
					Cassia Fistula	20
					ស្រូវ ១០ ដើម	10
					Caesalpinia pulcherrima	70
					ឈូក ១៥ ដើម	15
					Total seedling	500
៣	Takhe Meanchey Community (០8.០9.2022)	27	6	33	Wild guava	110
					Afzelia xylocarpa	100
					Dalbergia oliveri	80
					Dalbergia Cochinchinensis	50
					ឈូក ៤០ ដើម	40
					ស្រូវ ១០ ដើម	10
					ស្រូវ ២០ ដើម	20
					Caesalpinia pulcherrima	50
					Cassia Fistula	30
					Total seedling	500
៤	Oslev (០9.០9.2022)	29	5	29	Dalbergia oliveri	50
					Afzelia xylocarpa	110
					Pteroncarpus Macrocarpus	60
					Total seedling	220
Grand Total		105	27	១៣២		1720

Annex 3. 3. Planting Equipment Used in Training, Planting, and Delivering to Site



Materials distributed to MJP/ICEM target community forests and rangers during seedlings planting demonstrations

Community Forest	Material Distributed	Quantity	Handover date
Dontret	Grass cutter (gasoline)	01	06 September 2022
	Hoe	10	
	Shovel	10	
	Axe	03	
	Machete	10	
	2 hand baskets (plastic)	10	
	Watering bucket (plastic)	04	
	Hand saw	02	
	Anakotkoma Samaky	Grass cutter (gasoline)	
Hoe		10	
Shovel		10	
Axe		03	
Machete		10	
2 hand baskets (plastic)		10	
Watering bucket (plastic)		04	
Hand saw		02	
Takhes Meanchey		Grass cutter (gasoline)	01
	Hoe	10	
	Shovel	10	
	Axe	03	
	Machete	10	
	2 hand baskets (plastic)	10	
	Watering bucket (plastic)	04	
	Hand saw	02	
	Park Director, Samlaut	Grass cutter (gasoline)	01
Hoe		10	
Shovel		10	
Axe		03	
Machete		10	
2 hand baskets (plastic)		10	
Watering bucket (plastic)		04	
Hand saw		02	

Prepared by:

LONG Laen

NRM program officer

Annex 3. 4. Photographs of Site Visits

Dontret Restoration Activities



Anakot Komasmaky Restoration Activities





Takhe Meanchey Restoration Activities

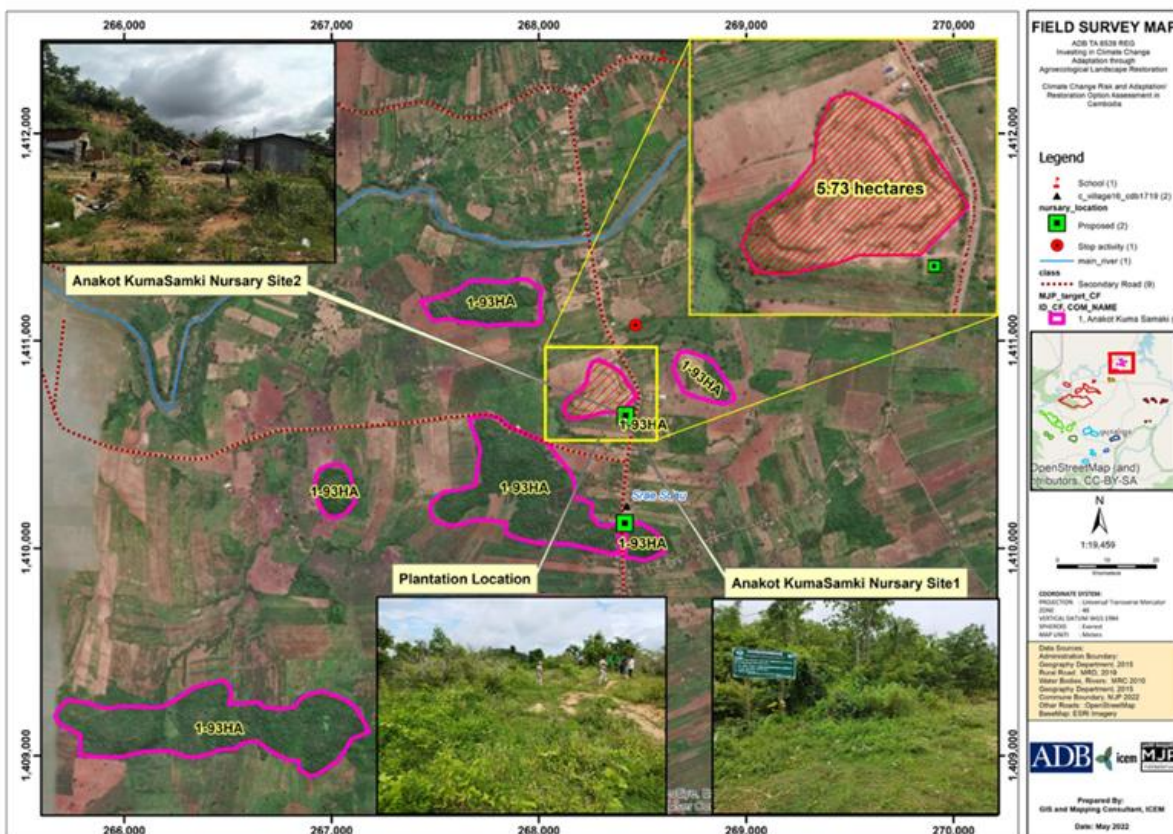


Oslev, SMUA Restoration Activities

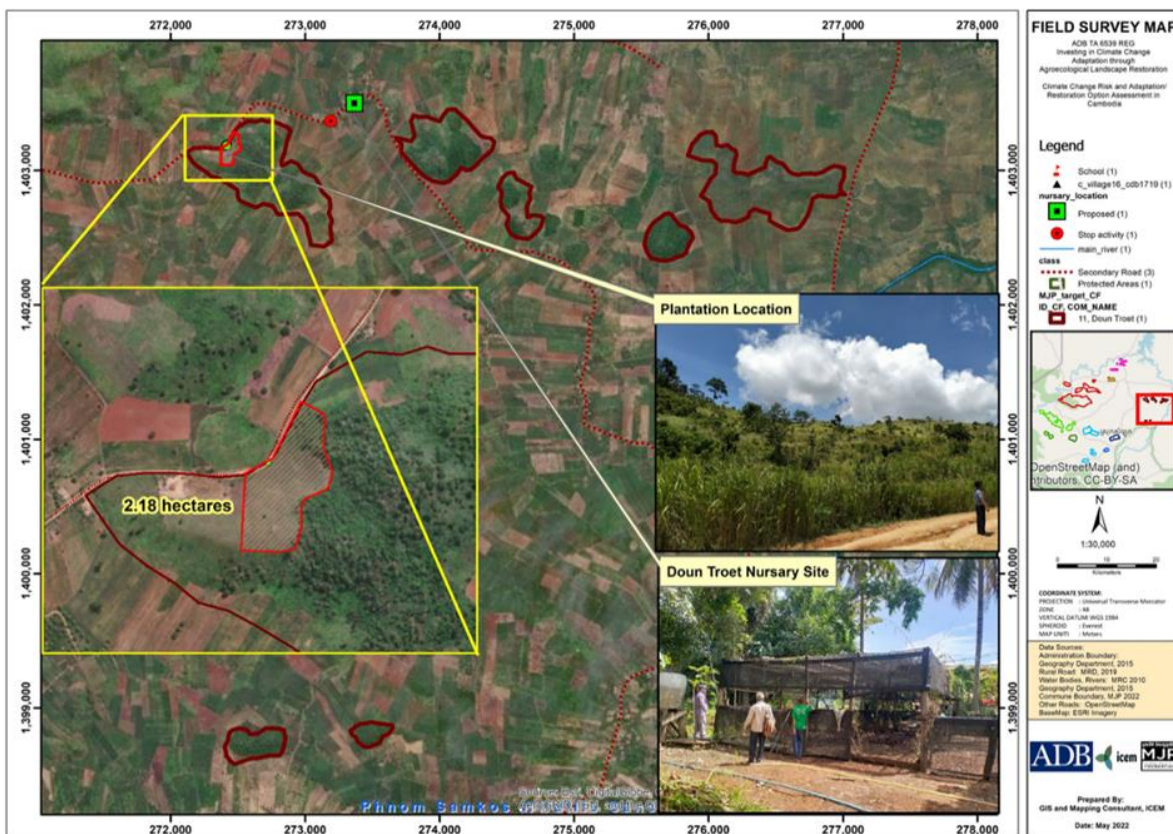


Annex 3. 5. Maps of Restoration Sites

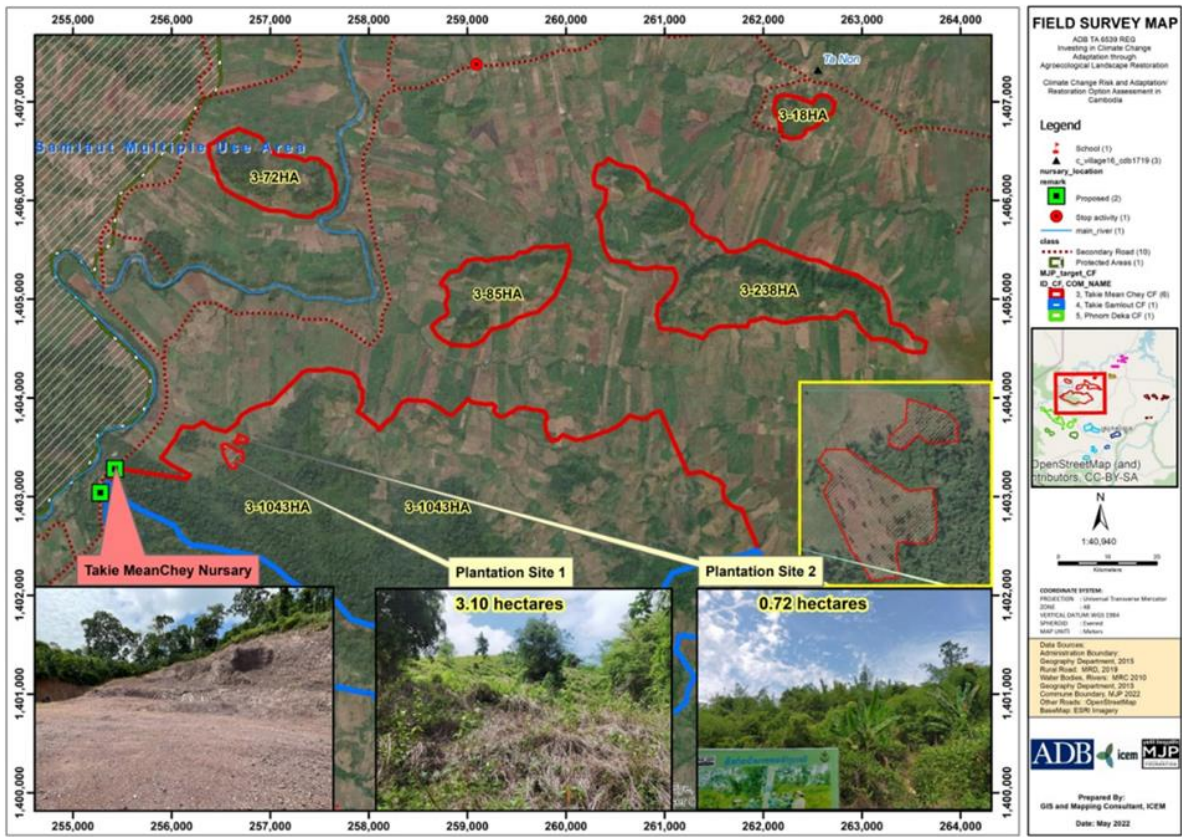
Anakot Kumasamky Restoration Site Location



Dontret Restoration Site Location



Takhe Meanchey Restoration Site Location



Oslev, SMUA Restoration Site Location



Annex 3. 6. Tree Planting Site Signboard

ព្រៃសហគមន៍អនាគតកុមារសាមគ្គី តំបន់ដាំស្ពាន់ព្រៃឡើងវិញ



- ចំនួនកូនឈើបានដាំស្ពាន់ឡើងវិញ៥០០កូន
- ប្រភេទកូនឈើក្រញូងបេង នាងនួន ក្រោក
- បច្ចេកទេសដាំជាលក្ខណៈបណ្តុំ៩ដើមក្នុងចន្លោះ៤ម៉ែត្រ
- កាលបរិច្ឆេទដាំ ថ្ងៃទី៩ កញ្ញា ២០២២។

ព្រៃសហគមន៍អូរស្លែច តំបន់ដាំស្ពាន់ព្រៃឡើងវិញ



- ចំនួនកូនឈើបានដាំស្ពាន់ឡើងវិញ៥០០កូន
- ប្រភេទកូនឈើក្រញូងបេង នាងនួន
- បច្ចេកទេសដាំ ជាលក្ខណៈជួរត្រង់ ចន្លោះ៣ម៉ែត្រ
- កាលបរិច្ឆេទដាំ ថ្ងៃទី៦ កញ្ញា ២០២២។

ព្រៃសហគមន៍ដូនត្រត តំបន់ដាំស្ពានព្រៃឡើងវិញ



- ចំនួនកូនឈើបានដាំស្ពានឡើងវិញ៥០០កូន
- ប្រភេទកូនឈើក្រញូង បេង ក្បោក
- បច្ចេកទេសដាំ ជាលក្ខណៈបណ្តុះដើមក្នុងចន្លោះ ឆ្នើមត្រ
- កាលបរិច្ឆេទដាំ ថ្ងៃទី១ កញ្ញា ២០២២។

ព្រៃសហគមន៍តាខៈមានជ័យ តំបន់ដាំស្ពានព្រៃឡើងវិញ



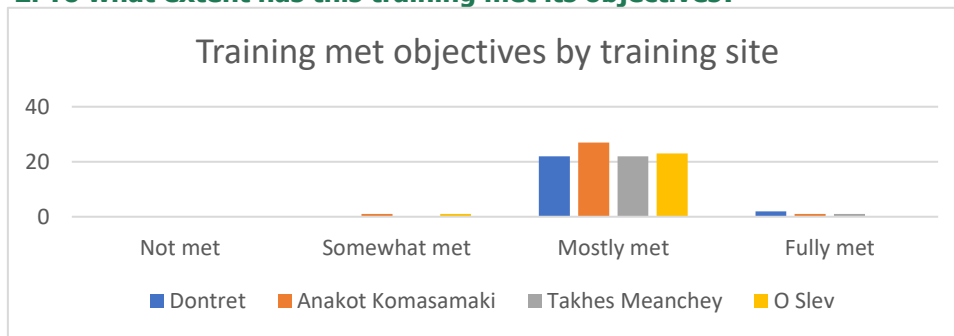
- ចំនួនកូនឈើបានដាំស្ពានឡើងវិញ៥០០កូន
- ប្រភេទកូនឈើក្រញូង បេង ក្បោក
- បច្ចេកទេសដាំ ជាលក្ខណៈបណ្តុះដើមក្នុងចន្លោះ ឆ្នើមត្រ
- កាលបរិច្ឆេទដាំ ថ្ងៃទី១ កញ្ញា ២០២២។

Annex 3. 7. Results of Training Evaluation

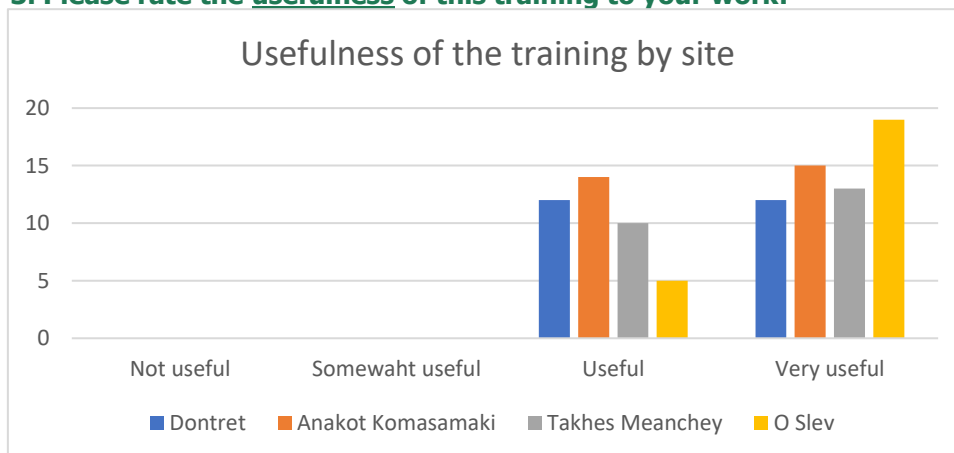
1. What parts of the training did you find most useful to your work?

Site	Number of answers	Most useful part of training
Dontret	24	Planting techniques
Anakot Komasmaki	29	Planting techniques
Takhes Meanchey	23	Planting techniques
Oslev	24	Planting techniques and Restoration plan

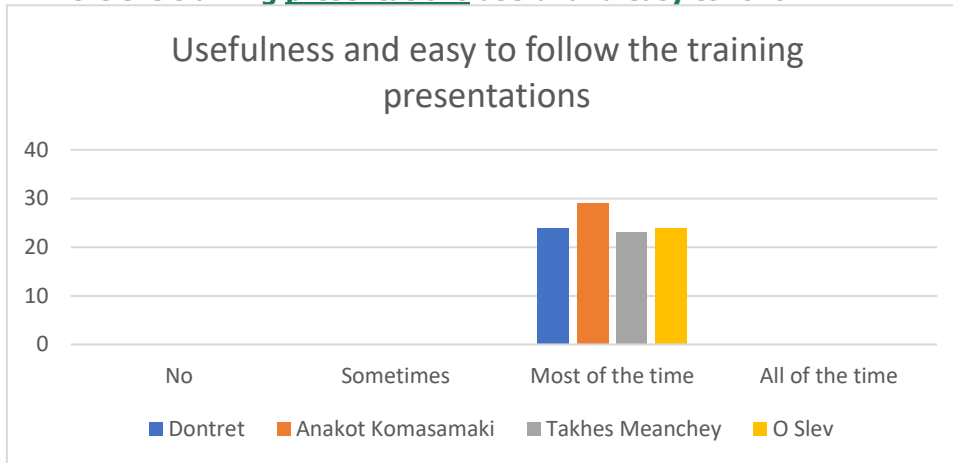
2. To what extent has this training met its objectives?



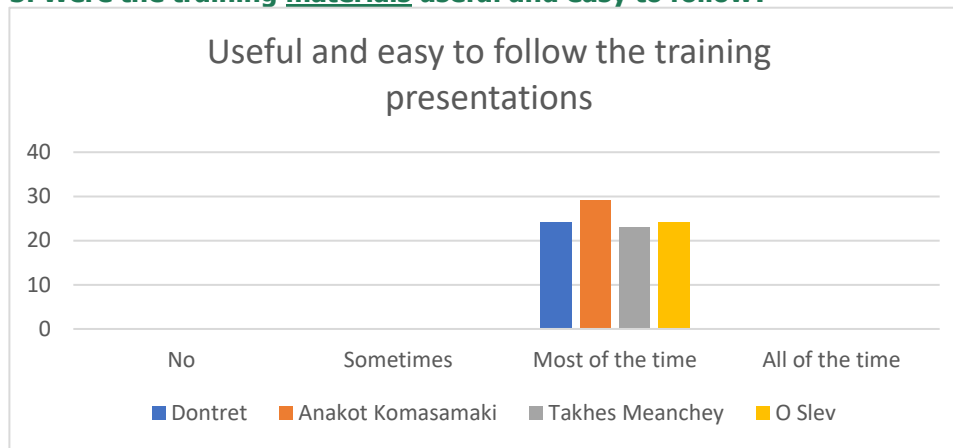
3. Please rate the usefulness of this training to your work:



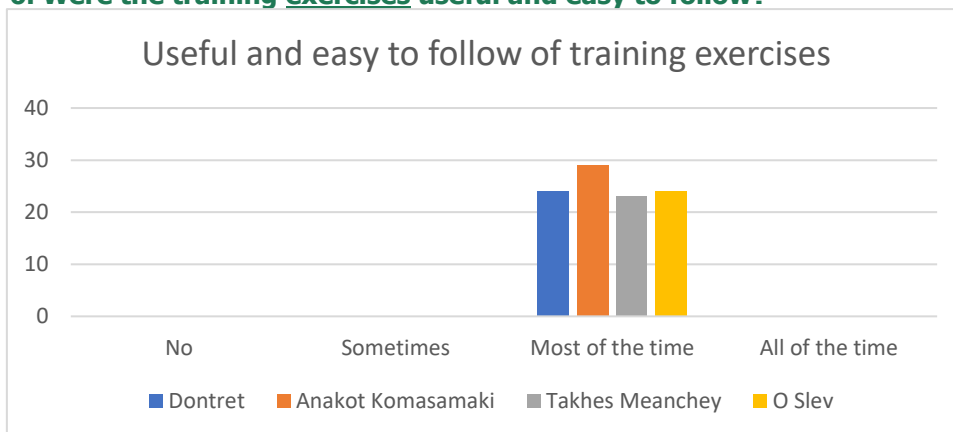
4. Were the training presentations useful and easy to follow?



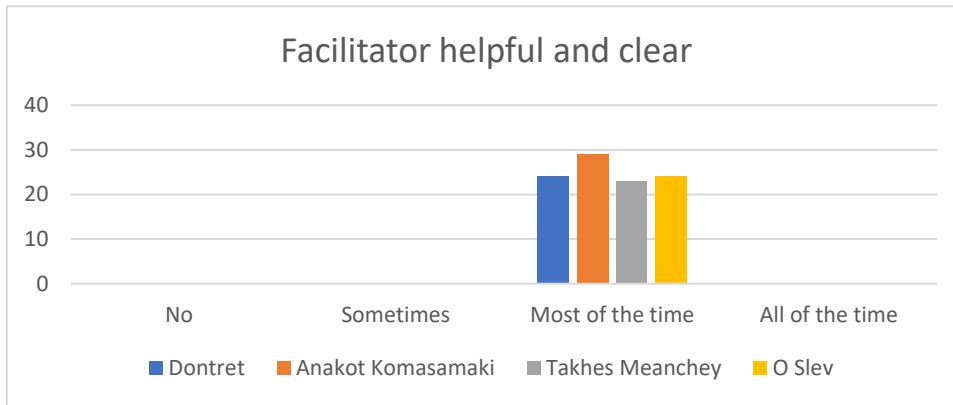
5. Were the training materials useful and easy to follow?



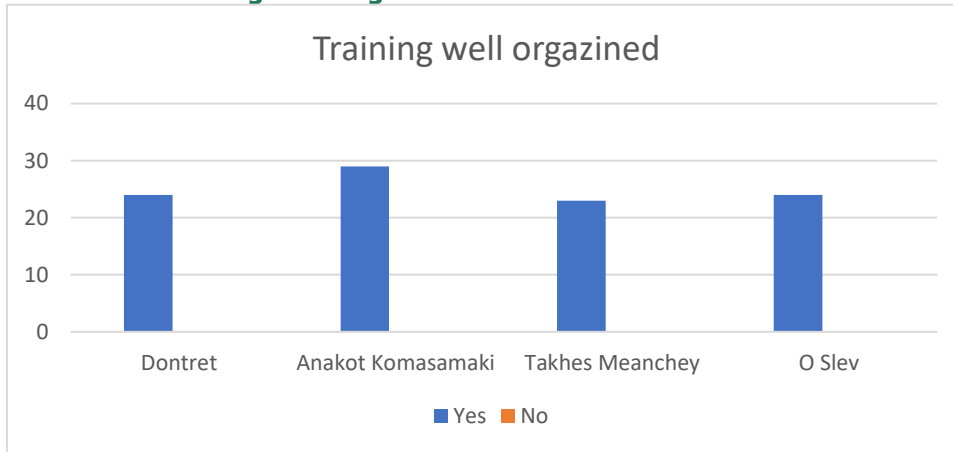
6. Were the training exercises useful and easy to follow?



7. Was the facilitator helpful and clear?



8. Was the training well-organized?



9. Please provide suggestions for us to improve future trainings:

Site	Suggestions
Dontret, Anakot Komasmaki, Takhes Meanchey, and Oslev	<ol style="list-style-type: none"> 1. Suggest having at least two days training for each Community Forest 2. Suggest learning other planting techniques related to income generation

Thank you for your participation!

Annex 3. 8. Community Work Plan

វិស័យការងារសម្រាប់ការងារសហគ្រាសស្រូវ
 លម្អិតសម្រាប់ការងារសហគ្រាសស្រូវ

ល	សកម្មភាព	កាលបរិច្ឆេទ	អ្នកទទួលខុសត្រូវ
១	បង្កើតក្រុមការងារសហគ្រាសស្រូវ (៥០០)	៩-១០ កញ្ញា ២២	លោកស្រី ហ៊ុន ធីតា ០៩ ២៩១៤៩ លេខស្រី
២	គ្រូបង្រៀន + ការងារសហគ្រាសស្រូវ (ស្រែចម្ការ + ការងារសហគ្រាសស្រូវ)	ចាប់ពី ១២ ត្រូវការ ដល់ ២០ ត្រូវការ ២០២៣	លោកស្រី ហ៊ុន ធីតា
៣	ផ្ទេរស្រូវស្រែ	ចាប់ពី ១០ ត្រូវការ ២០២២ (០៥ ត្រូវការ)	លោកស្រី ហ៊ុន ធីតា

វិស័យការងារសម្រាប់ការងារសហគ្រាសស្រូវ
 លម្អិតសម្រាប់ការងារសហគ្រាសស្រូវ

ល	សកម្មភាព	កាលបរិច្ឆេទ	អ្នកទទួលខុសត្រូវ
១	បង្កើតក្រុមការងារសហគ្រាសស្រូវ (៥០០)	១៦-១៧-២២	លោកស្រី ហ៊ុន ធីតា
២	គ្រូបង្រៀន + ការងារសហគ្រាសស្រូវ (ស្រែចម្ការ + ការងារសហគ្រាសស្រូវ)	១៨-២០-២២	លោកស្រី ហ៊ុន ធីតា
៣	ផ្ទេរស្រូវស្រែ	២០-២២-២២	លោកស្រី ហ៊ុន ធីតា

វិស័យការងារសម្រាប់ការងារសហគ្រាសស្រូវ
 លម្អិតសម្រាប់ការងារសហគ្រាសស្រូវ

ល	សកម្មភាព	កាលបរិច្ឆេទ	អ្នកទទួលខុសត្រូវ
១	បង្កើតក្រុមការងារសហគ្រាសស្រូវ (៥០០)	៩-១០ កញ្ញា ២២	លោកស្រី ហ៊ុន ធីតា ០៩ ២៩១៤៩
២	គ្រូបង្រៀន - ការងារសហគ្រាសស្រូវ (ស្រែចម្ការ + ការងារសហគ្រាសស្រូវ)	ចាប់ពី ១២ ត្រូវការ ដល់ ២០ ត្រូវការ ២០២៣	លោកស្រី ហ៊ុន ធីតា
៣	ផ្ទេរស្រូវស្រែ	ចាប់ពី ១០ ត្រូវការ ២០២២ (០៥ ត្រូវការ)	លោកស្រី ហ៊ុន ធីតា

វិស័យការងារសម្រាប់ការងារសហគ្រាសស្រូវ
 លម្អិតសម្រាប់ការងារសហគ្រាសស្រូវ

ល	សកម្មភាព	កាលបរិច្ឆេទ	អ្នកទទួលខុសត្រូវ
១	បង្កើតក្រុមការងារសហគ្រាសស្រូវ (៥០០)	១០-១១-២២	លោកស្រី ហ៊ុន ធីតា ០៩ ២៩១៤៩
២	គ្រូបង្រៀន + ការងារសហគ្រាសស្រូវ (ស្រែចម្ការ + ការងារសហគ្រាសស្រូវ)	១២-១៤-២២	លោកស្រី ហ៊ុន ធីតា
៣	ផ្ទេរស្រូវស្រែ	១៤-១៦-២២	លោកស្រី ហ៊ុន ធីតា

Video Released by MOE

There were two project activities videos published on the Ministry of Environment website.

MJP Executive Director joined tree planting activities





Fourth Cambodia National Field Mission Report



Protected area restoration activities at Oslev Community Forest, Samlaut district, Battambang province, Cambodia (photo by Khun Bunnath, ICEM)



Technical Assistance 6539: Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-based Solution for Climate Resilience

Fourth Cambodia National Field Mission Report

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1 Background and Objective of the Mission

This fourth mission continues to build on the work ICEM experts in collaboration with the Maddox Jolie-Pitt Foundation (MJP)⁴ and Ministry of the Environment counterparts have undertaken in previous missions in the first three quarters of 2022.

The national team and MJP met with local communities in the first mission. They identified forest sites of concern to the communities, which would then serve as sites to demonstrate ecological agriculture and agroforestry principles for the remainder of the project.

In the second mission, attended by international experts, the project team undertook a detailed assessment of the sites, including participatory mapping sessions. Working with local communities, the team identified a broad range of landscape restoration measures. These emphasized nature-based solutions to forest rehabilitation, erosion control, drainage corridor management, and agroforestry approaches for biodiversity conservation and livelihood improvement. The team then used the maps to produce site restoration plans and priority tasks for each site, along with detailed guidance for the preparation of species lists and use descriptions, and planting regimes.

In the third field mission, the team provided training and began implementing restoration plans at each demonstration site.

This fourth national mission, which took place from November 20 - 26, followed up on aspects of the third field mission, including identifying water sources and developing new nurseries at each site.

1.1. Mission Objectives

The field mission will provide technical support to guide restoration activities in Cambodia's four selected demonstration sites: Dontret Community Forest (CF), Anakot Komasamak CF, Takhes Meanchey CF, and Oslev SMUA. The restoration activities will follow the restoration plans established in the second field mission to Samlout. The mission will also follow up on aspects of the third field mission, including identifying water sources for each site and the development of new nurseries at each location.

In summary, the mission objectives were to:

- Establish a plan to overcome potential water shortages at each demonstration site.
- Determine the potential to revive the disused nursery at the Dontret site and the potential for establishing nurseries at the other three sites.
- Provide training on Nursery Technical Management at each nursery site.
- Provide training in site maintenance methods and agroforestry and agroecology methodologies for local participants.
- Begin to implement the monitoring survey at each site. Establish responsibilities for the survey.

1.2. Mission Activities

The team established a plan to overcome potential water shortages at each demonstration site. They then determined the potential to revive the disused nursery at the Dontret site and the potential for establishing commercial nurseries at the other three sites. For existing nurseries, the team developed a planting plan for the coming year with the nursery teams. The plans identified the quantity, species, growing duration, and costs of seedlings required. The team also provided training on Nursery

⁴ The Maddox Jolie-Pitt Foundation is the project's partner NGO. MJP has worked in the Samlout area since 2003 in forest restoration and conservation, agriculture, and education. Through its work it has developed strong and productive relationships with local communities and local government in the target demonstration areas, which proved invaluable throughout the mission.

Technical Management and training in site maintenance methods and agroforestry, and agroecology methodologies to local community members designated to work on the sites. To establish the success of the planting thus far and monitor progress over time, the team administered the monitoring and seedling survival survey at each site and established responsibilities for the survey.

1.3. Participants

The participants were:

1. Khun Bunnath, Forest and Landscape Restoration Specialist,
2. Heng Bauran, GIS and Spatial Planning Specialist, and
3. Field Team of MJP

1.4. Duration and Sites of the Mission

The team conducted the five-day mission in three community forests (CFs): Dontret, Anakot Komasamak, and Takhes Meanchey, and Oslev, located in the Samlout MUA, Samlout district, Battambang Province, Cambodia.

2. Field Training Activities

Table 5. Field Training Activities

Date	Location	Activity	Method	Responsible team member
Nov 20	Phnom Penh to Battambang	Travel to field site		All
Nov 21	MJP office-Battambang	Meeting with MJP to plan and prepare field training and site monitoring survey	Group Meeting	Khun Bunnath
Nov 22	MJP field office at Samlout-Battambang / Oslev site	<ul style="list-style-type: none"> • Site assessment and drone mapping of planted seedlings at the Oslev site and Takhes Meanchey. • Monitor nursery PA nursery Pailin 	Field activity	Heng Bauran Khun Bunnath
Nov 23	Three Community Forest restoration sites	<ul style="list-style-type: none"> • Survival survey, drone and mapping exercise at Dontret and Anakot. • Monitor nurseries sites of PA O rotkroh and Kanchang 	Field activity	Heng Bauran Khun Bunnath
Nov 24	MJP field office at Samlout-Battambang	Theory sessions (morning) and field exercises (afternoon) on nursery management, propagation techniques, soil mixing, soil boiling etc.	Field training	Khun Bunnath
Nov 25	MJP field office at Samlout-Battambang	Field day training on nursery business plan development (morning). Develop nursery planting plans (afternoon).	Field training	Khun Bunnath
Nov 26	Battambang to Phnom Penh	Return travel.		All

3. Mission Outcomes

The following describes the mission outcomes for the mission activities:

3.1. Determine the potential to revive the disused nursery at the Dontret site, and the potential for establishing nurseries at the other sites

During the mission, the team visited communities, protected areas (PAs), and MJP nurseries. Following a discussion with the MJP field team, the team decided to install new nurseries and continue to support the existing nurseries, as described in Table 6.

Table 6. Nursery Support Activities

No.	Site	Nursery status	Supporting activities
1	O rotkroh – PA (Samlout)	Existing nursery (large size nursery funded by MOE)	Technical support on soil mixing and sterilizing, seed propagation, seed treatment, and tree seedling maintenance techniques. Tree seed supplies are required as the MOE has not distributed sufficient seeds.
2	O Tavoaw – PA (Pailin)	Existing nursery (large size nursery funded by MoE)	As above.
3	Kanchang - Community	New (15m x 20m)	The team installed a new nursery. The team provided technical support for nursery management, seed supply, water infrastructure installation, soil mixing, soil sterilization, seed propagation, seed treatment, and tree seedling maintenance.
4	Dontret – Community	Existing nursery (10m x 15m)	Technical support provided for nursery management, seeds supply, re-water infrastructure installation, soil mixing, soil sterilization, propagation, seed treatment, tree seedling maintenance, and how to graft branches.
5	Takhes Meanchey – Community	New (15m x 20m)	The team installed a new nursery. Technical support provided for nursery management, seed supply, water infrastructure installation, soil mixing, seed sterilization, propagation, seeds treatment, and tree seedling maintenance.
6	Anakot - Community	New (15m x 20m)	The team installed a new nursery. Technical support provided for nursery management, seed supply, water infrastructure installation, soil mixing, seed sterilization, propagation, seed treatment, and tree seedling maintenance.

3.2. Provide training on Nursery Technical Management at each nursery site

The team provided training over two days to 32 participants, including ten women from selected communities and Protected Area rangers. The training covered nursery management, soil mixing and sterilization, seed treatment and propagation, tree seedling maintenance, and a field-day practice at the MJP nursery. Training equipment included a nursery management manual, a short video, and power point presentation in the local language.

The training topics included the nursery as a concept, nursery installation (temporary and permanent), nursery works, nursery location selection, nursery structure, materials and tools, nursery seedling production plan, seed collection techniques, transportation and storing, soil mixing and soil sterilizing methods, pot, and potting mixes, maintenance of seedlings in the nursery, pest and disease control, hardening off seedlings and preparation for planting, and transportation of tree seedlings to restoration sites. The training course final evaluation and the participant list are provided in Annex 4.3 and Annex 4.4.

The nursery managers engaged with the project team to develop a tree seedling production plan (Table 7).

Table 7. Seedling Production Plan in 2023

Site name	Tree Species	Number	Error number*
Kanchang	Dalbergia cochinchinensis	2000	3000
	Pahadia Cochinchinensis	2000	3000
	Pterocarpus pedatus	3000	3500
	Dalbergia bariensis pierre	2000	3000
	Total	9,000	12,500
Samki	Pahadia Cochinchinensis	800	1000
	Pterocarpus pedatus	1000	1200
	Syzygium sp.	1000	1500
	Dalbergia cochinchinensis	1000	1200
	Cashew	1000	1500
	Total	4,800	6,400
Takhes Meanchey	Pahadia Cochinchinensis	1000	1500
	Dalbergia cochinchinensis	500	600
	Hopea and Shorea sp.	500	600
	Sindora sumatrana	1000	1500
	Capok	1000	1500
	Dalbergia bariensis pierre	500	600
	Total	4,500	6,300
Donkrek	Pahadia Cochinchinensis	1000	1500
	Dalbergia bariensis pierre	1000	1500
	Dalbergia cochinchinensis	1000	1500
	Acacia	1000	1500
	Caesalpinia pulcherrima	1000	1500
	Hopea and Shorea sp.	500	600
	Pterocarpus pedatus	1000	1500
	Total	6,500	9,600
PA- Pailin (O Tavoaw)	Dalbergia cochinchinensis	6500	7500
	Pterocarpus pedatus	5000	6000
	Dalbergia bariensis pierre	2000	2500
	Hopea and Shorea sp.	6000	6000
	Pahadia Cochinchinensis	3000	3500
	Cashew	5000	5500
	Rubber	5000	5500
	Total	32,500	36,500
PA-Battambang (O rotkroh)	Pahadia Cochinchinensis	1000	1500
	Dalbergia bariensis pierre	1000	1500
	Dalbergia cochinchinensis	1000	1500
	Pterocarpus pedatus	1000	1500
	Hopea and Shorea sp.	500	600
	Sindora sumatrana	1000	1500
	Dipterocarpus alatus	700	1000
	Dolabriformis	1000	1500
	Rubber	1000	1500
	Cashew	2000	2500
	Sugar-palm tree (Borassus flabelliformis)	2000	2500
	Maringa	2000	2500
	Caesalpinia pulcherrima	1000	1500
	Cassia fistula	2000	2500
	Acacia	2000	2500

	Capok	2000	2500
	Cardamom	2000	2500
	Total	23,200	35,600
	Grant Total	80,500	106,900

Note: * A larger number of seedlings than planned were planted to account for seedling loss.

3.3. Provide training in site maintenance methods and agroforestry and agroecology methodologies to local participants.

The team noticed that the majority of trees planted at the sites were dying for various reasons, including a lack of rainfall and being covered by humans and weeds for days without sunlight, especially at Oslev. The team also noted that the monitoring plans had not been adequately implemented. Omissions included the water storage mechanism to water tree seedlings and compensation to the community for tree planting maintenance. The MJP field team explained that the internal procurement process to provide compensation is complicated and as yet unresolved. The Protected Area Ranger Officers, community leaders, and MJP agreed on the following monitoring (Table 8).

Table 8. Monitoring Plan

Site	Activities	#	Date	Note
Takhes Mean chey	Replacing plant of Capok seedlings	100	4 th week of Dec	The height of tree seedlings of all ages is under 0.50 meters. After receiving the water container from MJP, the community leaders should water planted seedlings weekly and continue replacing planting urgently if any new seedlings die.
	Replacing plant of Caesalpinia pulcherrima seedling	50		
	Replacing plant of Syzygium sp. Seedlings	50		
	Replacing plant of Pahadia Cochinchinensis seedlings	50		
	MJP distribute water container (5000L) to the community	1		
	MJP distribute one pump and 200m hose to the community	1		
Samki	Replacing plant of Pahadia Cochinchinensis seedlings	100	4 th week of Dec	The height of tree seedlings of all ages is upper five feet (0.50 meters). After receiving the water container from MJP, the community leaders should water planted seedlings weekly and continue replacing planting urgently if any new seedlings die.
	Replacing plant of Dalbergia cochinchinensis seedlings	50		
	Replacing plant of Pterocarpus pedatus seedlings	100		
	Replacing plant of Dalbergia bariensis pierre seedlings	100		
	Replacing plant of Chan kiri seedlings	50		
	Replacing plant of Hopea and Shorea sp. Seedlings	50		
	Replacing plant of Caesalpinia pulcherrima seedlings	50		
	MJP distribute water container (5000L)	1		
	MJP distribute one pump and 200m hose	1		
Donkrek	Replacing plant of Pahadia Cochinchinensis seedlings	100	4 th week of Dec	The height of tree seedlings of all ages under 0.50 meters. After receiving the water container from MJP, the community leaders should
	Replacing plant of Acacia seedlings	50		
	Replacing plant of Caesalpinia pulcherrima seedlings	100		

Site	Activities	#	Date	Note
	Replacing plant of Chan Kiri seedlings	50		water planted seedlings weekly and continue replacing planting urgently if any new seedlings die.
	MJP distribute - Water container (5000L)	1		
	MJP distribute - 1 pump and 200m hose	1		
Oslev, PA	Weed cleaning on the restoration site to save tree seedlings planted	2 days	4 th week of Nov	Weed-killing spray after weed cleaning.
	Replacing plant of Dalbergia cochinchinensis seedlings	100	4 th weeks of Dec 2022	The height of tree seedlings of all ages is upper five feet (0.50 meters). After receiving the well and water container from MJP, the PA rangers should water newly planted seedlings weekly and continue replacing planting urgently if any new seedlings die.
	Replacing plant of Hopea and Shorea sp. seedlings	100		
	Replacing plant of Dolabriformis seedlings	100		
	Replacing plant of Pterocarpus pedatus seedlings	100		
	Replacing plant of Dalbergia bariensis pierre seedlings	100		
	Replacing plant of Pahadia Cochinchinensis seedlings	100		
	MJP Provide water well	1	First week of Jan 2023	
	MJP distribute water container (5000L)	1		
	MJP distribute - PA post	1		
	MJP distribute one pump and 200m hose			
4 Restoration sites	Tree survival survey	1	Mar 2023	National consultant team and MJP field team

3.4. Restoration site assessment and drone mapping of demonstration sites.

The mission team conducted a site survey to assess the progress of planted tree seedlings, landscape characteristics, and tree growth. The team also conducted physical checks of the water source availability and advised PA rangers, community leaders, and the MJP field team to purchase water containers, digging wells, pumping machines, and hoses to water tree seedlings between November and June 2023. In most restoration sites, private water supply companies are available with the exception of Oslev, which has provided a well and a PA patrolling post to protect the seedlings and land due to an emerging dispute. See Table 8 for technical recommendations for replacing dying seedlings.

A GIS and Spatial Planning Specialist flew a drone over each restoration site to establish the size of the planted area and produce aerial photos. The restoration activities were carried out according to the original restoration maps prepared by the team in advance. See Annex 4.1 for maps and aerial photos.

3.5. Administer monitoring surveys at each site. Establish responsibilities for the survey.

Community leaders and PA ranger managers agreed to conduct monitoring surveys and water newly planted seedlings at each restoration site on a weekly basis. MJP is committed to providing equipment, materials, and incentives to ensure a high tree survival rate.

The national consultant team will conduct a technical survival survey in March 2023. The survey methodology will be physical counting of surviving and dying planted seedlings in 10 meters x 10 meters sample plots. The sample plots will cover at least 60% of the planted area.

Site custodians should maintain tree seedlings planted within the four sites until June 2023 and the commencement of the rainy season. Maintenance methods include protection from humans, animals, and insects and a lack of rain throughout the dry season.

4. *Issues Identified in the Mission*

The third mission report noted that the community monitoring plans developed and agreed upon as part of the restoration activities in September were yet to be implemented. During this fourth mission visit, the team reiterated the importance of the plans. In discussion with community leaders, PA ranger managers, and the MJP field team, the team revisited the plans addressing aspects considered unclear or impracticable.

The consultant team investigated the progress of tree seedlings growing at both PA ranger stations and found that most of the tree seedlings (perhaps 90%) suffered from bacteria, funguses, and parasites. The team determined that the main reason was that there had been no mix of soil sterilizing before putting soil into propagation plastic bags. The team advised that seriously affected seedlings should be destroyed immediately, and the remaining seedlings should be separated into infected and healthy groups. Some chemical pesticides were recommended.

5. *Action Plan and Next Steps*

MJP will implement the replacement planting work plan (Table 8) and undertake the seedling production plans (Table 7).

In March 2023, the consultant team will conduct the survival survey, assess the implementation of the monitoring plan, provide nursery and seedlings production refresher training and coaching at the six nurseries (Table 7), ensure the nurseries are adequately equipped and ensure a sufficient number of seedlings have been produced in line with production plans.

Local communities will open some nurseries in January 2023. A technical mission is recommended to ensure that the nursery managers can apply what they have learned (such as installing nursery infrastructure and water supplies, mixing soil, sterilizing seeds, etc.).

Annexs

Annex 4. 1. Restoration Maps

Figure 64. Locations of All Four Restoration Sites

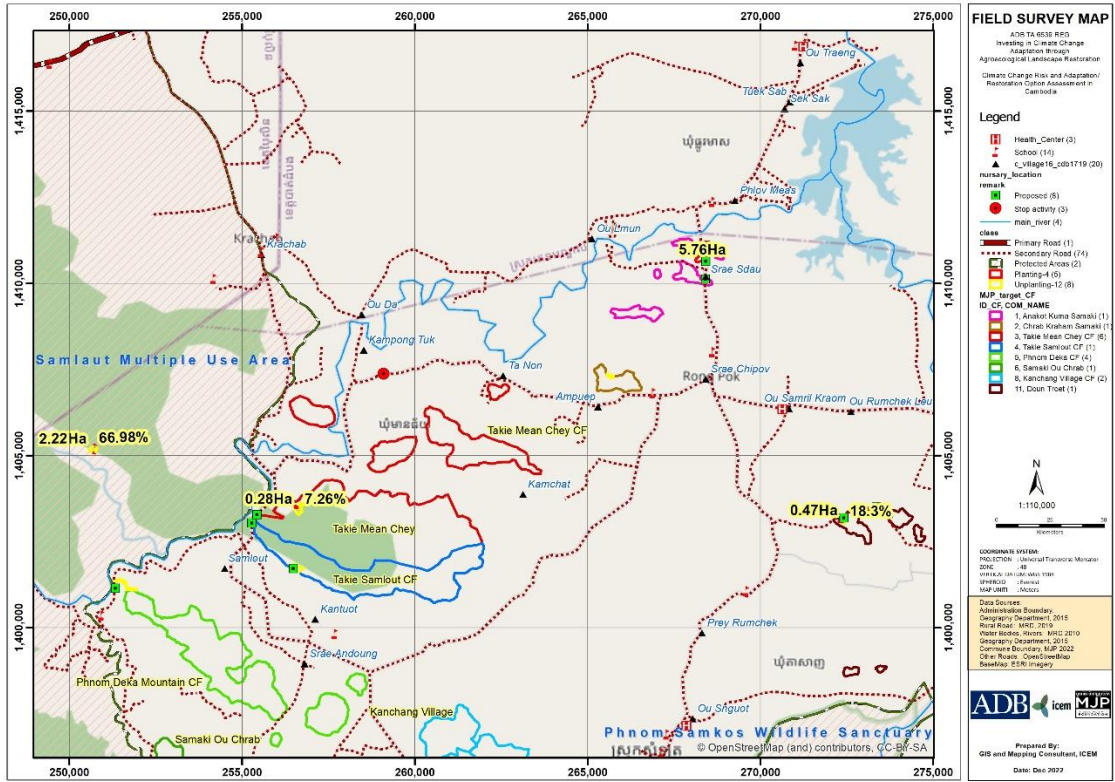


Figure 65. Donkrek Restoration Site Map

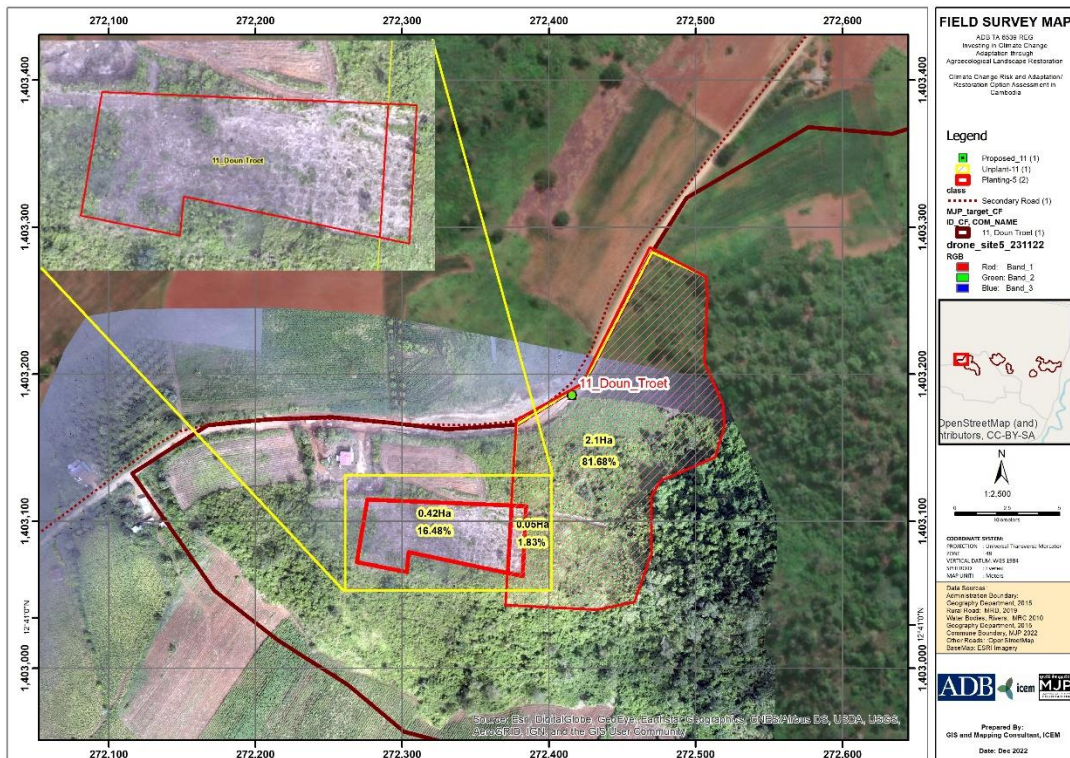


Figure 66. Anakot Kuma Samaki Restoration Site Map

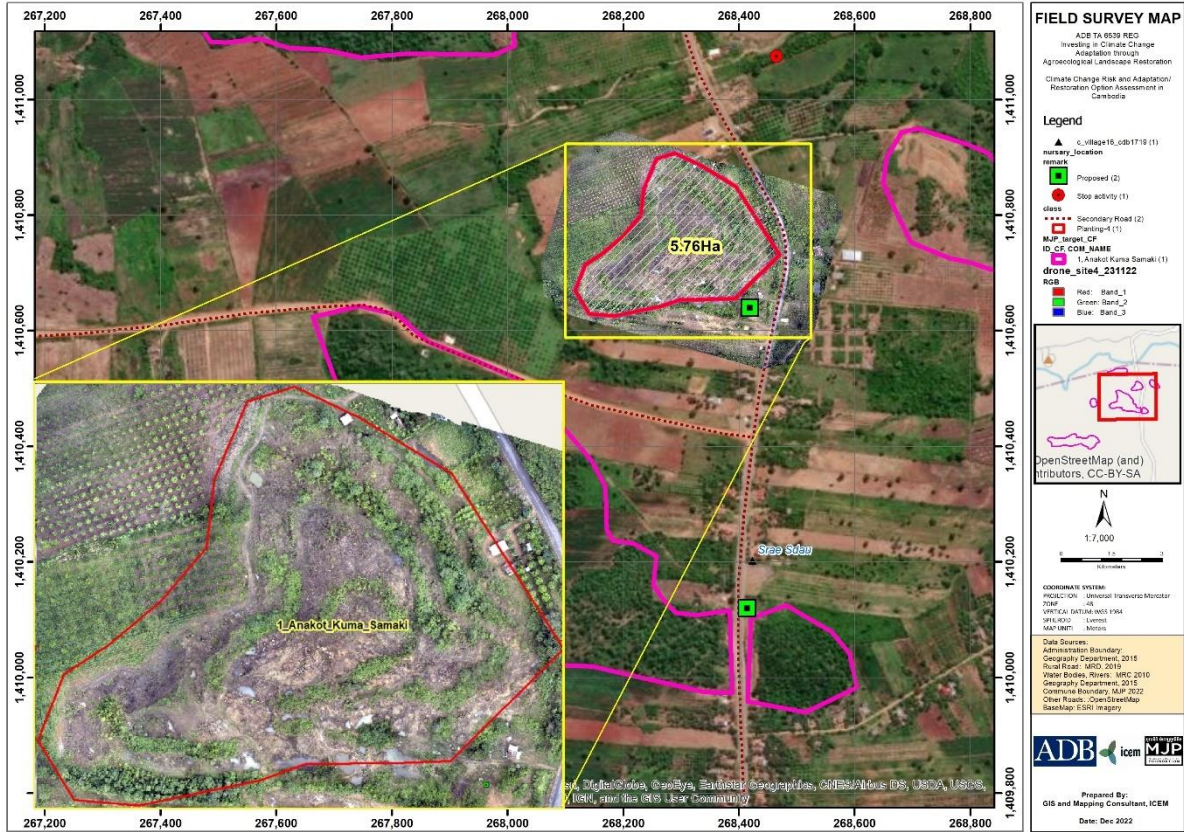


Figure 67. Takie Mean Chey restoration site map

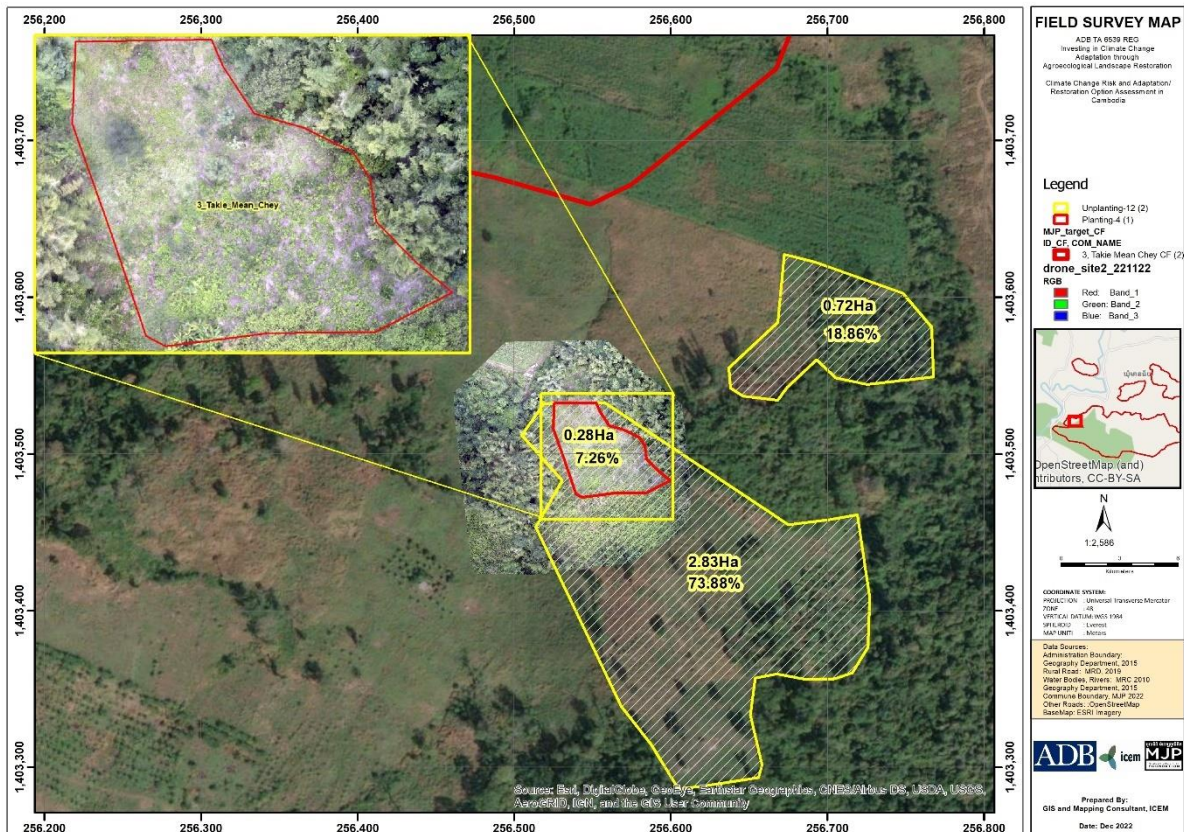
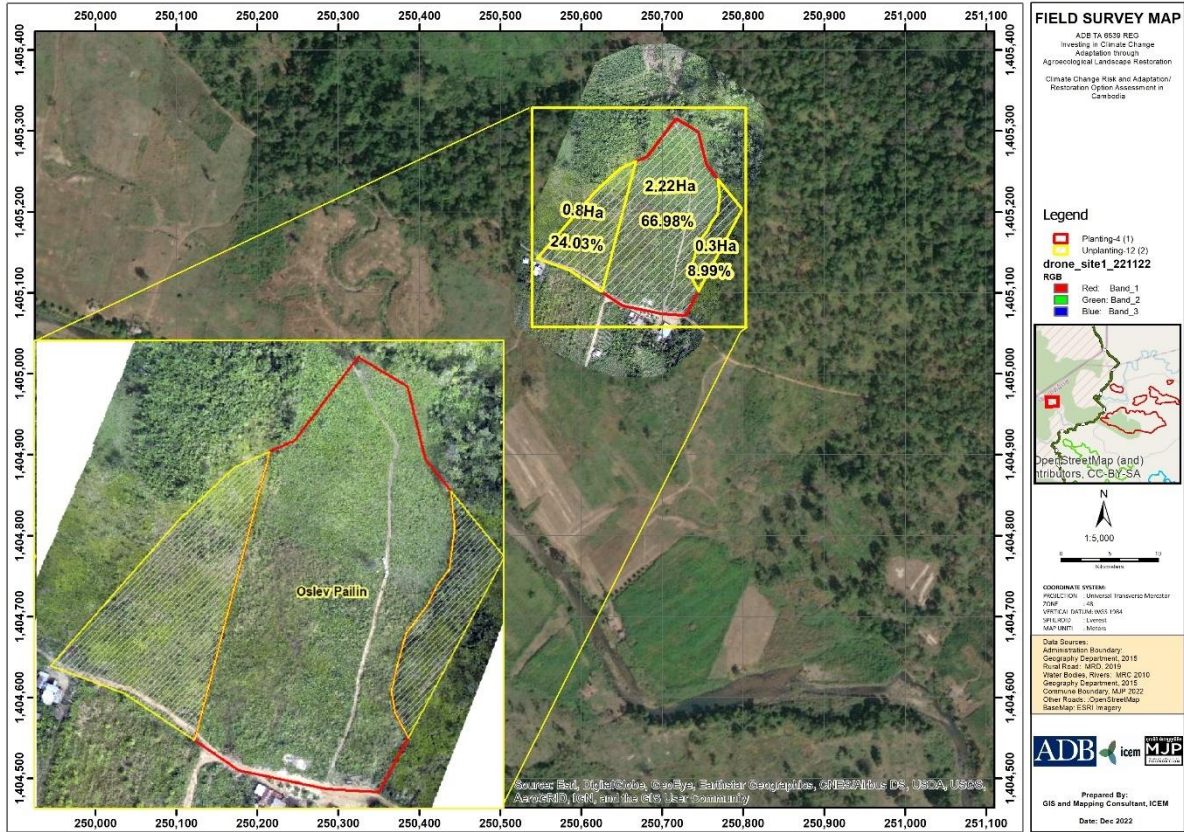


Figure 68. Oslev Restoration Site Map



Annex 4. 2. Field Mission Images

Figure 69. Oslev, Protected Area Restoration Site Activities



Figure 70. Takhes Meanchey Restoration Site Activities



Figure 71. Samki Restoration Site Activities



Figure 72. Donkrek Restoration Site Activities



Figure 73. O Rotkrohs' Nursery



Figure 74. O Tavoaws' Nursery



Figure 75. Training Activities Photos





Annex 4. 3. Participant List

MJP FOUNDATION

បញ្ជីចំណុះអ្នកចូលរួម

អង្គប្រជុំស្តីពី: ការគ្រប់គ្រងប្រព័ន្ធធារាសាស្ត្រកសិកម្មក្នុងតំបន់... ទីកន្លែង: F.H.Q.
 គម្រោង ICEN-ADB

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម				លេខទូរស័ព្ទ
				ថ្ងៃទី២៤ ខែវិច្ឆិកា ឆ្នាំ២០២២		ថ្ងៃទី២៥ ខែវិច្ឆិកា ឆ្នាំ២០២២		
				ព្រឹក	ល្ងាច	ព្រឹក	ល្ងាច	
1	អំ គង់ធា	ស្រី	ប្រធានក្រុមការងារ	Cm	Cm	Cm		089785806
2	សេង គ្រី ពៅ ធី	ស្រី	ស្រី គង់ធា	-	-	-		0717841166
3	ប្រាក់ សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	-	-	-		0717277759
4	ស៊ុន សេនីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		017344465
5	ស៊ុន សារ៉ាស៊ីន	ស	សមាជិក	-	-	-		07164116843
6	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		0779043053
7	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	A	A	A		08137 22-12
8	ស៊ុន សារ៉ាស៊ីន	ស	សមាជិក	Cm	Cm	Cm		0966325653
9	ស៊ុន សារ៉ាស៊ីន	ស	សមាជិក	Cm	Cm	Cm		088 9063761
10	យ៉ាង វិចិត្រ	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		0881238625
11	យ៉ាង ពារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		092 254597
12	យ៉ាង សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		082598040
13	យ៉ាង សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		093727873
14	យ៉ាង សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		0963219500
15	យ៉ាង សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		088657197
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17	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		09296124628
18	ស៊ុន សារ៉ាស៊ីន	ស	សមាជិក	Cm	Cm	Cm		077434103
19	ស៊ុន សារ៉ាស៊ីន	ស	សមាជិក	Cm	Cm	Cm		0889579296
20	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		092573084
21	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		011589442
22	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		0978999851
23	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	Cm	Cm		0882282262
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25	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	A	A		
26	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន	Cm	A	A		096 4915938
27	ស៊ុន សារ៉ាស៊ីន	ស	សមាជិក	Cm	Cm	Cm		092920145
28	ស៊ុន សារ៉ាស៊ីន	ស	ប្រាក់ សារ៉ាស៊ីន ICEN	Connate	Connate	Connate		012263647
29	ស៊ុន សារ៉ាស៊ីន	ស						
30	ស៊ុន សារ៉ាស៊ីន	ស	NRH PO					
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Annex 4. 4. Nursery Technical Training Course Evaluation Summarized

MJP Samlot Office, November 24 to 25, 2022

No.	Topic	Good understood	Able to apply	Note
1	The purpose of establishing a nursery	30	23	Total 32 participants.
2	Arrangement of nurseries	30	22	
3	Work arrangement at the nursery	30	21	
4	Nursery work location and nursery structure	30	21	
5	Nursery Equipment, tools & supplies	30	19	
6	Soil sterilizing	30	20	
7	Seedling preparation and production plan, and seed collection and seed reaction	30	23	
8	Seed collection and seed treatment	30	21	
9	Preparation of soil bags and types of soil bags	30	22	
10	Pest and disease control	30	22	
11	Seedling strengthening and preparation for planting seedlings	30	21	

Noted: There were 30 participants were completed the course evaluation expected 2 MJP officers.

Diagram 1: The purpose of establishing nursery

The purpose of establishing a nursery

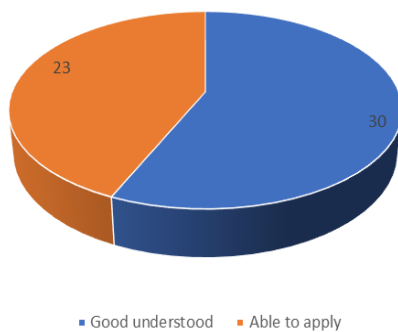


Diagram 2: Arrangement of the nurseries

Arrangement of nurseries

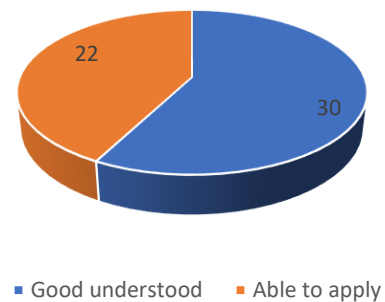


Diagram 3: Work arrangement at the nursery

Work arrangement at the nursery

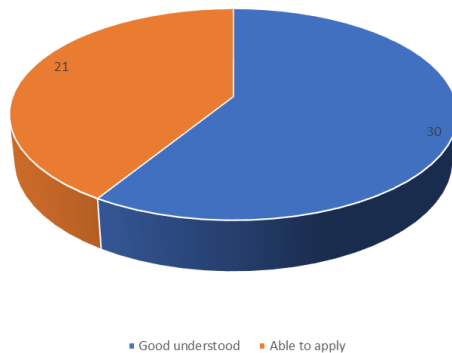


Diagram 4: Nursery work location and nursery structure

Nursery work location and nursery structure

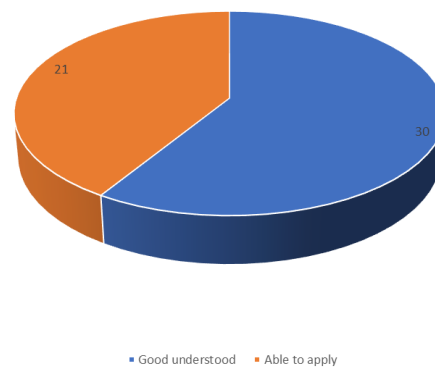


Diagram 5: Nursery equipment, tools, and supplies

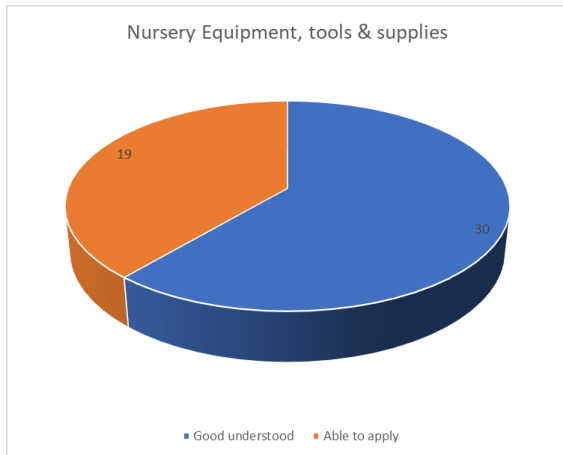


Diagram 6: Soil sterilizing techniques

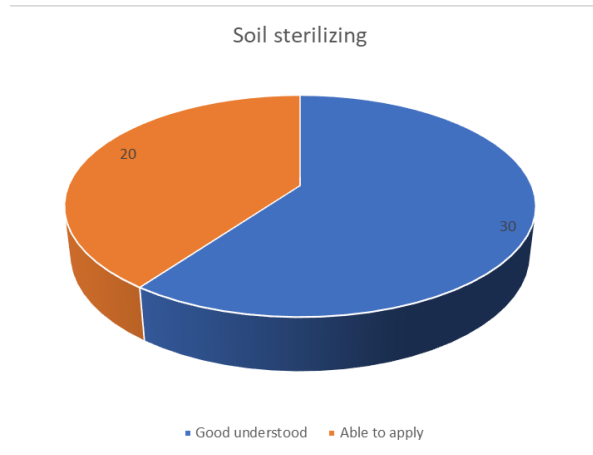


Diagram 7: Seedling preparation, production plan, seed collection and seed treatment

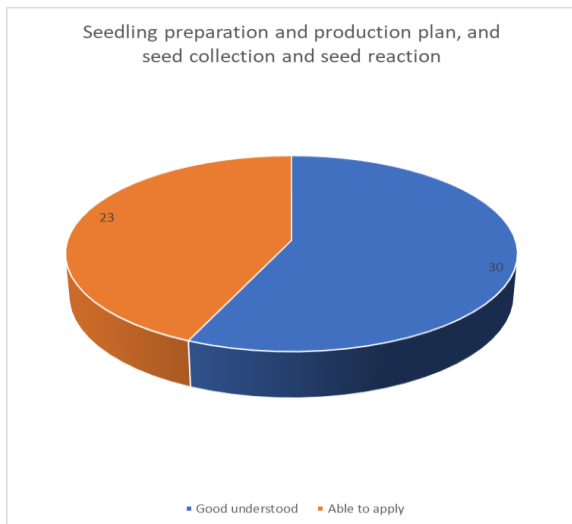


Diagram 8: Preparation of soil bags

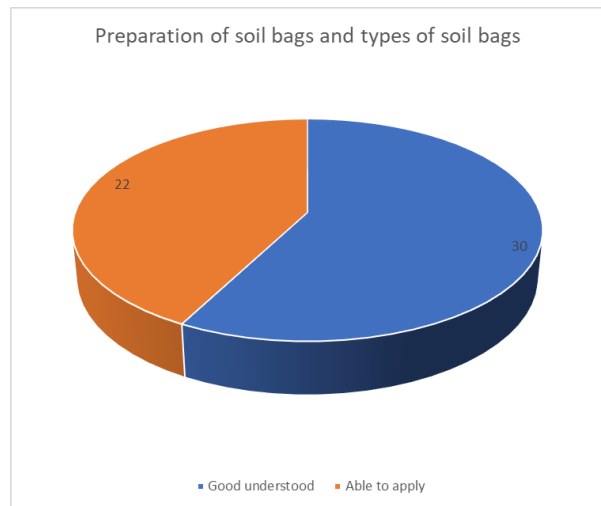


Diagram 9: Pest and disease control

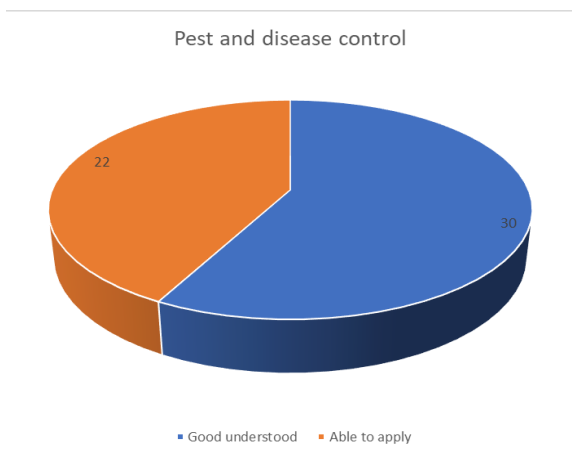
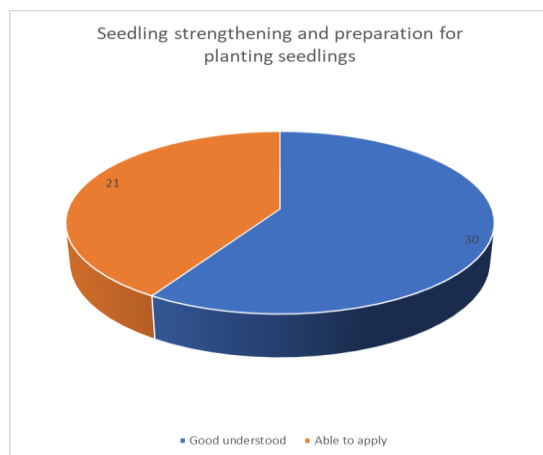


Diagram 10: Seedling strengthening and preparation for planting seedlings



Annex 4. 5. Training Material



Content

1. Purpose
2. Arrangement of nurseries
3. Work arrangement at the nursery
4. Nursery location and nursery structure
5. Nursery Equipment & Supplies
6. Seedling preparation and production plan
7. Seed collection and seed reaction
8. Preparation of soil bags and types of soil bags
9. Pest and disease control
10. Seedling strengthening and preparation for planting seedlings



1. Purpose of Nursery Establishment

- Increase the amount of existing seedlings
- Increase tree species near extinction
- Create a job
- Establish plantations
- Provide seedlings for Arbor Day and World Environment Day
- Provide seedlings for various planting activities, both social and cultural activities
- Build business and income ... etc.

FA Canton Chief caring for his nursery seedlings



Permanent Nursery



2. Arrangement of nurseries

There are three types of nurseries:

- Permanent Nursery
- Temporary or mobile nursery
- Nursery for awareness raising or demonstration

Discussion via brainstorming exercise

Temporary or mobile nursery



Nursery for awareness raising or demonstration



Major activities at the nursery site

Activities range from seed collection to transporting seedlings to plantations:

1. Seed storage and treatment
2. Sowing and planting arrangements
3. Production, collection and storage of fertilizers
4. Producing seedlings
5. Removal and transplanting of seedlings
6. Caring for seedlings with weeds, weather and pests
7. Selection of seedlings
8. Transportation/delivering
9. Distribution of seedlings.

3. Work arrangement at the nursery

First job:

- Location selection and identification
- Planning (restoration and business)
- Timing
- Preparation of training and maintenance activities
- Nursery management
- Implementation of plans and
- Protection and maintenance of tree seedlings.

Old seedlings for planting



4. Nursery location and nursery structure

Nursery location based on two basic techniques and horticulture:

- Good access and all seasons
- Available water and electricity
- The town has enough manpower
- Horticultural techniques determine the location of the nursery
- Good environment and no flooded
- Land for sub-planting and planting Ph = 5.5-7 (large leaf seedlings and Ph = 4,5-6 (small leaf seedlings) Land level slope from 1-3 °.

5. Nursery Equipment & Supplies

- A. Chemical protection material?
- B. Nursery supplies?
- C. Materials or resources used for nursery practice?

Discuss!

Nursery infrastructure

Divided into 2 parts: inside the nursery and outside

1. Inside the nursery

- Land for sowing and nursery beds
- Sub-dimensions can be 1-1.2 m, length 6-10 m and spacing 0.50 m
- There is a mesh roof and a parallel irrigation system, etc.

2. Outside the nursery

- There is a barbed wire fence around the pond and water tank.
- Nursery
- Seeds
- Warehouse Equipment & Supplies
- Fertilizer piles and soil for propagation seedlings ...Toilets and restrooms ... etc.

Nursery Equipment & Supplies





6. Seedling preparation and production plan

A. Seedling production as a business enterprise
 B. Production of seedlings for reforestation purposes
 C. Seedling production for promotion

Discuss the above points!



Tree Seedlings Production plan

Community: _____
 Nursery manager# : _____

No.	Species	Number	Error number	Date
1	ក្រូច	៥០០០	៥៥០០	២០២៣
2	ស្រូវ	១០០០	១១០០	២០២៣

FA Canton's nursery of Battambang and PA O rotkrohs' nursery



Unhealthy tree seedlings at PA O rotkroh nursery



Teak seedlings



Nursery group formulation

- Formulation a group
- Select a team leader
- Encourage women to participate
- Define the roles of team leaders and members
- Create a simple group policy
- Training through hands-on or field trips
- Plan for sapling production with participation.

7. Seed collection and seed reaction

- Selection of parent tree
- Seed characteristics
- Good quality
- Transportation
- Storing
- Seed treatment.



Discuss!

8. Preparation of soil bags and types of soil bags

Soil for mixing:

1. Land on the spot or forest land
2. Sand, river or stream
3. Free material in the form of manure or rice husk charcoal



Different soil types



The right soil mixing method

1 part of normal land + 1 part of forest land or lump
+ 1 part of rice husk charcoal



Soil treatment



Soil treatment by fire heating or roasting

1. Mix the soil according to the above formula.
2. Mix the soil and put it in a saucepan.
3. Bake at 60 degrees for 30 minutes.
4. Leave to cool
5. Entrance to the nursery bag.

Treating the soil and putting it in the nursery bag



Soil treatment advantages

- Kill parasites and bad bacteria
- Kill seeds, unwanted species seeds and weeds
- Make the soil mix well
- Provides optimal moisture and nutrients for seedlings and crops to grow and fight germs and parasites.

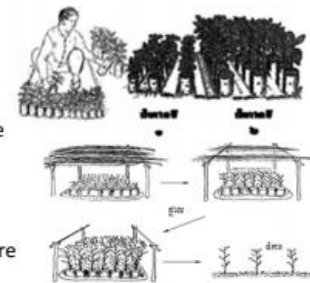
9. Pest and disease control

- Water regularly in the morning and evening
- Cut the roots
- Weeding and killing insects
- Feed the plants to grow well.
- Water repellent protection
- Arrange the seedlings well in the nursery.



10. Seedling strengthening and preparation for planting seedlings

- Arrange seedlings according to height
- Open the roof or take seedlings of all ages outside the shed to soak up the sun before planting.







Fifth Cambodia National Field Mission Report



New restoration site near the 400 border check point. Samlaut district, Battambang province, Cambodia
(photo by Khun Bunnath, ICEM).



Technical Assistance 6539: Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-based Solution for Climate Resilience

Fifth Cambodia National Field Mission Report

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1. BACKGROUND AND OBJECTIVE OF THE MISSION

This fifth national mission built on the work of the previous four missions, which took place between May and November 2022.

In the first mission the national team, in collaboration with the Maddox Jolie-Pitt Foundation (MJP) met with local communities – many of whom have already worked with MJP for many years on various aspects of ecological agriculture and agroforestry – and visited community forest sites of concern to the communities. The sites are relatively distinctive in Cambodia as they are community forests owned collectively by the target communities, except for the Samlout Multiple Use Area (SMUA) site, which is the responsibility of the Ministry of the Environment (MOE) and the local Department of Environment (DOE).

In the second mission, the project team and MJP were joined by community forest committee members and rangers, forestry officers, and military representatives to conduct detailed surveys of the identified sites for restoration. The information collected informed a participatory mapping workshop in which a broad range of landscape restoration issues and measures were identified and documented spatially. The restoration measures emphasized nature-based solutions to the challenges facing the sites. Utilising the maps, the team produced site restoration plans and priority tasks for each site.

In the third field mission, the team provided training sessions in restoration techniques, nursery management, and ecological agriculture livelihood skills including bee keeping. The mission also supported commencement of restoration plan implementation for the four demonstration sites, including seedling planting.

The fourth mission took place from 20 – 25 November 2022 and provided support and guidance for restoration activities, conducted monitoring and continued the capacity building program for the community forest management groups. The mission continued implementing the restoration plans and followed up on actions agreed during the third field mission.

1.1. Mission Objectives

During the mission, the team set out to conduct a survival survey of planted seedlings, evaluate new nurseries, monitor the Oslev site and investigate an alternative site to Oslev given the sensitive community and local government situation, assess the consistency of the water supply at each of the sites, and review the implementation of the restoration plans. A priority activity was the engage the community forest groups in conducting monitoring activities to determine seedling survival rates during the dry season which was severe.

Table 9. Mission Plan Activities

Date	Location	Activity	Responsible team member
April 17	Phnom Penh to Battambang	Meeting with MoE Travel to field site at Battambang	All
April 18	MJP office- Battambang	<ul style="list-style-type: none"> Meeting with MJP to plan and Prepare field works and site monitoring survey Prepare equipment's and tools for field practices 	Khun Bunnath Lay Chanthy Heng Bauran
April 19	MJP field office at Samlout- Battambang/ Anakut Koma Samaki and Takhes Meanchey site	<ul style="list-style-type: none"> Briefing to community members. Survival survey and drone observation of planted seedlings at Anakut Koma Samaki site. Technical assessment of beekeeping, Reservoir observation 	Khun Bunnath Heng Bauran Lay Chanthy
April 20	MJP field office at Samlout- Battambang/	<ul style="list-style-type: none"> Survival survey and drone observation of planted seedlings at Oslav site. Technical assessment at the Ourotkrosh nursery 	Khun Bunnath Lay Chanthy Heng Bauran

Date	Location	Activity	Responsible team member
	Oslav and new restoration site	<ul style="list-style-type: none"> Identify measures to control soil erosion, i.e., build simple soil erosion protection terrace. Assess on drought situation and a possible natural water storage built for restoration site Review implementation of restoration plan Observe new restoration site 	
April 21	MJP field office at Samlout-Battambang Dontret site	<ul style="list-style-type: none"> Survival survey and drone observation of planted seedlings at Dontret site. Technical assessment the Anakut nursery Identify measures to control soil erosion, i.e build simple soil erosion protection terrace. Assess on drought situation and a possible natural water storage built for restoration site Review implementation of restoration plan Introduce agroforestry and agroecology application 	Khun Bunnath Lay Chanthy Heng Bauran
April 22	Battambang to Phnom Penh	Return travel.	All

1.2. Participants

The participants were ADB/ICEM national technical team and field MJP staffs included:

1. Khun Bunnath, Forest and Landscape Restoration Specialist;
2. Lay Chanthy, Community Based Climate Adaptation Specialist;
3. Heng Bauran, GIS and Spatial Planning Specialist; and
4. Field Team of MJP.

1.3. Duration and Sites of the Mission

The five-day field mission was conducted within three community forests (CFs), including Dontret, Anakut Koma Samaki, Takhes Meanchey, Oslev, and a new restoration site located in the Samlout MUA, Samlout district, Battambang and Pailin Province. As part of the mission, a restoration survival rapid survey was combined with technical coaching on survival survey, soil erosion-protected construction, and a nursery rapid assessment.

2. FIELD ACTIVITIES

2.1. Anakut Koma Samaki Site

2.1.1. Survival Survey and Activities

On 19 April, at the Anakut Koma Samaki site, the team conducted a coaching session on restoration survival survey objectives and methodologies for members of the community forestry management committee, FA officers, and the MJP field team. The survey focused on counting and documenting surviving seedlings within five sample lots measuring 10 x 10 meters. In addition, drones were utilized for field observations of the planted seedlings. This produced orthophoto images and facilitated a 3D visualization of the landscape, aiding in identifying water flow patterns to the existing reservoir. Fifteen participants, including five women, actively participated in the on-site technical field coaching and restoration survival survey exercises.

Figure 76. Conducting the Survival Survey



Of the 152 trees counted, 34 had died or were dying, implying a survival rate of 77.6%. Assuming a true representation of the 700 seedlings planted in 2022, approximately 540 have survived.

Table 10. Survival Survey in Anakut Koma Samaki

No.	Trees planted 2022	Assigned lot/ size	Result	Survival Rate
1	700	5x10mx10m	34 of 152 dead	77.6%

The team determined that the seedlings that had not survived had either been too immature at the time of planting or were planted in fast-draining soil. The team determined that where the soil was rocky and sandy fast-growing, multiple-use trees with low root structures and mulching would be more suitable.

MJP restored the pond in March, 2023. The pond was dry at the time of the mission, although it is expected to fill during next rainy season and will provide sufficient water for the planted trees. The technical team, MJP field team, FA officers, and community members agreed to replace the dead tree seedlings with 1,000 fast-growing multiple-use trees.

2.1.2. Restoration Actions in Anakut Koma Samaki

The team reviewed the progress of the restoration plan.

Table 11. Restoration Action Plan in Anakut Koma Samaki

Objective	Action planned	Action done
Creation of Wetland Areas		
Sept-Oct 2022	Plant tree seedlings around wetland/ pond and link small drainage corridors with native tree species to enhance and protect as community assets.	Deepened and extended existing pond. However, the excavated pond needs to be further improved especially the water channel, to collect water from catchment areas. Keep network of smaller ponds connected.
Dry season 2022-23	Monitor the wetland and pond area in the dry season and plan for future works such as small brushwood dams. Monitor growth of seedlings planted	Wetland areas have been planted tree seedlings since September 2022. No progress as yet with erosion control on waterways from uphill to the ponds at hill footage.
Forest nursery production		
Sept-Oct 2022	Procure seedlings from established nurseries in Y1.	Tree seedlings supplied by MJP.
Dry season 2022-2023 (and subsequent years)	Establish the community nursery in Y1 to prepare plants for Y2.	Community has identified a 15mx20m land plot close to main pond of restoration site for community nursery. However, preparation is not yet completed.
Field planting		
Sept-Oct 2022	Planting tree seedlings.	Tree seedling been planted over the wetland area during mission 3 in September 22.

Objective	Action planned	Action done
Establishment of Community Buildings	1. Identify building requirements according to site and community goals. 2. Procure materials 3. Erect buildings	Community found community building at site is necessary. However, plan for building is not done yet.
Development as Visitor Attraction		
Sept-Oct 2022	Identify the outline restoration process, procure materials required to build and maintain the path and prepare it as required.	Beside tree seedling planting and pond preparation, other works including improving the access path not yet commenced.
Dry season 2022-23	Develop a multi-purpose plan for the site based on a study on local demand and interest. The plan should be discussed and formally agreed by the community.	The plan to establish an attractive tourist site to be prepared.

2.1.3. Water Resource at Anakut Koma Samaki Site

The water resources at the Anakut Koma Samaki restoration site primarily rely on the water available on-site. The soil conditions at the site are sandy and rocky. Recently, as part of the project activities, MJP excavated a large pond linking several existing quarry ponds and expanded them to store water for on-site use. This pond, known as the mother pond, serves as the main water source for site restoration. Additionally, there are six other quarry holes that can be converted into subordinate ponds to supplement the mother pond. They will require additional excavation work to increase their capacity and allow them to collect water from catchment areas. The seven ponds are arranged in descending order of elevation, offering a picturesque view of the landscape and bodies of water. Those ponds should be treated as constructed wetlands and planted out for multi uses.

The water flows between the ponds through a series of buried pipes. As an additional water source, the site can be connected to the nearest local water supply pipe, which pumps water from the Sangke River for domestic use in nearby houses. Another option provided by MJP is the provision of a 3,000L PVC tank with a stand for the community. These tanks can be placed at the top of the hill. With these water storage containers in place, water can be pumped from the pond into the tank and then flow downhill through an installed water pipe. During the dry season, water can be manually collected from the pipe and distributed to the seedling trees for irrigation purposes. The tank will need to be screened with vegetation so it hidden from view.

Preparation of Seedling Watering Pond



Landscape View at Community Tree Planting Site



Drone Photo of Water Storage Pond



Lot 10m x 10m for Counting Seedlings



Using the Sketch Method to Draw a Map of Water Flow to the Storage Reservoir



Recording the Number of Survived Seedlings



Involvement of Community Groups



Meeting Place Arrangement



2.1.4. Technical Assessment of Beekeeping

The Anakut Koma Samaki beekeeping community group is an integral part of the project. The technical team recently visited the beekeeping site to better understand each group's teamwork and rotational cycle procedures. The team received additional technical input from an MJP expert during the visit. Five beekeeping group members participated in the meeting, including two women. Currently, there are 30 members in the beekeeping community group, including ten women.

Investments in beekeeping have been limited thus far, with the project providing only short-term technical training in the weeks leading up to the technical team's visit. To have a greater impact on the project, MJP is considering scaling up the investment by providing local transportation facilities for the mobilization of beehives and purchasing more beehives to meet market demand. In light of this, the technical team recommended developing a long-term business plan for the beekeeping groups and creating a bee safety mobilizing map to enhance the effectiveness and safety of beehive mobilization. These measures are essential for the sustainability of beekeeping in Samlout, particularly as most agricultural lands in Samlout are contaminated with chemicals.

The next national technical team mission visit will consider the development of the beekeeping business plan, provide technical guidance and training, and create a bee safety mobilizing map. These

initiatives will contribute to the long-term success of beekeeping in the region and support the growth of a forest with diverse and flourishing trees.

Beekeeping Harvesting Activities



Discussion about Beekeeping Method, Harvesting Time, Marketing and Planning

Beehive Monitoring Activities



Finding the Bee Queen



2.2. Oslev site

The Oslev restoration site has been placed under the jurisdiction of the Pailin Provincial Administration, designated as a Protected Area and managed by Pailin DOE. However, the findings from a fact-finding assessment revealed that all the sapling trees planted by DOE staff, community members, MJP, and the project team in 2022 have been destroyed by unidentified individuals involved in clearing and encroachment on the Protected Area. Additionally, the project awareness billboard was deliberately burnt.

Consequently, the technical mission team organized a meeting with 17 PA Rangers to discuss the feasibility of continuing restoration activities at the site or considering a withdrawal. Numerous challenging factors emerged, suggesting withdrawing from the site and shifting focus to another Protected Area within the Samlout area under the jurisdiction of Samlout and Battambang administration which is more supportive of the restoration work.

The primary challenge stems from the fact that the Oslev restoration site is no longer under the jurisdiction of the Battambang administration. Moreover, as highlighted by the PA Rangers, the decision not to conduct the restoration survival survey exercise was made to avoid potential conflicts with the local people who are illegally occupying the area.

As a result, it is recommended to discontinue any further activities at the Oslev restoration site.

Group Photo Session at Oslev Site



Meeting Place Arrangement at Oslev Site



Discussion with Local Patrol Team



Burnt Project Billboard



Behind the Proposed Tree-Planted Oslev Site



Landscape View at Community Tree Planting Site



Land Grabbing and Deforestation



Deforestation for New Road Development Project



2.3. Takhes Meanchey

2.3.1. Restoration Survival Survey in Takhes Meanchey

The project team provided coaching to local community members on how to conduct a survival survey. Eighteen people, including four women participated in the coaching session and undertook the restoration survival survey exercise. The team also deployed drone technology for field observations of planted seedlings and water flow analysis to the reservoir.

Table 12. Survival survey in Takhes Meanchey

No.	Tree Planted Y-2022	Assigned Lot/ Size	Result	Survival Rate
1	1,450	10 x 10mx10m lots	20 of 370 dead	95%

The survival rate was high because of the moisture of the soil, soil nutrition, and the maturity of the planted tree seedlings. The technical mission advised the community to grow typical root crops such as ginger and chili to protect against soil erosion and provide extra income.

Discussing the Results



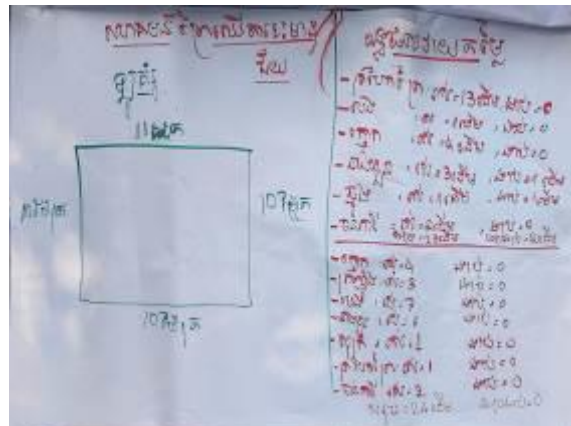
Summarizing the Number of Survived Seedlings



Using the Sketch Method to Draw a Map of Water Flow to the Storage Reservoir



Recording Survey Results



Lot 10m x 10m for Counting Seedlings



Restoration Site



2.3.2. Restoration Plan Implementation Status in Takhes Meanchey

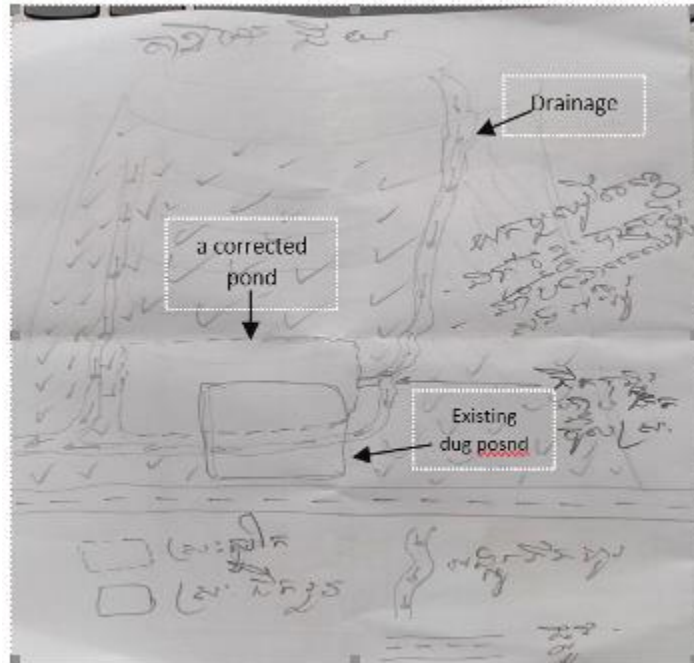
The team reviewed the implementation of the restoration plan at Takhes Meanchey. Table 13 provides a summary of progress thus far.

Table 13. Restoration Action in Takhes Meanchey

Objective	Action Planned	Action Done
West (0.81 ha): Re-establish the forest cover with a mix of native and exotic trees		
Sep-Oct 2022	Plant tree seedlings.	Tree seedlings planted in September 2022
2022 and subsequent years	After first year, seedlings to come from MJP's own nursery (see below).	MJP supplied tree seedlings for community to plant.
East (0.41 ha)	Reestablish forest cover with a mix of native and exotic trees	Pending
East - Establish Nursery	Establish the community nursery in Y1 to prepare plants for Y2.	Pending
East - Stabilize Drainage Line (0.23 ha)		
Sep-Oct 2022	Rehabilitate main drainage line by clearing bamboo and removal of debris in drainage corridor using material cleared to create 'Leaky Dam(s)' to pool water for wildlife. Replace bamboo in channel with native species. brushwood check-dams: use smaller pieces of wood woven between stakes and are usually used to stabilize small gullies.	Some bamboo trees along the drainage at the footage have been cleared. No erosion control check dams have been prepared for the drainage.
Dry season 2022-2023	Continue drainage line rehabilitation by clearing bamboo and constructing leaky dams and/or brushwood check dams as necessary.	Pending
Wet season 2023	Monitor plantings from previous season and infill as necessary and as seedlings become available. Check performance of dams and maintain/change design as necessary.	The fifth mission surveys seedling survival. The replacement of dead seedlings and further planting seedlings were scheduled during the fifth mission.
Sep-Oct 2022	Allow harvesting of cassava crop, infill furrows with unrequired plant material. Aim is to replace cultivation with native and exotic trees.	pending
Dry season 2022-23	Assess whether cultivation can continue: Vegetative Fencing Vegetative fencing is a conservation practice that consists of a combination of planting materials planted in rows with grass and legumes sowed behind these rows.	Pending

2.3.3. Water Resource

As part of the project, MJP supported the community by digging a pond at the base of the mountain, near the community road. The pond is approximately 10mx10mx5m. However, the current position of the pond, directly exposed to the drainage from uphill of the mountain may not function effectively. This position obstructs the natural water flow and makes the pond susceptible to filling up with debris and eroded soil from uphill. Adjusting the pond's position to maintain the natural waterway is recommended. The correct placement of the pond should be slightly away from the natural waterway, allowing the pond to receive water through a digging drainage ditch or trench. Another concern raised by the community is the capacity of the new pond to hold water, which could be problematic in the first and second years. The pond is located in a hilly area, so its capacity to retain water may be limited initially. However, the community can conduct tests to assess the pond's water-holding capacity and expect improvements over the years.



Additionally, MJP has provided the community with a 3,000L PVC water storage tank along with a stand. The community plans to place the on the mountain to facilitate water flow. The water can then flow downhill through a water pipe, ensuring a stable water supply. This collected water can be accessed from taps to water the seedlings during the dry season. The tank will need to be appropriately screened with vegetation.

2.4. Dontret site

2.4.1. Restoration Survival Survey in Dontret

The team worked with the forest community to undertake a survival survey and identify suitable water sources to support the seedlings at the restoration site. The team also provided technical training on seedling replacement, soil erosion control, and lessons learned from successful agroforestry practices in Cambodia.

A total of 35 individuals, including 15 women, actively participated in the restoration survival survey and the construction of soil erosion protection infrastructure demonstration. The community's involvement in these activities demonstrates their commitment to the project and their dedication to achieving successful restoration outcomes.

Table 14. Survival Survey

No.	Tree Planted Y-2022	Assigned Lot/ Size	Result	Survival Rate
1	1,500	5 x 10mx10m lots	259/884 dead	71%

Community Training

Agroforestry Lesson-learnt



Seedlings Counting



Recording the survived seedlings



Growing Seedlings at Dontret



Growing Seedlings at Dontret



2.4.2. Restoration Plan Implementation Status of Dontret Community Site

Table 15 provides a summary of progress made in the implementation of the restoration plan at the Dontret community site.

Table 15. Restoration action in Dontret

Objective	Activities planned	Status
Area A 5.07 ha: Establish a mix of native and exotic trees and other plant species that best contribute to local livelihoods		
Forest Area Sep-Oct 2022	Plant tree seedlings and prepare nursery site	Tree seedlings planted in September 2022
2022 and subsequent years	After the first year, continue planting trees and take care of seedlings	Tree seedling survival survey conducted during fifth mission. Dead seedlings will be replaced by new seedlings in May 23.
Cassava Cultivation Area		
Sep-Oct 2022	Reduce soil erosion in existing cassava areas by creating small check dams with rocks and natural debris in furrows every few meters.	A soil erosion control demonstration site at hill slope at about 18m x 16m has been established with the community and materials supplied from MJP. Representatives from Anakut Koma Samaki, Takhes Meanchey, and Rangers participated in the construction.
Dry season 2022-23	Assess whether cultivation can continue: continue planting seedlings Vegetative fencing would be a suitable soil & water conservation measure for use in rehabilitation of cassava cultivated land.	Cassava production on the hill slope halted, but cassava in adjoining area will continue for one more year.
Vegetative Fencing	Vegetative fencing is a conservation practice that consists of a combination of planting materials established in rows with grass and legumes sowed behind these rows.	Agroforestry: Dontret agreed to be a site for practicing agroforestry. As agreed, community decided to grow gingers and pineapple during the coming rainy season.
Wet season 2023	Plant native and exotic trees and vegetative fencing as required.	Plan to continue planting more tree seedling in May 2023 and in coming rainy season
B 2.99 ha	As A	Pending
C 1.67 ha	As A	Pending
D 0.79 ha	As A	Pending
E 0.31 ha	As A	Pending
F 0.05 ha	As A	Pending
Rehabilitation of the local nursery in Donkrek village	Start rehabilitation of the nursery in Y1 to prepare plants for Y2.	Pending

2.4.3. Water Resource at Dontret Site

The availability of water at the Dontret restoration site is scarce, particularly during the dry season. There are no ponds or ground wells nearby, and the topsoil is compacted, making it difficult for water to penetrate the ground. The groundwater level is not accessible at a depth of above 80 meters during the dry season. To address this issue, it is necessary to prepare a water pond at the foot of the sloping hill-mountain to collect water, the deep drill well is also an option, beside the pond, which may not hold the water.

However, the community has confirmed that the soil in Dontret does not retain water well due to the site's high elevation. To ensure that the pond can effectively hold water, it is recommended to line the bed and walls of the pond with biological (ie algae) or clay/lime sealing technology as an alternative to plastic liners. The aim is to prevent water from seeping into the ground, thus maximizing water retention in the pond. The team will need to explore the costs of various pond sealing options and some experimentation will be needed to assess effectiveness with differing soil types.

In addition to the pond, MJP has provided the community with a 3,000L PVC water storage tank along with a stand. The tank will be placed uphill on the mountain to facilitate water flow downhill. With the availability of this water storage tank, the community can pump water from the pond to fill the tanks

during the dry season. The water can then be released downhill through a water pipe, providing a reliable water supply. The collected water can be accessed from taps to manually water the seedlings during the dry season. This approach will help overcome the water scarcity issue at the site.

2.5. Ourotkrosh Nursery

The team introduced the concept of nursery standardization to 14 PA Rangers, including three women. The PA Rangers actively participated in the assessment by using a standardized assessment form for the nursery. They collected the necessary data and entered it into the recording form.

Based on the participatory assessment, it was observed that the nursery still lacks certain aspects such as proper soil mixing and sterilization techniques. The PA Rangers also have limited knowledge of tree seed germination techniques, seed growth stimulation, and seedling maintenance. Additionally, there is a shortage of necessary nursery materials and equipment, including tree seeds, plastic bags, small shovels, and soil sterilizing pans, as per their production plan.

To address these gaps, a refresher technical coaching session was provided to ensure that all PA Rangers are familiar with the required technical skills and ready to apply them in their own nursery operations. MOE established and manages the Ourotkrosh Nursery.

The PA Rangers reported that the investment in the nursery, including the pumping machine and other equipment, is insufficient. Consequently, the team requested that the investment be scaled up to have a greater impact on the project's contribution under the management of MOE. The mission team submitted a list of required nursery equipment, tools, and seeds to the MJP Director during the feedback mission, highlighting the need for increased investment in these areas.

Table 16. Seedling Production Plan in Ourotkrosh for the restoration work

Tree Species	Number of seedlings	Number of errors*	Existing seedlings
Pahadia Cochinchinensis	1,000	1,500	1,130
Dalbergia bariensis pierre	1,000	1,500	423
Dalbergia cochinchinensis	1,000	1,500	3,580
Pterocarpus pedatus	1,000	1,500	
Hopea and Shorea sp.	500	600	
Sindora sumatrana	1,000	1,500	
Dipterocarpus alatus	700	1,000	260
Dolabriformis	1,000	1,500	320
Rubber	1,000	1,500	
Cashew	2,000	2,500	
Sugar-palm tree (Borassus flabelliformis)	2,000	2,500	
Maringa	2,000	2,500	
Caesalpinia pulcherrima	1,000	1,500	1,007
Cassia fistula	2,000	2,500	100
Acacia	2,000	2,500	
Capok	2,000	2,500	
Cardamom	2,000	2,500	
Total	23,200	35,600	6,820

Note: * It was proposed to increase the actual number of seedlings planned to replace the death if it occurred.

Nursery Standardize Assessment Training



Inside Ourotkrosh Nursery

Nursery Standardize Assessment Activities



Ourotkrosh Nursery



2.6. Kanchang Nursery

The current state of several parts of the nursery is old and dilapidated, posing concerns about its viability. To address the issue of water management during the dry season, the community has proposed new constructions near the fence and the pond. The nursery business plan outlines that the nursery should have dimensions of approximately 15 meters by 25 meters, which would be suitable for producing around 10,000 to 15,000 seedlings.

A technical feasibility rapid study was conducted by 14 community members and FA Officers, including two women, to assess the proposed site. Based on their assessment, the proposed site is deemed sound and technically appropriate for the nursery.

To ensure sustainability and effectiveness, the community requires a five-year nursery seedling production plan. This plan would transform the nursery into a self-sustaining enterprise that can provide seedling distribution over an extended period.

The community members and FA Officers have requested the project's support in providing nursery installation materials, tools, and equipment. They emphasized the importance of initiating the installation process as soon as possible, prior to the raising season, to ensure timely establishment and operation of the nursery.

Table 17. Seedling Production Plan in Kanchang

Tree Species	Number	Error number*	Existing seedlings
Dalbergia cochinchinensis	2,000	3,000	
Pahadia Cochinchinensis	2,000	3,000	
Pterocarpus pedatus	3,000	3,500	
Dalbergia bariensis pierre	2,000	3,000	6,500
Total	9,000	12,500	6,500

Note: * It was proposed to increase the actual number of seedlings planned to replace the death if it occurred.

Propose New Nursery Behind Old Structure



Meeting Place Arrangement



Site of old Kanchang Nursery



Inside Old Structure of Kanchang Nursery



2.7. New restoration Protected Area site

A conflict-free location is a priority condition for selection of a restoration site. According to the results of the team survey of options and the advice of MJP and the MoE-Samlout Patrol Team the proposed new site is located 7 kilometers from Ourotkrosh nursery site and 2 kilometers from the 400 Border Check point of Samlout District. Site selection criteria include the absence of land disputes, the availability of open land areas, accessibility to transportation, and participation from all relevant stakeholders, especially the PA Rangers, the Provincial Department of Environment, and the local authorities. After formal approval by the Provincial DOE, the restoration plan will be developed during the next field mission, and restoration activities should begin in June. The new PA restoration site identification process involved 2 PA Rangers, 2 MJP field staff, and the mission team.

Map Location of Propose New Restoration PA Site



Drone Photo of New Restoration Location



2.8. Soil Erosion Control Demonstration

The soil erosion control demonstration showcased the most appropriate measures that communities can learn from and implement at their respective restoration sites.

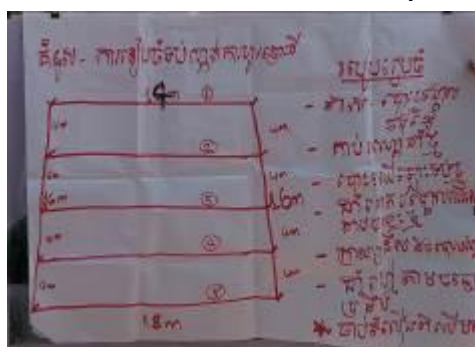
The adopted measures include a combination of green techniques such as brush mattresses, field trenches, vegetated riprap, and live staking. These techniques have been chosen for several reasons: they are environmentally friendly, they are suitable for controlling soil erosion in hilly areas with use of locally available materials, and they effectively contribute to improving soil condition and facilitating underground water filtration.

The materials used for these measures are natural and readily available within the community. The materials provided by the project for the demonstration include 300 stones measuring 30cm x 30cm, bamboo brush mattresses with a height of 2 meters covering 80 meters, 100 live sticks, 5 bags of local grass, 100 bamboo sticks, and 1kg of jute string.

By utilizing these materials and implementing the recommended techniques, communities can effectively control soil erosion, retain moisture, and promote the sustainable management of their restoration sites.

The soil erosion control demonstrations were established to present the most appropriate soil erosion measures that communities can apply at their respective restoration sites. This soil erosion control demonstration shows how to prepare and slopes, the materials required, and the methods for their installation.

Community activities to install erosion control equipment



Selection of site: The Dontret restoration site was chosen as the demonstration site for soil erosion control measures. This site is particularly prone to soil erosion due to its steep terrain and lack of vegetation to protect the soil. To address this issue, a specific plot of land on a steep hill within the Donkrek restoration site was identified for the demonstration.

This plot of land serves as a visible and accessible location, conveniently situated near the road to Donkrek village.

Participants: There were about 40 participants from Dontret community, Takhes Meanchey community, Anakut Koma Samaki community, Rangers, and MJP staff participated in establishing the soil erosion control demonstration.

Installation of soil erosion control demonstration

On 21 April 2023, the soil erosion control demonstration site was established at Dontret restoration site. The selected plot of land for the demonstration measures 18mx16m in size. Before the field exercise, participants received instructions on setting up the materials on the site.

The participants were divided into different groups, each assigned specific responsibilities. One group was responsible for placing stones, another for planting live sticks, another for setting up the bamboo brush mattress, and a group of women participants focused on planting grass.

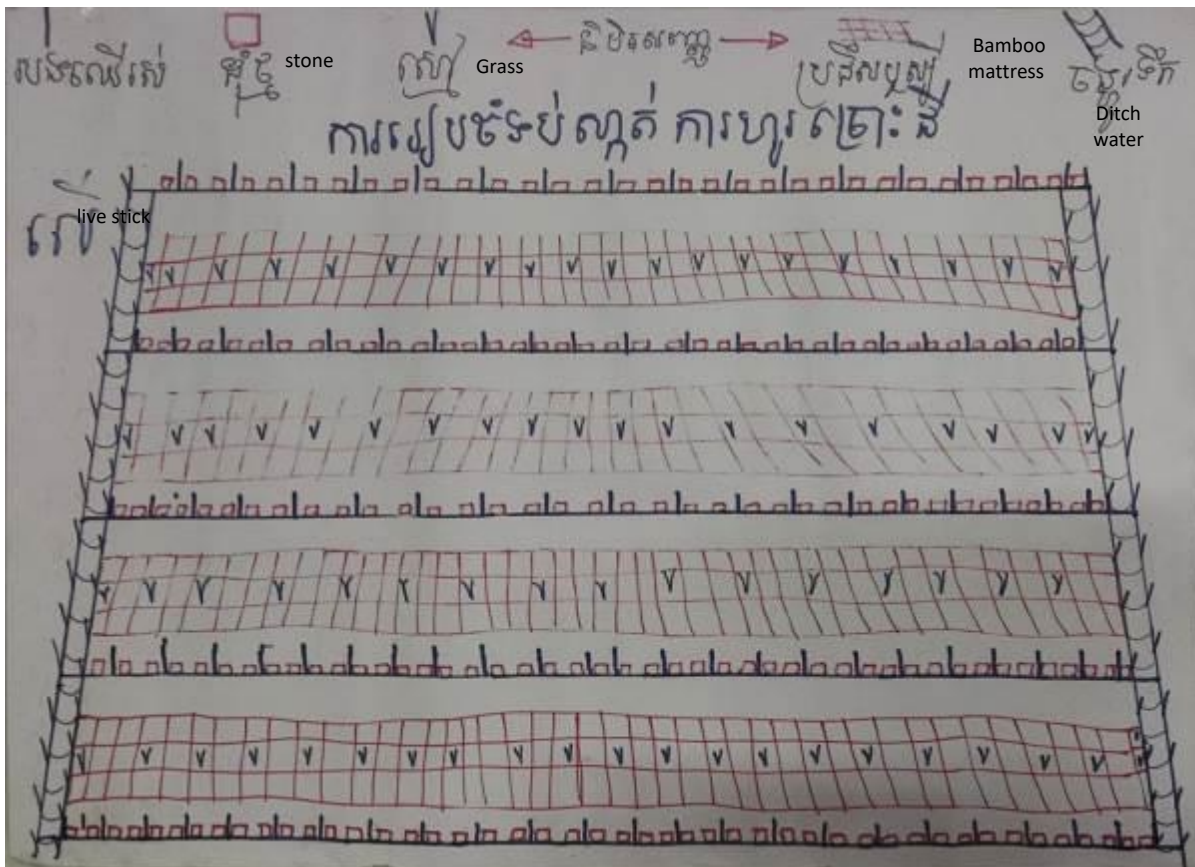
Following the instructions, the participants began setting up the demonstration site. They divided the area into five rows from uphill to downhill, with row lines marking the boundaries. One group started placing stones along the row lines, ensuring that each stone was inserted one-third into the ground and maintaining a spacing of 10cm between stones.

Simultaneously, another group planted live sticks approximately 20cm in front of the stone rows, with a spacing of 1.0m between each live stick. Once the stone rows and live sticks were in place, the group responsible for the brush mattress began laying them between the rows. Each piece of brush mattress was positioned 0.5m apart from the adjacent one.

The group of women participants assigned to planting grass then started planting grass within the spaces allowed by the brush mattress, maintaining a distance of 30cm between each bunch of grass.

The work exercise took the entire morning to complete. At the end of the exercise, the participants, particularly the Dontret community, were instructed to water the demonstration site every three days until the grass and live sticks grow properly or until the rainy season begins. Additionally, the community was encouraged to plant tree seedlings within the allowable spaces of the demonstration site, especially uphill and on both sides. It was recommended to plant the tree seedlings as early as possible in May 2023 to facilitate their growth.

Guidance Sheet for Instructing Participants in Installation of the Soil Erosion Control Equipment



Installing Erosion Control Equipment



The soil erosion control demonstration site has the potential to become a tourist attraction in the near future. The site is situated in a beautiful landscape with captivating views. The sticks planted as part of the demonstration are known to produce beautiful flowers, adding to the site's visual appeal. Additionally, the site's proximity to the main road that leads to Dontret village makes it easily accessible for visitors.

3. MISSION OUTCOMES

The mission outcomes align with the expected outputs as follows:

Replacement Planting at Anakut Koma Samaki: It was agreed to replant 1,000 fast-growing seedlings at Anakut Koma Samaki in May 2023. The seedlings will be purchased from private nursery distributors, ensuring their maturity and health. Also, water extraction from the existing water distribution tub will be facilitated to provide water for the replanted seedlings.

Scale Up Beekeeping: The mission team and MJP agreed to invest in scaling up beekeeping based on market demand and community capacity.

Decision on Oslev Site: Due to a serious land dispute and the transfer of the Oslev site to the Pailin Provincial Administration, it was agreed to withdraw from the Oslev restoration and identify a new restoration site under the jurisdiction of Samlout. MJP and PA Rangers strongly recommended this replacement.

Agroforestry at Takhes Meanchey: Since the survival rate is high at the Takhes Meanchey restoration site, there is no need for replacement planting. Instead, the mission team recommended implementing agroforestry practices by growing multiple crops such as gingers and chili alongside the planted trees.

New Tree Planting and Replacement at Dontret Site: The mission team recommended new tree planting at the soil barrier erosion protection area built during the mission. Fast-growing trees were recommended for the site. Additionally, due to the low survival rate at the previous restoration site, cultivating multiple crops such as ginger and galanga under the planted trees was recommended.

Scaling Up Nurseries: All supported nurseries, including those of the PA and communities, will be transformed into seedling distributor enterprises. The mission team agreed to provide coaching and guidance to help these nurseries become profitable and sustainable in the long run.

These outcomes reflect the mission's objectives and contribute to the overall success and sustainability of the project.

The nursery monitoring outcomes area summarized in Table 18.

Table 18. Nursery Monitoring Indication

No.	Site	Nursery status	Specific progress activities during the visited
1	Ourotkrosh – PA (Samlout)	Existing nursery (large size nursery funded by MoE)	Tree seedling productions are in progress but lack tree seeds, plastic bags, other materials, and equipment. MJP agreed to provide those required tree seeds, plastic bags, other materials, and equipment.
2	O Tavoaw – PA (Pailin)	Existing nursery (large size nursery funded by MOE)	No, visited. Out of target.
3	Kanchang - Community	New (15mx20m)	Tree seedling productions are in progress but the nursery is old and dilapidated. MJP agreed to provided new nursery construction and infrastructure.
4	Dontret – Community	Existing nursery (10m x15m)	No, progress was made.
5	Takhes Meanchey – Community	New (15mx20m)	No, progress was made.
6	Anakut - Community	New (15mx20m)	No, progress was made.

4. ISSUES IDENTIFIED IN THE MISSION

The high staff turnover at MJP has posed challenges in conducting effective fieldwork and community engagement. The ponds dug at Anakut and Takhes require further work and the water well at Dontret has not yet been constructed.

5. ACTION PLAN AND NEXT STEPS

The sixth national technical mission should include the following activity items:

Tree planting and development of a maintenance plan for the new PA restoration site: The mission should focus on planting trees at the Oslev replacement site and work with the community to develop a comprehensive plan for the ongoing maintenance and care of the planted trees.

Replication of the soil erosion barriers protected demonstration to other sites: Based on the success of the soil erosion control demonstration, the mission should replicate this technique at other restoration sites to prevent soil erosion and promote soil health.

Observation of ponds' water storage and reservoirs: The mission should assess and observe the functionality and effectiveness of the ponds and water reservoirs established at various sites.

Beekeeping and other alternative livelihood activities (crops growing under greenhouse): The mission should support and promote alternative livelihood activities such as beekeeping and greenhouse farming.

Orientation of nursery business plan modality to all nursery managers: The mission should conduct an orientation session to educate and guide all nursery managers on the proper implementation of the nursery business plan.

Follow-up on the progress of agroforestry/agroecology application at Dontret and Takhes Meanchey and scaling up to other sites: The mission should monitor and evaluate the implementation and progress of agroforestry and agroecology practices at Dontret and Takhes Meanchey restoration sites.

ANNEX 5. 1. RESTORATION SITE ASSESSMENT AND MAPPING OF DEMONSTRATION SITES.

Figure 77. Lot Assignment in Anakut Koma Samaki



Figure 78. Lot Assignment in Dontret

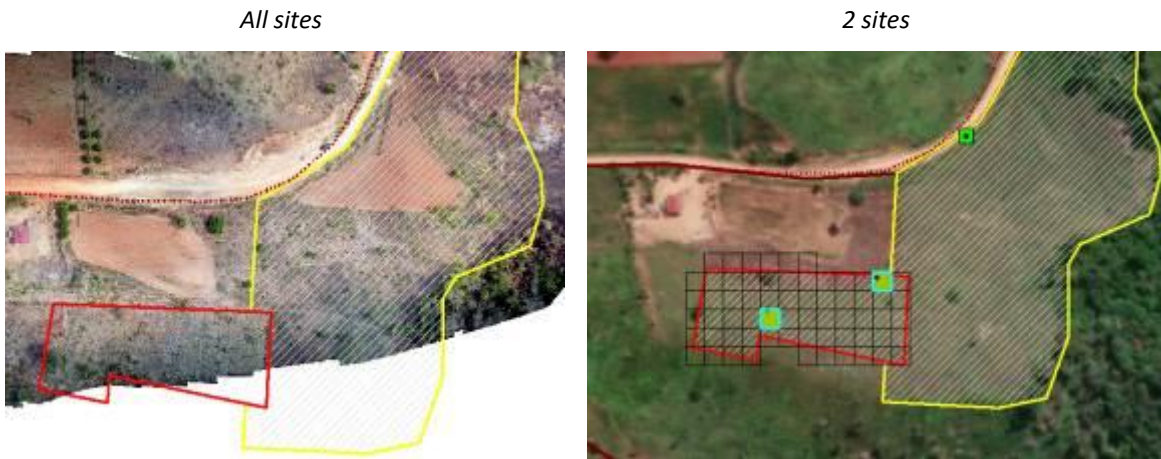


Figure 79. Lot Assignment in Oslev

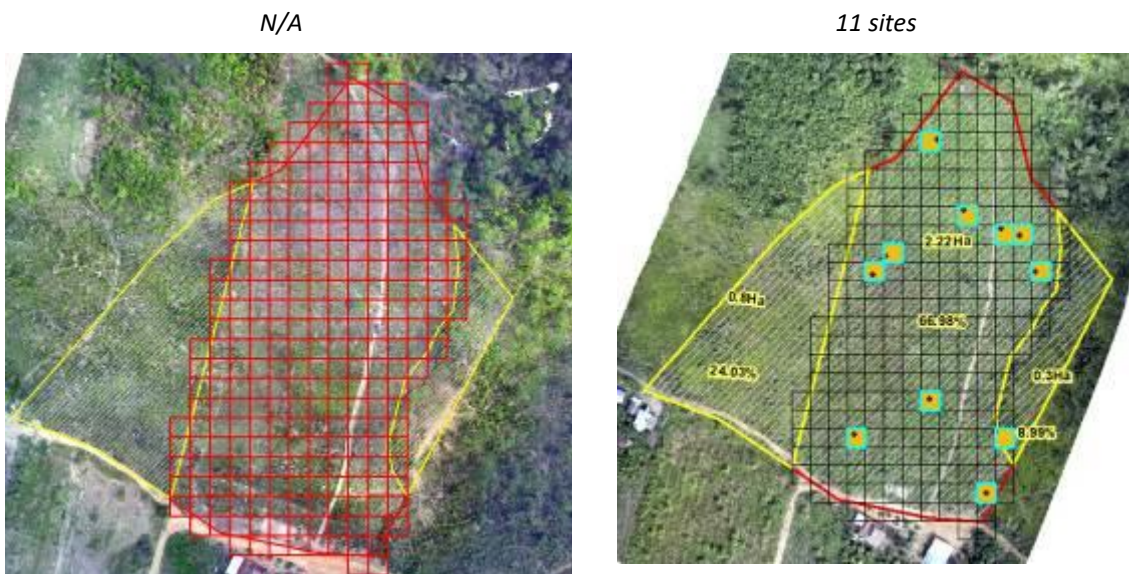


Figure 80. Proposed New Site Near the 400 Border Check Point

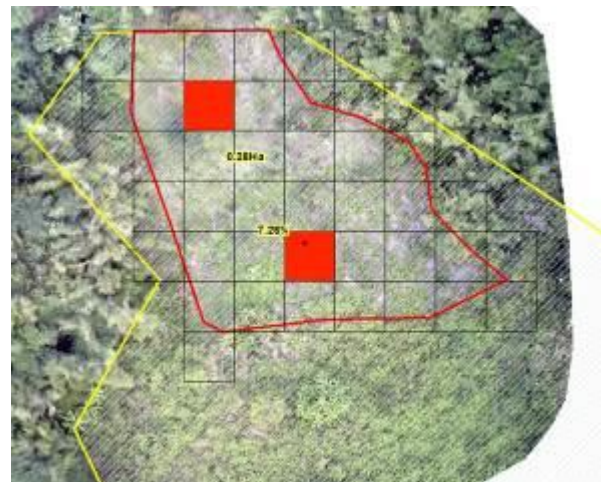


Figure 81. Lot Assignment in Takhes Meanchey

All sites



2 sites



ANNEX 5. 2. FIELD MISSION PHOTOS

Figure 82. Restoration Site Activities in Oslev Protected Area



Figure 83. Takhes Meanchey Restoration Site Activities



Figure 84. Anakut Koma Samaki Restoration Site Activities



Figure 85. Dontret Restoration Site Activities



Figure 86. Ourotkrosh Nursery

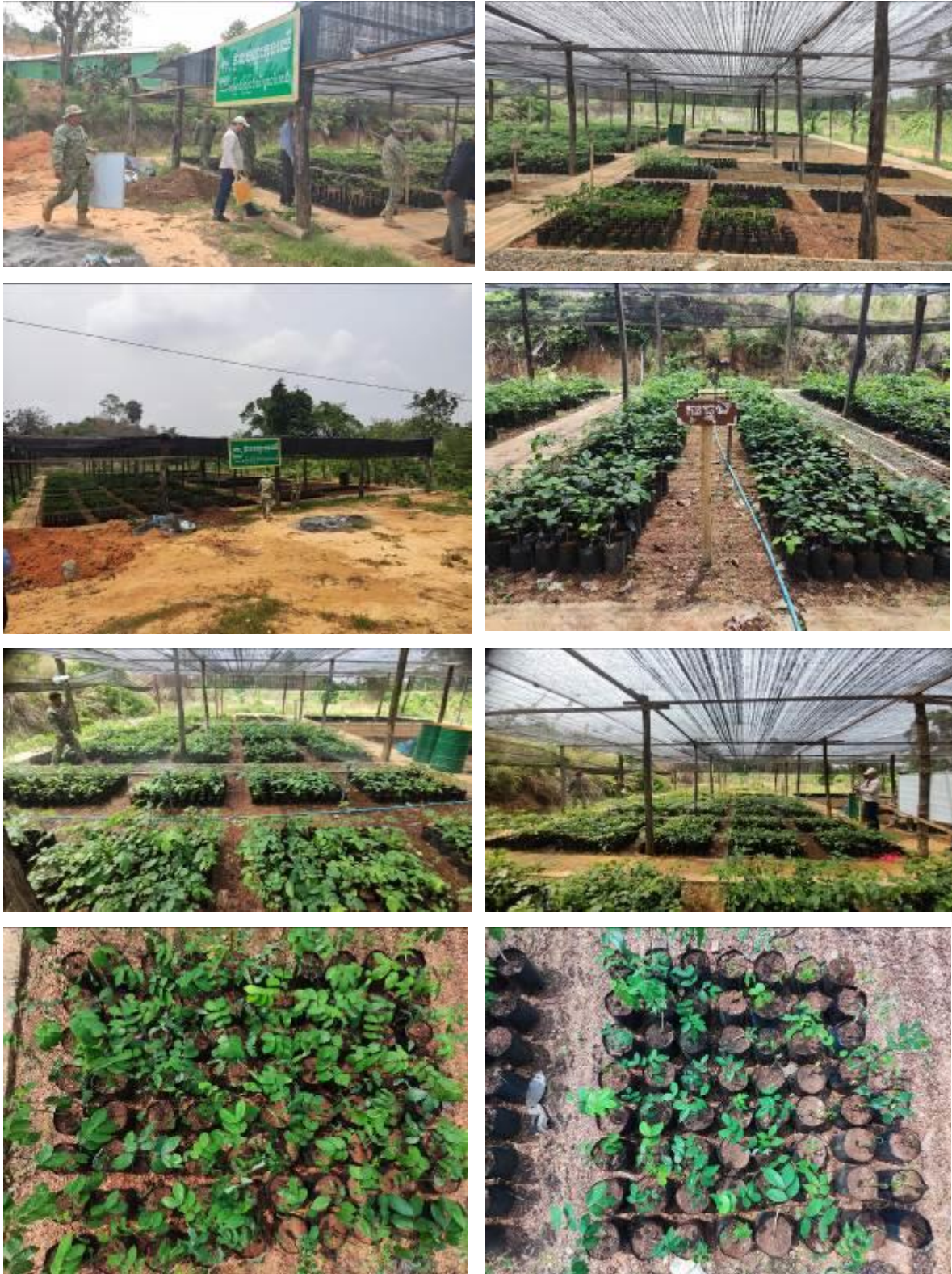




Figure 87. O Tavoaws' Nursery



Figure 88. Training Activities







Figure 89. Visit Beekeeper Community at Anakut Koma Samaki



Figure 90. Group Technical Team Meeting



ANNEX 5. 3. PARTICIPANT LIST (Originals)

Figure 91. List of Participants in Takhes Meanchey

ល.រ	ឈ្មោះអ្នកចូលរួម	ភេទ	ភូមិ	ឃុំ/សង្កាត់		លេខទូរស័ព្ទ
				ឃុំ	សង្កាត់	
1	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៩៧៧៥៥៤១
2	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
3	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៩៧៧៥៥៤១
4	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
5	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
6	ក្រសួងរដ្ឋ	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
7	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
8	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
9	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
10	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
11	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧

Figure 92. List of Participants in Anakut Koma Samaki

ល.រ	ឈ្មោះអ្នកចូលរួម	ភេទ	ភូមិ	ឃុំ/សង្កាត់		លេខទូរស័ព្ទ
				ឃុំ	សង្កាត់	
1	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៩៧៧៥៥៤១
2	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៩៧៧៥៥៤១
3	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
4	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៦៦៣៥៧៧៧
5	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
6	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៩៧៧៥៥៤១
7	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៦៦៧៦៥៣
8	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
9	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៧៧៥០៧៧
10	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៩៧៧៥៥៤១
11	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៩៧៧៥៥៤១
12	ស៊ុន សារ៉ា	ស្រី	ក្រសួងរដ្ឋ	៤៤		០៩៧៧៥៥៤១

Figure 93. List of Participants in Oslev

ល.រ	ឈ្មោះ	ភេទ	ស្ថានភាព	ស្ថានភាព		លេខទូរស័ព្ទ
				ក្រុម	ស្ថានភាព	
1	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS		0972996782
2	គុយ គុយ	ប	ស្ថានភាព			087223208
3	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS		0922991133
4	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS		077117222
5	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS		0972516957
6	គុយ គុយ	ប	ស្ថានភាព	OS		0922991133
7	គុយ គុយ	ប	ស្ថានភាព	OS		0922991133
8	គុយ គុយ	ប	ស្ថានភាព	OS		0922991133
9	គុយ គុយ	ប	ស្ថានភាព	OS		0922991133
10	គុយ គុយ	ប	ស្ថានភាព	OS		0922991133
11	គុយ គុយ	ប	ស្ថានភាព	OS		0922991133

Figure 94. List of Participants in Ourotkrosh Nursery

ល.រ	ឈ្មោះ	ភេទ	ស្ថានភាព	អង្គការ	លេខទូរស័ព្ទ	ហត្ថលេខា
១	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS	0897755174	OS
២	គុយ គុយ	ប	ស្ថានភាព	OS	060663377	OS
៣	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS	07724940	OS
៤	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS	099433907	OS
៥	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS	092212350	OS
៦	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS	069775506	OS
៧	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS	092249543	OS
៨	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS	092249552	OS
៩	ស៊ីម ឌីណា	ប	ស្ថានភាព	OS	07740157	OS
១០	ស៊ីម ឌីណា	ប	ស្ថានភាព	ADG/ICM	012263647	ICM
១១	ស៊ីម ឌីណា	ប	ស្ថានភាព	ICM	089775506	ICM
១២	ស៊ីម ឌីណា	ប	ស្ថានភាព	MJP - KIR	MJP	MJP
១៣	ស៊ីម ឌីណា	ប	ស្ថានភាព	MJP	MJP	MJP
១៤	ស៊ីម ឌីណា	ប	ស្ថានភាព	MJP	MJP	MJP
១៥	ស៊ីម ឌីណា	ប	ស្ថានភាព	MJP	MJP	MJP
១៦	ស៊ីម ឌីណា	ប	ស្ថានភាព	MJP	MJP	MJP
១៧	ស៊ីម ឌីណា	ប	ស្ថានភាព	MJP	MJP	MJP

Figure 95. List of Participants in Kanchang Nursery

ជាតិ សាសនា ព្រះមហាក្សត្រ
មន្ទីរកសិកម្ម
រុក្ខាប្រមាញ់ និងនេសាទ

ថ្ងៃទី ១០ ខែ វិច្ឆិកា ឆ្នាំ ២០២៣

ល.រ	ឈ្មោះ	ភេទ	តំណភ្ជាប់	អង្គការ	លេខទូរសព្ទ	ហត្ថលេខា
១	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	សហគមន៍កសិកម្ម	០៩៨៤៥៣១៧១៧	—
២	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១១២១៥៥៤១	—
៣	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	សហគមន៍កសិកម្ម	០១១៧៥១៥៥៥៤	—
៤	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៥	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៦	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៧	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៨	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៩	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១០	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១១	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១២	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១៣	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១៤	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១៥						

Figure 96. List of Participants in training course on measures to prevent and control soil erosion at Dontret

MJP
មន្ទីរកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ

ថ្ងៃទី ១០ ខែ វិច្ឆិកា ឆ្នាំ ២០២៣

ល.រ	ឈ្មោះ	ភេទ	តំណភ្ជាប់	អង្គការ	លេខទូរសព្ទ	ហត្ថលេខា
១	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
២	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៣	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៤	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៥	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៦	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៧	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៨	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
៩	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១០	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១១	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១២	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១៣	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១៤	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—
១៥	ស្រី ឈន់	ប	សហគមន៍កសិកម្ម	—	០១២៧៥៥៥៥៥	—

FOUNDATION បណ្ណាចារ្យសាលាស្រុកមូលរូប

អង្គប្រជុំស្តីពី:..... ទីកន្លែង:.....

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី.....ខែ.....ឆ្នាំ២០២.....		
				ព្រឹក	ល្ងាច	
២៤	សាយ . ថា	ប	ប្រធានការដ្ឋាន	ឃ		០១០ ៨១ ៩៦០៥
២៥	តាំ វិធីម	ស	Assst NRM	Syds		០៦៩៨៥៦៥៦៩ ✓
២៦	សៀម គន្ធី	ប	NJP			
២៧	ខុន វិវិកា	ប	NJP			
២៨	សារី បុត្រា	ប	ទីស្នាក់ការ			០១៧៩៩០៩៥៧
២៩	សុខ គន្ធី	ប	ICEM			០៨៩៧៩៣០៧
៣០	សុខ ប៊ុនណារ	ប	ប្រធានការ	Clameth		០១២២៦២៦៤៧
៣១	សុខ សម្រេច	ប	NJP.ACS.P0			០៧៧៩៣៥៦៤
៣២	សុខ វិធី	ប	អនុ.ប្រធានការ កូស្រីក	M		០៦៧៦៧៦៤២៧
៣៣	សុខ ឈៀន	ប	ប្រធានការ កូស្រីក	AmS		០៩៧៩៣៥៦៤៧

ATTENDANCE LIST (FORMATTED)

Anakut Koma Samaki

19 April 2023

No	Name	Sex	Position	Contact number
1	Siem Pov	F	CF member	0967723141 0886484764
2	Mouch Sreyneang	F	CF Finance	0964915938
3	Seng Roern	M	CF member	0719372538
4	Kun Tha	M	CF member	066335799
5	Kong Moerk	M	CF member	012763076
6	Karn Kea	F	CF member	0889063761
7	Kan Chantha	F	CF member	0966315653
8	Seng Sochan	F	CF member	011215549
9	Seng Samai	M	CF member	092733757
10	Sem Long	M	MJP	092398887
11	Kong Monichan	M	MJP	-
12	Lay Chanthly	M	ICEM	083793307
13	Mil Samen	M	MJP	-
14	Vorn Som El	M	MJP	-
15	Prom Sreymom	M	MJP	-
16	Deab Sochantha	M	MJP	-
17	Khun Bunnath	M	ICEM	012263647
18	Heng Bouran	M	ICEM/GIS	017990957

Takhes Meanchey Community

19 April 2023

No	Name	Sex	Position	Contact number
1	Veang Heng	F	CF Member	0887955413
2	Thoern Thavy	F	CF Member	0715004173
3	Chan Somnang	M	CF Member	0972573084
4	Eng Sreypich	F	Chief of CF	0717841166
5	Cheang Robang	M	Member	0716643137
6	Kruiy Sro Em	M	Deputy chief of CF	0979600037
7	Thorn Phern	M	Community Secretary	0884104738
8	Prak Savern	M	Community Treasurer	0717747759
9	Pot Savean	M	Member	0717841166
10	Lun Yeab	M	Member	089980001
11	Von David	M	Member	095947043
12	Prom Sreymom	F	MJP	069856569
13	Deab Sochenda	M	MJP	0965666624
14	Vorn Som El	M	MJP	-
15	Seng Samai	M	Deputy Chief	012733757
16	Seng Sochan	M	Member	011215549
17	Sem Long	M	MJP	092398887
18	Kong Monichan	M	MJP	-
19	Lay Chanthly	M	ICEM	089793303
20	Heng Bouran	M	ICEM/GIS	017990957
21	Khun Bunnath	M	ICEM	012263647

Nursery Management Rapid Assessment (Kanchang)

20 April 2023

No.	Name	Gender	Position	Organization	Contact
1	Dok Meng	M	Treasurer	Community Forest	0886531797
2	Seng Socha	M	Member	Community Forest	011215549
3	Pot Thoern	M	Member	Community Forest	0977515554
4	Seng Samai	M	Chief Forestry Officer	Triage FA	012733757
5	So Mana	M	Deputy Chief Forestry Officer	Triage FA	012898140
6	Nget Norb	F	Chief Community Forestry	Community Forest	0973655339
7	Mae Sov	M	Deputy Chief of Community Forest	Community Forest	0889984054
8	Sou Chhorn	M	Member	Community Forest	
9	Prom Sreymom	F	Assistant NRM	MPJ	069856569
10	Heng Bauran	M	GIS Specialist	ICEM	017990957
11	Lay Chanthy	M	Community-based CCA Specialist	ICEM	089793307
12	Khun Bunnath	M	Forest and Landscape Restoration Specialist	ICEM	012263647
13	Nae Som El	M	Project Officer	MJP	
14	Mil Samet	M	MJP-ACI-PO	MJP	07793564

Nursery Technical Coaching (Ourotkrosh)

20 April 2023

No.	Name	Gender	Position	Organization	Contact
1	Keo Heng	M	PA Ranger	Provincial DoE	089775817
2	Ek Sokhern	M	PA Ranger	Provincial DoE	060662277
3	Korng Thearith	M	PA Ranger	Provincial DoE	0972410400
4	Nae Rady	M	PA Ranger	Provincial DoE	099433307
5	Mao Sopheak	M	PA Ranger Team Leader	Provincial DoE	092212350
6	Om Channoun	F	PA Ranger	Provincial DoE	089775806
7	Long Khorn	M	PA Ranger Deputy Team Leader	Provincial DoE	092949543
8	Sum Narin	M	PA Ranger	Provincial DoE	0883475952
9	Heng Bouran	M	GIS Specialist	ICEM	017990957
10	Khun Bunnath	M	Forest and Landscape Restoration Specialist	ICEM	012263647
11	Lay Chanthy	M	Community-based CCA Specialist	ICEM	089793307
12	Mil Sanet	M	MJP-ACI-PO	MJP	07793564
13	Chan Som El	M	MJP Officer	MJP	
14	Prom Sreymom	F	MJP Officer	MJP	069856569

Oslev Restoration Site

20 April 2023

No	Name	Sex	Position	Contact number
1	Man Vesna	M	PA Ranger	0976996862
2	Sou Sokun	M	PA Ranger	0882233263
3	Ouch Sophol	M	PA Ranger	0887951133
4	Soerm Saroern	M	PA Ranger	077492573
5	Chhoern Chheab	M	PA Ranger	0975569357
6	Sok Sat	M	PA Ranger	0882221665
7	Thou Pov	M	PA Ranger	012770355
8	Sim Ji	M	PA Ranger	0976451777
9	Sok Barang	M	PA Ranger	0972351948
10	Sok Toert	M	PA Ranger	0886611677
11	Yoerng Pov	M	PA Ranger	012929330
12	Phon Sokon	M	PA Ranger	0979341268
13	Sok Kheng	M	PA Ranger	0974673046
14	Toerng Sophea	M	PA Ranger	088989264
15	Man Sokoern	M	PA Ranger	0976951697
16	Eav Ra	M	PA Ranger	0979376277
17	Prom Sreymom	F	MJP	069856569
18	Deab Sochenda	M	MJP	0965666624
19	Vorn Som EL	M	MJP	-
20	Lay Chanthy	M	ICEM	089793303
21	Heng Bouran	M	ICEM/GIS	017990957
22	Khun Bunnath	M	ICEM	012263647
23	Mil Samet	M	MJP	077935642

Dontret

21 April 2023

No	Name	Sex	Position	Contact number
1	Nget Soky	F	Member of Samaki Community	0979782599
2	Seng Roern	M	President of Samaki Community	0719372558
3	Kun Tha	M	Member of Samaki Community	066335799
4	Toch Phoun	M	Member of Samaki Community	0979588085
5	Chheng Rim	F	Member of Samaki Community	0979588085
6	Pen Sovann	M	Member of Samaki Community	0888363849
7	Va Ken	F	People of Samaki Community	066335799
8	Voern Thoern	F	People of Samaki Community	081594685
9	Nhorn Saray	F	People of Samaki Community	081594685
10	Ut Sreyneang	F	People of Samaki Community	0712650379
11	Siem Pov	F	Member of Samaki Community	0886484764
12	Boerk Seavminh	F	Member of Samaki Community	0967723141
13	Phoern Sophea	F	Member of Samaki Community	015737257
14	Eng Sreypich	F	Takhet Meanchey Community Member	0717841166
15	Prak Savoern	M	Takhet Meanchey Community Member	0717747759
16	Chan Somnang	M	Takhet Meanchey Community Member	0972573084
17	Ne Phoern	M	Takhet Meanchey Community Member	0884104738
18	Long Loum	M	Takhet Meanchey Community Member	068319185
19	Cheang Poug	M	Takhet Meanchey Community Member	0716643437
20	Nov Chanthou	M	Donkrek Community Member	0718724732
21	Soerng Phoerng	M	Donkrek Community Member	069490940
22	Teng Phing	M	Donkrek Community Member	0963666893
23	Somnang Sinath	M	Takhet Meanchey Community Member	
24	Som Re	M	Donkrek CF member	090895705
25	Prom Sreymom	F	MJP/ Assistant NRM	069856569

No	Name	Sex	Position	Contact number
26	Deab Chantha	M	MJP	-
27	Vorn Som El	M	MJP	-
28	Heng Bouran	M	GIS	017990957
29	Lay Chanthy	M	ICEM	089793307
30	Khun Bunnath	M	Team Leader	012263647
31	Mil Samet	M	MJP.ACI.PO	07793564
32	Sim Ravy	M	Vice President of Daun Trait Community	067676427
33	Leang Moern	M		0973535697
34	Seng Samai	M	Deputy Chef	012733757
35	Seng Sochan	M		011245549

ANNEX 5. 5. GUIDANCE ON PREPARATION FOR SOIL EROSION CONTROL MEASURE

1. Site selection

Site to be selected to apply the measure should be steep hill and bare area without good presence of grass and trees. Area is exposed to erode from stormwater water runoff from uphill to downhill.

2. Land preparation

Clear bad grass that disturbs the growth of live stick, seedling tree, and grass planted. Prepare land as grader if community wants to apply agroforestry technique then.

3. Materials and equipment needed

Materials and equipment for the preparation of measure are described in Table below:

Materials	Characteristics of materials
(1) Stone	choose good solid stone without crack or decay with size of about 0.3cmx0.3cm
(2) Bamboo mattress	Bamboo mattress that uses for concrete holder with grid of 10-15cm that linked with rattan or bamboo string.
(3) Live stick	Local live stick of about thump size should be cut about 80cm long. Selection for live stick that can grow easily and produce good root to protect soil from erosion, good for soil quality, and it is available at community.
(4) Grass	Local live grass for planting should be collected with root. Selection for grass that have a better root to protect soil from erosion, improve soil quality, eatable by cattle, and available at community.
(5) Stick	Bamboo/wood stick of 60-80cm long needs to sharp on one side for hammering into ground behind stone to hold stone from moving to downslope.
String	In case of needing string, use natural string like jute string, avoid PVC string.
Hoe	Hoe is used to dig ground for standing stones
Axe	Axe is used to sharp and hammer the stick into ground
PVC String	Use PVC string to demarcate rows for land preparation

Is this soil erosion control measure necessary to use all five types of materials as mentioned in table above? If community has all five materials is great for preparing the measure. If not, there is an option between option B1-B3.

Option	Materials
Option A	(1), (2), (3), (4), ជើង and (5)
Option B1	(1), (2), (4), ជើង and (5)
Option B2	(1), (3), (4), ជើង and (5)
Option B3	(2), (3), (4), and (5) in case of preparing land as graders.

4. Time to prepare the measure

Time to start depend on availability of water, in case there is a good water, measure can be prepared in dry season. If water availability is an issue in dry season, appropriate time to prepare should be at beginning of rainy season.

5. Preparation

Preparation of row: prepare row as horizontal position parallely to contour of the hill. Spacing between one row to another is 4.0m.

Putting stone: Use hoe to dig ground to prepare stone by putting 1/3 of stone into ground and keep 2/3 of stone above ground level. The interval from one stone to another is 10cm. Stick should be place into ground to hold stone from behind to protect slippery downhill.

Putting live stick: Put live stick in front of stone with interval 0.4-1.0m from one live stick to another depending on type of stick if it is a small or big tree generation. In case Kriseriya tree, it generates big tree, the live stick should be placed about 1.0m from each other. Steel stick should be used to dig the ground for placing live stick. Live stick should put about 15cm into ground. Live stick should be cut and keep in hormone solution one night before taking to field for planting.

Preparation of bamboo mattress⁸: Bamboo mattress of 2m height should be put with bamboo strip horizontal to water runoff. Keep space about 40-50cm from one piece of bamboo mattress to another. Bamboo mattress should be placed about 20cm below stone row and mattress should be hold by stick to protect it slippery downhill.

Planting grass: Grass is planted in between bamboo strip and allowable space with spacing of 30-40cm each.

Preparation of drainage: drainage should be prepared to collect water. Drainage should be prepared in vertical position. Space from one drainage to another should be 15m long. Should place some stones on bed of drainage and place live sticks at both edges of the drainage to protect erosion.

6. Maintenance and taking care

After measure is prepared, if no rain, there should be watering on grass and live stick in every three days until live stick and grass start to grow. Should cut out or remove unnecessary grass.

7. Tree seedling planting

After measure is prepared, tree seedling can be planted at space where is suitable in between 4m due to planting technique.

8. Advantages of measure

There are four advantages from introducing this measure:

- (1) Protection of top soil erosion
- (2) Improvement of soil quality and increase penetrable of water into ground
- (3) Increase penetrable of water into ground and keep moisture in soil, and
- (4) Increase natural beauty of site.



Sixth Cambodia National Field Mission Report



Restoration activities at Takhes Meanchey Community Forest. Samlout district, Battambang province, Cambodia (photo by Munichan Kung, MJOP).



Technical Assistance 6539: Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-based Solution for Climate Resilience

Sixth Cambodia National Field Mission Report

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1 Background

The sixth national technical mission is built on the work of the previous five missions, especially the follow-up and expansion work conducted in the fifth mission in April 2023.

In the first mission, the national team, in collaboration with the Maddox Jolie-Pitt Foundation (MJP), met with local communities – some of whom have already worked with MJP for many years on various aspects of ecological agriculture and agroforestry – and visited community forest sites of concern. Cambodian sites are distinct because they are community forests owned by the target communities, except for the Samlout Multiple Use Area (SMUA), which is the responsibility of the Ministry of the Environment (MOE) and the local Department of Environment (DOE).

As part of the second mission, the project team and MJP were joined by community forest committee members and rangers, forestry officers, and military representatives to conduct detailed surveys of the identified restoration sites. In a participatory mapping workshop, a wide range of landscape restoration issues and measures were identified and spatially documented. Nature-based solutions were used to address the challenges facing the sites during restoration. Using the maps, the team developed site restoration plans and priority tasks.

On the third field mission, the team provided training on restoration techniques, nursery management, and ecological agriculture livelihood skills, including beekeeping. Moreover, the mission supported the implementation of the restoration plans for the four demonstration sites, including the planting of seedlings.

The fourth mission took place from 20 – 25 November 2022 and provided support and guidance for restoration activities, conducted monitoring, and continued the capacity-building program for the community forest management groups. The mission continued implementing the restoration plans and followed up on actions agreed during the third field mission.

The fifth mission, conducted from 17-22 April 2023, undertook a survival survey of planted seedlings, evaluated new nurseries, assessed the consistency of the water supply at each of the sites, reviewed the implementation of the restoration plans, demonstrated soil erosion control, and investigated alternatives to Oslev given the sensitive community and local government situation. The mission team provided advice on replacement planting of dead seedlings and expanding new seedlings' sites, preparation and improvement of water storage facilities at the sites, application of agroforestry technique through growing gingers and chili, learning and applying soil erosion control measures at erosion sites of other communities.

This sixth mission was conducted at the project site in Samlout district, Battambang province activities from 20-26 August 2023.

2 Mission Objectives

The field mission aimed to:

- Monitor the implementation of the restoration plans at each site,
- Undertake site investigations,
- Expand seedling sites,
- Initiate a greater range of agroforestry activities,
- Enhance water storage facilities, and
- Roll out soil erosion control measures at restoration sites.

In the context of the newly designated site in SMUA, the mission sought to coordinate with rangers to plant tree seedlings and devise a maintenance plan for the site.

The mission also intended to follow up on aspects addressed during the fifth field mission. These included the assessment of water infrastructure development, the status of infrastructure construction at each site, and the progress of new nurseries. Additionally, the team planned to evaluate the implementation of the monitoring plan and, where necessary, provide refresher training and coaching for nursery and seedling production. Mission activities are detailed in Annex 6.1.

3 Mission Composition

The participants were ADB/ICEM national technical team and field MJP staffs included:

1. Path Sokunvath, MoE focal person
2. Khun Bunnath, Forest and Landscape Restoration Specialist;
3. Lay Chanthy, Community Based Climate Adaptation Specialist;
4. You Porny, Media and Communication Specialist
5. Heng Bauran, GIS and Spatial Planning Specialist;
6. Munichan Kung, MJOP Country Director;
7. Prasith Lorn, MJP Deputy Director;
8. Sameth Moel, MJP Agriculture Program Officer; and
9. Samel Vorn, Conservation Program Coordinator.

4 Duration and Sites of the Mission

The five-day national mission comprised a one-day team meeting at the MJP office in Battambang, two days dedicated to technical training at the MJP site office in Samlout, and an additional two days allocated for fieldwork and practical exercises (Annex 6.2).

In the final two days of the mission, the focus shifted to field restoration activities, encompassing agroforestry practices, nursery and seedling preparation, installation of soil erosion control measures, and the construction of brushwood leaky weirs in the three community forests. Mission Activities

4.1 Meeting with MJP on Mission Schedule and Field Preparation

The mission team convened a meeting with MJP and MOE on August 21, at the MJP office in Battambang to address mission logistics and field preparation, encompassing training agendas and field schedules. Following discussions, adjustments were made to the mission schedule, reducing it from the originally planned six days to five days to better align with the availability of the communities' PA rangers.

The meeting also discussed the necessary materials for training and fieldwork practices, covering topics such as agroforestry, forest fire control, nursery and seedling preparation, soil erosion control demonstrations, and water leaky weir installations.

Mission Preparation Meeting. Meeting on mission schedule and preparation at MJP office, Battambang (photo by Khun Bunnath, ICEM).



4.2 Technical Training

In response to requests from the community, the team provided a series of training sessions covering agroforestry techniques, forest fire control management, nursery and seedling preparation, soil erosion control, and water leaky weir installation.

4.2.1 Agroforestry and Agroecology

The agroforestry training covered a range of crucial topics, including agroforestry concepts, various agroforestry applications, methods for economic analysis in agroforestry, site identification and selection, site fencing, soil preparation, crop planting, crop maintenance, as well as the principles of agroforestry benefit sharing and sustainable practices for the long term.

The training adopted a participatory approach, featuring clear and accessible technical explanations, plenary and group discussions, group exercises, role-playing scenarios, and hands-on field practices. During the training session, lessons learned from successful interventions elsewhere in Cambodia were shared as examples of best practice (Annex 6.10).

As part of the training, an agroforestry field application plan was developed and agreed upon by the MJP team and the community forestry management committee members. The plan aims to translate the knowledge in training and coaching sessions into tangible benefits for their community members in the upcoming rainy season. For detailed training materials, please refer to the Annex.

Figure 97. Agroforestry Field Modality



4.2.2 Community Forest Fire Management Samaki

The training emphasized key technical aspects related to fire break control techniques, forest fire concepts, various types of forest fires, notable forest fire events in Cambodia, community engagement

in forest fire management, the practical application of fire break techniques, and community planning for forest fire management.

The training was designed in accordance with adult learning principles and approaches, featuring straightforward technical explanations, plenary and group discussions, group exercises, role-playing scenarios, and hands-on field practices. During the training session, lessons learned from successful interventions elsewhere in Cambodia were shared (Annex 6.10).

As part of the training, a plan for implementing fire break construction in the designated areas was developed and mutually agreed upon by the MJP team and the community forestry management committee members. For detailed training materials, please refer to the Annex.

4.2.3 Nursery and Seed Propagation Techniques

The refresher training focused on nursery and seed propagation techniques, encompassing a range of topics such as tree seed collection, seed transportation and storage, seed propagation methods for various tree species, soil sterilization techniques, sapling care, germination processes, and planting procedures.

The training methods employed coaching and mentoring sessions, complemented by practical field exercises at the MJP nursery site.

During the field demonstration, a nutrient-rich soil mixture was prepared and heated over a fire for 45 minutes until the soil was thoroughly sterilized, eliminating unwanted grass seeds and harmful pathogens. The sterilized soil mixture was then placed into germination plastic bags.

As part of the training, a plan for implementing these techniques in the designated nurseries was developed and mutually agreed upon by the MJP team and the community forestry management committee members. Detailed training materials can be found in the Annex.

4.2.4 Soil Erosion Control Measures

Soil erosion control is a vital aspect of landscape restoration in Samlout, where restoration sites often consist of hilly and steep terrain with insufficient forest cover and vegetation, making sections of the restoration sites vulnerable to soil erosion, necessitating the implementation of soil erosion control measures. Target communities play a central role in safeguarding specific erosion-prone areas within their restoration sites. To facilitate this, it is imperative to provide the communities with a comprehensive understanding of the benefits associated with soil erosion control within their restoration sites.

The training materials for soil erosion control have been specifically designed for application in hilly and steep areas. The materials encompassed seven sessions:

- i. An overview of nature-based solutions for soil erosion control at restoration sites.
- ii. A brief introduction to locally and regionally used natural soil erosion control measures, enabling communities to explore and select appropriate measures for their specific needs.
- iii. Guidance on selecting natural soil erosion control measures suitable for the restoration sites.
- iv. Discussion on site selection and the materials required to install soil erosion control measures.
- v. Instruction on effectively installing these measures at the site.
- vi. Insights into the maintenance of installed measures following their initial installation.
- vii. A discussion on the practical aspects of soil erosion control measure installation at the site, as scheduled by the mission.

For detailed training content and resources, please refer to Annex 6.3.

Figure 98. Training on Soil Erosion Control Technique



4.2.5 Water Runoff Control Measure- Leaky Weir

The drainage corridors within the restoration sites are vulnerable to erosion due to the hilly and steep terrain, which can cause rapid water runoff during intense rainfall. As outlined in the restoration plans, it is essential for the community to address this issue by installing leaky weirs. Leaky weirs reduce the speed of water runoff, protecting against soil erosion in critical eroded drainage corridors and helping to retain water within the drainage system.

The training session comprised five key components:

- i. An examination of the concept of nature-based solutions for controlling drainage water at restoration sites.
- ii. A concise overview and discussion of natural leaky weirs that have been employed locally and regionally, providing the community with options to consider for effective water runoff control measures.
- iii. The selection of natural water runoff control measures suitable for application at the restoration sites.
- iv. The process of selecting appropriate drainage locations and materials for implementing water runoff control measures, including brushwood leaky weirs.
- v. Detailed instructions on how to install and maintain these measures onsite.

For comprehensive training content and additional resources, please refer to Annex 6.4.

Figure 99. Training Session on Water Runoff Control, Leaky Weir

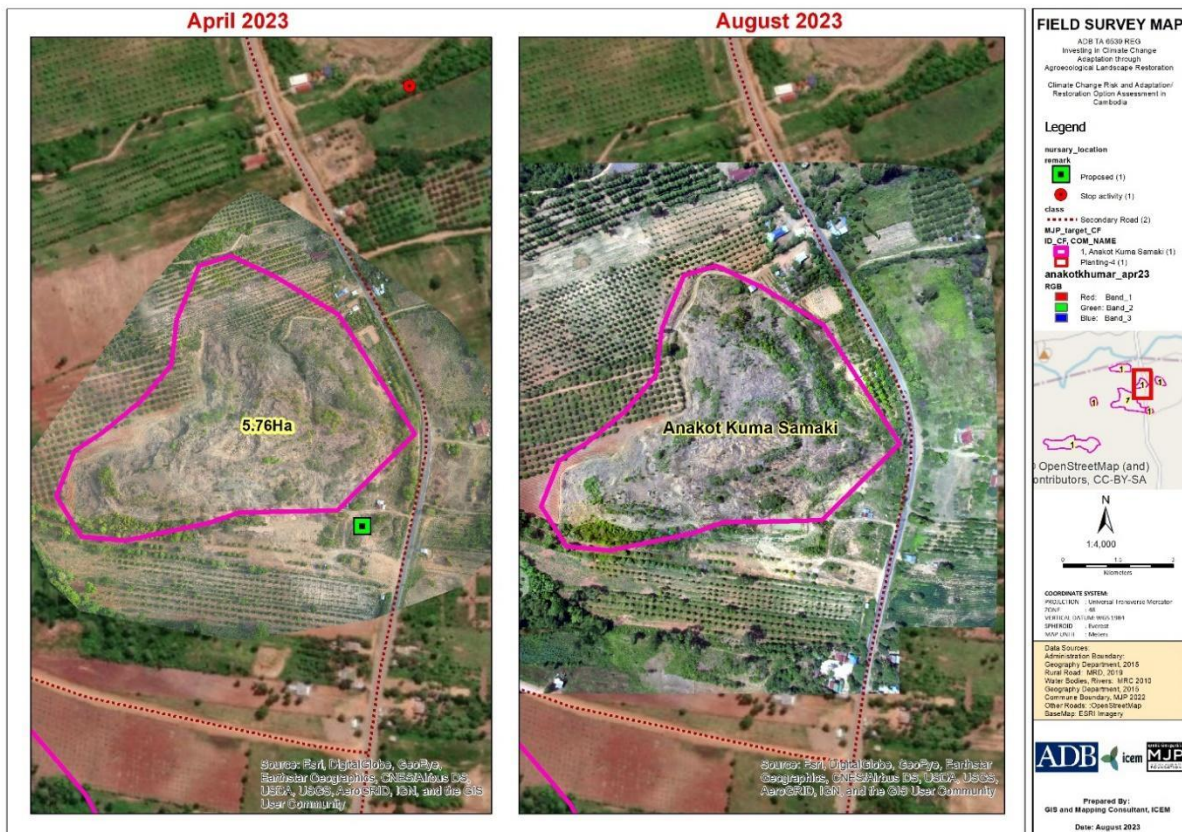


4.3 Anakot Koma Samaki Site

4.3.1 Restoration and Agroforestry

The site contained 502 mature tree seedlings and 956 kilograms of commercial root crops, including ginger, turmeric, Lesser ginger, and plai. These root crops are intended for domestic consumption and market sale after harvesting within the next few months.

Figure 100. Anakot Koma Samaki Site



4.3.2 Soil Erosion Control and Leaky Weir Installation

Following the training on August 22, field practices were organized to implement soil erosion control measures and install leaky weirs in designated areas of the Anakot Koma Samaki restoration site on the afternoon of August 24.

Soil erosion control measures represent the most suitable approach for communities to learn and apply at their respective restoration sites. The selected measures encompass a combination of environmentally friendly nature-based solutions, including brush mattresses, field trenches, vegetated riprap, and live staking. These techniques were chosen for several reasons: they are environmentally friendly, well-suited for controlling soil erosion in hilly areas, utilize locally available materials, and effectively enhance soil conditions while facilitating groundwater filtration. Due to the relatively small area of the selected site, the soil erosion control measure installed at Anakot Koma Samaki measures 12m x 12m.

Materials provided by MJP for the soil erosion control demonstration at Anakot Koma Samaki includes 300 stones measuring 30cm x 30cm, bamboo brush mattresses with a height of 2 meters covering 70 meters, 100 live sticks, five bags of local grass, 100 bamboo sticks, and 1kg of jute string. By utilizing these materials and following the recommended techniques, communities can effectively control soil erosion, retain moisture, and promote the sustainable management of their restoration sites. The soil

erosion control demonstration illustrates how to prepare slopes, lists the required materials, and outlines the installation methods.

Figure 101. Practicing Soil Erosion Control Measures at Anakut Koma Samaki



A leaky weir was installed at Anakut Koma Samaki on August 24.

The leaky weir installation included eco-friendly materials and techniques such as wooden sticks, stones, live stakes, and grass, chosen for their environmentally friendly and nature-based attributes.

Two brushwood leaky weirs were installed in two sections of the selected drainage corridor. Materials provided for the installation of brushwood leaky weirs at Anakut Koma Samaki included 60 stones measuring 30cm x 30cm, 12 large wooden sticks with a diameter of 20cm and a length of 2 meters, 60 live sticks, and two bags of local grass.

Figure 102. Practicing Brushwood Leaky Weir Installation at Anakut Koma Samaki



4.4 Takhes Meanchey

4.4.1 Restoration and Agroforestry

The team identified 341 mature tree seedlings and 1,450 kilograms of local marketing-oriented root crops, including ginger, turmeric, Lesser ginger, and plai. Upon harvesting within the next few months, these roots will be consumed domestically and sold for market sales.

Figure 103. Developments at Takhes Meanchey



4.4.2 Soil Erosion Control and Leaky Weir Installation

Field sessions were arranged to practice soil erosion control measures and the installation of leaky weirs at a designated area within the Takhes Meanchey restoration site on August 25.

Materials provided by MJP for the demonstration of soil erosion control at Takhes Meanchey included 300 stones measuring 30cm x 30cm, bamboo brush mattresses covering 70 meters with a height of 2 meters, 100 live sticks, five bags of local grass, 100 bamboo sticks, and 1kg of jute string.

Figure 104. Practicing Soil Erosion Control Measure Installation at Takhe Meanchey



A leaky weir was installed at Takhes Meanchey on August 25. Brushwood leaky weirs were installed in two sections, creating two leaky weir barrages within a selected drainage corridor. The materials provided to install brushwood leaky weirs at Takhes Meanchey included 60 stones measuring 30cm x 30cm, 12 substantial wooden sticks measuring 20cm in diameter and 2 meters long, 60 live sticks, and two bags of local grass.

Figure 105. Practicing Leaky Weir Installation at Takhes Meanchey

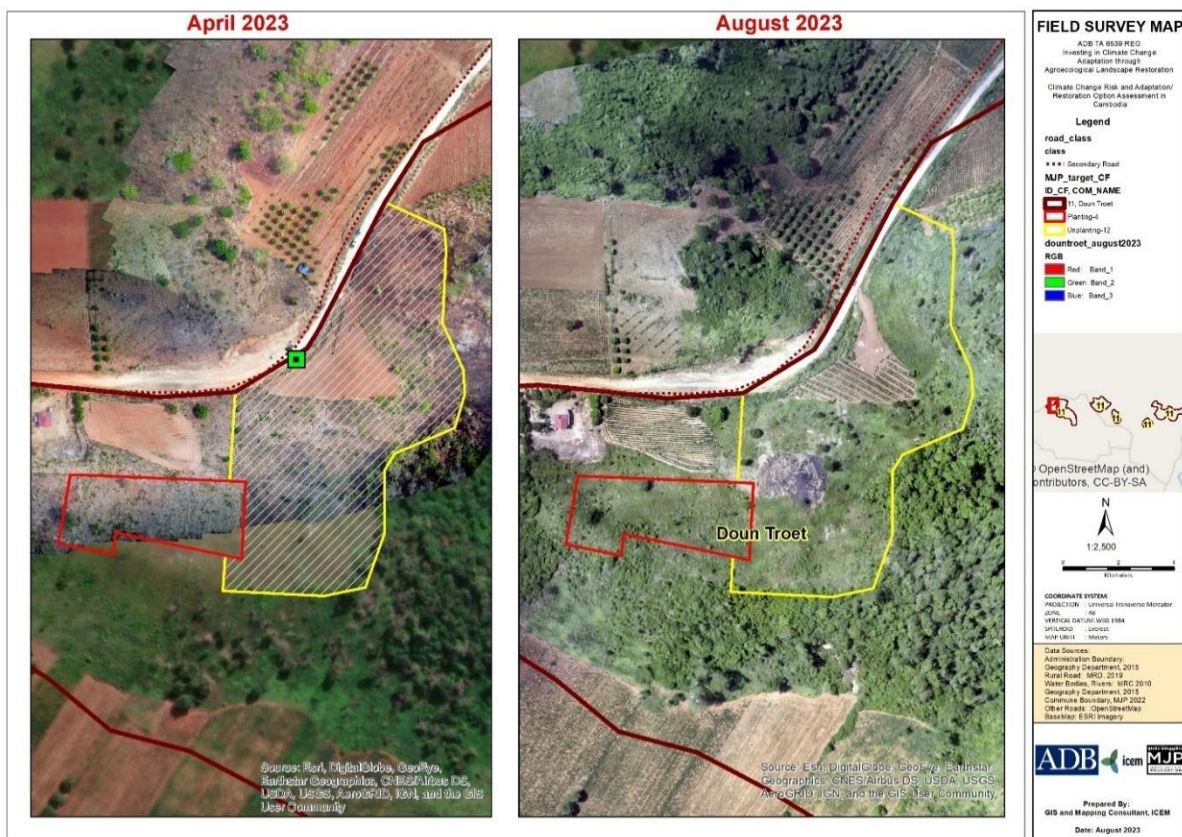


4.5 Dontret site

4.5.1 Restoration and Agroforestry

The team identified 246 mature seedlings and 1,200 kilograms of local commercial root crops, including ginger, turmeric, Lesser, and plai. These roots will be consumed domestically and sold for market sale once harvested in the next few months.

Figure 106. Developments at Dontret



4.5.2 Soil Erosion Control and Leaky Weir Installation

Field exercises were arranged to implement soil erosion control measures and install leaky weirs within the Dontret restoration site on the afternoon of August 25. Soil erosion control measures at

Dontret were initially installed during the 5th national mission. The current mission focused on maintenance and replacing grass and live sticks. The materials provided by MJP for Dontret included live sticks and bags of local grass. Through the application of these materials and the recommended techniques, communities can effectively manage soil erosion, enhance moisture retention, and ensure the sustainable upkeep of their restoration sites.

Figure 107. Practicing Maintenance and Replacement of Grass and Live Sticking at Dontret Community



Brushwood leaky weirs were established in two sections, creating two leaky weir barriers within the chosen drainage corridor. The materials for brushwood leaky weirs at Dontret included 60 stones measuring 30cm x 30cm, 12 substantial wooden sticks measuring 20cm in diameter and 2 meters in length, 60 live sticks, and two bags of local grass.

Figure 108. Practicing Leaky Weir Installed at Dontret Restoration Site



4.6 Ourotkrosh Nursery

There are 6,820 seedlings in the nursery site. Bacteria and parasites infected 36% of the total nursery seedlings. The team separated affected seedlings. The PA Rangers were advised to burn affected seedlings to prevent the spread of bacteria and parasites.

Figure 109. Practicing Seedling Separation Modality for Bacteria and Parasites Control at Ourotkrosh Nursery



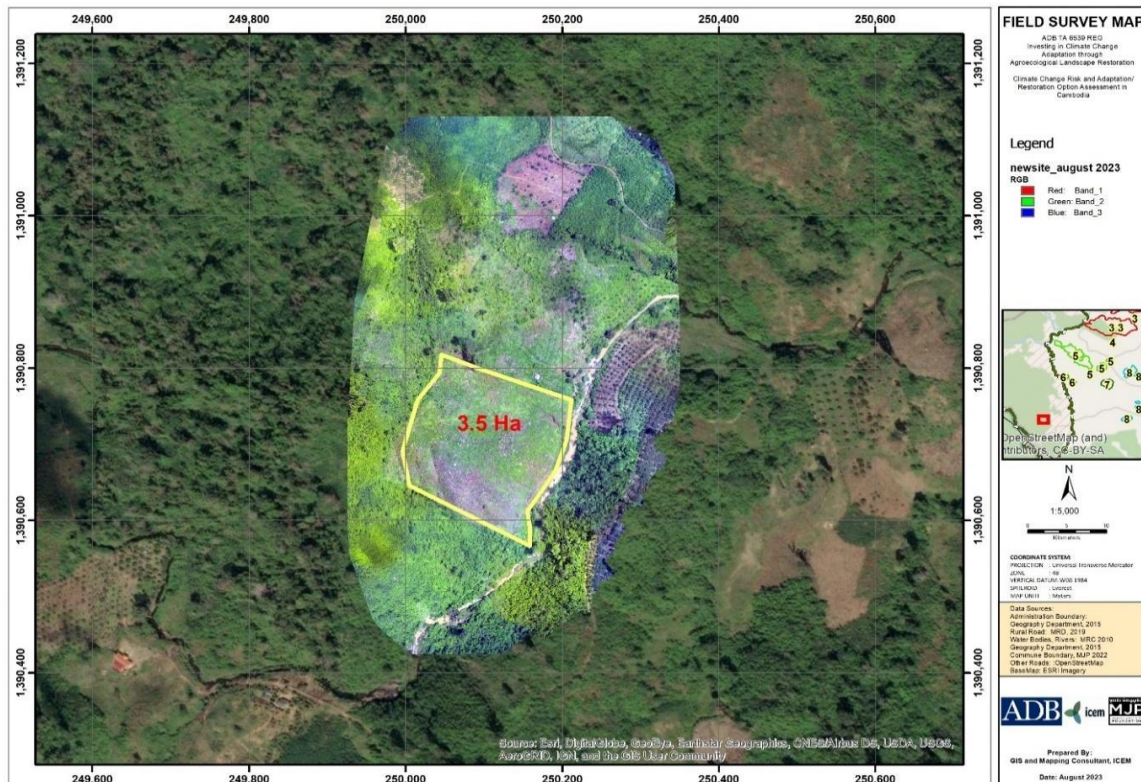
4.7 New Restoration Site in Samlout Multiple Use Area

Due to a dispute regarding the most recent site earmarked for restoration within the Samlout Multiple Use Area (SMUA), the mission team, in collaboration with SMUA rangers, conducted an evaluation of

an alternative site proposed by the rangers. The site visit took place on the morning of August 24 and included the mission team, MJP staff, and a contingent of SMUA rangers.

The proposed new site, known as Ou Chabpors, is situated approximately 5 kilometers from the Ourotkros nursery station of the rangers, 2 kilometers from the Samlout District’s 400 Border Checkpoint, and about 3 kilometers from a pathway accessible from the national road. The access path includes four natural stream crossings. The new site benefits from a consistent stream flow, ensuring a reliable water supply, even during dry seasons.

Figure 110. Proposed site at Ou Chabpors



During the visit, it was observed that the site had been recently cleared of forest cover, apparently due to illegal land encroachment. However, the rangers expressed confidence in their ability to resolve the conflict peacefully and regain control of the land. The site holds immense potential for restoration due to its extensive open areas, convenient transportation access, and the commitment of various stakeholders, particularly the PA Rangers, the Provincial DOE, and local authorities. Upon formal approval by the Provincial DOE, the restoration plan will be developed in alignment with the 6th National mission.

Figure 111. Proposed New Restoration Site in Samlout Multiple Use Area





4.8 Media and Video Production

Field activities were documented for video production, aiming to showcase the evolution of the community forest, emphasizing the impact of restoration efforts on the daily livelihood of its residents. Contributors represented diverse stakeholders, including members of the commune, police, forest rangers, the forest division, community forest committee, villagers, students, ICEM, and MJP, all of whom played direct roles in implementing the activities.

The photographs and videos captured technical training and coaching moments provided to community forest members. The sessions covered various topics, such as tree nursery preparation, the selection of tree species, including fruit-bearing varieties, the nurturing of trees at restoration sites, soil erosion and prevention techniques, water storage facilities, gender-inclusive participation, and their collective impact on livelihoods. The documentation aimed to illustrate the progress made and the challenges faced while also showcasing the reflections of those involved in the restoration efforts, all in pursuit of long-term sustainability.

The footage was curated to create a video documentary complete with English subtitles. The final videos will be shared with development partners and stakeholders, both within and outside Cambodia, who are involved in similar initiatives. Currently, these activities have been focused exclusively on Cambodia's SMUA. The documentary serves as a testament to the effectiveness of the agroforestry approach in revitalizing community forests and improving livelihoods, offering valuable insights and best practices gained from the community forest restoration efforts.

Figure 112. Media Activities



5 Mission Outcomes

- **Provision of Technical Training:** The training sessions covering agroforestry techniques, forest fire control methods, nursery, and seedling preparation techniques, soil erosion control techniques, and leaky weir installation were successfully conducted, involving a total of 165 participants, including 41 women from the three CFs, SMUA rangers, MoE focal personnel, and MJP staff. Post-training evaluations indicate that the majority of participants (87%) have

acquired the ability to apply technical knowledge and skills, adapting them to the local context, particularly in the domains of agroforestry, agroecology, fire control, and nursery management.

- **Installation of Soil Erosion Control Measures:** Demonstrations for soil erosion control have been established at Takhes Meanchey, Anakut Koma Samaki, and Dontret. These serve as demonstration sites for the respective communities. The communities have expressed their willingness to expand the use of these measures to control soil erosion in locations suitable within their restoration sites.
- **Installation of Leaky Weirs:** Leaky weirs have been installed at the three CFs to demonstrate selected locations and installation methods. Similarly, these serve as demonstration sites for the communities. The communities have consented to implementing this measure to control water runoff and soil erosion along drainage areas within their restoration sites where appropriate.
- **Maintenance of Tree Seedlings:** The Ourotkrosh tree seedlings are thriving following simple techniques to control harmful pests and parasites, as introduced by the technical team during their visit.
- **Identification of New PA Restoration Site:** A new site, Ou Chabpors, has been identified. The site is approximately 5 kilometers from the Ourotkros nursery station of rangers, 2 kilometers from the 400 Border Checkpoint of Samlout District, and about 3 kilometers from a path accessible from the national road. The Provincial DOE approved the site during the visit.
- **Development and Agreement on a Local Long-Term Plan:** The mission resulted in the creation and unanimous agreement on a long-term plan for the community forests, nurseries, and the new PA restoration site. All stakeholders, including MJP field staff, MOE focal person, the technical team, and local communities, endorsed the plan. The plan encompasses restoration activities, agroforestry and forest fire control applications, and seedling management. In addition to providing financial and technical support, MJP commits to ensuring the proper implementation of these initiatives based on the specific needs of the communities. Aside from the Forest Community Plan which focus mainly on forest protection and restoration, MJP committed to provide active community members the skills and starting materials on bee keeping, chicken raising, and vegetable farm. Possibility to apply agro-forestry techniques that would allow community members from planting crops within the lose forest will also be considered.

6 Issues Identified in the Mission

- **MJP's Natural Resource and Forest Management Officer Position:** The role of the Natural Resource and Forest Management Officer at MJP is currently in the recruitment process and remains unfilled. The absence of this key officer has raised concerns as the right individual is yet to take charge and oversee the community's restoration activities effectively.
- **Soil Erosion Control Demonstration at Dontret Community:** The soil erosion control demonstration at Dontret community, carried out during the 5th mission, yielded a low rate of grass and live stick survival. This can be attributed to the installation taking place during the dry season in April when the weather was hot and there was limited rainfall. Additionally, the site lacked a water source for community members to provide adequate watering.
- **Conventional Water Ponds at Anakut Komasmaki and Takhes Meanchey:** The water ponds dug at Anakut Komasmaki and Takhes Meanchey are of a conventional design. Concerns have arisen regarding their capacity to retain water during periods of low or no rainfall.
- **Timing of Restoration Activities and Tree Planting:** The restoration activities were initiated late in the planting season, resulting in a rush to plant young tree seedlings. Consequently, a significant portion of the trees planted did not survive during the first restoration session.

- **Community Participation in Forest Ownership:** While the mission witnessed participation from Community Forestry Management Committee members, concerns persist regarding the engagement of the broader community, including youth, males, females, and the general public within the community. Ensuring the involvement and motivation of all community members in various field activities is essential for the sustainability of forest community management.

7 Action Plan and Next Steps

The lessons learned from the field application will be presented at the regional workshop which is expected in early 2024. Lessons learned will be shared on the project website. MJP will continue to promote best practices within their target communities and PA site and or expand to other new potential sites as opportunities arise.

There were identified as potential core activities to be scaled up and expanded larger to maximize the project impact using those lessons learned including:

- a. Restoration
- b. Agroforestry and agroecology
- c. Nursery management
- d. Watershed management
- e. Livelihoods improve, and
- f. Climate change, and mitigation.

The specific activities align with those proposed core activities including scale up the existing project activities at the ground, expanding to new sites which is under jurisdictions of MoE as national interest, and knowledge sharing to the public through difference social, media platforms, and national education and awareness raising events.

Annex 6. 1. Mission Plan Activities

No.	Activities	Site
1.	Provide capacity building and technical training for communities and MJP project team for both concept and field practice focus on agro-forestry, fire break control to prevent forest fire, soil erosion control, and related topics such as seed germinating, transplanting, and seedling care according to different soil quality.	For communities, Protected Area (PA) Rangers and MJP staff
2.	Tree planting and development of a maintenance plan for the new PA restoration site: The mission will focus on planting trees at the Oslev replacement site and working with the community to develop a comprehensive plan for the ongoing maintenance and care of the planted trees.	A new PA replacement site
3.	Replication of the soil erosion control measure to other sites. Based on the success of the soil erosion control demonstration, the mission will replicate this technique at other restoration sites to prevent soil erosion and promote soil health.	Anakut Komasmaki and Takhe Meanchey
4.	Demonstration of leaky weirs: The mission demonstrated the construction of leaky weirs at certain sections of critical water canals at the three Community Forest (CF) sites.	Anakut Momasmaki, Takhe Meanchey, and Dountret
5.	Observation of ponds' water storage and reservoirs: The mission will assess and observe the functionality and effectiveness of the ponds and water reservoirs established at various sites.	The three community sites and the new site
6.	Orientation of nursery business plan modality to all nursery managers: The mission will conduct an orientation session to educate and guide all nursery managers on the proper implementation of the nursery business plan.	
7.	Follow-up on the progress of agroforestry/agroecology application at Dountret and Takhes Meanchey and scaling up to other sites:	Dountret and Takhes Meanchey

Annex 6. 2. Mission Program

Date	Activities	Presenters/ facilitator
20 August	Team travel from Phnom Penh to Battambang	TA Team
21 August	Team meeting and discussion with MJP in Battambang	TA Team, MoE, MJP
22 August	Training for communities and MJP project team on Agro-forestry and fire break control	TA Team
23 August	Tree Seeds Propagation Training	TA Team
24 August	Visit new proposed restoration site in SMUA Visit Ou Rakros Nursery site	TA Team
	Meeting with community members and MJP project team at MJP field office at Samlout- Battambang on progress at Anakut Koma demonstration sites	TA Team and Narin
25 August	Meeting with community members and MJP project team at MJP field office at Samlout- Battambang on progress at Takhes Meanchey demonstration sites	Bunnath, Chanthy, and Narin
	Meeting with community members and MJP project team at MJP field office at Samlout- Battambang on progress at Dontret demonstration sites	
26 August	TA team travel back to Phnom Penh	

Annex 6. 3. Agenda of Technical Training for Communities and MJP Project Team on Agro-Forestry and Fire Break Control

Date and time	Activities	Presenters/ facilitator
08:00 – 8:30	Opening and introduction	Monichan, MJP representative
08:45 – 10:15	<ul style="list-style-type: none"> ● Agroforestry concepts ● Type of agroforestry application ● Agroforestry economic analysis methods ● Agroforestry site identification and selection ● Site fencing ● Soil preparation ● Crop planting ● Crop maintenance ● Agroforestry benefits and sustainable practices 	TA Team
10:15 – 10:30	Refreshment break	
10:30 – 11:00	Soil erosion control	TA Team
11:00 – 11:15	Instruction for field practice	TA Team
11:30 – 13:00	Lunch break	
13:00 – 14:45	Fire break control technique <ul style="list-style-type: none"> ● Forest fire-related concepts ● Type of forest fire ● Major forest fire events in Cambodia ● Community participation in forest fire management ● Fire break technical application ● Community plan for forest fire management 	TA Team
14:45 – 15:00	Refreshment break	
15:00 – 14:50	Water drainage erosion and storage control (leaky weir and check dam)	TA Team
14:50 – 15:00	Instruction for field practice	TA Team
15:00 – 16:30	Discussion on field programs for the four sites	TA Team
16:30-17:00	Post training evaluation	Plenary

Annex 6. 4. Agenda of Training on Tree Seeds Propagation

Time	Activities	Presenters/ facilitator
08:45 – 10:15	Tree Seeds Propagation Training <ul style="list-style-type: none"> ● Tree seed collection ● Transportation and storage 	TA Team
10:15 -10:30	Refreshment break	
10:30 -11:30	<ul style="list-style-type: none"> ● Seed propagation techniques ● Soil sterilizing techniques ● Sapling, germination, and planting ● Briefing PA rangers on methods of planting trees at new restoration site 	TA Team
11:30 - 13:00	Break lunch	
13:00 -14:00	Field application of Agroforestry at Takhes Meanchey	TA Team
15:00 – 16:30	Make fire breaks at Donntret	TA Team
16:30-17:00	Post training evaluation	Plenary

Annex 6. 5. Participant List

Summary of Training Participants

22 August 2023

Training Session	Total	Female
Agroforestry concepts	8	2
Soil Erosion Control	10	2
Fire Break Control	10	2
Water Drainage	7	1
	35	7

មូលនិធិ ម៉ាតឡូធូលីតិក
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MADROP JOBS-PTA FOUNDATION

បញ្ជីបង្កបង្កើនអ្នកចូលរួម

អង្គប្រជុំស្តីពី វិធានការសម្រាប់ការកែលម្អប្រព័ន្ធធារាសាស្ត្រ និងកម្រិតផ្ទះកសិករ MJP កម្ពុជា
ខេត្តកោះកុង ក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី ខែ ឆ្នាំ	ស្ថានភាព	
១	ស៊ីន សុភ័ណ្ណ	ប	ស្រីស្រែ	[Signature]	[Signature]	012 700 506
២	លី ចាន់ធីន	ស	មន្ត្រីមូលដ្ឋាន	[Signature]	[Signature]	089775206
៣	ស៊ីន សុភ័ណ្ណ	ស	មន្ត្រីមូលដ្ឋាន	[Signature]	[Signature]	0963219500
	ស៊ីន សុភ័ណ្ណ	ប	មន្ត្រីមូលដ្ឋាន	[Signature]	[Signature]	092212350
៤	ឡាន ឃន	ប	មន្ត្រីមូលដ្ឋាន	[Signature]	[Signature]	092949543
៥	លី ចាន់ធីន	ប	មន្ត្រីមូលដ្ឋាន	[Signature]	[Signature]	077618330
៦	លី ចាន់ធីន	ប	មន្ត្រីមូលដ្ឋាន	[Signature]	[Signature]	089775817
៧	លី ចាន់ធីន	ប	មន្ត្រីមូលដ្ឋាន	[Signature]	[Signature]	012733757

មូលនិធិ ម៉ាដាស៊ីធីស៊ីត
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MADON JOLU-2011 FOUNDATION

បញ្ជីបញ្ជីអ្នកចូលរួម

អង្គប្រជុំស្តីពី: ទីកន្លែង:

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី ១៤ ខែ វិច្ឆិកា ឆ្នាំ ២០២៤		
				ស្រី	ប្រុស	
	ស្រី ឈី	ប	ប្រធានគ.ក ស្រុក			0718724732
	ស្រី វ៉ាន់	ប	អនុ. ប្រធាន			067676427
	ស្រី ឈី	ប	សមាជិក			0973535697
	ស្រី វ៉ាន់	ប	សមាជិក			097366893
	ស្រី វ៉ាន់	ប	សមាជិក			
	ស្រី វ៉ាន់	ប	សមាជិក			
	ស្រី វ៉ាន់	ប	—			
	ស្រី វ៉ាន់	ប	—			
	ស្រី វ៉ាន់	ប	—			
	ស្រី វ៉ាន់	ប	—			031511383

អង្គការមជ្ឈមណ្ឌលស្រុក
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បញ្ជីបណ្តាញសត្វល្អិត

អង្គបេតិកភណ្ឌ:..... ទីកន្លែង:.....

លរ	ឈ្មោះបណ្តាញសត្វល្អិត	ភេទ	តួនាទី	បណ្តាញសត្វល្អិត		លេខទូរស័ព្ទ
				ថ្ងៃទី.....ខែ.....ឆ្នាំ២០២២.....	ក្រីក	
៤	ស្រី គ្រី គ្រី	ស	ប្រធានគម្រោង សម្របសម្រួល			០៧៧៨៤១១៦៦
១.	គ្រី គ្រី	ស	ប្រធានគម្រោង			០៧៧៧៤១៧៧៧៩
២.	ស្រី គ្រី	ស	សមាជិក			
៤.	គ្រី គ្រី	ស	សមាជិក			០៩៧៧៥៧៣០៨៤
៥.	ស្រី គ្រី	ស	—			
៦.	ស្រី គ្រី	ស	—			០៧៦៦៤៣១៣៧
៧.	ស្រី គ្រី	ស	—			
៨.	ស្រី គ្រី	ស	—			
៩.	ស្រី គ្រី	ស	—			០៧៧៨៤១១៦៦
១០.						
១១.	ស្រី គ្រី	ស	ប្រធានគម្រោង សម្របសម្រួល			០៧១៣៧២៥៥៨

MJP
បណ្ណាល័យស្រូវសីហនុ
ប្រធានបទ: ឧបត្ថម្ភការងារស្រូវសីហនុ 3 ឆ្នាំ វិស័យការពារព្រៃឈើ និង កសិកម្ម
ថ្ងៃទី ១១ ខែ សីហា ឆ្នាំ ២០២៣ ទីកន្លែងស្រុកកោះសីហនុ ស្រុកស្រែចម្ការ (MJP - FHO)
សំគាល់: អ្នកចូលរួមទទួលបានស្រូវសីហនុ: ថ្នាក់នានា និងបានអនុញ្ញាតិឱ្យកម្មវិធីយកមកប្រើ និងដឹកចេញ: ជួយកម្មវិធីស្រូវសីហនុ។

ល.រ	ឈ្មោះ	ភេទ	អាយុ	តំបន់	ភូមិ	ឃុំ	សញ្ជាតិ				លេខទូរស័ព្ទ	ហត្ថលេខា ឬស្នាមមេរ័ត
							សៀវភៅ AMIAH	ឯកសារបៀវត្ស	ចិញ	ស៊ីមី		
1.	កង ក្រីងក្រីង	ស្រី	54	ក្រសែង ព្រៃឈើ	កោះសីហនុ	កោះសីហនុ	1	1	1	1	0717841166	
2.	ក្រីងក្រីង	ប	53	ក្រសែង	—	—	1	1	1	1	0717747759	
3.	កង ក្រីង	ប	56	កោះសីហនុ	—	—	1	1	1	1	0716643137	
4.	កង ក្រីង	ប	54	—	—	—	1	1	1	1	0972573084	
5.	ក្រីង ក្រីង	ប	58	—	—	—	1	1	1	1		
6.	ក្រីង ក្រីង	ប	43	—	—	—	1	1	1	1	0977629646 0716643137	
7.	កង ក្រីង	ប	61	—	—	—	1	1	1	1		

23 August 2023

Training Session	Total	Female
Tree Seeds Propagation	28	8
Field Applications	5	1
	33	9

មជ្ឈមណ្ឌលប្រយោជន៍ប្រជាជន
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បញ្ជីបញ្ជីប្រជាជនអ្នកចូលរួម

អង្គប្រជុំស្តីពី: ទីកន្លែង:

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី ១២ ខែសីហា ឆ្នាំ២០២១		
				ព្រឹក	ល្ងាច	
1.	ធីតា ធីតា	ប	ប្រធានល.ក អ្នកគ្រប់គ្រង			0718724732
2.	ធីតា ធីតា	ប	ល.ក ល.ក អ្នកគ្រប់គ្រង			067676427
3.	ធីតា ធីតា	ប	ហិរញ្ញវិទ្យា			0973535697
4.	ធីតា ធីតា	ប	ល.ក			097366893
5.	ធីតា ធីតា	ប	សមាជិក			
6.	ធីតា ធីតា	ស	---			
7.	ធីតា ធីតា	ប	---			
8.	ធីតា ធីតា	ស	---			
9.	ធីតា ធីតា	ប	---			
10.	ធីតា ធីតា	ប	---			
11.	ធីតា ធីតា	ប	ប្រធានល.ក លេខាធិការ			0719372558

12	ថ្មី កំណែសម្រួល	ច	គន្លឹះ លេខកូដ			
13	ច្បាប់ ៦	ច	លេខកូដ			
14	វិញ ១២	ស	—			
15	ច្បាប់ ៦	ស	—			
16	កិច្ចសន្យា	ស	—			
17	ម្ចាស់ គ្រប់គ្រង	ច	—			
18	ច្បាប់ ១២	ច	—			
19	ក្រុមប្រឹក្សា	ស	—			0886484764
20	ប្រធាន គ្រប់គ្រង	ច	—			
21	គ្រប់គ្រង គ្រប់គ្រង	ស	ប្រធាន គ្រប់គ្រង			
22	ប្រធាន គ្រប់គ្រង	ច	ថ្នាក់ គ្រប់គ្រង			
23	សមាជិក គ្រប់គ្រង	ច	លេខកូដ			

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី	ខែ	
				ឆ្នាំ២០២	ល្ងាច	
24	ច្បាប់ កំណែសម្រួល	ច	លេខកូដ			
25	ម្ចាស់ គ្រប់គ្រង	ច	—			
26	ច្បាប់ ១២	ច	—			
27	គ្រប់គ្រង គ្រប់គ្រង	ស	—			
28	គ្រប់គ្រង គ្រប់គ្រង	ច	—			

មូលនិធិ ម៉ាកដូលីត
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FOUNDATION

បញ្ជីគម្រោងអ្នកចូលរួម

អង្គប្រជុំស្តីពី:.....ទីកន្លែង:.....

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី.ខ.ខ... ខែ.សី.យ... ឆ្នាំ២០២៣.		
				ព្រឹក	ល្ងាច	
1.	ឡូ ណារី	ស	ទីភ័ក្ត្រទំនាក់ទំនង			012617092
2.	ឡាន ច័ន្ទ	ប	អាកាសធាតុ			08979330
3.	ឧបុន ប៊ុនណាត	ប	ទំនាក់ទំនងកសិកម្ម			012263647
4.	លាង បូរាណ	ប	បណ្តោះអាសន្ន			017990957
5.	វ៉ាត សុភវង្ស	ប	លទ្ធផលការងារកសិកម្ម			012700506

25 August 2023

Sessions	Total	Female
Field application at Anakut Koma Samaki	20	8
Field application at Takhes Meanchey	19	9
Field application at Dontret	29	7
Visit to Chabpors	4	1
Total	72	25

មូលនិធិ ម៉ាតឡូឡូស៊ីស
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MADON JALIN PITI FOUNDATION

បណ្តឹងគុណប្រកបដល់រួម

អង្គប្រជុំស្តីអំពី: ទីកន្លែង:

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេ
				ថ្ងៃទី ១៥ ខែ ៧ ឆ្នាំ ២០២៣	ថ្ងៃទី ១៧ ខែ ៧ ឆ្នាំ ២០២៣	
				ព្រឹក	ល្ងាច	
1	រតន វីង្សា	ស	អគ្គនាយក	<i>Radya</i>	<i>Radya</i>	
2	ឃុន ភីមឡាន	ស	អគ្គនាយក	<i>Kimlang</i>	<i>Kimlang</i>	
3	តាន សៀមម៉ី	ស	វិទ្យាសាស្ត្រ	<i>Somy</i>	<i>Somy</i>	
4	កាវ រតន	ប	វិទ្យាសាស្ត្រ	<i>Ru</i>	<i>Ru</i>	
5	ឃុំ សុភាព័ណ	ប	វិទ្យាសាស្ត្រ	<i>B-H</i>	<i>B-H</i>	
6	តាន និហា	ស	វិទ្យាសាស្ត្រ	<i>Nira</i>	<i>Nira</i>	
7	សៀម សុគន្ធា	ស	វិទ្យាសាស្ត្រ	<i>Su</i>	<i>Su</i>	
8	ថន សុវណ្ណាភិ	ប	វិទ្យាសាស្ត្រ	<i>Ru</i>	<i>Ru</i>	
9	សុភាព័ណ	ប	វិទ្យាសាស្ត្រ	<i>Cey</i>	<i>Cey</i>	
10	តាក់ វណ្ណ	ស	វិទ្យាសាស្ត្រ	<i>See</i>	<i>See</i>	
11	វិបត្តិ សុខាណិ	ប	វិទ្យាសាស្ត្រ	<i>Somy</i>	<i>Somy</i>	

12	ស្រែង ប្រើទុក្ខប	ប	វ. វិស្វកម្ម	D. គ	D. គ
13	គ្រុឌ កញ្ចប់	ស	វ. វិស្វកម្ម	T. គ	T. គ
14	ស្រែង ចាន់ថ្មី	ស	វ. វិស្វកម្ម	S. គ	S. គ
15	ម៉ាស់ កាត់ដាច់	ប	វ. វិស្វកម្ម	N. គ	N. គ
16	កាត ប៉ាន់បង	ប	វ. វិស្វកម្ម	០៥	០៥
17	តា ចាត់	ប	វ. វិស្វកម្ម	០៥	០៥
18	ដីកំបាំង កញ្ចប់	ប	វ. វិស្វកម្ម	V. គ	V. គ
19	ក្បាល កែវបោល	ស	វ. វិស្វកម្ម	H. គ	H. គ
20	ស្រែង កែវបោល	ស	វ. វិស្វកម្ម	C. គ	C. គ

ប្រតិបត្តិការស្រុកស្រែក
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ប្រតិបត្តិការស្រុកស្រែក

អង្គប្រជុំស្តីពី:..... ទីកន្លែង:.....

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី ១៥... ខែ វិច្ឆិកា... ឆ្នាំ ២០២១	ស្រុក... ស្រុក	
១	ភាព ព្រឹត	៧	អ្នកប្រឹក្សា			09690399283
២	វិស ជ្រៃសុត	ស	សិស្ស			0975410122
៣	ឈន ចាន់ហ័រ	ស	សិស្ស			081609314
៤	ស៊ីវី ឌីណូ	ស	សិស្ស			0973500216
៥	ស៊ីវី ណារីណា	ស	សិស្ស			0716532096
៦	ហ៊ុន ស្រីសុដ្ឋា	ស	សិស្ស			081590857
៧	សុខ ជ្រៃសុត	ស	សិស្ស			0884336618
៨	សុខ ជ្រៃសុត	ស	សិស្ស			088258554 088869554
៩	វិស ជ្រៃសុត	ស	-			0762112192
១០	វិស ជ្រៃសុត	ស	-			0889202723
១១	សុខ ជ្រៃសុត	ស	-			0884003708

13	ឃុំស្រែចម្ការ	ស	សិស្ស	<i>Phum</i>	<i>Phum</i>	0979733051
14	ឃុំស្រែចម្ការ	ប	សិស្ស	<i>Phum</i>	<i>Phum</i>	095751212
15	ឃុំស្រែចម្ការ	ប	សិស្ស	<i>Phum</i>	<i>Phum</i>	0719628000
16	ឃុំស្រែចម្ការ	ប	សិស្ស	<i>Phum</i>	<i>Phum</i>	016816615
17	ឃុំស្រែចម្ការ	ប	សិស្ស	<i>Phum</i>	<i>Phum</i>	0719400314
18	ឃុំស្រែចម្ការ	ប	សិស្ស	<i>Phum</i>	<i>Phum</i>	0829239591
19	ឃុំស្រែចម្ការ	ប	សិស្ស	<i>Phum</i>	<i>Phum</i>	086493579
20	ឃុំស្រែចម្ការ	ប	សិស្ស	<i>Phum</i>	<i>Phum</i>	092326876

លេខដី ម៉ាតឺរីយ៉ូលីក
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ប្រតិបត្តិការស្រុកកម្ពុជារួម

អង្គប្រជុំស្តីពី: ទីកន្លែង:

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី ១៥... ខែ ៧/២០២១... ឆ្នាំ ២០២១...	ស្រុក លាច	
1	លី ធីតា	ប	គណនីស.ក អ្នកគ្រឹះ			
2	កៀន ឥន្ទ	ប	អគ្គ.ប.ក អ្នកគ្រឹះ			
3	លាង ធីតា	ប	បរិស្ថានិក			
4	សាន ធីតា	ប	សេវា			
5	ហេង គុណ	ប	សហគមន៍			
6	វិធីតា ធីតា	ស	សហគមន៍			
7	ក្រីង ធីតា	ប	---			
8	ធីតា លី	ស	---			
9	អ៊ុន ធីតា	ប	---			
10	ក្រីង ធីតា	ប	---			
11	លី ធីតា	ស	គណនីស.ក អ្នកគ្រឹះ			

12	បាត់ លាត្បែង	ប	បាត់ លាត្បែង			
13	ស៊ី ឈើ	ប	សម្រាល់			
14	ចាន់ សំណាម	ប	សម្រាល់			
15	តាត លាត្បែង	ប	---			
16	ឡី ឡើ	ស	---			0718120665
17	រោង ប៊ុនហា	ប	សម្រាល់			
18	ស៊ី ឈើ	ប	សម្រាល់ស្រាល់ កុលា			
19	ថ្កូវ កុលា	ប	កុលា សម្រាល់ កុលា			
20	កុន ហា	ប	សម្រាល់			
21	ហា ឈើ	ស	---			
22	ចាន់ ហា	ស	---			
23	ស៊ី ឈើ	ប	---			

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម		លេខទូរស័ព្ទ
				ថ្ងៃទី.....ខែ.....ឆ្នាំ២០២.....	ព្រឹក ល្ងាច	
24	ស្រ្តី ឈើ	ស	សម្រាល់			
25	បុរស ឡើ	ប	សម្រាល់			
26	កុន ហា	ប	សម្រាល់ស្រាល់ កុលា			
27	វិសេស ឡើ	ប	---			
28	បុរស កុលា	ប	---			
29	ហាត់ ហា	ប	សម្រាល់ស្រាល់ កុលា			

មូលនិធិ វិវឌ្ឍន៍កម្ពុជា
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បណ្តែងគ្រួសារអនាម័យ

អង្គប្រជុំស្តីពី: ទីកន្លែង:

លរ	ឈ្មោះអ្នកចូលរួម	ភេទ	តួនាទី	ហត្ថលេខាអ្នកចូលរួម	
				ថ្ងៃទី ១៤ ខែ វិច្ឆិកា ឆ្នាំ ២០២១	ថ្ងៃទី ១៤ ខែ វិច្ឆិកា ឆ្នាំ ២០២១
				ប្រុស	ស្ត្រី
៤	ឈុន ឆាយ	ស	ក្រុមប្រឹក្សា		
២	ឡាន ឆ្លាត	ស	អគ្គនាយក		
៣	ឈុន ធីនណាត	ស	អគ្គនាយកប្រចាំខេត្ត		
៤	ហេង មុនា	ស	បច្ចេកជំនាញ		

Grant total participants: 165, including 41 females

Annex 6. 6. Field Evaluation Form

Results of Post-Training Evaluation

1. Rate your overall enjoyment of the course

The majority of participants found that the training was enjoyable or extremely enjoyable in training.

Rate of answer (1- Not enjoyable, 5 – Extremely enjoyable)	1	2	3	4	5
Answer	0	0	1	3	22

2. Part of training did you find most useful

Participants provided a range of answers, reflecting their different concerns and specialisms. The most useful session was Agroforestry, followed by soil erosion control, leaky weir construction, and seed propagation.

Training part/session	Answer
Agroforestry	9
Soil erosion control and leaky weir	5
Forest fire	1
Seed propagation	5
Nursery	3

3. What aspects of the training did you find less enjoyable or challenging?

Only three participants found a session challenging or less enjoyable.

Answer	
Economic analysis of agroforestry	2
Forest fire	1
No answer	20

4. How confident do you feel in your knowledge and understanding of the course material after completing the course?

The majority of participants answered that they understand training materials.

Rate of answer (1- Not at all confident, 5 – Extremely confident)	1	2	3	4	5
Answer	0	0	4	8	13

5. Were the course materials (slides, handouts) clear and helpful in supporting your learning?

The majority of participants found that training materials were clear and helpful.

Rate of answer (1- Unclear and unhelpful, 5 – Very clear and helpful)	1	2	3	4	5
Answer	0	0	2	5	19

6. How would you rate the variety and effectiveness of the exercises and activities in the course?

The majority of participants rated the variety and effectiveness of training course as excellence.

Rate of answer (1- Very poor, 5 – Excellent)	1	2	3	4	5
Answer	0	0	1	3	22

7. How would you rate the facilitator's presentation and engagement during the course?

The majority of participants found that trainers and facilitators were excellent.

Rate of answer (1- Poor, 5 – Excellent)	1	2	3	4	5
Answer	0	0	1	4	21

8. How confident do you feel in your knowledge and understanding of the course material after completing the course?

While completing the training, most participants were most confident in their knowledge and understanding of the training materials.

Rate of answer (1- Not at all confident, 5 – Extremely confident)	1	2	3	4	5
Answer	0	1	4	3	17

9. Please indicate whether the course helped you.

At the end of training, 42% of participants found that they had significantly increased their knowledge. The remaining 58% found that they have somewhat increased their knowledge from the training.

Answer	
Significantly increase your knowledge	11
Somewhat increase your knowledge	15
Did not impact your knowledge	0
Decreased your knowledge	0

10. Please share a specific concept or topic from the course that you feel you better understand now.

Topic	Answer
Agroforestry	3
Soil erosion control and leaky weir	4
Forest fire	3
Seed propagation	2
Nursery	3
All	7

11. Please provide any additional comments or suggestions for improving the course.

Comments	Answer
Should extend time of training	4
Should cover more training session	0
Practice on nursery	0
Good enough	8

Post Training Evaluation Form



Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience (Technical Assistance 6539)

TRAINING title

Date

Venue

POST-TRAINING EVALUATION SHEET

Name of the participant:	
Organisation:	
Position:	

Please take a few moments to provide feedback on your experience with the course. Your responses will help us improve our future courses. Your honesty is greatly appreciated.

1. On a scale of 1-5, please rate your overall enjoyment of the course? (1- Not enjoyable, 5 – Extremely enjoyable)

1 ○ 2 ○ 3 ○ 1 4 ○ 3 5 ○ 22

2. What parts of the training did you find most useful?

1. Agroforestry 9
2. Soil erosion control 5
3. Forest fire 1
4. Seed propagation 4
5. Nursery 2 -----

3. What aspects of the training did you find less enjoyable or challenging?

1. economic analysis of agroforestry 2
2. Forest fire 1-----

4. How confident do you feel in your knowledge and understanding of the course material after completing the course? (1 – Not at all confident, 5 – Extremely confident)

1 2 3 4 5

5. Were the course materials (slides, handouts) clear and helpful in supporting your learning? (1 – Unclear and Unhelpful, 5 Very clear and helpful)

1 2 3 4 5

6. How would you rate the variety and effectiveness of the exercises and activities in the course? (1- Very Poor, 5 – Excellent)

1 2 3 4 5

7. How would you rate the facilitator's presentation and engagement during the course? (1 – Poor, 5 – Excellent)

1 2 3 4 5

8. How confident do you feel in your knowledge and understanding of the course material after completing the course? (1 – Not at all confident, 5 – Extremely confident)

1 2 3 4 5

9. Please indicate whether the course helped you:

- Significantly increase your knowledge
- Somewhat increase your knowledge
- Did not impact your knowledge
- Decreased your knowledge

10. Please share a specific concept or topic from the course that you feel you better understand now.

Agroforestry 2.

Forest fire and nursery 3-----s

3. Understand all- 7-----

4. Leaky weir and soil erosion control 3-----

11. Please provide any additional comments or suggestions for improving the course:

-----1. Extend time 4-----

-----2. Provide more training sessions -----

-----3. Practice on nursery-----

4. Good enough 8

Thank you for your participation!

Annex 6. 7. Training Materials

Agroforestry and agroecology



icem ប្រធានបទ

1. គោលបំណងវគ្គបណ្តុះបណ្តាល
2. និយមន័យប្រព័ន្ធកសិកម្ម
3. កសិកម្មផ្តល់ផលប្រយោជន៍ដល់ជីវចម្រុះ និង ការប្រែប្រួលអាកាសធាតុ
4. ផលប្រយោជន៍កសិកម្មនិង ក្សេត្របរិស្ថាន
5. មូលដ្ឋានគ្រឹះប្រព័ន្ធកសិកម្ម
6. ការជ្រើសរើសប្រព័ន្ធកសិកម្ម
7. ការរៀបចំប្លង់បច្ចេកទេស តាមទីតាំងសហគមន៍ព្រៃឈើនីមួយៗ
8. បទពិសោធន៍អនុវត្តកសិកម្មនៅកម្ពុជា
9. អនុសាសន៍ និងជំហានបច្ចេកទេសអនុវត្តជាក់ស្តែង
10. រៀបចំផែនការអាជីវកម្មកសិកម្ម

icem ១. គោលបំណងវគ្គបណ្តុះបណ្តាល

1. បង្កើនចំណេះដឹងដល់អ្នកចូលរួមពីទស្សនៈទាននិងការអនុវត្តកសិកម្ម
2. ណែនាំពីប្រព័ន្ធកសិកម្មដែលបានជ្រើសរើសយកមកអនុវត្តនៅសហគមន៍ព្រៃឈើ
3. ជំរើសនានានិងភាពសមស្របនៃការអនុវត្តប្រព័ន្ធកសិកម្ម
4. មូលដ្ឋានគ្រឹះនៃការរៀបចំផែនការអាជីវកម្មកសិកម្មរយៈពេលវែង





**ផលប្រយោជន៍
កសិវត្តកម្ម**

**The Benefits of
Agroforestry**

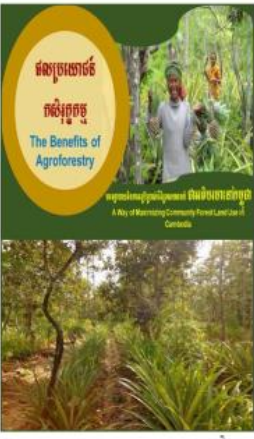


មធ្យោបាយនៃការប្រើប្រាស់ដីព្រៃសហគមន៍ ជាអតិបរមានៅកម្ពុជា
A Way of Maximizing Community Forest Land Use in Cambodia



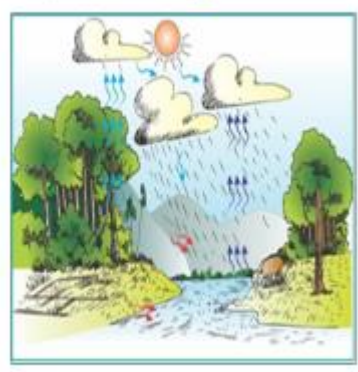
២. និយមន័យកសិវត្តកម្ម

- **កសិវត្តកម្ម** ជាប្រព័ន្ធប្រើប្រាស់ដីបែបបុរាណ និងទំនើប ដែលដើមឈើត្រូវបានគ្របគ្រងរួមគ្នាជាមួយដំណាំ និង/ឬប្រព័ន្ធផលិតកម្មសត្វនៅក្នុងការកំណត់កសិកម្ម។ ពួកវាជាប្រព័ន្ធគ្រប់គ្រងធនធានធម្មជាតិ ផ្អែកលើអេកូឡូស៊ី ដែលធ្វើពិពិធកម្ម និងនិរន្តរភាពផលិតកម្ម ដើម្បីបង្កើនអត្ថប្រយោជន៍សង្គម សេដ្ឋកិច្ច និងបរិស្ថានសម្រាប់អ្នកប្រើប្រាស់ដីនៅគ្រប់មាត្រដ្ឋាន។ (យោងតាម FAO)
- **មូលដ្ឋានប្រព័ន្ធកសិវត្តកម្ម** ជាប្រព័ន្ធមួយដែលដាំដុះដំណាំកសិកម្ម គ្រាប់ពូជ/វត្តជាតិ ដើមឈើ និងសត្វនៅពេលដំណាលគ្នាលើទីតាំងផ្ទៃដីកសិវត្តកម្មដែលបានរៀបចំ។
- **ប្រព័ន្ធកសិវត្តកម្ម** ជាសិល្បៈនៃការដាំដុះដំណាំកសិកម្ម និងដើមឈើ រួមទាំងសត្វ ក្នុងទីតាំងដីតែមួយ។ ប្រព័ន្ធនេះមានលក្ខណៈសមស្របសម្រាប់ការអនុវត្តតាមសហគមន៍ព្រៃឈើ តំបន់ការពារធម្មជាតិ និងតំបន់អេកូទេសចរណ៍ភាគច្រើន។



៣. កសិវត្តកម្មផ្តល់ផលប្រយោជន៍ដល់ជីវចម្រុះ និង ការច្របូលអាកាសធាតុ

- ផលប្រយោជន៍ចំនួន៤ នៃការអនុវត្តកសិវត្តកម្ម៖**
- (១). ការកាត់បន្ថយការប្រែប្រួលអាកាសធាតុតាមរយៈការស្រូបយកការបំបាត់កាបូន (រុក្ខជាតិស្រូបយកកាបូន បំបាត់អុកស៊ីសែន)
 - (២). ការអភិរក្សជីវចម្រុះ (បង្កើនសារពាង្គកាយមានជីវិតនិងគ្មានជីវិត ធនធានធម្មជាតិ)
 - (៣). ការកែលម្អគុណភាពដី និងសុខភាពដី (បង្កើនគុណភាពដី ដីមានជីវិត មានសុខភាពល្អ ដំណាំលូតលាស់ រុក្ខជាតិពុកផុយក្លាយជាកំប៉ុស្តិ៍ ផ្តល់សារធាតុចិញ្ចឹមដល់ដី និងដំណាំ)
 - (៤). ការកែលម្អគុណភាពទឹក និងខ្យល់អាកាស (ការដាំដុះព្រៃឈើនិងដំណាំកសិវត្តកម្មបានជួយការទប់ការស្តាត់ការហូរច្រោះ និងបន្ថយខ្យល់អាកាសបានល្អ ។
- (Oxford University Press 2022)



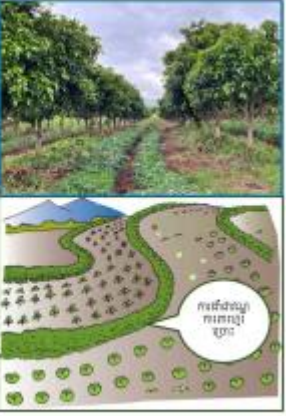
icem ៤. ផលប្រយោជន៍កសិកម្មនិងកេរ្តិ៍ឈ្មោះ

- ដំណាំធ្លាប់កសិកម្ម៖ ដំណាំធ្លាប់ត្រូវបានអនុវត្តក្នុងការដាំដំណាំ ឬប្រើមុខនៅជិតៗគ្នា ដែលអនុញ្ញាតឱ្យប្រើប្រាស់ធនធានដែលមានស្រាប់ ក្នុងការបង្កើនទិន្នផលនិងប្រសិទ្ធភាព។
- ដំណាំធ្លាប់គឺជាសមាសភាគចំបងក្នុងប្រព័ន្ធកសិកម្ម៖
- ដំណាំជំនួយអាសូត៖ ក្នុងប្រព័ន្ធដំណាំធ្លាប់ភាគច្រើនមានដាំដំណាំជំនួយអាសូត ដូចជា សណ្តែកបាយ សណ្តែកដី និងអំបូរសណ្តែកផ្សេងៗ។ កសិកម្មប្រើប្រាស់ដំណាំជំនួយអាសូត ដូចជាអង្កាញ់ កន្ទុំថេត អំពិល សីលាបកណ្តុរ ។ល។
- រុក្ខជាតិរស់តម្របដី៖ សុខភាពដីត្រូវការការពារពីធាតុដីអាក្រក់ដូចជាព្រះអាទិត្យនិងភ្លៀង ។ ការត្រូវកំដៅខ្លាំងពេកនាំឱ្យធាតុទាំងអស់ក្នុងដី បង្ហាញសារធាតុចិញ្ចឹម ពីក្នុងដី។ ប្រើប្រាស់រុក្ខជាតិធាតុដីដើម្បីជួយការពារដី និងបន្ថែមដំណាំនិងអត្ថប្រយោជន៍សេដ្ឋកិច្ចទៅក្នុងប្រព័ន្ធកសិកម្ម។



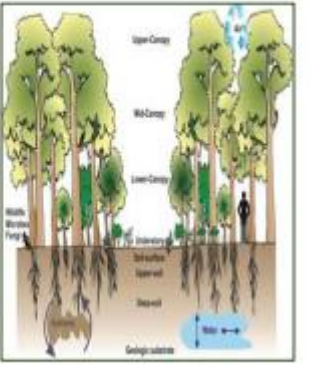
icem ៤. ផលប្រយោជន៍កសិកម្មនិងកេរ្តិ៍ឈ្មោះ

- ប្រព័ន្ធដំណាំធ្លាប់កសិកម្ម៖
- ការដាំដំណាំជាជួរ៖ ការអនុវត្តដោយដាំដំណាំជំនួយអាសូតជាបន្តបន្ទាប់ ជាមួយដំណាំរយៈពេលខ្លី។ ដើមឈើដាំក្នុងរង្វង់សន្លឹកដាំជួរ ហើយដំណាំដាំក្នុងចន្លោះដើមឈើនោះ គឺដាំដំណាំដើមឈើ និងដំណាំចន្លោះជួរ។ ក្នុងដំណាក់កាលលុតលាស់ដំណាំ ឈើត្រូវបានក្រែមែក និងប្រើប្រាស់ជាគម្របដំណាំដើម្បីបង្កើនសារធាតុមាត់ (ជម្រកជាតិ) ផលជី និងផ្តល់នូវសារធាតុចិញ្ចឹមដល់ដំណាំ។ ការអនុវត្តនេះបើមានសភាពរាបស្មើ ធំទូលាយ។
 - ការដាំជាកងវណ្ណប្រុង៖ ការអនុវត្តប្រហាក់ប្រហែលនឹងការដាំដំណាំជាជួរដែរ តែរុក្ខជាតិជំនួយអាសូតត្រូវបានកាត់ជាប្រចាំ និងរក្សាជាជួរតូចដែលអាចមានកំពស់ ១-១.៥ម៉ែត្រ។ ការដាំជាកងវណ្ណជាមួយដំណាំរយៈពេលខ្លី ឬឈើហ្មត់ត្រូវបានដាំតាមចន្លោះជួរ និងតាមរបងត្រូវបានក្រែមែកជាប្រចាំសម្រាប់ដាំដំណាំសត្វ និងសារធាតុចិញ្ចឹមផលជី។ ការដាំតាមរបងជាកងវណ្ណ ឬតាមខ្សែកំពស់កាត់ផ្ទៃដីការទាំងមូល ដែលបង្កើតបានជាបន្ទាត់កាងជាច្រើនជួរ។



icem ៤. ផលប្រយោជន៍កសិកម្មនិងកេរ្តិ៍ឈ្មោះ

- កេរ្តិ៍ឈ្មោះស្ថាន រួមបញ្ចូលនូវដំណាំរយៈពេលវែង និងដាំដំណាំពហុប្រយោជន៍ (ដំណាំដែលបានដាំតែម្តង តែបន្តផ្តល់ផលរហូត ឬច្រើនឆ្នាំ ដូចជាដើមឈើ ស្លឹកគ្រី រមៀត រំដឹង ម្នាស់ ម្រេច ដំឡូងដ្ឋា) និងរួមទាំងដំណាំរយៈពេលខ្លី។
- កេរ្តិ៍ឈ្មោះស្ថាន បង្កើននូវប្រព័ន្ធកសិកម្មដោយអនុវត្តគ្រាប់តាមដំណើរការធម្មជាតិ។
- កេរ្តិ៍ឈ្មោះស្ថាន អាចដូចគ្នានឹងដំណើរព្រៃឈើធម្មជាតិ ដែលជីវិតនិងប្រព័ន្ធកសិកម្មមិនបានបន្ថែមទៅក្នុងការអនុវត្តការដាំជួរទេ។ ម្យ៉ាងទៀត ប្រព័ន្ធព្រៃឈើនេះវាចែរក្សាដោយខ្លួនឯង ដោយការបង្កើតនូវប្រសិទ្ធភាព សមតុល្យផលិតផលរវាងប្រភេទដំណាំប្រព្រឹត្តិដែលមាននៅក្នុងកន្លែងនេះ។



icem ៤. ផលប្រយោជន៍កសិកម្មក្នុងការកែលម្អបរិស្ថាន

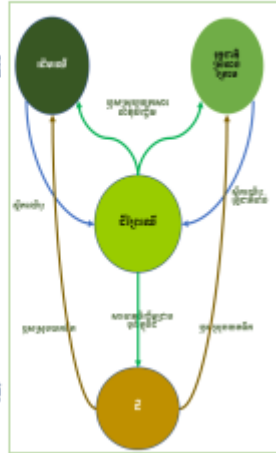
ធាតុផ្សំគ្រួសាររៀបចំ និងការអនុវត្តប្រព័ន្ធក្រុមប្រឹក្សាបរិស្ថាន ៖

- ស្រទាប់នៃប្រព័ន្ធអេកូឡូស៊ីព្រៃឈើ៖ គម្របព្រៃ ចុល្លត្រីកស្រទាប់ខាងក្រោម គម្របដី រុក្ខជាតិជំនួយអាស៊ូត។ ជីជាតិក្នុងព្រៃ៖ រុក្ខជាតិជំនួយអាស៊ូត គម្របដី ស្លឹកពុកផុយ និងបំលែងជាជីកំប៉ុស្តិ៍។
- ការគ្រប់គ្រងសត្វល្អិត៖ ថ្នាំសំលាប់សត្វល្អិតធម្មជាតិ សត្វល្អិតមានប្រយោជន៍ តុល្យភាពអេកូឡូស៊ី។

រុក្ខជាតិ មនុស្ស និងសត្វនៅក្នុងប្រព័ន្ធក្រុមប្រឹក្សាបរិស្ថាន

ធ្វើការរួមគ្នាដើម្បីបង្កើតប្រព័ន្ធជីវមូលដ្ឋានដោយ៖- កែច្នៃសារធាតុចិញ្ចឹម និងថាមពល កាត់បន្ថយធាតុចូលពីខាងក្រៅ។

- ការរួមបញ្ចូលដំណាំនិងចិញ្ចឹមសត្វ៖ ធ្វើពិពិធកម្មដំណាំ ប្រើប្រាស់ច្រើនជាងមួយប្រភេទ។
- បង្កើតអន្តរកម្មដែលមានប្រយោជន៍រវាងប្រភេទដំណាំ សត្វ និងមនុស្ស ត្រូវបានអនុវត្ត នៅក្នុងប្រព័ន្ធនេះដែលមានប្រយោជន៍ទៅវិញទៅមក។



icem ៤. ផលប្រយោជន៍កសិកម្មក្នុងការកែលម្អបរិស្ថាន

- ក្នុងមជ្ឈដ្ឋានព្រៃឈើ (ប្រព័ន្ធអេកូឡូស៊ី) រុក្ខជាតិ និងសារធាតុកាយមានជីវិតនិងគ្មានជីវិតមានតួនាទី និងបំពេញតួនាទីទៅវិញទៅមកនូវសារធាតុចិញ្ចឹមដែលជាចំណីអាហាររបស់វា ហើយដែលគេហៅថា ព្រៃឈើអាហារ។
- វិទ្យុសាស្ត្រនៃសត្វ៖ ប្រព័ន្ធទាំងនេះធ្វើគ្រាប់តាមព្រៃធម្មជាតិ ប៉ុន្តែជំនួសសមាសធាតុព្រៃឈើសំខាន់ៗជាមួយនិងដំណាំរោចបរិភោគបាន ឬរុក្ខជាតិជំនួយអាស៊ូត។លំហបញ្ឈរ បម្រើដើរតួជាទ្រទ្រង់ចំណី និងបង្កើតម្លប់សម្រាប់ដំណាំស្រទាប់ក្រោម ដែលជាធាតុសំខាន់នៃព្រៃឈារ។
- មានសមាសធាតុចំនួនប្រាំពីរនៅក្នុងព្រៃឈើអាហារ៖ រុក្ខជាតិស្រទាប់ឈើកាំទ្រ, ដើមឈើខ្ពស់បំផុត, វល្លិ៍តោង និងសណ្តែក, រុក្ខជាតិជំនួសអាស៊ូត, ពល្លកមើម, និងពល្លកស្រទាប់ឈើ និងពល្លកស្រទាប់ខាងក្រោមដី ជាមួយដំណាំដុះដីទ្រូង និងខ្លឹម។ គម្របដី រុក្ខជាតិ គម្របដី រសំនៅដែលលាតសន្ធឹងឆ្ងាយ ឬរកចងក់នៅជិតគ្នា ដុះជាដុះទ្រូងធ្លា ល្ងៅ និងសណ្តែកដី ចុល្លត្រីកស្រទាប់ អាចជា រុក្ខជាតិជំនួយអាស៊ូត ឬរុក្ខជាតិកម្រិតកណ្តាលផ្សេងទៀត និងជាធម្មតាជំនួយដុះ និងដំណាំការពារ រុក្ខជាតិដែលអាចជួយបណ្តាញសត្វល្អិត ឬការពាររុក្ខជាតិពីសត្វល្អិតដុះផ្លា ស្បែករៀង រុក្ខជាតិមានបន្លា និងស្លឹកក្រៃ។ ព្រៃឈើអាហារ គឺជួយសម្រាប់ផ្ទៃដីតូច ឬធំ។ ពួកវាមានប្រយោជន៍ជាពិសេសនៅក្នុងចន្លោះនៃជិតផ្ទះ ហើយអាចបម្រើជាសួនច្បារនៅផ្ទះ។



icem ៥. មូលដ្ឋានគ្រឹះនៃប្រព័ន្ធកសិកម្ម

យោងតាមចំណាត់ថ្នាក់និងប្រព័ន្ធកសិកម្ម ICRAF បានចាត់ថ្នាក់ដូចខាងក្រោម៖

1. **ប្រព័ន្ធកសិកម្មក្រុម (Agri-Silviculture/Agro-forestry)** ៖ ដំណាំកសិកម្ម + ដើមឈើ (ដែលដាំដុះបញ្ចូលគ្នារវាងដំណាំកសិកម្ម និង ព្រៃឈើ គ្រាប់ដើមឈើ នៅពេលដំណាលគ្នា)
2. **ប្រព័ន្ធក្រុម-សត្វចម្រុះ (Silvo-Pastoral)** ៖ ដើមឈើ + សត្វ (ដែលដាំដុះបញ្ចូលគ្នារវាងព្រៃឈើ និង ការចិញ្ចឹមសត្វ នៅពេលដំណាលគ្នា)។ សត្វឱស្សនៅក្រោមដើមឈើ នៃចំការដើមឈើ ឬឈើដែលមានស្រាប់ ក្នុងសហគមន៍ព្រៃឈើ។ ប្រព័ន្ធចិញ្ចឹមសត្វ មានគោ ក្របី ពពែ ចៀម ឱស្សនៅក្រោមដើមឈើដុះក្នុងចំការឬឈើមានស្រាប់ក្នុងសហគមន៍ ចំការដើមឈើសម្រាប់យកផលឈើ ឬផ្លែឈើ។
3. **ប្រព័ន្ធកសិកម្ម-ក្រុម-សត្វចម្រុះ (Agro-Silvo-Pastoral)** ៖ ដំណាំកសិកម្ម + ដើមឈើ + សត្វ (ដែលដាំដុះបញ្ចូលគ្នារវាងដំណាំកសិកម្ម ព្រៃឈើ គ្រាប់ដើមឈើ និង ការចិញ្ចឹមសត្វ នៅលើផ្ទៃដីតែមួយជាបន្តបន្ទាប់)។ ប្រភេទនេះអាចបំបែកជាប្រព័ន្ធក្រុម-សត្វឬក្រុមដែលមានវត្តមានតែដើមឈើ និងសត្វចិញ្ចឹម។
4. **ប្រព័ន្ធកសិកម្មចម្រុះ (Integrated Agroforestry)** ៖ **កសិកម្មក្រុម + ទឹកស្អាត (ដំណាំកសិកម្ម-ដើមឈើ-សត្វ + ទឹកស្អាត) (Agroforestry + Aquaculture)** វាជាការដាំដំណាំកសិកម្ម ជាមួយដើមឈើដាំឬមានស្រាប់ ដោយការចិញ្ចឹមសត្វ (គោ ក្របី ពពែ...) និងការចិញ្ចឹមត្រី ក្នុងផែនព្រៃសហគមន៍។

icem ១. ការជ្រើសរើសប្រព័ន្ធកសិកម្ម

1 ប្រព័ន្ធកសិកម្ម: ដំណាំកសិកម្ម + ដើមឈើ



icem 2 ប្រព័ន្ធ រុក្ខ-សត្វចម្រុកម្តង៖ ដើមឈើ + សត្វ



icem 3 ប្រព័ន្ធកសិកម្ម-រុក្ខ-សត្វចម្រុកម្តង៖ ដំណាំកសិកម្ម + ដើមឈើ + សត្វ





icem ៤. បទពិសោធន៍អនុវត្តកសិកម្មនៅកម្ពុជា

ដើម្បីអនុវត្តកសិកម្ម បានងាយស្រួលសកម្មភាពមួយ ចំនួនត្រូវអនុវត្ត ដូចជាការធ្វើសុវត្ថិភាពព្រៃឈើខ្លះដើម្បី បើកប្រឡោះព្រៃ គំរបព្រៃ និងអនុញ្ញាតិឱ្យមានពន្លឺចូល មកដល់ដំណាំកសិកម្ម (កសិកម្មនៅសហគមន៍ ព្រៃឈើខេត្តសៀមរាប) ។



icem កសិកម្មនៅសហគមន៍ព្រៃឈើក្រាំងធំ ខេត្តពោធិ៍សាត់



icem សកម្មភាពបោចស្មៅ និងពូនគល់ខ្ចី និងម្ចាស់ ក្នុងកសិកម្ម





ម្ចាស់ទឹកឃ្មុំ ខ្លី រំដេង និងការចិញ្ចឹមសត្វក្នុងកសិដ្ឋានកសិរុក្ខកម្មសហគមន៍ព្រៃឈើវាលកន្សែង ក្រចេះ ឧសភា ២០២៣



កសិរុក្ខកម្មនៅក្នុងព្រៃសហគមន៍ ប្រាសាទទឹកខ្មៅ ក្រចេះ



កសិរុក្ខកម្ម នៅសហគមន៍ព្រៃឈើភូមិរូបបាក់ត្រា (ការប្រមូលផលត្រសក់ស្រូវ) និងការដាំម្ចាស់រដូវកាលថ្មី



icem ៩. ការប្រឈមជាមួយនៃការអនុវត្តកសិកម្ម

ការប្រឈមជាមួយ	ដំណោះស្រាយ
<ul style="list-style-type: none"> សុខភាពសត្វ: អន់ថយ សត្វទឹក ឬខាំ (មូស) និង ការផ្តល់ទឹក ចំណីមិនគ្រប់គ្រាន់ និងការថែទាំមិនបានល្អ 	<ul style="list-style-type: none"> បែងចែកការទទួលខុសត្រូវច្បាស់លាស់ដល់គណៈកម្មការ ឬសមាជិក
<ul style="list-style-type: none"> ដី: ការខ្សោះដីជាតិដី (ដាំច្រើនសារ) 	<ul style="list-style-type: none"> ដាំដំណាំជំនួសអស្តបន្ថែម ឬដំណាំគម្របដី និងថែមដី មេរោក កំប៉ុស្ត
<ul style="list-style-type: none"> ផ្ទឹក: ខ្វះខាតប្រឈមនិងការខ្វះទឹកស្រោចស្រពដំណាំ ឬសត្វ ផង 	<ul style="list-style-type: none"> រៀបចំកន្លែងស្តុកទឹក ឬបាង ឬជីកអណ្តូងស្រះ
<ul style="list-style-type: none"> ការចូលរួម: ការចូលរួមមិនសកម្ម ឬបាត់ការចូលរួម 	<ul style="list-style-type: none"> កំណត់ការទទួលខុសត្រូវ និងបែងចែកជម្រកដល់ អ្នកអនុវត្ត
<ul style="list-style-type: none"> ដំណាំស្រូវ មិនមានផ្លែ ឬអន់ដើម 	<ul style="list-style-type: none"> ថែទាំបានទៀតទាត់ ជាពិសេសធ្វើដីអោយបានល្អបំផុត
<ul style="list-style-type: none"> រៀងខ្លាំង ជាទឹក ខូចដំណាំ 	<ul style="list-style-type: none"> រៀបចំលើករងជាមុន មានប្រព័ន្ធបង្ហូរទឹកចេញ
<ul style="list-style-type: none"> មិនមានចិរភាព 	<ul style="list-style-type: none"> ត្រូវមានផែនការរកជីកម្ម និងផែនការវិនិយោគរយៈពេល វែង ដោយធ្វើការដាំដុះប្រភេទដំណាំរយៈពេលខ្លី មធ្យម និងវែង។

icem ធ្វើត្រូវច្រើនវិស័យប្រព័ន្ធណាមួយមកអនុវត្តកសិកម្ម ក្នុងសហគមន៍ព្រៃឈើ



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icem ១. សហគមន៍ព្រៃឈើ កុម្មុភារកន្សែង



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icem គោលបំណងនៃការធ្វើផែនការអាជីវកម្ម

សារៈសំខាន់នៃការរៀបចំផែនការអាជីវកម្ម

- បង្ហាញពីការគោលគំនិតអាជីវកម្ម និងការវិនិយោគដែលមានគោលដៅ គោលបំណងច្បាស់លាស់រយៈពេលវែង
- ចូលរួមចំណែកលើកំណត់ការអភិវឌ្ឍន៍កសិរុក្ខកម្មនិងកែលម្អជីវភាពសហគមន៍មូលដ្ឋាន
- ជាផែនទីបង្ហាញផ្លូវក្នុងការអនុវត្តសកម្មភាពកសិរុក្ខកម្ម និងការវិភាគសេដ្ឋកិច្ចក្នុងការអនុវត្តកសិរុក្ខកម្មឱ្យបានល្អ
- បញ្ចូលក្នុងផែនការគ្រប់គ្រងសហគមន៍ព្រៃឈើ



icem ១. ទីតាំង និង អាសយដ្ឋានសហគមន៍ព្រៃឈើ

- ១). សហគមន៍ព្រៃឈើ:.....
- ២). អាសយដ្ឋានបច្ចុប្បន្ន: ភូមិ.....ឃុំ.....ស្រុក.....ខេត្ត.....
- ៣). ផែនការអាជីវកម្មកសិកម្មនេះរៀបចំដោយ:.....
- ៤). សមាជិកអនុវត្តកសិកម្ម:..... ភ្នាក់(ស្រី).....ភ្នាក់



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icem ២. សកម្មភាពអាជីវកម្មកសិកម្ម

- ១). ផលិតកម្ម:.....
- ២). សេវាកម្ម:.....

ក្នុងការអនុវត្តសកម្មភាពនេះ មានពីរ គឺ **ផលិតកម្ម** កសិកម្ម ឬ ការផ្តល់ **សេវាកម្ម** ។
ផលិតកម្ម សំដៅលើការដាំដុះដំណាំគ្រប់ប្រភេទ ទាំងរយៈពេលខ្លី ធម្មតា វែង ទាំង ដើមឈើ និងដំណាំកសិកម្ម លែង លែង លែង និងការចិញ្ចឹមសត្វ មានដូចជាគោ ក្របី ពពែ ។ល។
ចំពោះការផ្តល់សេវាកម្ម វិញ សំដៅដល់ការរៀបចំកន្លែងកសិកម្មទេសចរណ៍ ដែល អាចទាក់ទាញភ្ញៀវទេសចរណ៍មកកំសាន្ត ការស្នាក់នៅតាមផ្ទះសហគមន៍ព្រៃឈើ និង បម្រើផ្ទះមើលសត្វចេញចូល ឬ សកម្មភាពរៀបចំអាហារទទួលបាននៅតាមសហគមន៍ កសិកម្ម ជាដើម។



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icem ៣. គោលដៅ និង គោលបំណង

- 1. គោលដៅ:
- 2. គោលបំណង:



គោលដៅ និង គោលបំណង
 ការរៀបចំកំណត់បាននូវ **គោលដៅ** រយៈពេលវែង 2. ការបង្កើតតំបន់កសិកម្មដើម្បីទាក់ទាញ ភ្ញៀវទេសចរណ៍ ឬការបង្កើនផលិតផលកសិកម្មដើម្បីស្តារធនធានព្រៃឈើ ការកំណើនសត្វ ចិញ្ចឹម និងរក្សាលំនឹងប្រព័ន្ធអេកូឡូស៊ី ទប់ទល់ការហូរចេញ និងធន់ការប្រែប្រួលអាកាសធាតុ។
ចំពោះគោលបំណង ដើម្បីបង្កើនប្រាក់ចំណូលដល់សមាជិកកសិកម្ម តាមរយៈបង្កើន ផលិតផលកសិកម្មតាមរយៈការអនុវត្តការដាំដុះដំណាំកសិកម្មរយៈពេល ខ្លី មធ្យម និងការ ចិញ្ចឹមសត្វ។

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icem ៤. ពេលវេលាអនុវត្តផែនការកសិកម្ម

- រយៈពេលអនុវត្តពីថ្ងៃទី.....ខែ.....ឆ្នាំ.....
- និងបញ្ចប់នៅថ្ងៃទី.....ខែ.....ឆ្នាំ.....

ពេលវេលាអនុវត្តផែនការកសិកម្ម៖ ការអនុវត្តកសិកម្ម មានរយៈពេលខ្លី មធ្យម និង វែងតាមប្រភេទដំណាំ និងការដាំដុះ និងការទទួលផល។
ការធ្វើផែនការរយៈពេល៥ឆ្នាំម្តង និងបំបែកជារៀងរាល់ឆ្នាំ និងត្រួតពិនិត្យ កែលំអររៀង រាល់ឆ្នាំម្តង។

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icem ៥. ប្រព័ន្ធកសិកម្មដែលបានជ្រើសរើស

ប្រព័ន្ធកសិកម្ម៖.....

៣ ប្រព័ន្ធកសិកម្មសត្វចិញ្ចឹម ដែលកសិកម្ម «ដើមឈើ + សត្វ

ប្រព័ន្ធកសិកម្មដែលបានជ្រើសរើស៖ ការ ជ្រើសរើសប្រព័ន្ធកសិកម្ម បានសមស្របតាម ប្រភេទទីតាំង ដី និងគោលបំណងរបស់សហគមន៍ ដើម្បីបំពេញប្រយោជន៍ផ្នែកសេដ្ឋកិច្ច សង្គម វប្បធម៌ និងបរិស្ថាន (ឬគោលបំណងអភិរក្ស ធនធានធម្មជាតិ)។



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icem ៦. ទីតាំងកូអរដោនេសាស្ត្រកសិកម្ម

• ទីតាំងកូអរដោនេ៖

ទីតាំងកូអរដោនេសាស្ត្រកសិកម្ម៖ កំណត់ទីតាំងកូអរដោនេឱ្យបានច្បាស់លាស់ និងដាក់ស្នើសុំ ការគូសផែនទីទីតាំងកសិកម្មបញ្ចូលដោយមានការទទួលស្គាល់ និងមានការផ្សព្វផ្សាយ ដល់សមាជិកសហគមន៍ អាជ្ញាធរមូលដ្ឋាន និងស្ថាប័នជំនាញ ដូចជា រដ្ឋបាលព្រៃឈើ និង មន្ត្រីបរិស្ថាន។ ជៀសវាងការកណ្តាច្រលំពីសមាជិក ឬអ្នកកូមី នូវការធ្វើទូតិកសិកម្មនេះ មើលទៅហាក់ដូចជាការកាន់កាប់ដោយឯកជនក្នុងដីព្រៃឈើសហគមន៍ ដែលទាមទារត្រូវ ផ្សព្វផ្សាយឱ្យបានដឹងគ្រប់ៗ ក៏ដូចជាចូលរួមការពារផលប្រយោជន៍រួមនេះ។

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៧. ផ្ទៃដីត្រូវអនុវត្តកសិកម្មក្នុងព្រៃសហគមន៍

• ផ្ទៃដី:(ហិកត) ឬ ម៉ែត្រការ៉េ

ផ្ទៃដីត្រូវអនុវត្តកសិកម្មក្នុងព្រៃសហគមន៍: កំណត់ផ្ទៃដីដែលត្រូវអនុវត្តតាមដំណាក់កាល ឬជំហាន ព្រោះការងារអនុវត្តកសិកម្ម ដែលមានការដាំពង្រីកដំណាំកសិកម្ម និងការបិទបិទសត្វ មានការលូតលាស់ជាបន្តបន្ទាប់ដែលត្រូវការដី និងទីវាលអនុវត្តកសិកម្ម បានជំនួយ ។ ១. ដំណាក់កាលដំបូង ត្រឹម១ហិកត ឆ្នាំបន្តបន្ទាប់២-៣ហិកត និងដល់ឆ្នាំទី៥អាចដល់៥-១០ហិកត តាមធនធាននិងផែនការអាជីវកម្មដែលបានជោគជ័យ។ ការកំណត់និងពង្រីកទីតាំងនេះអាស្រ័យ និងធនធាន លទ្ធភាពថវិកា និងផែនការរបស់គម្រោងដែលជួយគាំទ្រផងដែរ។

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ក. ផែនការផលិតកម្មកសិកម្ម

១). ប្រភេទដំណាំកសិកម្ម

ល.រ	ប្រភេទដំណាំកសិកម្ម	ចំនួន	ផ្ទៃដីដាំដុះ (ម ^២)	ទិន្នផលគ្រោង (គ.ក្រ/ហិកត)	ផលិតផល (គ.ក្រ)	ពេលវេលា
១						
២						
៣						

ប្រភេទដំណាំកសិកម្ម (ជាដំណាំដែលធន់និងម្តប់ បើត្រូវការដាំនៅក្នុងឬក្រោមគម្របព្រៃឈើ ដូចជាម្សៅត រំដេង ខ្លី ម្នាស់ ។ល។)

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ក. ផែនការផលិតកម្មកសិកម្ម

២). ប្រភេទព្រៃឈើ

ល.រ	ប្រភេទព្រៃឈើ	ចំនួន	ផ្ទៃដីដាំដុះ (ម ^២)	ទិន្នផលគ្រោង (គ.ក្រ/ហិកត)	ផលិតផល (គ.ក្រ)	ពេលវេលា
១						
២						
៣						

ប្រភេទព្រៃឈើ មានដូចជាដើមឈើប្រណិត និងឈើសំណង់ដែលសហគមន៍មើលឃើញថា មានប្រយោជន៍នាពេលអនាគត និងជួយស្តារលទ្ធភាពការសិក្សាវិចារព្រៃឈើ ដែលជាឈើរយៈ ពេលវែង ជាដំណាំកសិកម្មធម្មតា។

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icem ក. ផែនការផលិតកម្មកសិកម្ម

៣) ប្រភេទសត្វចិញ្ចឹម

ល.រ	ប្រភេទសត្វ	ចំនួន	ផ្ទៃដីដាំដុះ (ម ^២)	ទិន្នផលគ្រោង (គ.ក្រ/ហិកត)	ផលិតផល (គ.ក្រ)	ពេលវេលា
១						
២						
៣						

ប្រភេទសត្វចិញ្ចឹម សត្វមួយចំនួនអាចចិញ្ចឹមបានក្នុងទីតាំងកសិកម្ម ដោយការគ្រប់គ្រង និងដោយព្រៃលែង ឃ្វាល ។ ការចិញ្ចឹមសត្វត្រូវមានការយកចិត្តទុកដាក់បន្ថែមពីអ្នកទទួលខុសត្រូវទាំងចំណី ទឹក ការថែទាំ និងព្យាបាលជំងឺនានា រួមទាំងការពារពីសត្វល្អិតទិច ខាំពេលយប់ផងដែរ។

43

icem ក១. ផែនការទុនអាជីវកម្ម

ផែនការទុនអាជីវកម្ម: ការគិតគូរពីទុនវិនិយោគ គេគិតគូរពីចំណុច គឺ ចំណាយប្រែប្រួល និង ចំណាយមិនប្រែប្រួល។

- ចំណាយប្រែប្រួល សំដៅលើការប្រើប្រាស់អស់ ដូចជាចំណីសត្វ វត្ថុធាតុដើមដែលប្រើអស់។ល។
- ចំណាយមិនប្រែប្រួល ដូចជាសម្ភារៈឬបរិក្ខារដែលប្រើប្រាស់បានយូរឆ្នាំ ឬយូរអង្វែង ដូចជា រោង ទ្រុងសត្វ ស្នាក់ការ ថ្នាលបណ្តុះកូនដំណាំ ដែលគេយកមកគិតគូរគណនាជាការរំលោះ (អាចជា២ឬ៣ ទៅដល់៥ឆ្នាំ) វាអាស្រ័យលើគុណភាពនៃវត្ថុទាំងនោះ។

44

icem ក១. ផែនការទុនអាជីវកម្ម

ល.រ	បរិយាយ	ចំនួន	តម្លៃរាយ	តម្លៃសរុប	ចំណាយ ក្នុង១ ផ្ទៃ ផលិតកម្ម	សាច់ប្រាក់ចំណាយ		
						ទុនខ្លួនឯង	ទុនកម្ចី	គាំទ្រពីគម្រោង
I. ចំណាយប្រែប្រួល								
១								
២								
៣								
៤								
៦								
៧								
៨								
៩								
១០								
	សរុបចំណាយប្រែប្រួល							

45

icem ក១. ផែនការទុនអាជីវកម្ម

ល.រ	បរិយាយ	ចំនួន	តម្លៃរាយ	តម្លៃសរុប	ចំណាយ ក្នុង១ វដ្ត ផលិតកម្ម	សាច់ប្រាក់ចំណាយ		
						ទុនខ្លួនឯង	ទុនកម្ចី	គាំទ្រពីគម្រោង
I. ចំណាយមិនប្រែប្រួល								
១								
២								
៣								
៤								
៦								
៧								
៨								
៩								
១០								
	សរុបចំណាយមិនប្រែប្រួល							
	ក១. ផែនការទុនអាជីវកម្មសរុប (I+II)							

icem ខ. សកម្មភាពផលិតកម្ម

ល.រ	សកម្មភាព	ថ្ងៃខែឆ្នាំ		កំលាំងពលកម្មចូលរួម		
		ចាប់ផ្តើម	បញ្ចប់	សមាជិក	ជួល	សរុប
១						
២						
៣						
៤						
៥						
៦						
៧						
	សរុបកំលាំងពលកម្ម					
	ថ្លៃជួលកំលាំងពលកម្មសរុប (ខ)					

សកម្មភាពផលិតកម្ម: ជាពេលវេលាដែលត្រូវចាប់ផ្តើមអនុវត្តសកម្មភាពនីមួយៗ និងបញ្ចប់ ។ ការអនុវត្តសកម្មភាពនីមួយៗ ត្រូវមានការចូលរួមកំលាំងពលកម្ម អ្វីខ្លះដែលអនុវត្តដោយសមាជិកសហគមន៍ ឬត្រូវជួលគេមកអនុវត្ត។

47

icem គ. ផែនការទីផ្សារ

ល.រ	ប្រភេទផលិតផល	ដ្យាលក	អ្នកទិញ/ទូរស័ព្ទ	គ្រោងបរិមាណ ត្រូវលក់	តម្លៃទីផ្សារឯកតា
១					
២					
៣					
៤					

បញ្ជាក់: សូមលំអិតទីផ្សារសម្រាប់ផលិតផល ០១មុខៗ

ផែនការទីផ្សារ: ការងារទីផ្សារ គឺត្រូវដឹងពីផលិតផលអ្វីដែលអាចលក់បាន លក់នៅទីណា អ្នកណា ជាអ្នកទិញ ឬប្រមូលទិញ (ទិញដុំ ឬទិញរាយ) តម្លៃប៉ុន្មានក្នុងមួយឯកតា (ឬគ.ក) និងលេខ ទំនាក់ទំនងដើម្បីទាក់ទងពេលមានផលិតផលលក់ចេញ។

48

icem ប. ផែនការចំណូលរំពឹងទុក (បានពីការលក់ផលិតផល)

ល.រ	ប្រភេទផលិតផល	ឯកតា	ចំនួន	តម្លៃរាយ (រៀល)	តម្លៃសរុប (រៀល)
១					
២					
៣					
៤					
៥					
ចំណូលរំពឹងទុកសរុប (ប)					

ផែនការចំណូលរំពឹងទុក (បានពីការលក់ផលិតផល)៖ តើប្រភេទផលិតផលពីកសិកម្មមួយៗដែលអាចប្រមូលផលលក់បាន ពេលណា និងដឹងពីតម្លៃលក់ដុំ និងលក់រាយ ដើម្បីស្វែងរកណែនាំផែនការចំណូលដែលយើងរំពឹងទុកពីការផលិតកម្មកសិកម្ម។

49

icem ខ. ផែនការប្រាក់ចំណេញរំពឹងទុក

ផែនការប្រាក់ចំណេញរំពឹងទុកសរុប (ង) = ផែនការប្រាក់ចំណូលរំពឹងទុក (ប) - (ផែនការទុនសរុបក្នុង១វដ្តផលិតកម្ម (ក១) + ថ្លៃឈ្នួលកំណែលម្អសរុប (ខ))

ផែនការប្រាក់ចំណូលរំពឹងទុក (ប) (រៀល)	ផែនការទុនសរុបសម្រាប់អាជីវកម្ម (ក១+ខ) (រៀល)	ប្រាក់ចំណេញរំពឹងទុក (ង) (រៀល)

ផែនការប្រាក់ចំណេញរំពឹងទុក៖ ការគណនាពីប្រាក់ចំណូល ដកនិងទុនវិនិយោគ និងការចំណាយនានា។

50

icem អរគុណដែលបានយកចិត្តទុកដាក់ស្តាប់ និងពិភាក្សា



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បច្ចេកទេសដាំដំណាំ

២

លក្ខណៈអាជីវកម្ម

សម្រាប់សហគមន៍ក្រែលឃី ឃុំកែវដំរីឃុំកែវស្រុកកម្ពុជា



ក្រុមការងារបច្ចេកទេស ផ្តល់ដីវិភាគសហគមន៍

១. លក្ខណៈជីវសាស្ត្រ

- លក្ខណៈជីវសាស្ត្ររបស់ថ្លី អាចដុះលូតលាស់បានលឿនដែលមានជីជាតិ ដីខ្សោះទឹក (មិនជាទឹក) ដីមេតាត ដីក្រហម ឬដីព្រៃដែលមានជីជាតិល្អ។ វាលូតលាស់ល្អនៅក្រោមម្លប់ពី ៥០-៦០% វាក្រែវការម្លប់ ដែលអាចដាំក្រោមម្លប់ មានដើមកៅស៊ូ ស្វាយចន្ទី ដើមត្រពាំងមួយចំនួន ដូចជាដើមអង្កាសដី ក្រោមគម្របស្បែកខៀវ ឬក្រោមដើមឈើព្រៃសហគមន៍ ហើយវាជាត្រពាំងដែលងាយដាំដុះ ទទួលបានលទ្ធផលល្អ
- វាអាចបង្កពូជបានល្អ (ទោះបីគាស់យកមើមចេញពីដី ឬក្បាលដើម និងមើមក្នុងដី ដើម្បីបង្កការរីកចំរើនលូតលាស់នៅវដ្តបង្ក (ឆ្នាំបង្ក))
- ថ្លីបង្កពូជដោយ មើម ឬគ្រឿង ហើយលក្ខណៈសំគាល់មើមចាស់ល្អ ដាក់ម្សៅ ស្លឹកចាប់។



២. ការជ្រើសរើសពូជ

- ការជ្រើសរើសមើមថ្លីមកដាំ គឺជើមណាដែលមានពន្លកឆ្នោសៗ ហើយជាមើមចាស់ គ្មានដំបូង និងសត្វល្អិតបំផ្លាញ ។
- ជាពូជដែលមានតម្រូវការទឹកតិច និងនិយមប្រើប្រាស់ក្នុងសហគមន៍
- ជាពូជក្នុងស្រុកងាយស្រួលដាំដុះ មិនជើសដី និងរកកាសតាម

៣. ការរៀបចំ

- ត្រូវរក្សាដីឱ្យបានយ៉ាងតិច ២ទៅ៣ដង (បើអាចធ្វើបាន) ជម្រៅ ២០ ទៅ ៣០ ស.ម និងហាលដីពី ៧ ទៅ ១០ថ្ងៃ
- រៀបចំដីឱ្យម៉ត់ចត់ និងដាក់ជីចម្រុះជាតិ ឬជីកំប៉ុស្ត ពី ២ ទៅ ៣គ.ក្រ ក្នុងថ្ងៃដី ១ម៉ែត្រការ៉េ
- លើករងកម្ពស់ពី ២៥ ទៅ ៣០ស.ម ទទឹងរង ពី ៤គ.ក ទៅ ១ម៉ែត្រ បណ្តោយរងពេញតាមស្ថានភាពដី និងទុកក្នុងដីរយៈពេល១០ថ្ងៃមួយទៅរងមួយ ពី ៤ ទៅ ៥គ.ក



៤. ដាំដំណាំ

- ត្រូវមើមថ្លីក្នុងទឹកឱ្យបាន១យប់ ឬយ៉ាងតិច៤ម៉ោង ដើម្បីដាស់ដំណើរមើម និងបង្កភាពសើមឱ្យមើមរហ័សចេញពន្លក
- កប់មើមថ្លីចូលក្នុងដីបាន១ថ្ងៃរយៈពេល ដោយកប់ដីលើ និងគ្របកំណត់ចំបើង
- ក្នុងមួយរណ្តៅអាចដាំបាន២-៤គុម្ព ដោយទុកចន្លោះគុម្ពប្រវែង២គ.ក និងចន្លោះមួយរណ្តៅទៅមួយរណ្តៅប្រវែង៤-៥គ.ក
- ស្រោចទឹកដំណាំសើមល្អ ដើម្បីដំណាំចេញពន្លក

៥. ការថែទាំ

- ក្រោយពេលដាំហើយ ត្រូវគ្របគម្របរង្វងស្រទាប់ ។ ស្រទាប់ទី១ រៀបមែក ឬ ដៃឫស្សី ឬដើមបោស ពោត ព្រែងជាដើម ។ ស្រទាប់ទី២ ត្រូវពង្រាយចំបើង បើអាចរកបានដើម្បីផ្តល់សំណើមនិងការលូតលាស់បានល្អ។
- ការស្រោចទឹក ប្រព្រឹត្តទៅក្នុងមួយសប្តាហ៍ម្តងតែចំណុះ ព្រោះយើងបាន គ្របចំបើងលើរងដើម្បីរក្សាសំណើមដី ។
- ការប្រើជីចំប៉ង យើងគួរប្រើជីធម្មជាតិ ដូចជា អាចម៍គោ អាចម៍ប្រឡៃ អាចម៍ មាន់ ដោយដាក់ជីពេលទឹកចាប់ចេញផ្កា ក្នុងបរិមាណ ១កំប៉ុងទឹកដោះគោ សម្រាប់៤ធុរ ។
- នៅពេលទឹកចាប់ផ្តើមបែកកូន និងឡើងមើម ត្រូវពិនិត្យបាន២ដង ដោយ កាយយកដីខ្លះរលួយកម្រិតក្នុងសំណួរ ដែលធ្វើឱ្យគល់ឡើងខ្ពស់ ហើយគ្រងកន្លែងឆ្នើមនោះ ក្លាយជាចង្កូដីព្យ ដែលធ្វើឱ្យទឹកហូរចេញពេល មានភ្លៀង ។



៦. ការប្រមូលផល

- ការប្រមូលផលចាប់ផ្តើមក្នុងរយៈពេល៤ខែទៅ៦ខែ បន្ទាប់ពីដាំ អាស្រ័យទៅតាមតម្លៃទីផ្សារ (ករណីមើមស្រស់)។
- គួរប្រមូលនៅពេលគ្រជាក់ (ពេលរសៀល) និងកាត់ស្លឹក ដើមចេញ ដោយរក្សាទុកគល់ខ្លះជាមួយមើម ដើម្បីរក្សា សម្រស់ និងគុណភាពបានល្អ។



ផលប្រយោជន៍

ខ្លីជាប្រភេទបន្លែមើមមួយប្រភេទ ដែលមានភាពពេញនិយមនៅអាស៊ីអាគ្នេយ៍ ដែលយើងអាចកែច្នៃវាធ្វើជាគ្រឿងផ្សំរបស់ម្ហូបអាហារ ឬក្រេស្តជ្ជៈតាមចំណង់ចំណូល ចិត្ត។ ទន្ទឹមនឹងនេះ ការទទួលបានខ្លី មានសារប្រយោជន៍យ៉ាងសំខាន់បែប ដូចជា៖

1. ព្យាបាលការក្អកចង្កៀរ
2. ជួយដល់ការសម្រកទម្ងន់
3. ជួយបញ្ចុះជាតិស្ករក្នុងឈាម
4. បញ្ចុះសារធាតុកូឡេស្តេរ៉ូល
5. ព្យាបាលជំងឺរលាកសន្លាក់។





បណ្តុះបណ្តាលបច្ចេកទេសដាំ ដំណាំរំដេង

លក្ខណៈពេលវេលា

សម្រាប់សហគមន៍តំបន់ការពារធម្មជាតិ លើការដាំដំណាំកសិកម្ម



មេរៀនទី១. ការជ្រើសរើសពូជ

- ជ្រើសរើសពូជដែលមានលក្ខណៈល្អ ផ្លោសល្អ មិនមានជំងឺ ឬគ្រឿង មើមធំ មើមចាស់ល្អ (ដាក់ម្សៅ)។
- ពូជដែលជន់ទ្រាំនឹងអាកាសធាតុ កូនពូជសុខភាពល្អ និងយកចេញពីដើមដែលជ្រើសរើសជាដើមពូជ។
- ពូជដែលត្រូវជ្រើសរើសត្រូវជាពូជដែលល្អមើមមានភ្នែក២-៣ក្នុងមួយមើម មិនមានស្លាក់ស្លាមច្រើន ជាមើមដែលអាយុចាស់ មានពន្លកជុះតិចៗហើយទំងន់ពូជ១មើមចាប់ពី៣០ក្រាមទៅ១០០ក្រាមសម្រាប់ដាំក្នុងមួយគុម្ព។
- ជាពូជដែលកសិករចូលចិត្តយកមកបរិភោគ ជាគ្រឿងទេស មានមើមច្រើន ឬគ្រឿងសំអាង។
- ប្រភពពូជដែលល្អ អាចមកពីចំការលើ ខេត្តកំពង់ចាម ត្បូងឃ្មុំ ឬខេត្តពោធិ៍សាត់។



មេរៀនទី២. ការរៀបចំដី លើកទេ និងដាំ

- គួរ រាស់ដីឱ្យបានល្អ ដើម្បីផ្ទុះលូតលាស់បែកគុម្ព និងមើមធំៗល្អ កាប់រណ្តៅសមស្របដែលមានទំហំ២តិក ឬ៣ ជ្រុង ៨ម្រៅ១.៥តិក កំពស់១៣តិក។
- ក្នុងរណ្តៅដែលបានកាប់រួចត្រូវប្រើដីកំប៉ុស្តរួចជា កន្ត្រាំងខេត្រចិត្រាវ៉ា ជីល្អុងអង្កាម និងជីធម្មជាតិសុទ្ធ និងទុករយៈពេល១អាទិត្យបានអាចដាំបាន។
- ដាំពីគុម្ពមួយទៅមួយ ៤-៦តិក (៤០-៦០សម) ទុកចន្លោះផ្លូវដី ៥-៦តិក ។
- មើមដាំត្រូវទុកកន្ទុយដើមប្រវែង៣តិកបន្ទាប់ពីកាប់មកដាំ ដោយដាំរាងទេចេញក្រៅ។



មេរៀនទី៣. ការថែទាំ និងដាក់ដី

- បន្ទាប់ពីដាំដុះបាន១ខែ យើងត្រូវធ្វើការសម្អាតស្មៅតាមចន្លោះគុម្ព និងដាក់ដីកំប៉ុស្តបំបន់ ២ទៅ៣ដង និងពិនិត្យតាមដានក្រែងមានកត្តាចង្រៃណាមួយមានវត្តមានក្នុងគុម្ពរងរំដង។
- ប្រមូលដីដាក់គម្រប និងតាមគល់វា ដើម្បីផ្តល់សំណើមដល់ដី ណាំលូតលាស់ (ដីដែលបានមកពីដើមសណ្តែកដី សណ្តែកសៀង ឬស្លឹកក្រូចជាតិ...) បានជំនួយដល់ការលូតលាស់របស់វាទទួលបានផលច្រើន បង្កើតបានគុម្ពធំៗ មើមថ្លោសល្អៗ មានសុខភាពល្អ។
- ការដាំដុះក្រោមម្លប់ មានការលូតលាស់ជាង មិនមានម្លប់ និងបានផលច្រើនជាង ការដាំមិនមានម្លប់ ឬក៏ផ្សំទីតាំងដីមានដីជាតិ ឬយើងថែមដីពុកផុយដល់ដំណាំ។



មេរៀនទី៤. ការទុកដាក់ ការប្រមូលផល និងការគ្រប់គ្រងក្រោយប្រមូលផល

- រំដងបន្ទាប់ពីដាំដុះបាន៤ទៅ៥ខែ យើងអាចធ្វើការប្រមូលផលរំលាស់បានហើយ ដោយធ្វើការគាស់ចេញពីដី រួចយកទៅសម្អាត លាងទឹកឱ្យស្អាត និងទុកឱ្យស្ងួត រួចយើងច្រកថង់ដើម្បីយកទៅលក់នៅលើទីផ្សារ។
- ត្រូវទុកដាក់ឱ្យបានល្អដោយប្រើកញ្ចប់ កាវ៉ាង បាវ ឬវត្ថុផ្សេងៗដែលអាចធានាសុវត្ថិភាពបាន តែត្រូវលាងសំអាត ហាលឱ្យស្ងួត។
- ត្រូវបែងចែកគុម្ពណាដែលល្អខ្លាំង ទុកពូជដាំបន្ត និងអាចលក់ជាពូជបាន។
- បន្ទាប់ពីប្រមូលផលរួចត្រូវកូរកាស់ដី២-៣លើក និងបាចកំបោសម្លាប់មេរោគនិងបង្កើនគុណភាពដី រួចហាលទុករយៈពេល២០-៣០ថ្ងៃ រួចដាំម្តងទៀត។



មេរៀនទី៥. សារៈសំខាន់ និងការកែច្នៃ

- ❖ ជួយបន្ថយអាការៈឈឺចុករោមរាងកាយ បំបាត់ស្ទះក្នុងបំពង់កនិងស្លឹកស្រពន់ ព្យាបាលជម្ងឺសើស្បែក ខាត់ស្បែកឱ្យឆ្លីមីត់ រលោង ជួយវិលាយអហារ ព្យាបាលរាគរស ព្យាបាលជម្ងឺទល់លាមកនិងហើមពោះ។





បច្ចេកទេសដាំដំណាំ ដំឡូងថ្លា លក្ខណៈអាជីវកម្ម

សម្រាប់សហគមន៍វត្តពេញ ឃុំការដំណាំកសិកម្ម



ក្រុមការងារបច្ចេកទេស ផ្ទុយដីវាលសហគមន៍

១. សារៈសំខាន់របស់ដំឡូងថ្លា

- ដំឡូងថ្លា ជាដំណាំមើមមួយប្រភេទដែលសម្បូរជាយូរវិភាគមិនអា និងជាតិម្សៅដុត អង្ករដែលអាចយកទៅបរិភោគជំនួសបាយបាន។ ម្យ៉ាងគេអាចឆ្កែមើមដំឡូងធ្វើជា បង្កែម ដំណាប់ ។ល។ ចំណែកទង និងស្លឹករបស់វា គេយកទៅធ្វើជាបន្លែ និង ចំណីសត្វផងដែរ។



២-ការជ្រើសរើសដី និងទ្រុឌកាលដាំដុះ

- > ដីដែលសមស្របសម្រាប់ដាំដំឡូងថ្លា គឺតំបន់ដីក្រហម ដីភ្នំ ដីល្បាប់មន្លេ ឬស្នឹង និងដីល្បាប់ខ្សាច់។ ចំណែកដីស្រែក៏អាចដាំដុះបានដែរ គឺដាំ នៅបន្ទាប់ពីប្រមូលផលហើយ។
- > ដំឡូងថ្លាគេអាចដាំបាននៅគ្រប់រដូវកាល។ នៅរដូវវស្សាគេត្រូវដាំនៅ លើដីខ្ពស់ ឬដីមិនលិចទឹក និងជាទឹក ។ ពេលវេលាដែលសមស្រប សំរាប់ដាំដំឡូងថ្លា គឺនៅខែមេស្រា ។



៣-ការធ្វើបម្រុងដី

- > កូរដីជម្រៅ ពី២០ទៅ៣០ស.ម ហាលដីពី ៧ ទៅ ១០ថ្ងៃ និងដាក់ដីធម្មជាតិ ឬដីកំប៉ុស្តរំពឹង ១ ទៅ ២គ.ក ក្នុងថ្ងៃដី ១ម៉ែត្រការ៉េ
- > លើករងកំណស់ ពី២៥ ទៅ៣០ស.ម មីងរង ១ម៉ែត្រ បណ្តោយតាមស្ថាន ភាពដី
- > លើដីស្រែ ដែលទើបប្រមូលផលរួច ត្រូវកូរដីចោលឱ្យបាន២សា។១០ថ្ងៃ ក្រោយមកដាក់ដីលាមកគោទរទះក្នុងថ្ងៃដី១០ម៉ែត្រការ៉េ រួចស្រែខ្សាច់ លុប និងទុកចោលរយៈពេល៣ថ្ងៃ។



៤-ការជ្រើសរើសទទួលបានសម្រាប់ដាំ

- > ត្រូវជ្រើសរើសទទួលបានដែលគ្រោស និងខ្លីល្មម ហើយដែលមានអាយុពី៤០ ទៅ៥០ថ្ងៃ និងមានថ្លាងញឹកល្អ ។
- > ប្រវែងទងដែលសមស្របសម្រាប់ដាំនោះ គឺមានប្រវែងពី១០ទៅ៣០ស.ម ហើយមិនត្រូវយកទទួលបានដែលមានឫសដុះច្រើននៅតាមថ្លាងនោះទេ ម្យ៉ាង ទៀតត្រូវកាត់ស្លឹកនៅដាច់ទងចោលមួយចំនួន ប៉ុន្តែត្រូវទុកខ្លះ ។

៥-អង្វែងដាំ

- > ការដាំដំឡូងថ្លា វាអាស្រ័យទៅតាមប្រភេទដី ប្រសិនបើដីល្អជាងគេតែងតែទទួល អ្នកអាចដាំបានពីរដួងនៅលើមួយមួយ ប៉ុន្តែបើនៅលើប្រភេទដីស្រែអ្នកដាំតែ មួយដួងនៅលើមួយមួយជាធម្មតា ។
- > ចន្លោះដីដើមមួយទៅដើមមួយ ប្រវែងពី ៣០ទៅ៥០ស.ម
- > ត្រូវដាក់ទងដំឡូងកប់ដីឱ្យជ្រៀងប្រហែល៤៥ស.ម ដោយឱ្យចុងទងដំឡូង ពុកពីដីមួយថ្លាង ឬពីរថ្លាង ។



៦-ការថែទាំ

- > នៅពេលអ្នកដាំដំឡូងរួចរាល់ ត្រូវយកចំបើង ឬស្មៅក្រៀម ឬក៏ឆ្នោកគ្របពីលើ រងឱ្យជិត ដើម្បីការពារកុំឱ្យក្តៅពេក ដាច់ខ្លះទឹកពីក្រោមដី ហើយម្យ៉ាងវិញ ទៀត ដើម្បីការពាររងដំឡូងកុំឱ្យប៉ះទៅនឹងដីនាំឱ្យវាចាត់ឫសច្រើន។
- > បើសិនដំឡូងល្អខ្លាំងពេកអ្នកត្រូវឧស្សាហកម្មកាត់ត្រួយ ឬក៏ត្រូវកាត់វិលែកដើម ខ្លះ ដើម្បីឱ្យវាមើមរបស់វាឆ្នោសល្អ ហើយអ្នកអាចយកដើមដែលកាត់នោះទៅ ធ្វើជាចំណីរបស់សត្វ។
- > ទងដៃដំឡូងមិនត្រូវឱ្យវារលើសពី២ម៉ែត្រឡើយ។
- > មិនត្រូវស្រោចទឹកឱ្យដាក់ដីពេកទេ ពីព្រោះវាអាចនាំឱ្យដីក្តៅ។ បើពឹងផ្អែក យូរពេក ត្រូវជ្រួយដីឱ្យមីជ្រួល ពុះលើថែម
- > ត្រូវសំអាតស្មៅចោលពេលដំឡូងនៅតូច ហើយគួរជ្រួយពុះជុំវិញគល់ ដើម្បី ឱ្យដំឡូងចុះមើលល្អ ។
- > ត្រូវប្រុងប្រយ័ត្ននៅពេលជ្រួយដីមិនត្រូវឱ្យដាច់ឫសរបស់ដំឡូងឡើយ ពីព្រោះ វាប៉ះពាល់ដល់ការចុះមើមរបស់ដំឡូង។



៧-ការប្រមូលផល

- > ដំឡូងថ្លាអាចប្រមូលផលបានពេលអាយុពី៥០ទៅ១៥០ថ្ងៃបន្ទាប់ពីដាំ រួច។
- > ម្យ៉ាងនៅពេលដំឡូងថ្លាពិតគ្រប់ខែប្រមូលផល គួរឧស្សាហកម្ម ពិនិត្យ មើលមើម ដើម្បីឱ្យដឹងថា តើមើមដំឡូងមានគឺងស៊ីឬទេ បើគឺមើមទាស់ ស៊ី យើងអាចពន្យារពេលប្រមូលផលមួយរយៈទៀត ដើម្បីមើមកាន់តែ ធំល្អ។ សម្រាប់ដំឡូងដាំនៅរដូវប្រាំង មិនត្រូវទុកឱ្យយូរពេកទេ ពី ព្រោះវាអាចនាំឱ្យគឺងស៊ីមើមរបស់ដំឡូង
- > ការប្រមូលផលដំឡូងអាចប្រើបច្ចេកទេសផ្សេងៗ ប៉ុន្តែគួរតែ ៗអាច ប្រមូលផលដំឡូងដោយក្តួរ ហើយដើរវិសាមើមតែម្តង។

៨-ការកេចត្រួតពិនិត្យសំរាប់ដាំ

- > ប្រសិនបើដាំដំឡូងថ្លានៅរដូវសម្រក ត្រូវដាំពូជស្រាល ហើយត្រូវត្រៀមពូជ ទុកតាំងពីខែកក្កដា ដោយគ្រាន់តែដាំដំឡូងទុកនៅលើដីទួល ឬនៅតាមរាន ខ្ពស់ៗ ដែលមីមានជីជាតិល្អ ហើយមិនត្រូវឱ្យដំឡូងត្រូវកំដៅថ្ងៃពេកទេ គឺ ដើម្បីរក្សាមើមដំឡូងឱ្យនៅខ្លីល្អ ដើម្បីទទួលបានផលច្រើន ។





**បណ្តុះបណ្តាលបច្ចេកទេសដាំដំណាំ
ម្ចាស់ទឹកឃ្មុលក្នុងរោងចក្រ**

សម្រាប់សហគមន៍ព្រៃឈើ លើការដាំដំណាំកសិកម្ម



មេរៀនទី១. ការជ្រើសរើសពូជ

- ជាពូជដែលបានផលិតក្នុងស្រុក ដែលមានការនិយម មានរសជាតិធ្លាញ់ និងមានតម្លៃថ្លៃ និងមានតម្រូវការទីផ្សារ។
- ពូជដែលធន់ទ្រាំនឹងអាកាសធាតុ កូនពូជសុខភាពល្អ និងយកចេញពីដើមដែលជ្រើសរើសជាដើមពូជ។
- ពូជមានប្រវត្តិល្អ និងដាំដុះមានកសិដ្ឋានច្បាស់លាស់ និងមិនមែនជាពូជលក់តាមតៗគ្នា។



មេរៀនទី២. ការរៀបចំដី លើកទេ និងដាំ

- ត្រូវធ្វើឱ្យបានយ៉ាងតិច២ទៅ៣ដង ព្រមទាំងគ្រាប់បាតជីកំប៉ុស្ត។
- ហាលដីបាន១សប្តាហ៍មុនពេលដាំដុះ និងកំចាត់មេរោគពពួកផ្សិត និងពពួកបាក់តេរីតប្រយោជន៍នានាក្នុងដី។
- រៀបចំលើករងនីមួយៗ មានបណ្តោយ២៥ម៉ែត្រ ១ទទឹង១ម៉ែត្រ កំលស់ ២.៥-៣ស៊ិក គម្លាតគ្នា៣-៤ស៊ិក និងចន្លោះគម្លាត១ម៉ែត្រ ដើមនិងចុងរងត្រូវមានចង្កូរបង្ហូរទឹក។
- ពេលដាំត្រូវធ្វើឡើងពេលព្រឹក និងល្ងាច (មេឃត្រជាក់) ដាំជារបៀបមុខរណា ជីករណ្តៅដាំ១ស៊ិក និងលប់ដីឲ្យណែនដើម្បីឲ្យទាបដុះឫសថ្មី។
- ម្ចាស់អាចដាំលាត និងដាំគ្របកៅស៊ូតែត្រូវរៀបប្រព័ន្ធទឹកក្រោមកៅស៊ូគ្រប។



មេរៀនទី៣. ការថែទាំ និងដាំដុះ

- ក្រោយពីបានដាំកូនម្ចាស់បាន២-៣ខែ ត្រូវរៀបចំបោប សំអាតស្មៅ និងដាក់ជីបំប៉នម្តងទៀត (ជីកំប៉ុស្ត ធម្មជាតិ) ដើម្បីឱ្យកូនម្ចាស់លូតលាស់បានល្អ ការ តាក់តែងស្លឹក និងពិនិត្យក្លាចង្រៃផ្សេងៗ។
- ម្ចាស់មានផ្លា និងផ្លែ មិនស្រុះគ្នាទេ។ បើចង់បានការ ចេញផ្កានិងផ្លែស្រុះគ្នាក្នុងកំឡុងពេលតែមួយ អាចប្រើ ប្រាស់យន្តការជម្រុញផ្កាបន្ថែមបាន ដោយសង្កេតរាប់ ស្លឹកម្ចាស់ពី១៥-២០ស្លឹក ដោយដាក់មេជីអ៊ីមីម (EM ជីធម្មជាតិ) ១០០មល លាយទឹក២០លីត្រ ស្រោច ៣-៥ថ្ងៃជាប់ៗគ្នា លើបណ្តាល និងស្លឹកម្ចាស់។
- នោះម្ចាស់នឹងចេញផ្កាផ្លែស្រុះគ្នា អាចប្រមូលផលបាន ច្រើនក្នុងពេលតែមួយ។



មេរៀនទី៤. ការប្រមូលផល ការទុកដាក់

- មើលផ្លែចាស់ល្អនៅពេលពណ៌បៃតងចាស់ និងស្រគាល កុំទុកឱ្យម្ចាស់ទុំពេញចំការបាន ផ្ដើមប្រមូលផល ត្រូវប្រមូលផលរលាស់តាម តម្រូវការទីផ្សារ។
- ត្រូវប្រើកាំបិតមុតដើម្បីក្រោយស្លឹក និងកាត់ផ្លែ ដោយទុកទងជាប់ផ្លែ២តិក រួចទុកដាក់ក្រោម ម្លប់ដោយថ្មមៗ និងដឹកជញ្ជូនដោយដាក់ កញ្ចប់។
- ការដឹកជញ្ជូនគឺជាពេលដែលប្រយ័ត្នព្រោះជា ពេលដែលត្រូវរក្សាតម្លៃ គុណភាព និងសមត្ថ ភាព។



មេរៀនទី៥. សារៈសំខាន់ និងការកែច្នៃ

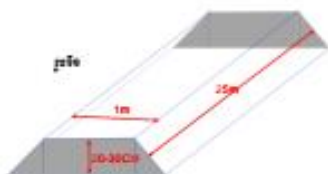
អត្ថប្រយោជន៍ផ្លែ ប្លាស់

- ជំនួយសង្គម
- ជំនួយផ្លែ
- ខ្វះខាតប្រយោជន៍
- សង្គមតម្រូវការ
- ធ្វើមតាយស្រកស្រាស្រា
- ធ្វើមតាយស្រកស្រាស្រា
- សម្រាប់បាយបាយបាយ
- ប្រើប្រាស់ជាស្រាស្រា
- គ្រប់គ្រងប្រយោជន៍

❖ យើងអាចកែច្នៃម្ចាស់ជា៖ ដំណាប់ម្ចាស់ កេសដុះម្ចាស់ បង្កើតម្ចាស់ត្នោត ម្សៅផ្កា តែម្ចាស់ ក្រាមេក្រីម្ចាស់ និងជាច្រើន ប្រភេទទៀត។ល។



បច្ចេកទេសដាំកូនម្លាស់



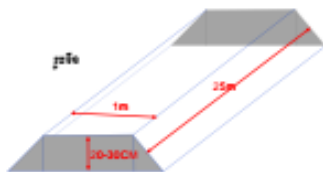
- រៀបចំរង ទំហំទំងន់ កំពស់រង ២-៣តឹក បណ្តោយ ២៥ម៉ែត្រ (រូបទី១) គន្លាតរងទៅ១ ទុក០,៥ម៉ែត្រ
- ដាំកូនម្លាស់ ១គុម្ព ចន្លោះ ៤០សម (៤តឹក) ពីឆ្នាំ ក្នុងរងដាំរបៀបឆ្មេញណា (រូបទី២)
- ដាំកូនម្លាស់ ១រង ២ជួរ (បើមានពូជច្រើន)
- កប់កូនម្លាស់ត្រឹមគល់ឱ្យបានល្អ



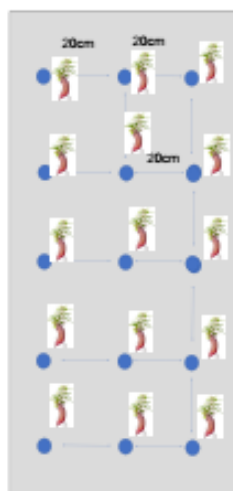
រូបទី២



បច្ចេកទេសដាំដុលឡា



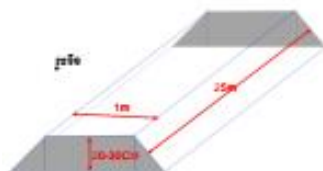
- រៀបចំរង ទំហំទំងន់ កំពស់រង ២-៣តឹកបណ្តោយ ២៥ម៉ែត្រ (រូបទី១) គន្លាតរងទៅ១ ទុក០,៥ម៉ែត្រ
- ដាំដុលឡា ១គុម្ព ចន្លោះ ២០សម (២តឹក) ពីឆ្នាំ ក្នុងរង (រូបទី២)
- ដាំដុលឡា ១រង ៣ជួរ (បើមានពូជច្រើន)
- ដោតដុលឡាជិត១ម្រាបដៃទៅក្នុងដី រួចកប់គល់



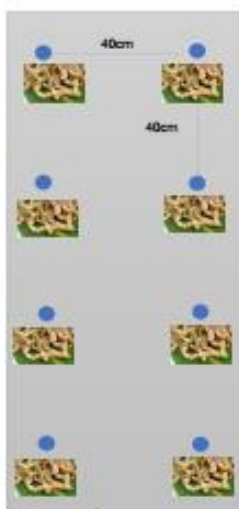
រូបទី២



បច្ចេកទេសដាំមីមរំដេច



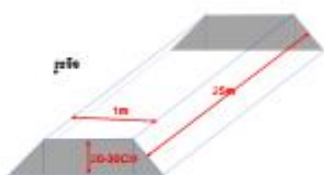
- រៀបចំរង ទំហំទំងន់ កំពស់រង ២-៣តឹក បណ្តោយ ២៥ម៉ែត្រ (រូបទី១) គន្លាតរងទៅ១ ទុក០,៥ម៉ែត្រ
- ដាំមីមរំដេច ១គុម្ព ចន្លោះ ៤០សម (៤តឹក) ពីឆ្នាំ ក្នុងរង (រូបទី២)
- ដាំមីម ១រង ២ជួរ (បើមានពូជច្រើន)
- កប់ដីជុំវិញ ០,៥-១តឹក ក្បែរសំណើមនិងដំណុះល្អ



រូបទី២



បច្ចេកទេសដាំមីមឌី



- រៀបចំរង ទំហំទម្រង់ កំពស់រង ២-៣គីឡូម៉ែត្រ យ ២៥ម៉ែត្រ (រូបទី១) គ្រួសារទំហំទំហំ ០,៥ម៉ែត្រ
- ដាំមីមឌី ១គុម្ព ចន្លោះ ៥០សម (៤គីក) ពីគ្នាក្នុងរង (រូបទី២)
- ដាំមីមឌី ១រង ២ជួរ (បើមានពូជរួច)
- កប់មីមឌីដំរី ០,៥-១គីក រក្សាសំណើមនិងជំនុះជួរ



Nursery management

ការគ្រប់គ្រងផ្ទាល់បណ្តុះកូនឈើ





ថ្នាលបណ្តុះកូនឈើខណ្ឌរដ្ឋបាលព្រៃឈើបាត់ដំបង



មាតិកា

1. គោលបំណង
2. ការរៀបចំថ្នាលបណ្តុះកូនឈើ
3. ការរៀបចំការងារនៅថ្នាលបណ្តុះកូនឈើ
4. ទីតាំងថ្នាល និងរចនាសម្ព័ន្ធថ្នាល
5. ឧបករណ៍ និងសម្ភារៈប្រើប្រាស់ក្នុងថ្នាល
6. ផែនការនៃការរៀបចំ និងផលិតកូនឈើ
7. ការបេះប្រមូលគ្រាប់ពូជ និងការធ្វើប្រតិកម្មគ្រាប់ពូជ
8. ការរៀបចំថង់ដាក់ដី និងប្រភេទថង់ដាក់ដី
9. ការត្រួតពិនិត្យសត្វល្អិត និងជម្ងឺ
10. ការពង្រឹងកូនឈើ និងការត្រៀមសម្រាប់ដាំកូនឈើ



១. គោលបំណងនៃការបង្កើតថ្នាលបណ្តុះកូនឈើ

- បង្កើនបរិមាណកូនឈើដែលមានស្រាប់
- បង្កើនពូជឈើដិតដាច់ពូជ
- បង្កើតការងារ
- បង្កើតចំការឈើដាំ
- ផ្តល់កូនឈើសម្រាប់ទិវាដាំកូនឈើ និងបរិស្ថានពិភពលោក
- ផ្តល់កូនឈើសម្រាប់សកម្មភាពដាំកូនឈើផ្សេងៗទាំងកិច្ចការសង្គម និងវប្បធម៌
- បង្កើតអាជីវកម្ម និងប្រាក់ចំណូល...។ល។



លោកនាយខណ្ឌរដ្ឋបាលព្រៃឈើបាត់ដំបង





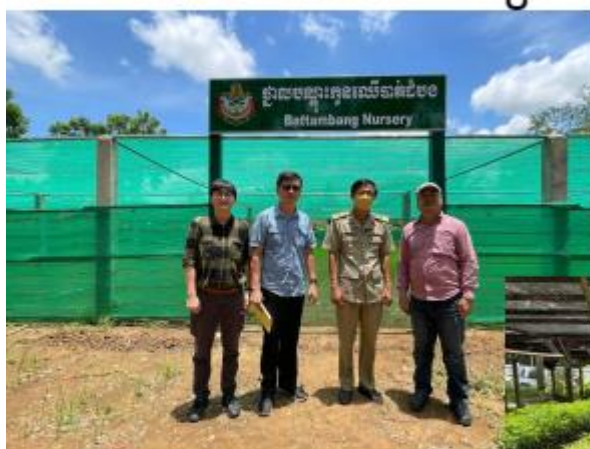
២. ការរៀបចំផ្ទាល់បណ្តុះកូនឈើ

ផ្ទាល់បណ្តុះកូនឈើមាន៣ប្រភេទ៖

1. ផ្ទាល់អចិន្ត្រៃយ៍
2. ផ្ទាល់បណ្តោះអាសន្នឬចល័ត
3. ផ្ទាល់សម្រាប់ការផ្សព្វផ្សាយ



១. ផ្ទាល់អចិន្ត្រៃយ៍



icem ២. ថ្នាលបណ្តោះអាសន្នឬចល័ត



icem ៣. ថ្នាលសម្រាប់ការផ្សព្វផ្សាយ





៣. ការរៀបចំការងារនៅថ្នាលបណ្តុះបណ្តាល

ការងារដំបូង

1. ការពិនិត្យ និងជ្រើសរើសទីតាំង
2. ការរៀបចំផែនការ
3. ការកំណត់ពេលវេលា
4. ការត្រៀមសកម្មភាពបណ្តុះ និងថែទាំ
5. ការគ្រប់គ្រង
6. ការអនុវត្តតាមផែនការ និង
7. ការការពារ និងថែទាំ។



ការងារសំខាន់ៗនៅថ្នាល

សកម្មភាពចាប់ផ្តើមពីការរកគ្រាប់ពូជ រហូតដឹកជញ្ជូនកូនឈើទៅដល់ចំការឈើដាំ៖

1. ការរក្សាទុកគ្រាប់ពូជ និងការធ្វើប្រតិកម្ម
2. ការរៀបចំរងសាប និងរងបណ្តុះ
3. ការផលិត ប្រមូល និងទុកដាក់ដី
4. ការបណ្តុះសាបព្រោះកូនឈើ
5. ការដកនិងស្ទង់កូនឈើ
6. ការថែទាំកូនឈើជាមួយស្មៅ អាកាសធាតុ និងសត្វល្អិតចង្រៃ
7. ការជ្រើសរើសកូនឈើ
8. ការដឹកជញ្ជូន
9. ការចែកចាយកូនឈើ។


icem កូនឈើហ្លួសអាយុកាលសម្រាប់ការដាំ



icem ៤. ទីតាំងថ្នាល និងរបេងសម្ព័ន្ធថ្នាល

ទីតាំងថ្នាលផ្អែកលើមូលដ្ឋាន៖

- ផ្លូវចេញចូលល្អ និងគ្រប់រដូវកាល
- មានប្រភពទឹកដែលអាចប្រើបាន និងអគ្គីសនី
- ទីប្រជុំជន មានកម្លាំងពលកម្មគ្រប់គ្រាន់
- បច្ចេកទេសរុក្ខវប្បកម្មជាអ្នកកំណត់ទីតាំងថ្នាល
- បរិស្ថានល្អ
- មានដីសម្រាប់ធ្វើរង និងបណ្តុះ Ph=5,5-7 (កូនឈើស្លឹកធំ និង Ph=4,5-6 (កូនឈើស្លឹកតូច)
- ឋានលេខាដីជំរាលពី១-៣°។

 **icem** រចនាសម្ព័ន្ធផ្ទាល

ចែកជា២ផ្នែក៖ ខាងក្នុងផ្ទាល និងខាងក្រៅ

១. ខាងក្នុងផ្ទាល

- មានដីសម្រាប់រងសាបនិងរងបណ្តុះកូនឈើ
- ទំហំរងអាច1-1.2ម៉ែត្រ បណ្តោយពី6-10ម៉ែត្រ និងចន្លោះរង0.50ម៉ែត្រ
- មានដំបូលសំណាញ់ និងប្រព័ន្ធស្រោចស្រប។ល។

២. ខាងក្រៅផ្ទាល

- មានរបងលូសបន្លាត់នូវជុំវិញ ស្រះទឹក និងធុងទឹក
- កន្លែងបន្សុំកូនឈើ
- ឃ្នាំងស្តុកពូជ ឧបករណ៍ និងសំភារៈផ្ទាល
- គំនរដី និងដីសម្រាប់បណ្តុះកូនឈើ...
- បង្គន់ និងកន្លែងសម្រាក...។ល។

 **icem**

៥. ឧបករណ៍ និងសម្ភារៈប្រើប្រាស់ក្នុងផ្ទាល

ក. សម្ភារៈការពារសារធាតុគីមី ?

ខ. សម្ភារៈប្រើប្រាស់ក្នុងផ្ទាល ?

គ. សម្ភារៈ ឬធនធានប្រើប្រាស់សម្រាប់អនុវត្តបណ្តុះកូនឈើ ?

ពិភាក្សា!



ឧបករណ៍សម្រាប់ធ្វើការបណ្តុះកូនឈើ



ឧបករណ៍សម្រាប់ធ្វើការបណ្តុះកូនឈើ





ថ្នាលបណ្តុះកូនឈើអូរថ្មក្រោះ



៦. ផែនការនៃការរៀបចំ និងផលិតកូនឈើ

- ក. ការផលិតកូនឈើជារូបភាពសហគ្រាសអាជីវកម្ម
- ខ. ការផលិតកូនឈើសម្រាប់គោលបំណងដាំស្តារព្រៃឡើងវិញ
- គ. ការផលិតកូនឈើសម្រាប់ការផ្សព្វផ្សាយ

ពិភាក្សារលើចំណុចខាងលើ!





តារាងផែនការផលិតសម្រាប់ដាំស្ពានព្រៃឡើងវិញ

ឈ្មោះសហគមន៍៖

ឈ្មោះប្រធានក្រុម៖

ល.រ	ឈ្មោះឈើ	ចំនួនព័ក	ចំនួនបណ្តុះ	កាលបរិច្ឆេទ
១.	ក្រញ៉ង	៥០០០	៥៥០០	មករា ២០២៣
២.	បេង	១០០០	១១០០	កុម្ភៈ ២០២៣



ថ្នាលបណ្តុះកូនឈើខណ្ឌរដ្ឋបាលព្រៃឈើ និងឧទ្យានក្សេម្សុំចៅក្រោះ





ការរៀបចំក្រុមផលិតកូនឈើ និងការបណ្តុះបណ្តាល

- ចងក្រងក្រុម
- ជ្រើសរើសអ្នកដឹកនាំក្រុមការងារ
- លើកទឹកចិត្តស្ត្រីអោយចូលរួម
- កំណត់តួរនាទីអ្នកដឹកនាំក្រុម និងសមាជិក
- បង្កើតគោលការណ៍ក្រុមសាមញ្ញមួយ
- បណ្តុះបណ្តាលតាមរយៈការអនុវត្តផ្ទាល់ ឬទស្សនៈកិច្ចសិក្សាតំបន់ផ្សេងៗ
- ធ្វើផែនការផលិតកូនឈើដោយមានការចូលរួម។



៧. ការបេះប្រមូលគ្រាប់ពូជ និងការធ្វើប្រតិកម្មគ្រាប់ពូជ

- ការជ្រើសរើសដើមមេ
- លក្ខណៈគ្រាប់ពូជគុណភាពល្អ
- ការដឹកជញ្ជូន
- ការទុកដាក់
- ការធ្វើប្រតិកម្មគ្រាប់ពូជ។



ពិភាក្សា!

icem ប្រភេទដីផ្សេងៗគ្នា



icem កំម្រិតលាយដី និងដីដែលត្រឹមត្រូវ

១ភាគនៃដីធម្មតា+១ភាគនៃដីមាត់ព្រៃឬជំបូក+១ភាគជួរអង្រាម





ការប្រព្រឹត្តិកម្មដីដោយកំដៅភ្លើងឬលីងដី

- ផ្សំលាយដីអោយរួចរាល់ តាមរូបមន្តខាងលើ
- យកដីផ្សំរួចដាក់ក្នុងខ្ទះរម្ងាស់ស្តុកឆ្នោត
- ដុតកំដៅអោយបាន៦០អង្សាសេ រយៈពេល៣០នាទី
- ទុកអោយត្រជាក់
- ច្រកចូលថង់បណ្តុះកូនឈើ។



ការលីងដី





ការលើងដី និងការប្រកដីក្នុងថង់



Community fire management

ការគ្រប់គ្រងភ្លើងចេញពីព្រៃសហគមន៍ គោលគំនិត និងវិធីសាស្ត្រ





មាតិកាសំខាន់ៗ

1. គោលនយោបាយគ្រប់គ្រងព្រៃឈើ និងទប់ស្កាត់ភ្លើងឆេះព្រៃ
2. គោលការណ៍ជាមូលដ្ឋាននៃភ្លើងឆេះព្រៃ (ប្រភេទភ្លើងឆេះព្រៃ)
3. ការកំណត់អត្តសញ្ញាណ និងការធ្វើផែនទីនៃតំបន់ងាយឆេះព្រៃ
4. កិច្ចខិតខំប្រឹងប្រែងលើការការពារភ្លើងឆេះព្រៃ
 - ការចូលរួមរបស់សហគមន៍ក្នុងការគ្រប់គ្រងភ្លើងឆេះព្រៃ
 - បច្ចេកទេសធ្វើផ្លូវភ្លើង
5. ស្ថាប័នការពារភ្លើងឆេះព្រៃ
6. ផែនការសកម្មភាពទប់ស្កាត់ភ្លើងឆេះព្រៃ (លំហាត់)



១. គោលនយោបាយគ្រប់គ្រងព្រៃឈើ និងទប់ស្កាត់ភ្លើងឆេះព្រៃ

ជនណាដែលបានប្រព្រឹត្តប្របង្កឲ្យមានភ្លើងឆេះព្រៃ ឬភ្លើងឆេះព្រៃលិចទឹកដោយចេតនា ត្រូវផ្តន្ទាទោសក្រោមបទល្មើសព្រៃឈើថ្នាក់ទី១ ឬបទល្មើសជលផលថ្នាក់ទី១ ដែលត្រូវជាប់ពន្ធនាគារពី ៣ឆ្នាំទៅ៥ឆ្នាំ ឬពី៥ឆ្នាំទៅ១០ឆ្នាំ។



គោលនយោបាយគ្រប់គ្រងព្រៃឈើ និងទប់ស្កាត់ភ្លើងឆេះព្រៃ (ត)

- បើតាមក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ ត្រូវទប់ស្កាត់ការប្រើប្រាស់ភ្លើងជាមធ្យោបាយយកឃ្នុំការដុតស្លាកំចាប់សត្វ និងការដុតស្មៅ។ ជាមួយគ្នានេះ ទប់ស្កាត់ការកាប់ឆ្ការឈូសឆាយ ដុតព្រៃឈើនិងព្រៃលិចទឹក ដើម្បីពង្រីកផ្ទៃដីកសិកម្ម។ ក្នុងករណីចាំបាច់ដែលត្រូវប្រើភ្លើងជាមធ្យោបាយដុតកាកសំណល់ព្រៃឈើ ក្នុងគោលបំណងដាំដំណាំកសិកម្ម និងសកម្មភាពស្របច្បាប់ផ្សេងទៀតត្រូវជូនដំណឹងដល់មន្ទីរកសិកម្មជាមុន។
- ការរុករកផល អនុផលព្រៃឈើជាប្រពៃណី និងសកម្មភាពផ្សេងទៀត ដែលចាំបាច់ប្រើភ្លើងជាមធ្យោបាយ (ដុតរណ្តៅដី) ត្រូវពន្លត់ភ្លើងឲ្យអស់ជាមុនចាកចេញពីទីតាំងនោះ។ ក្នុងករណីមានភ្លើងឆេះព្រៃ ត្រូវប្រញាប់ចាត់វិធានការទប់ស្កាត់ជាបន្ទាន់ តាមរយៈការប្រកាសអាសន្ន។



២. គោលការណ៍ជាមូលដ្ឋាននៃភ្លើងឆេះព្រៃ (ប្រភេទភ្លើងឆេះព្រៃ)

ភ្លើងព្រៃមាន៣ កម្រិត

កម្រិតទី១៖ ស្រាល

- ឆេះតែស្រទាប់ខាងលើដីមានដូចជាស្លឹកឈើងាប់ និងរុក្ខជាតិតូចតាច...។ល។



ភ្លើងព្រៃមាន៣ កម្រិត (ត)

កម្រិតទី២៖ មធ្យម

ឆេះតែស្រទាប់ខាងលើដីទាំងអស់ មានដូចជាស្លឹកឈើ

ងាប់ រុក្ខជាតិតូចធំ និងដើមឈើ...។ល។



ភ្លើងព្រៃមាន៣ កម្រិត (ត)

កម្រិតទី៣៖ ធ្ងន់ធ្ងរ

ឆេះតែស្រទាប់ខាងលើដីទាំងអស់ មានដូចជាស្លឹកឈើ

ងាប់ រុក្ខជាតិតូចធំ ដើមឈើ និងឫសឈើក្នុងដី...។ល។



<https://www.youtube.com/watch?v=jM1YTnCcxFY>
<https://www.youtube.com/watch?v=1Cy9XoDF6RY>
<https://www.youtube.com/watch?v=AP76oFEZ9t4>

ផ្សែងចេញពីព្រឹត្តិការណ៍ភ្លើងឆេះព្រៃនៅអូស្រ្តាលីឆ្នាំ២០១៩ និង ២០២០ បានបំផ្លាញស្រទាប់អូហ្សូននៅអឌ្ឍគោលខាងត្បូងអស់ជាច្រើន ខែ។ ស្រទាប់អូហ្សូន គឺជាផ្នែកនៃស្រទាប់ stratosphere របស់ បរិយាកាសផែនដី ដែលជាចាំងស្រូបយកការស្នើស្នាយអ៊ុលត្រាព្រះ អាទិត្យមិនឱ្យចាំងចូលផែនដីទាំងស្រុង។ នៅពេលស្រទាប់អូហ្សូនធ្លុះ ធ្លាយ នោះការស្នើរបស់ព្រះអាទិត្យនឹងជះចូលទៅផែនដីទាំងស្រុង ធ្វើឱ្យ ផែនដីឡើងកម្ដៅ និងប៉ះពាល់ដល់ជីវិតមនុស្ស។



3. ការកំណត់អត្តសញ្ញាណ និងការធ្វើផែនទីនៃតំបន់ងាយរងគ្រោះ

- ផ្សែងចេញពីភ្លើងឆេះព្រៃ បានបំផ្លាញស្រទាប់អូហ្សូនយ៉ាងខ្លាំង។ ក្រុមអ្នកស្រាវជ្រាវ បានគ្រូមានថា ប្រសិនបើព្រឹត្តិការណ៍ភ្លើងឆេះព្រៃ កើនឡើងកាន់តែញឹកញាប់ វានឹង បង្កឱ្យមានបម្រែបម្រួលអាកាសធាតុកាន់តែខ្លាំងឡើង ដោយសារការស្នើស្នាយអ៊ុល ត្រាបស់ព្រះអាទិត្យកាន់តែងាយចាំងចូលមកផែនដី។
- ផ្សែងដែលកាយចេញពីភ្លើងឆេះព្រៃ បានបំផ្លាញស្រទាប់អូហ្សូនរបស់ផែនដីយ៉ាងខ្លាំង។ ផ្សែងដែលកាយចេញពីភ្លើងឆេះព្រៃ មិនត្រឹមតែបំបាត់កាយកាបូនទៅក្នុង បរិយាកាស ដែលធ្វើឱ្យផែនដីឡើងកម្ដៅប៉ុណ្ណោះទេ វាថែមទាំងទៅធ្វើឱ្យស្រទាប់អូ ហ្សូនធ្លុះធ្លាយ និងបង្កឱ្យមានបម្រែបម្រួលអាកាសធាតុកាន់តែខ្លាំងថែមទៀត ព្រោះ ពន្លឺព្រះអាទិត្យកាន់តែងាយចាំងចូលមកផែនដី។ ផែនដីនឹងកាន់តែក្ដៅឡើងជារៀង រាល់ថ្ងៃ។



មូលហេតុនៃភ្លើងឆេះព្រៃ

១. កត្តាមនុស្ស





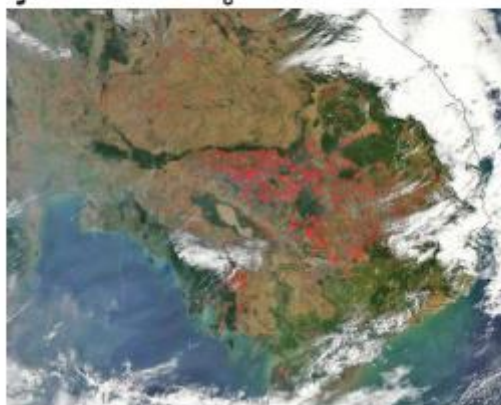
មូលហេតុនៃភ្លើងឆេះព្រៃ (ត)

២. កត្តាធម្មជាតិ

ខ្យល់ខ្លាំង និងអាកាសធាតុក្តៅស្ងួត ជាមូលហេតុបង្កឱ្យភ្លើងឆេះព្រៃ រាលដាលយ៉ាងឆាប់រហ័ស ហើយពិបាកនៅក្នុងការទប់ស្កាត់បំផុត



ការធ្វើផែនទីនៃតំបន់ងាយឆេះព្រៃ



4. កិច្ចខិតខំប្រឹងប្រែងលើការការពារភ្លើងឆេះព្រៃ

ការចូលរួមរបស់សហគមន៍ក្នុងការគ្រប់គ្រងភ្លើងឆេះព្រៃ

- បង្កើតក្រុមការងារបង្ការ និងពន្លត់ភ្លើងឆេះព្រៃ
- បង្កើតគោលការណ៍បង្ការភ្លើងឆេះព្រៃ
- ការផ្សព្វផ្សាយដើម្បីបង្ការ
- ធ្វើផ្លូវភ្លើងការពារ បង្ការភ្លើងឆេះព្រៃ និង
- ការល្បួត...។ល។





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បច្ចេកទេសធ្វើផ្លូវភ្លើង

- ធ្វើផែនទី ទីតាំងរសើប
- ការចូលរួមពីសមាជិកសហគមន៍
- ទទឹងផ្លូវភ្លើងយោលទៅតាមកំពស់ដើមឈើ
- បណ្តោយផ្លូវភ្លើងយោលតាមភាពរសើបនៃការឆេះ
- សំអាតកំទិចកំទីទាំងអស់ ដែលនៅតាមផ្លូវភ្លើង
- ធ្វើប្រឡាយប្រសិនជាមានលទ្ធភាព។



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5. ស្ថាប័នការពារភ្លើងឆេះព្រៃ

- ក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ
- រដ្ឋបាលព្រៃឈើ
- ក្រសួងបរិស្ថាន
- ឧទ្យានុរក្ស
- មន្ទីរបរិស្ថាន
- អាជ្ញាធរដែនដី
- សហគមន៍មូលដ្ឋាន។ល។



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6. ផែនការសកម្មភាពទប់ស្កាត់ភ្លើងឆេះព្រៃ (លំហាត់)

សកម្មភាព	1	2	3	4	5	6	7	8	9	10	11	12
ផ្សព្វផ្សាយ បង្កើតផែនទី												
បង្កើតក្រុមការពារភ្លើង												
ធ្វើផ្លូវភ្លើង												
ធ្វើប្រឡាយ												
ល្បាតភ្លើងឆេះព្រៃ												

Soil Erosion Control Technique

ការវិនិយោគការបន្តការប្រែប្រួលអាកាសធាតុ តាមរយៈការស្តារតំបន់ទេសភាពអេកូ
រុក្ខម្ម : ជំណោះស្រាយដោយលើធម្មជាតិ សម្រាប់ភាពធន់និងអាកាសធាតុ

ការបណ្តុះបណ្តាល ស្តីពីការស្តារតំបន់អេកូរុក្ខម្ម កសិរុក្ខម្ម
និង ការគ្រប់គ្រងភ្លើងឆេះព្រៃ

វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទី
ចំណោត

សំឡត ថ្ងៃទី ២២ ខែ សីហា ឆ្នាំ ២០២៣

តើជំនោះស្រាយតាមបែបធម្មជាតិ ជាអ្វី ?

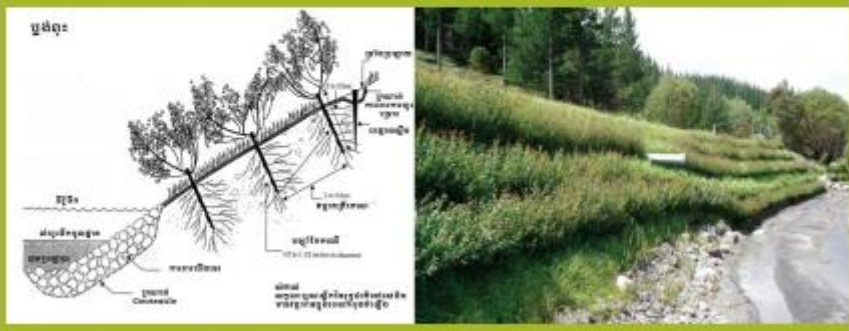
ការបណ្តុះបណ្តាល ស្តីពីការស្តារតំបន់អេកូរុក្ខម្ម កសិរុក្ខម្ម និង ការ
គ្រប់គ្រងភ្លើងឆេះព្រៃ

ជាការឆ្លើយតប ឬជាជំនោះស្រាយលើបញ្ហាអាកាសធាតុ ដោយប្រើវិធានការ
តាមបែបធម្មជាតិ ដើម្បីស្តារ និងពង្រឹងគុណភាពធម្មជាតិនៅហ្វូងកន្លែង

ការបង្ហាញពីវិធានការតាមបែបធម្មជាតិខ្លះ

សម្រាប់ការពារការហូរច្រោះដី

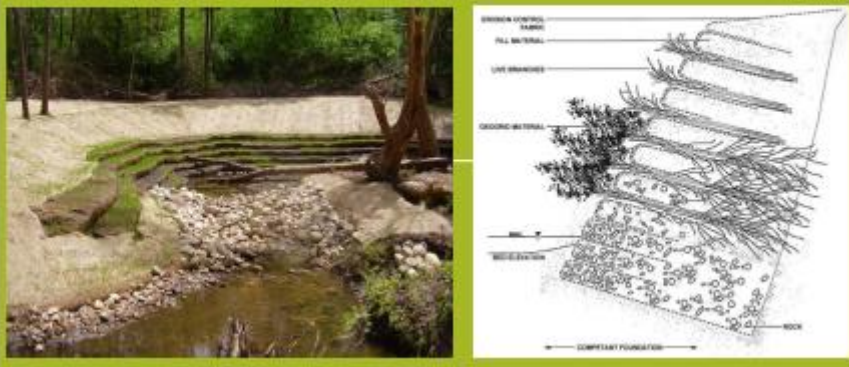
របៀបស្តីបន្លាតាមស្រែ



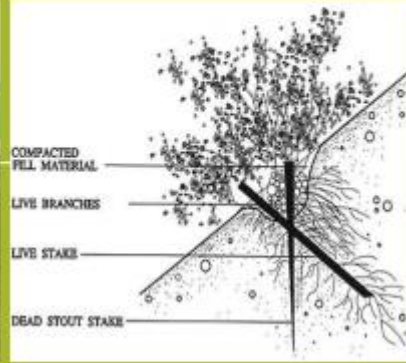
របៀបកំណត់ឈើជាថ្នាក់



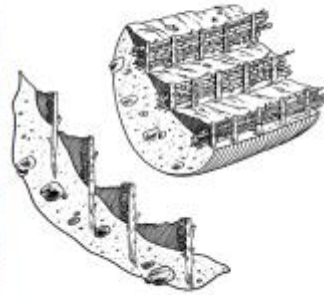
សំណង់ប្លង់ប្លង់



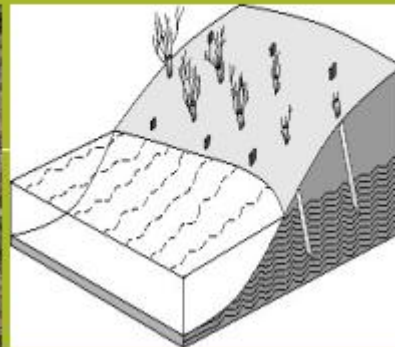
ចាំបាច់ក្រូចាតិស៍



មេក្រូចាតិស៍



មេស្ទីងក្រូចាតិ និងមេឈើ



ប្រកាសប្រជីស



វិធានការចម្រុះ: ការពារការហូរច្រោះដី នៅទីបំណោក



វិធានការចម្រុះជាតិការពារការហូរច្រោះដី នៅទីបំណោក

១. ការជ្រើសរើសទីតាំង

ទីតាំងដែលត្រូវជ្រើសរើស អនុវត្តវិធានការនេះ គួរតែជា ទីបំណោកគ្មានស្មៅ និងគ្មានជ្រើមឈើដុះល្អ និងជាទីតាំងដែលប្រឈមខ្លាំងនឹងការហូរច្រោះដីដោយសារលំហូរទឹកភ្លៀង។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

១. ការជ្រើសរើសទីតាំង



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

២. ការរៀបចំដី

សម្អាតស្មៅអាត្រាក់ ដែលរំខានដល់ការលូតលាស់បង្ហាញឈើរស់ និងស្មៅដែលផ្កា ។ បើសហគមន៍មានបំណងធ្វើទីតាំងនេះ សម្រាប់អនុវត្តកសិកម្ម គួររៀបចំដីជាថ្នាក់ៗ កាន់តែល្អ។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

៣. ឧបករណ៍ និងសម្ភារៈ

ឧបករណ៍ និងសម្ភារៈ	លក្ខណៈនៃឧបករណ៍ និងសម្ភារៈ
(1) ដុំថ្ម	ជ្រើសរើសថ្មវែងល្អ (គ្មានប្រេះ ឬពុកលួយ) ទំហំប្រហែល 0.3cm x 0.3cm
(2) ប្រដីសឫស្សី	ប្រដីសឫស្សី ក្រុងសម្រាប់ ចាក់បេតុង ដែលមានក្រឡា ចត្រង្គ 10 - 15cm ដែលភ្ជាប់ ជាមួយខ្សែរ៉ែត្យែត ឬ ឫស្សី។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

៣. ឧបករណ៍ និងសម្ភារៈ:

ឧបករណ៍ និងសម្ភារៈ:	លក្ខណៈនៃឧបករណ៍ និងសម្ភារៈ:
(៣) ឈើរស់	បង្គោលឈើរស់ ដែលមានក្នុងមូលដ្ឋាន ទំហំប៉ុនមេដៃ កាត់ជាកំណាត់ប្រវែងប្រហែល៨តិក។ ការជ្រើសរើសឈើរស់ ដែលមាននៅមូលដ្ឋាន ដែលងាយដុះលូតលាស់ មានដុះឫសល្អ ការពារជីវិតការហូរច្រោះ ល្អសម្រាប់គុណភាពដី។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

៣. ឧបករណ៍ និងសម្ភារៈ:

ឧបករណ៍ និងសម្ភារៈ:	លក្ខណៈនៃឧបករណ៍ និងសម្ភារៈ:
(៤) រស្មី	ស្មៅមានប្រយោជន៍ក្នុងមូលដ្ឋាន គួរតែត្រូវបានប្រមូលទាំងឫស។ ការជ្រើសរើសស្មៅដែលមានឫសការពារការហូរច្រោះដីបានល្អ និងធ្វើអោយប្រសើរឡើងនូវគុណភាពដី គោ គ្របអាចបរិភោគបាន។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

៣. ឧបករណ៍ និងសម្ភារៈ:

(៥) កំណាត់ឈើ	កំណាត់ឈើ ឬឫសស្រី មានប្រវែង៨តិក ត្រូវសម្រួលចុងម្ខាងសម្រាប់ដំដោតចូលទៅក្នុងដី ពីក្រោយដុំថ្ម ដើម្បីទប់ដុំថ្ម មិនអោយរអិលធ្លាក់ចុះតាមជម្រាល។
(៦) អម្ពុនឫស	អម្ពុនឫស សម្រាប់ត្រាំឈើរស់ ផ្នែកដែលត្រូវដោយចូលក្នុងដី ដើម្បីជម្រុញការលូតលាស់ឫស និងដុះលូតលាស់ឆាប់។
ខ្សែក្រចៅ	ក្នុងករណីត្រូវខ្សែចង សូមប្រើខ្សែក្រចៅជាលក្ខណៈធម្មជាតិ ជៀសវាងខ្សែជ័រ ដែលបង្កផលប៉ះពាល់ដល់បរិស្ថាន។
ខ្សែជ័រ	ប្រើខ្សែ PVC ដើម្បីកំណត់ជួរសម្រាប់ការរៀបចំដី



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

៤. ជម្រើសលើវិធានការ

តើវិធានការការពារការហូរច្រោះដីនេះ ចាំបាច់ត្រូវប្រើសម្ភារៈទាំង៥ប្រភេទដូចបានរៀបរាប់ក្នុងតារាងខាងលើដែរឬទេ?

- ប្រសិនបើសហគមន៍មានសម្ភារៈទាំងប្រាំមុខគឺល្អណាស់សម្រាប់ការរៀបចំវិធានការនេះ ។
- តែបើគ្មានទេ សូមជ្រើសរើសជម្រើសសមស្របៗ ក្នុងចំណោមជម្រើសពី B1-B3 ។

(១) ថ្មតាន់ល្អ, (២) ប្រដីសឈើ ឬ ឫស្សី, (៣) កំណាត់ឈើជោតរស់, (៤) ស្មៅ, (៥) ឈើស្លឹង, (៦) អម្មនប្រុស

ជម្រើស	សម្ភារៈ
ជម្រើស ក	(១), (២), (៣), (៤), (៥), និង (៦)
ជម្រើស ខ	(១), (២), (៤), និង (៥)
ជម្រើស គ	(១), (៣), (៤), (៥), និង (៦)
ជម្រើស ឃ	(២), (៣), (៤), (៥), និង (៦) ក្នុងករណីការរៀបចំដីជាថ្នាក់ៗ

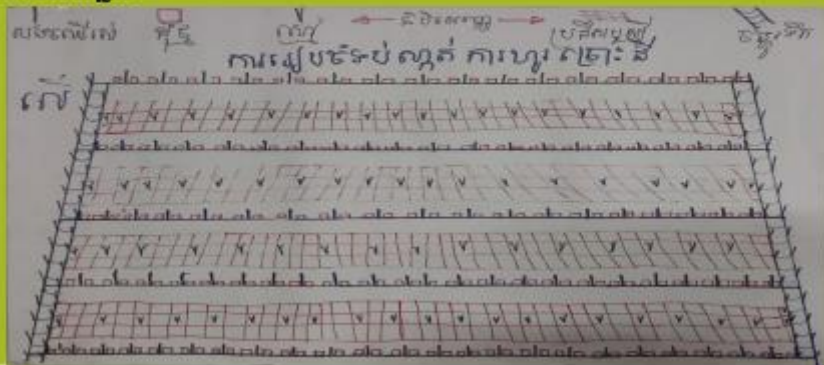
វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

៥. ពេលវេលារៀបចំវិធានការ

រុករានវេលាចាប់ផ្តើមអាស្រ័យលើភាពមានទឹក ក្នុងករណីមានទឹកល្អវិធានការអាចត្រូវបានរៀបចំនៅរដូវប្រាំង ។ ប្រសិនបើមានបូក្យាទឹកក្នុងរដូវប្រាំង ពេលវេលាសមស្រប ក្នុងការរៀបចំគួរតែនៅដើមរដូវវស្សា ។

វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

៦. ការអង្វែង



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីចំណោត

៦. ការអង្វើ



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីចំណោត

៦. ការអង្វើ

ការរៀបចំជួរ៖ ជួរ គឺរៀបចំជាជួរស្របទៅតាមណាដីនៃកំបូល។ គម្លាតរវាងជួរមួយទៅជួរមួយទៀតគឺ ៥.០ម៉ែត្រ។

ការរៀបថ្ម៖ ប្រើចបកាប់ដើម្បីកាប់ថ្ម រៀបចំដោយដាក់ថ្ម 1/3 ចូលទៅក្នុងដី និងទុក 2/3 នៃថ្មនៅលើដី។ ចន្លោះ ពីថ្មមួយដំបូងទៅថ្មមួយដំបូងទៀតគឺ ១គតិ។ បង្គោលប៊ូស្យូត្រូវដាក់ចូលទៅក្នុងដី ដើម្បីទប់ថ្មពីខាងក្រោយការពារការអស់ចុះចំណោត។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីចំណោត

៥. ការអង្វើ

ការដាក់ដាំកំណាត់ឈើស្តុះ៖ ដាក់កំណាត់ឈើស្តុះនៅក្នុងមុខថ្ម ដែលមានចន្លោះ ០.៤-១.០ម៉ែត្រ ពីកំណាត់ឈើស្តុះមួយទៅកំណាត់ឈើស្តុះមួយទៀត អាស្រ័យលើប្រភេទដើមឈើតូច ឬធំ។ ក្នុងករណីដើមឈើ Kriseriya ដែលជាដើមឈើធំ ចន្លោះដោត គួរតែប្រហែល ១.០m ពីគ្នា។ ការបាក់ដាំកំណាត់ឈើ គួរប្រើដែលត្រូវសម្រាប់បូកជាន់ណាត់ក្នុងដីជម្រៅ ១.៥គតិ ដើម្បីដាក់ដាំកំណាត់ឈើស្តុះ។ កំណាត់ឈើស្តុះត្រូវដោតដាំ គួរត្រាំផ្នែកត្រូវដាំ ជាមួយទឹកអម្ពុនឬសរយៈពេល ១ យប់ មុននឹងយកវាទៅដាំ។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

5. ការតម្កើង

-ការរៀបចំប្រដីសប្បុរសភាពដី ៖ ប្រដីសប្បុរសភាពដី ២ម ត្រូវដាក់ផ្នែកកែងជាមួយទឹកហូរ។ ទុកចន្លោះពី ៣០ ទៅ ៤០ ប្រដីស ១ ទៅ ២ ប្រដីស ១ ទៀត ចន្លោះពី ៤-៥ គីឡូម៉ែត្រ ។ ប្រដីសប្បុរសភាពដីរៀបចំនៅក្រោមជួរថ្ម ប្រហែល២គីឡូម៉ែត្រ ហើយផ្ទាំងប្រដីសត្រូវដាក់ទប់ដោយកំណាត់ប្រដីសប្រចាំ១០ ដើម្បីការពារការអីលចុះចំណោត ។

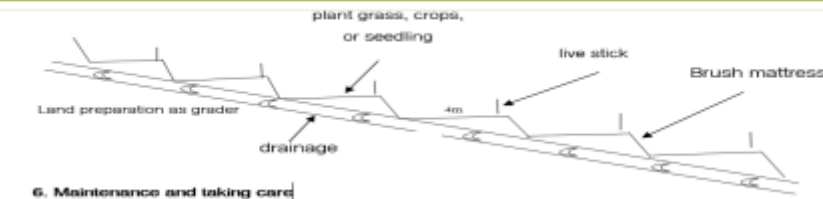
-ការដាំស្មៅ ៖ ស្មៅត្រូវដាំនៅចន្លោះប្រដីសនៃផ្ទាំងប្រដីស តាមចន្លោះដែលអាចដាំបាន ដោយទុកចន្លោះពី ៣ ទៅ ៥ គីឡូម៉ែត្រ ដាំស្មៅ ១ គុម្ព ទៅ ១ គុម្ព ទៀត ។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

5. ការតម្កើង

ការរៀបចំចង្កូរទឹក ៖ ចង្កូរទឹកត្រូវបានរៀបចំ ដើម្បីប្រមូលទឹក ។ ចង្កូរទឹកត្រូវរៀបចំនៅក្នុងទីតាំងបញ្ឈប់លើទៅក្រោម ដោយទុកចន្លោះពីចង្កូរមួយទៅចង្កូរ១ ទៀត ចំងាយប្រហែល ១៥ ម៉ែត្រ ។ គួរដាក់រាយថ្មខ្លះៗនៅបាតចង្កូរ និងដោយកំណាត់ឈើរស់នៅគែមចង្កូរសងខាង ដើម្បីការពារការហូរច្រោះ ឬការបាក់ដីចូលចង្កូរ ។



6. Maintenance and taking care

វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោក

6. ការថែទាំ

ក្រោយពីវិធានការបានតម្កើងរួច ប្រមិនមានភ្លៀងទេ ត្រូវប្រសាច់ទឹកស្មៅ និងកំណាត់ឈើដោតរស់ជាញឹកញាប់បំផ្លែម្តង ដោយចាប់ពីថ្ងៃតម្កើងតទៅ រហូតទាល់តែដើមឈើ និងស្មៅដុះ ។ គួរតែកាត់ ឬដកស្មៅចង្កែរខាងដល់ការលូតលាស់កំណាត់ឈើរស់ និងស្មៅដាំ ចេញ ។



វិធានការធម្មជាតិការពារការហូរច្រោះដី នៅទីបំណោត

7. ការដាំកូនឈើ

ក្រោយពីស្មៅ និងកំណត់ឈើដោតរស់ ដុះលូតលាស់ហើយ គួរដាំកូនឈើខ្លះនៅកន្លែងនេះ នៅចម្ងាយតាមបច្ចេកទេសចន្លោះ៤ម៉ែត្រ ។

8. អត្ថប្រយោជន៍នៃវិធានការ

វិធានការនេះ គឺផ្តល់អត្ថប្រយោជន៍ចំនួនបួន ដូចខាងក្រោម ៖

- (1) ការពារការហូរច្រោះដីដោយទឹកភ្លៀង ពីលើភ្នំ ឬទួល មកក្រោម
- (2) កែលម្អគុណភាពដី
- (3) បង្កើនទឹកជ្រាបចូលទៅក្នុងដី និងរក្សាស្នូលទឹកនៅក្នុងដី និង
- (4) បង្កើនភាពស្រស់ស្អាតលក្ខណៈធម្មជាតិនៃទីតាំង

វិធានការបន្ថែមនៅ ជួនត្រីត



សូមអរគុណ!

Leaky Weir Technique

ការវិនិយោគការបន្តការប្រែប្រួលអាកាសធាតុ តាមរយៈការស្តារតំបន់អេកូឡូស៊ី
កម្មៈ ដំណោះស្រាយតាមបែបធម្មជាតិ សម្រាប់កាត់បន្ថយអាកាសធាតុ

ការបណ្តុះបណ្តាល ស្តីពីការស្តារតំបន់អេកូឡូស៊ី កសិកម្ម
និង ការគ្រប់គ្រងភ្លើងឆេះព្រៃ

វិធានការស្តារតំបន់អេកូឡូស៊ី និងការពារការហូរច្រោះផ្លូវ
ទឹក តាមបែបធម្មជាតិ

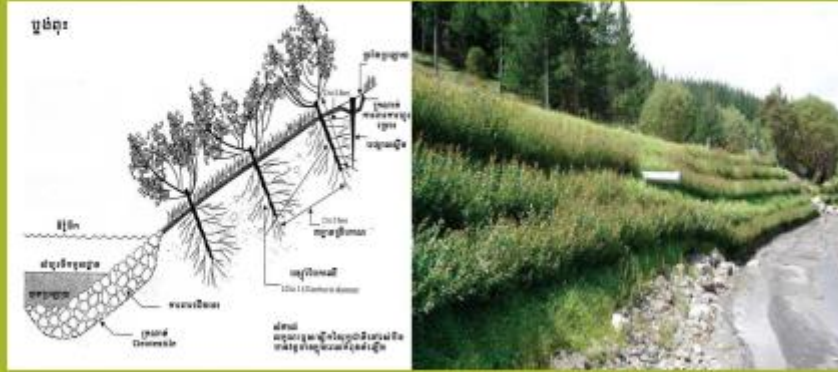
សំឡេង ថ្ងៃទី ២២ ខែ សីហា ឆ្នាំ ២០២៣

តើដំណោះស្រាយតាមបែបធម្មជាតិ ជាអ្វី?

ជាការធ្វើយតប ឬជាដំណោះស្រាយលើបញ្ហាអាកាសធាតុ ដោយប្រើវិធានការ
តាមបែបធម្មជាតិ ដើម្បីស្តារ និងពង្រឹងគុណភាពធម្មជាតិនៅក្នុងតំបន់

ការបង្ហាញពីវិធានការតាមបែបធម្មជាតិខ្លះ សម្រាប់
ស្តារតំបន់អេកូឡូស៊ី និង
ការពារការហូរច្រោះផ្លូវទឹក

របាំងស្ទឹងក្រូចជាតិស៊ី



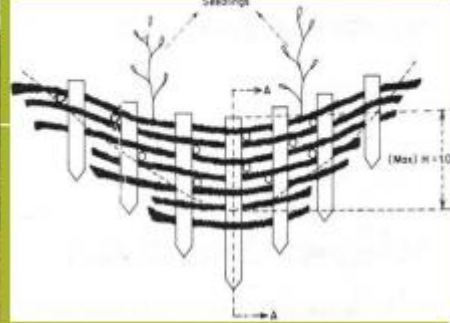
បង្កើតជីវសាស្ត្រ



សំណាក់ក្រូចជាតិស៊ី



ទំនប់ស្តារកំណើតរុក្ខជាតិ



ចោទឈើ ឬទំនប់ឈើ



ចោទឈើ ឬទំនប់ឈើ



ឆ្នាំងឈើ



ឆ្នាំងឈើ



ឆ្នាំងឈើ និងថ្ម



វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

១. ការជ្រើសរើសទីតាំង

វិធានការនេះគឺសមស្របសម្រាប់គ្រប់គ្រងទឹក និងការហូរច្រោះ នៅតាមចង្កូរទឹកតាមទំលើ។ ចង្កូរទឹកដែលត្រូវជ្រើសរើស តម្លើងវិធានការនេះ គួរតែជាចង្កូរទឹកដែលមានទឹកហូរខ្លាំង ចំណុចតែ និងរងការហូរច្រោះខ្លាំងពីលំហូរទឹកភ្លៀងហូរធ្លាក់ពីលើមកក្រោម។



វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

២. ការរៀបចំ

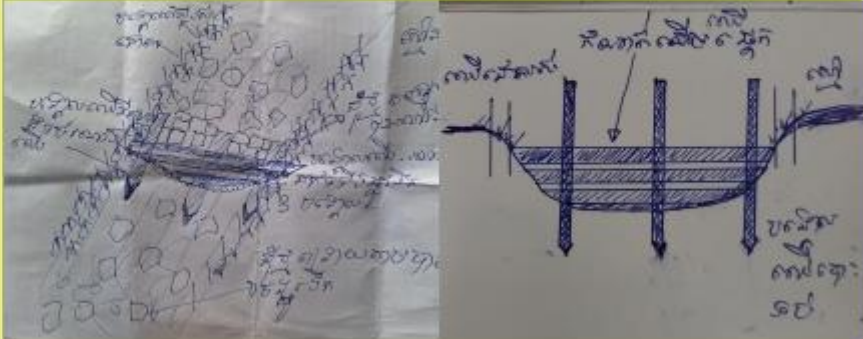
ផ្នែកនៃចង្កូរទឹក ដែលត្រូវជ្រើសរើស ដើម្បីតម្លើងវិធានការនេះ គឺផ្នែកដែលរងការហូរច្រោះខ្លាំង និងអាចស្តារទឹកទុកបានខ្លះ។



វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ



វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ



វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

៣. សម្ភារៈនិងឧបករណ៍ដែលត្រូវការ

សម្ភារៈ និងឧបករណ៍សម្រាប់ការរៀបចំវិធានការនេះ គឺដូចពិពណ៌នានៅក្នុងតារាងខាងក្រោម ៖

សម្ភារៈ	លក្ខណៈនៃសម្ភារៈ
(1) ដុំថ្ម	ជ្រើសរើសដុំថ្មរឹងល្អ គ្មានប្រេប្រូកូរល្មួយ ដែលមានទំហំប្រហែល 0.3cmx0.3cm
(2) កំណាត់ឈើធំ	កំណាត់ឈើ ទំហំ 20cm ឡើង ប្រវែងបណ្តោយ ២,៥ម ទៅ ៣,០ម
(3) បង្គោលឈើ	បង្គោលឈើតាន់ល្អ ទំហំប្រហែល ១គីត និង បណ្តោយ ១,៥មត្រូវ
(4) កំណាត់ឈើដោតរស់	ឈើរស់ដែលមានក្នុងមូលដ្ឋាន ដែលអាចកាប់ដោតរស់ ដែលមានទំហំប៉ុនមេដៃ ឬមេជើង កាត់ប្រវែង ៥មតិក។ ជ្រើសរើសឈើរស់ ដែលដោតងាយរស់ និងដុះលូតលាស់ល្អ នៅតំបន់ស្ថានភាពសើម និងបង្កើតឫសល្អ ដើម្បីការពារដីពីការហូរច្រោះ។

វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

សម្ភារៈនិងឧបករណ៍ដែលត្រូវការ

សម្ភារៈ និងឧបករណ៍សម្រាប់ការរៀបចំវិធានការនេះ គឺដូចពិពណ៌នានៅក្នុងតារាងខាងក្រោម ៖

Materials សម្ភារៈ	Characteristics of materials លក្ខណៈនៃសម្ភារៈ
(5) ស្មៅ	ស្មៅល្អក្នុងមូលដ្ឋាន ដែលអាចដុះលូតលាស់ល្អនៅតំបន់ដីសើម និងមានឫសល្អក្នុងការទប់ដីពីការហូរច្រោះ។ ស្មៅដឹកយកទាំងឫស។
(6) អម៉ូនីយ៉ូម	អម៉ូនីយ៉ូម សម្រាប់ត្រាំឈើរស់ ផ្នែកដែលត្រូវដោយចូលក្នុងដី ដើម្បីជម្រុញការលូតលាស់ឫស និងដុះលូតលាស់ឆាប់។
ចបកាប់	ចបកាប់ ប្រើសម្រាប់ដឹកដីដីថ្មី
តូចៅ	តូចៅត្រូវការប្រើដើម្បីសម្រួលឈើបង្គោល ដីចូលដី ចោះទប់រំបាំងឈើ

វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

តើវិធានការស្តារទឹក និងការពារការហូរច្រោះតាមបែបធម្មជាតិនេះ ចាំបាច់ត្រូវការសម្ភារៈទាំង៥ ដូចបានរៀបរាប់ក្នុងតារាងខាងលើ ដែរឬទេ? ប្រសិនបើសហគមន៍ មានសម្ភារៈទាំង៥ គឺល្អណាស់សម្រាប់ការរៀបចំវិធានការនេះ។ បើមិនដូច្នោះទេ មានជម្រើសរវាងជម្រើស B1-B3 ដូចបង្ហាញក្នុងតារាងខាងក្រោម។

(១) ជួនកាល, (២) កំណាត់ឈើងាប់ (៣) កំណាត់ឈើដាច់ស្រស់, (៤) ឈើបង្គោល, (៥) ស្មៅ, និង (៦) អម្មុយស្រូម

សម្ភារៈ	សម្ភារៈ
ជម្រើស ក	(១), (២), (៣), (៤), (៥), និង (៦)
ជម្រើស ខ	(១), (៣), (៤), (៥), (៦)
ជម្រើស គ	(១), (២), (៤), និង (៥)
ជម្រើស ឃ	(១), (២), (៣), (៤), និង (៦)

វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

4. ពេលវេលាដើម្បីរៀបចំវិធានការពេលវេលាសមស្របចាប់ផ្តើមសាងសង់ទន្ធបង្គោលនេះ គឺនៅរដូវប្រាំង ឬពេលគ្មានភ្លៀងធ្លាក់ ដោយគ្មានឫមានទឹកតិចតួចនៅក្នុងចង្កូរទឹក។



វិធានការស្តារទឹក និងការពារការហូរច្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

5. ការតម្លើង៖ របៀបតម្លើងរបាំងទប់ទឹកតាមចង្កូរ ការពារការហូរច្រោះដី

សម្ភារៈ	លក្ខណៈ	របៀបតម្លើង
បង្គោលឈើ	តានល្អ(អាចជាបង្គោលក្រាក) ទំហំ១គីក ប្រវែង ១,៥ម	ដឹកដំបង្គោលឈើ៣ ឬ ៤ បង្គោល (អាស្រ័យលើទំហំចង្កូរទឹក) ជម្រៅកន្លះម៉ែត្រ (កាន់តែជ្រៅកាន់តែល្អ) ជាខ្សែត្រង់ទទឹងចង្កូរ ដើម្បីទប់រំលាំងឈើ ដែលដាក់ទទឹងចង្កូរខាងលើខ្សែទឹកនៃបង្គោលដី។
កំណាត់ដើមឈើងាប់	ប្រវែង ២,៥ម ទំហំ ២គីក (អាចជាបង្គោលក្រាក)	ក្រោយដំបង្គោលរួចរាល់ នៅខាងលើខ្សែទឹក នៃបង្គោលដីនេះសូមដាក់ផ្នែកបង្គោលឈើ នៅច្រកចង្កូរ ១ដើម នៅចង្កូរចង្កូរ១ដើម និងនៅមាត់ចង្កូរ១ដើម ត្រួតលើគ្នា ដោយទុកចន្លោះ ប្រហែល៥ហ៊ុនពីគ្នា ដោយជីកដីបង្កប់ចុងសងខាងបង្គោល។
ដុំថ្ម	ទំហំ ៣គីក x ៣គីក	១. នៅខាងលើខ្សែទឹក នៃរបាំងឈើ ចូរដឹកល្អិតម្រៀបដុំថ្មជម្រៅ១គីក ជា៣ទៅ៤ជួរ ទទឹងចង្កូរ ដោយទុកចន្លោះ ១គីក និងដាំចន្លោះគ្នា រវាងជួរ១ និងជួរ១ទៀត។ ២. ដឹកដុំថ្មខ្លះៗ ពង្រាយ នៅច្រកចង្កូរ នៅកន្លែងដែលសមស្រប (កន្លែងរង ការហូរច្រោះ) ពីចង្កូរខាងលើ ដល់ ចង្កូរផ្នែកខាងក្រោម។

វិធានការស្តារទឹក និងការពារការហូរព្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

5. ការតម្លើង ៖ របៀបតម្លើងបាំងទប់ទឹកតាមចង្កូរ ការពារការហូរព្រោះដី

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វិធានការស្តារទឹក និងការពារការហូរព្រោះផ្លូវទឹក តាមបែបធម្មជាតិ

6. ការថែទាំ និងតាមដាន

បន្ទាប់ពីវិធានការបានតម្លើងហើយ បើមិនមានភ្លៀងទេ ត្រូវស្រោចទឹកលើស្មៅនិងឈើរស់រៀងរាល់បីថ្ងៃម្តង រហូតទាល់តែដើមឈើរស់ និងស្មៅដុះ ។ គួរតែកាត់ ឬដកស្មៅដែលមិនចាំបាច់ចេញ។

7. គុណសម្បត្តិវិធានការ មានអត្ថប្រយោជន៍បីពីការណែនាំវិធានការនេះ ៖

- (ក) ការពារការហូរព្រោះដីតាមចង្កូរ ពីសេមកក្រោម
- (ខ) រក្សាភាពសើមនៅក្នុងចង្កូរ និងផ្ទៃដីសងខាង
- (គ) បង្កើនភាពស្រស់ស្អាតធម្មជាតិនៃទំនាំង

សូមអរគុណ!

Annex 6. 8. New Restoration Site Assessment and Mapping



Annex 6. 9. Field Mission Photos



Team Meeting 20 August



Team Meeting 20 August



Training 22 August



Training 22 August



Training 22 August



Training 22 August



Tree Seeds Propagation 23 August



Soil Sterilization 23 August



Soil Sterilization 23 August



Soil Sterilization 23 August



Field Trip Takhes Meanchey 23 August



Field Trip Takhes Meanchey 23 August



Field Trip Takhes Meanchey 23 August



Field Trip Takhes Meanchey 23 August



Field Trip Takhes Meanchey 23 August



Field Trip Takhes Meanchey 23 August



Field Trip Takhes Meanchey 23 August



Field Trip Takhes Meanchey 23 August

Annex 6. 10. Lesson learned from the case studies

Background

Five forest communities in Kratie province implemented agro-forestry activities as part of a project funded by The Partnership for Forestry and Fisheries Communities in Cambodia (PaFF) Phase II 3. The project received technical assistance from WWF and the Technical Advisory Committee for Agriculture and Independent Environmental Conservation.

Challenges of Farming: Before, During, and After Implementation

The five community forestry groups faced numerous challenges before and during the implementation of agroforestry development activities:

Before Implementation:

- Community forests lacked management plans, and committees had limited understanding of bylaws and regulations, leading to poorly maintained or lost regulatory documents.
- The concepts and best practices of agroforestry were unfamiliar, making extensive discussions and consultations necessary to plan effectively and empower community decisions.

During Implementation:

- Some members who initially registered for activities later resigned or were terminated due to non-participation, a lack of perseverance, or willingness to engage in action plans, including forest and land clearing, cultivation, and care of crops and livestock.
- A portion of the group left, believing the agricultural benefits were too distant. Gender participation was not an issue, as men and women were equally involved.
- Leadership deficiencies and excessive technical guidance on cultivation and farming systems also posed significant challenges, potentially leading to inactivity or fragmentation within agricultural groups.

After Implementation:

- Challenges included accessing markets for agricultural products, equitable benefit distribution, and ensuring the sustainability of agricultural development.

Solutions or Recommendations:

1. **Strengthen Community Forestry Management:** Review and update internal regulations, agreements, and management plans to include a 15-year agricultural development plan. Notably, O'Kak, O'Krasaing, and Prasat Teuk Khmao communities have been reclassified as protected areas by the Royal Government.
2. **Enhance Member Engagement:** Organize annual meetings or festivals, encourage participation in forest patrols and credit activities, and explore community forest carbon credit sales to support agricultural development.
3. **Support Vulnerable Members:** The Community Forest Management Committee should assist disabled, widowed, elderly, and poor members by determining tree types, locations, and harvesting times.
4. **Clarify Agricultural Group Rules:** Define roles, responsibilities, benefit distribution, and conflict resolution mechanisms clearly.

5. **Establish Business Networks:** Coordinate market access at various levels through social organizations, government programs, and digital platforms to ensure effective market influence.
6. **Regularly Review Business Plans:** Update plans annually based on market and local economy changes, following a simple and comprehensible model.
7. **Diversify Crops:** Focus on mixed cropping with short-term yields and multi-purpose trees to enhance food security, soil quality, and provide year-round green cover.
8. **Educate on Agroforestry Benefits:** Emphasize agroforestry as a means of conserving forest biodiversity and improving livelihoods, requiring active participation and collective decision-making.

Achievements and Lessons Learned:

Although it's early to quantify the economic benefits for 2022-2023, notable achievements include:

- **Knowledge Gain:** Members acquired new knowledge and techniques in agriculture and forestry through training and participation.
- **Behavioral Changes:** Skills learned are applied to personal farmlands, shifting from deforestation to forest conservation practices.
- **Environmental Impact:** Observations show improved tree growth and retention of green cover due to enhanced farming practices.
- **Economic Prospects:** Initial economic forecasts based on the first year's activities have been made, with a focus on business planning for the five groups.
- **Market Linkages:** Efforts to coordinate product sales with local buyers are underway, planning for seasonal harvesting and further cultivation.

Conclusion:

The early stages of agroforestry development in Kratie province, supported by the Partnership for Forestry and Fisheries Communities in Cambodia (PaFF) and WWF, have led to significant changes in community attitudes and practices. The initiative aligns with the Royal Government's community forestry policy, promoting sustainable resource management and economic growth. These experiences are valuable for policy and technical guidance, aiming for conservation, biodiversity, and sustainable livelihoods.



Seventh Cambodia National Field Mission Report



O'Ratkros Protected area nursery site, Samlaut district, Battambang province, Cambodia
(photo by Khun Bunnath, ICEM).



Technical Assistance 6539: Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-based Solution for Climate Resilience

Seventh Cambodia National Field Mission Report

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1. Background

This seventh field mission will build on the work of the six previous missions and follow up and expand the work undertaken in the sixth mission, which took place in August 2023.

In the first mission, the national team, in collaboration with the Maddox Jolie-Pitt Foundation (MJP)⁵ met with local communities and visited community forest sites of concern to the communities. The sites are relatively distinctive in Cambodia as they are community forests owned collectively by the target communities, except for the Samlout Multiple Use Area (SMUA) site, which is under the jurisdiction of the Ministry of Environment (MoE) and the local Department of Environment (DOE).

In the second mission, the project team and MJP were joined by community forest committee members, rangers, forestry officers, and military representatives, who had conducted detailed surveys of the identified sites. The information collected informed a participatory mapping workshop in which a broad range of landscape restoration measures were identified. These emphasized nature-based solutions to the challenges facing the sites. Utilizing the generated maps, the team produced landscape restoration plans and priority tasks for each site.

In the third field mission, the team administered training sessions and began to implement restoration plans, including seedling planting, for the four selected demonstration sites.

The fourth mission took place on 20-25 November 2022, providing support and guidance to the communities for restoration activities. The mission continued implementing the restoration plans and followed through on work from the previous mission. During the mission, the team observed that some seedlings had suffered from bacteria and parasites, and a replacement planting plan was initiated. The team also provided advice on water supply and storage at each site.

The fifth mission undertaken on 17-22 April 2023 focused on a survival survey of planted seedlings, evaluation of new nurseries, assessment of the consistency of water supply at each site, review of the implementation of the restoration plans, demonstration of soil erosion control, and exploration of an alternative site to Oslev. The mission team advised on the replacement planting of dead seedlings and expansion of new seedling sites, preparation and improvement of water storage facilities at the sites, application of agroforestry techniques by growing ginger and chili, and application of soil erosion control measures.

In the sixth mission in August 2023, the TA team monitored the progress of implementation of the restoration plans and followed on the work from the previous mission, which covers water infrastructure development and construction at each site, and the development of new nurseries. The team assessed the implementation of the monitoring plan, and provided technical training on agroforestry, forest fire management, and tree seeds propagation to the communities and MJP project team.

This seventh and final mission was conducted on 7-13 January 2024 to monitor the progress and evaluate the results of restoration activities implemented in selected restoration sites in Samlout.

2. Objectives

The objectives of the mission were to:

- Evaluate demonstration activities undertaken at each restoration site;
- Identify good practices, lessons learned, and opportunities for improvement of the restoration activities; and
- Draw conclusions and recommendations from the demonstration activities and develop a restoration model that can be applied to other sites in Cambodia.

⁵ The Maddox Jolie-Pitt Foundation is the project's partner NGO. MJP has worked in the Samlout area since 2003 in forest restoration and conservation, agriculture, and education. Through its work it has developed strong and productive relationships with local communities and local government in the selected demonstration areas.

3. Methodology

Participatory tools, such as plenary discussions, semi-structured group discussions, observations, and interviews with community members, PA rangers, FA officers, and MJP staff members, were used to track the progress and evaluate the results of restoration activities (Table 19).

Table 19. Mission Activities

No.	Activity	Method	Restoration activities and survey technique
1.	Meeting with MJP	<ul style="list-style-type: none"> • Scheduling of site visits and corresponding arrangements • Discussion and finalization of site activities • Discussion on activities undertaken at each site 	<ul style="list-style-type: none"> • Survey schedule by site • PPP on survey methodologies • List of discussion points on results of field restoration activities.
2.	Restoration site visits and meetings with community members, local authorities, PA and FA officers	<ul style="list-style-type: none"> • Direct observation of listed restoration activities and evaluation of ground results • Individual interview and group discussion with community leader and members to discuss the results of their restoration activities. • Key informant interviews and focus group discussion with MJP staff, MoE representatives, SMUA (PA) rangers, and Forest Administration field officers 	<ul style="list-style-type: none"> • Tree survival survey • Nurseries survey • Agroforestry activity and results • Installed water system and performance survey and effectiveness. • Soil erosion demonstration survey technique • Water leaky weir installation and performance • Survey of current site green cover and comparison with baseline • Training/capacity building and reported additional knowledge on landscape restoration. • Restoration plan and results
3	Documentation of good practices and lessons learned from the site demonstrations	<ul style="list-style-type: none"> • Internal TA team discussion 	Discussion among TA team
4	Consultation meeting with Provincial Departments and MJP	<ul style="list-style-type: none"> • Presentation of major findings, lessons learned, and good practices identified by the TA team • Consultation discussion with relevant PDs for feedback on the presentation 	Consultation meeting

4. Mission Activities

The team undertook field surveys at the five demonstration sites to determine the success of the restoration efforts. The team used group discussions, field interviews, and direct observations to collect data, guided by a specific set of questions.

The survey assessed the success and efficacy of nine key restoration initiatives: (i) tree planting, (ii) development of tree nurseries, (iii) installation of irrigation systems, (iv) adoption of agroforestry techniques, (v) application of soil and water erosion prevention methods, (vi) training and capacity building in landscape restoration principles and techniques, (vii) support for local livelihoods, (viii) implementation of fire prevention strategies, and (ix) ongoing site upkeep.

At each site, the team met with local participants and engaged in discussions organized around a set of questions prepared in advance (Annex 7.1). The discussions aimed to introduce the participants to

the mission and gather information to assess the impact of the restoration program and the understanding and skill levels of participants. The team encouraged open dialogue, emphasizing that MJP officers, Forest Administration Officers, and Protected Area rangers were not present to ensure participants felt comfortable speaking freely about the restoration activities at their site. The dialogue covered the implementation process, challenges, outcomes, and lessons learned from each restoration activity.

Following the discussions, the TA team assessed the progress of the restoration efforts firsthand, including the growth of planted seedlings, the functionality of installed water systems, the application of agroforestry practices, demonstrations of soil and water erosion control, and the overall greenery of the site.

4.1 Anakut Komamaki

The TA team and MJP visited Anakut Komamaki on 09 January 2024. The team held discussions with 25 local people, including community committee members, community people, local authorities, the village chief, and the commune councilor. MJP did not attend the discussions. The discussions took the entire morning. Following discussions, the TA and MJP representatives evaluated the site, accompanied by two community members.

Summary of Evaluation

The restoration activities implemented at Anakut Komamaki include tree planting, water system installation, nursery preparation, soil erosion control including leaky weirs, agroforestry, firebreak creation, training and capacity building, and maintenance tasks such as watering and grass cutting. Two thousand six hundred ninety-one tree seedlings have been planted at Anakut Komamaki, consisting of a mix of native and local species, including flowering plants.

The community understood the restoration objectives: to increase tree cover and vegetation, enhance local biodiversity and soil ecology, attract rainfall, and improve community livelihoods through agroforestry and beekeeping programs. However, the community's understanding of restoration techniques and methods, such as the cluster method for tree planting, appears limited.

Community members are able to articulate the preparation process for tree planting, including grass cutting, selecting healthy seedlings, digging holes as trained by ICEM, planting, watering, and maintaining seedlings.

The community has adopted practices learned in ICEM training sessions at the nursery, including site and soil preparation, seed selection and treatment, watering systems, and daily maintenance. However, although recently established, responsibility for the nursery's upkeep is not clearly defined. Material supplies from MJP have also been delayed, affecting nursery operations, and the watering system lacks sufficient sprinklers.

The water system constructed in 2023 effectively collects and stores water. However, evaporation during the dry season reduces the water level, affecting the water supply for the nursery and planted seedlings. The community suggested planting banana trees around the pond and using floating vegetation to reduce evaporation. Water is pumped from the pond to a 3,000-liter tank to supply the nursery, attracting birds and indicating increased biological interaction.

Agroforestry techniques learned in training sessions provided by the team have been adopted by the community and were applied to ginger and other crops in August during the 6th national mission. However, the poor condition of the predominantly rocky soils has limited the productivity of the crop.

Soil and water erosion control techniques, including the use of natural materials such as mattresses, grass, live stakes, and stones, have shown limited success due to poor soil conditions, inappropriate species selection for grasses and sticks, and low maintenance by the community. Nevertheless, the community recognizes the value of employing the techniques elsewhere on the site.

The community acknowledges they have learned from the project, including knowledge of tree planting, nursery preparation, soil and water erosion control, and other restoration techniques. However, improved coordination for activity implementation, equipment provision, and technical support for more effective landscape restoration is required.

Group Discussions. Local communities share their practice and lessons learnt at Anakut Koma Samaki (photo by Khun Bunnath, ICEM).



4.2 Takhes Meanchey

The TA team and MJP visited Takhe Meanchey on 10 January 2024. Discussions were conducted throughout the morning with twenty local people, including community committee members, community people, local authorities, the village chief, and the commune councilor. MJP did not attend the discussions.

The team and MJP then visited the site, accompanied by two community committee members.

Group Discussion. Local communities share their improved restoration knowledge at Takhes Meanchey (photo by Khun Bunnath, ICEM).



Summary of Evaluation

Restoration efforts included tree planting, water system development, nursery set up, soil erosion control with the construction of leaky weirs, agroforestry, creation of firebreaks, restoration training, and capacity building, along with maintenance tasks such as watering and grass cutting. A total of 2,689 tree seedlings were planted at Takhes Meanchey, consisting of a mix of native and local species conducive to beekeeping, including the Kapok tree.

The Takhes Meanchey community understood the objectives of the restoration efforts (enhancing tree and vegetation cover, boosting local biodiversity, attracting rainfall, and improving community livelihoods through agroforestry and beekeeping programs). However, their recollection of the specific techniques used, such as the cluster method for tree planting, is vague. Nevertheless, community members can accurately describe the site preparation process for tree planting (which includes grass cutting, selecting seedlings, digging holes, planting, watering, and maintenance), for which they had received training.

At the tree nursery, the community followed the training on preparation, soil preparation, seed selection and treatment, establishing a watering system, and maintenance. The nursery was recently completed on a plot of community land near the main road about a month ago. The division of maintenance roles and tasks for the nursery remains undefined; currently, the community chief is primarily responsible. The level of commitment among the eleven committee members for Takhes Meanchey is relatively low.

The onsite pond, excavated last year (2023), fails to retain water due to rapid water penetration, leading to a swift decrease in water levels. Despite this, the lack of an onsite water source has not significantly affected the seedlings, thanks to the soil's adequate moisture retention. Additionally, a water system at the tree nursery, fed by an existing pond nearby, supplies water to the nursery. Water is pumped into a 3,000L tank situated on elevated ground near the nursery.

The agroforestry technique, implemented following provided training, involved planting ginger and similar herbs in August 2023 during the 6th national mission. Unfortunately, the plants did not thrive due to inadequate maintenance and the encroachment of wild grass. Given the site's steep terrain, soil and water erosion control is crucial, employing natural materials like bamboo mats, grass, live stakes, and stones. The effectiveness of these techniques has been limited due to the unsuitability of local grass and live stakes for the soil conditions and the lack of maintenance by the community. Nonetheless, the community recognizes the soil and water erosion control demonstration as a learning tool for application across their site.

The community has gained significant knowledge from the project and restoration efforts, learning new methods for tree planting, nursery preparation, soil and water erosion control, and site restoration techniques. To achieve effective landscape restoration, the community identified several needs: (i) enhanced coordination for activity implementation, including the provision of equipment, technical support, and better coordination; (ii) the construction of a community building to facilitate collaborative work and maintenance of the restoration site; and (iii) the provision of larger tree seedlings to ensure a higher survival rate.

4.3 Dontret

The team and MJP visited Dontret on 11 January 2024. Twenty people engaged in the discussion, including community committee members. Following the discussion, the team and two community committee members visited the site.

Group Discussion. Local communities share their experience at Dontret (photo by Khun Bunnath, ICEM).



Summary of Evaluation

The restoration objectives are to enhance the site's tree and vegetation cover, improve local biodiversity, gather rainfall, and improve community livelihoods by adopting agroforestry, beekeeping, and tourism programs. Restoration efforts include tree planting, establishing water systems and nurseries, soil erosion control, constructing leaky weirs, implementing agroforestry practices, firebreaks, restoration training, capacity building, and ongoing maintenance such as watering and grass cutting. A total of 3,140 tree seedlings have been planted in Dontret, consisting of a mix of native, local, and flowering varieties that support beekeeping and attract tourists.

The Dontret community understands the objectives of the restoration plan. However, they lack a comprehensive understanding of specific techniques, such as the cluster method of tree planting. Nevertheless, they can articulate the steps in preparing a tree planting site.

The community established a nursery following training, which covered site preparation, seedling soil preparation, seed selection and treatment, watering systems, and maintenance. This nursery was recently completed on a plot of community land near the main road. The division of roles and tasks for the nursery's maintenance remains undefined, with the community chief overseeing the work. The commitment among the nine committee members for Dontret is relatively weak.

The site's water system, which includes onsite ground wells dug several months ago, provides adequate water for restoration activities, nursery preparation, and agroforestry. An elevated 3,000 litre water tank has been installed near the nursery to supply water to the nursery. However, the system lacks a sprinkler, indicating it is incomplete.

Agroforestry techniques were applied following training. Ginger and similar herbal species were planted during the 6th national mission in August. Unfortunately, these plants have struggled due to poor maintenance and wild grass invasion. Soil and water erosion control, crucial due to the site's steep ground conditions, employs natural materials like bamboo mats, grass, live sticks, and stones. Despite these efforts, the results have been less than satisfactory due to unsuitable local grass and live sticks and poor maintenance by the community. Nevertheless, the community recognizes the soil and water erosion control demonstration as a learning tool for application across their site.

The community acknowledges the knowledge gained from the project and restoration efforts, including tree planting, nursery preparation, soil and water erosion control, and site restoration techniques. However, for effective landscape restoration, they identify several areas for improvement: enhanced coordination of activities, including equipment provision, technical support, and overall coordination; the construction of a community building for collaborative work and site maintenance; and the provision of larger tree seedlings to ensure a higher survival rate.

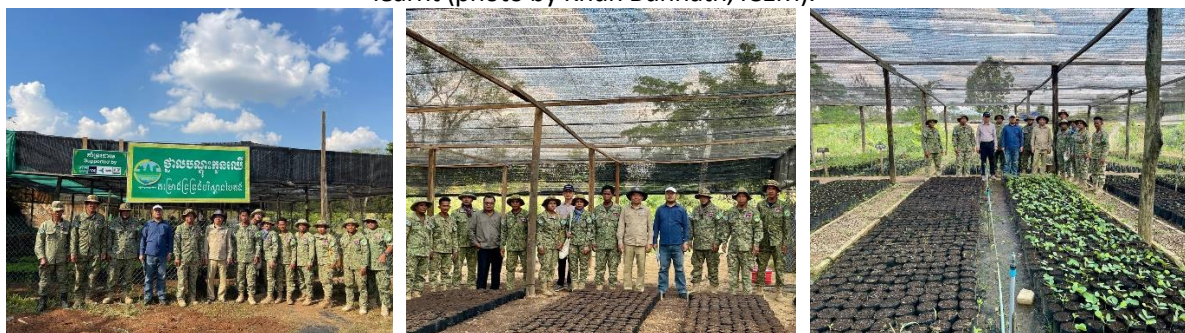
4.4 Oslev and O'Ratkros PA Nursery Site

The team and MJP visited the O’Ratkros nursery site on 12 January 2024. Ten rangers, including the Director, joined the discussion, which covered the implementation of the restoration plan, challenges, results, and lessons learned.

According to the restoration plan, the capacity of the tree nursery at O’Ratkros has been expanded to produce between 8,000 and 10,000 seedlings.

Following the discussion, the team assessed the nursery and Oslev restoration sites, accompanied by Pailin rangers.

Visit to O’Ratkros PA nursery site. Discussion with rangers on restoration achievements and lessons learnt (photo by Khun Bunnath, ICEM).



Summary of Evaluation

Oslev is located in the Samlout Multiple Use Area (SMUA). The site was previously within the Battambang administrative boundary and under the control of SMUS rangers. However, following the demarcation of administrative boundaries in early 2023, the site is now in Pailin.

Restoration activities were halted after the boundary adjustment. The site visit revealed that the site has been plowed for crops, and all the seedlings planted by the project have been destroyed.

Visit to Oslev Restoration Site. Site visit with SMUA rangers (photo by Khun Bunnath, ICEM).



5. Achievements

5.1 Field Mission Arrangements

Mission arrangements, including meetings, consultation meetings, and field arrangements of activities and logistics at each site, were successfully implemented by MJP according to the mission plan.

To prepare for the mission, the TA team met with MJP staff on 8 January 2024 at the MJP office in Battambang to discuss the field evaluation survey, logistics, survey materials used in the field, and restoration activities implemented at sites.

5.2 Reflection sessions with local stakeholders

The reflection session took place on January 12, 2024, at the MJP office in Samlout. Participants included MJP officers, Protected Area (PA) directors from SMUA and Pailin, forest administration officers, and the Technical Assistance (TA) team. The TA team summarized findings from three community sites and Oslev as a basis for discussion.

It was noted that some restoration activities, including tree nursery preparation, were initiated later than planned. Originally, the plan was to establish two tree nurseries: one at O'Ratkros PA, and another within the Kagnchang community. However, the nursery at Kagnchang could not be prepared due to a conflict concerning the location on land owned by a former community chief. As a resolution, three new tree nursery sites were prepared, and operations began at Anakut Koma Samaki, Takhes Meanchey, and Dontret. These nurseries aim to produce seedlings for local consumption, including fruit and local tree varieties. Training in tree nursery preparation and horticulture techniques was also recommended.

Reflection Sessions. Discussions on the mission findings at MJP office in Samlout (photo by Khun Bunnath, ICEM).



A major component of the restoration plan is developing a water system. The pond at Takhes Meanchey appears not to retain water adequately. Water seeps into the ground despite being well-situated to collect runoff. MJP is considering using small, plastic-lined pits to retain water in the tree-planting areas as an alternative to the ineffective pond. Implementing the water system requires pond preparation, water tank setup, and a distribution system to support the tree nurseries and newly planted seedlings. Dontret community members would like to sell water during the dry season, leveraging the abundant supply from newly dug groundwater wells.

The meeting concluded that refresher training sessions are necessary to support the community effectively. Additionally, PA directors from SMUA and Pailin were encouraged to identify additional restoration sites for inclusion in a larger project proposal. This larger project, coordinated under the Ministry of Environment (MOE), should prioritize sites within protected areas. Proposed activities for the next phase include expanding tree and flower tree planting to support beekeeping and forest preservation across all 14 forest communities in Samlout, focusing on sites near the Sangke River to improve the watershed, constructing spillways to capture water in natural streams for restoration and ecotourism purposes, and developing community and ecotourism sites within the PAs.

5.3 Project efficiency and impact

The following indicates project efficiency and impacts:

- Surveys and drone assessments indicate that 85% of the planted seedlings survived.
- The greenery of the site increased by 82% compared to the baseline aerial photos and satellite images.
- Encroachment onto the sites has been halted.
- Sales of nursery seedlings, agroforestry, beekeeping, and improved biodiversity have provided income opportunities for local communities.
- Technical skills and knowledge have been improved following training, field coaching, and mentoring exercises conducted by the technical team.
- Materials for eco-training are recycled and used for training new community members in the future.
- Nurseries of good quality and high standards have been constructed at reasonable cost.

5.4 Replication of the model

The project serves as a foundational step towards revitalizing the Sangke watershed, an area once characterized by dense forest. The project lays the groundwork for a more extensive landscape restoration initiative encompassing the watersheds of the Sangke, Dountri, and Pursat Rivers. The project suggests the following steps to replicate the model across the suggested watersheds:

- Identify additional restoration sites within Protected Areas (PAs) for inclusion in a broader project, under the jurisdiction of the Ministry of Environment. The aim is to extend the successful strategies and lessons learned from this pilot to new sites within the ministry's purview.
- Transfer the skills and knowledge acquired through this project to other regions, amplifying the impact on restoration efforts and community engagement.
- Expand the four demonstration sites into larger areas, increasing the scale of restoration efforts and the investment in assets and funding.
- Implement a proven set of restoration activities that have demonstrated effectiveness, suitability, and community acceptance in the pilot area, making them ideal for broader application in future projects.

6. Suggestions and Recommendations

Experience gathered over the course of the seven missions and the site assessments on the seventh mission suggests the following recommendations.

- Plant larger seedlings to ensure higher survival rates.
- Begin restoration programs at the beginning of the rainy season so as to access rainwater for as long as possible.
- Integrate restoration activities with agroforestry and agroecology to increase the number of trees planted, improve community livelihoods, and encourage soil conservation.
- Provide community members keen to apply agroforestry techniques to a plot of land to ensure seedlings are properly planted and good yields are achieved.;
- Reintroducing native and flower tree species is essential to restoring natural forests and supporting beekeeping.
- NGO partners coordinating restoration activities in the field must work closely and actively with communities to provide technical support.
- Ecotourism at restoration sites may help to incentivize conservation.
- Nursery business development is encouraging longer-term seedling distribution at the local level.

Annex 7. 1. Mission Activities

No.	Activity	Method	Restoration activities and survey technique
1.	Meeting with MJP	<ul style="list-style-type: none"> • Scheduling of site visits and corresponding arrangements • Discussion and finalization of site activities • Discussion on activities undertaken at each site 	<ul style="list-style-type: none"> • Survey schedule by site • PPP on survey methodologies • List of discussion points on results of field restoration activities.
2.	Restoration site visits and meetings with community members, local authorities, PA and FA officers	<ul style="list-style-type: none"> • Direct observation of listed restoration activities and evaluation of ground results • Individual interview and group discussion with community leader and members to discuss the results of their restoration activities. • Key informant interviews and focus group discussion with MJP staff, MoE representatives, SMUA (PA) rangers, and Forest Administration field officers 	<ul style="list-style-type: none"> • Tree survival survey • Nurseries survey • Agroforestry activity and results • Installed water system and performance survey and effectiveness. • Soil erosion demonstration survey technique • Water leaky weir installation and performance • Survey of current site green cover and comparison with baseline • Training/capacity building and reported additional knowledge on landscape restoration. • Restoration plan and results
3	Documentation of good practices and lessons learned from the site demonstrations	<ul style="list-style-type: none"> • Internal TA team discussion 	Discussion among TA team
4	Consultation meeting with Provincial Departments and MJP	<ul style="list-style-type: none"> • Presentation of major findings, lessons learned, and good practices identified by the TA team • Consultation discussion with relevant PDs for feedback on the presentation 	Consultation meeting

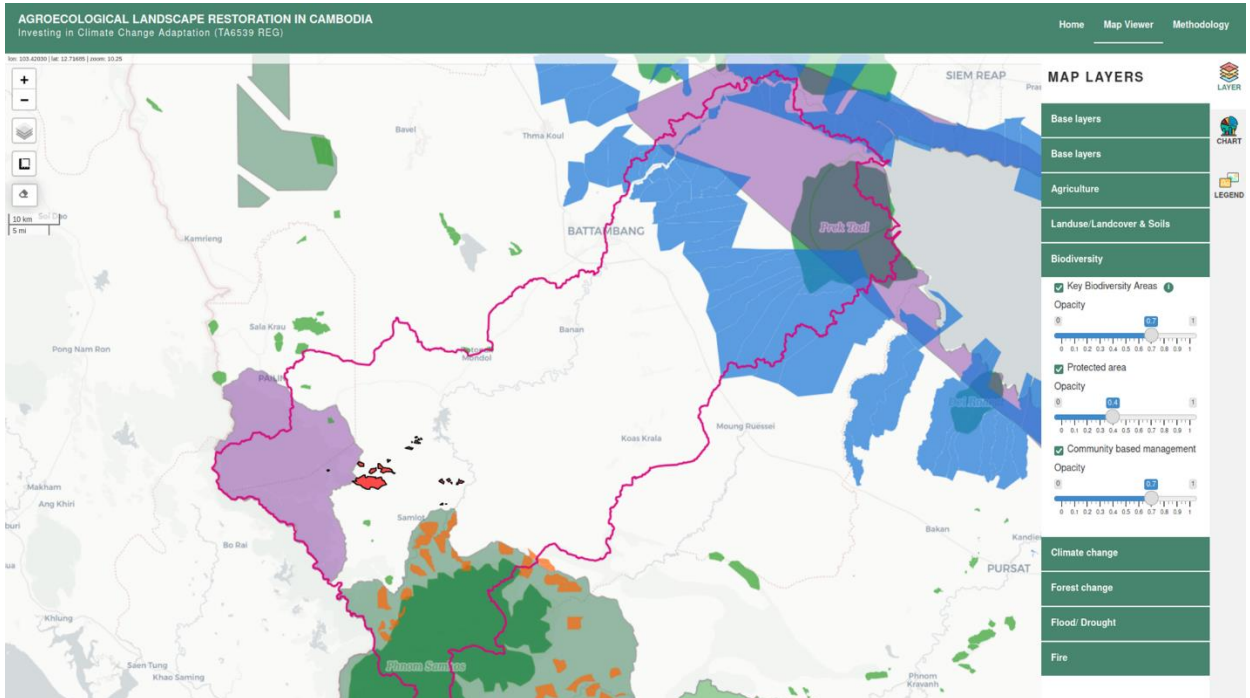
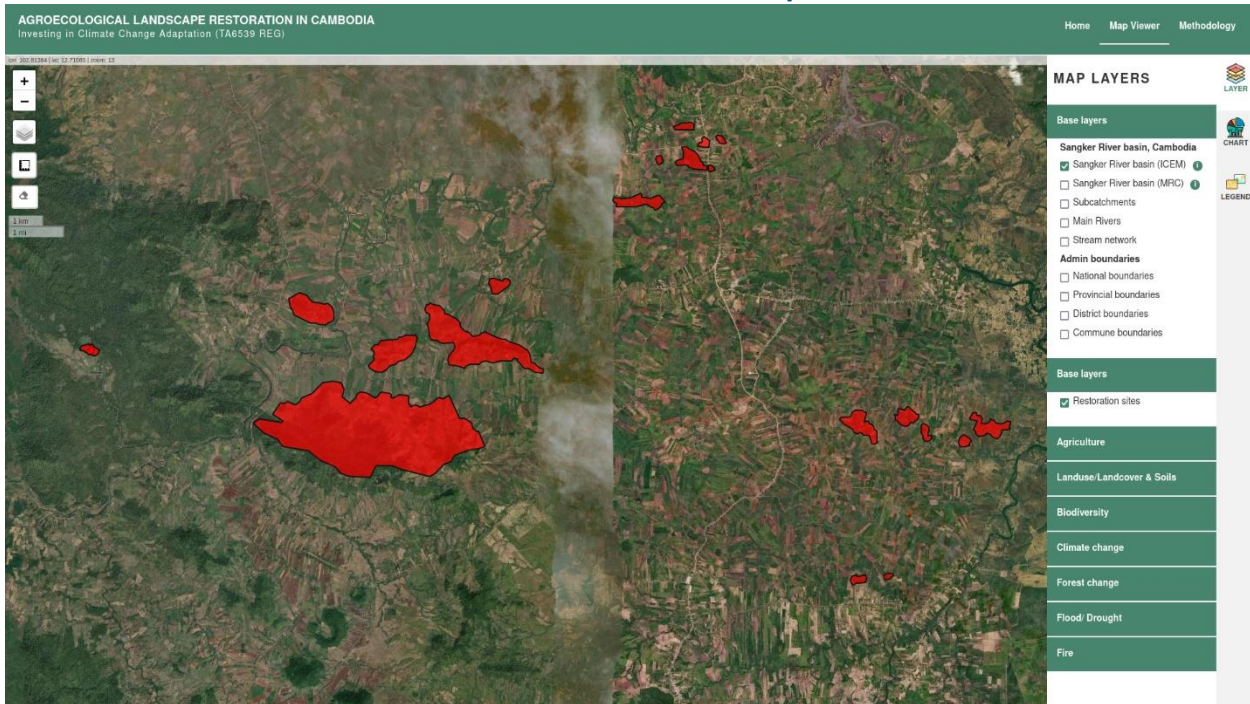
Annex 7. 2. Key field survey questions

No.	Objective	Guide Questions
1	Evaluate demonstration activities undertaken at each restoration site	<ol style="list-style-type: none"> 1. What restoration and integrated watershed management activities were applied to the demonstration site? 2. Can you explain the objectives of each activity? 3. Can you describe the technical approach adopted for each activity? 4. How many seedlings have been planted in your community? How many survived (in percentage)? 5. Can you describe how you prepared the site for tree planting? 6. Can you describe how you prepared the tree nursery? Can you describe how you currently manage the nursery (e.g. how many people work on the nursery? How do you determine which plants to grow?) Can you describe any issues you have confronted (e.g. disease) and how you managed the problem? How many healthy seedlings/ plants has the nursery produced? 7. Can you describe the water management system at the demonstration site? How has the system changed or improved due to the project? What is the impact of the improved irrigation system (e.g., how much more land receives water? Is there more water available in the dry season?)? 8. In what ways do you apply agroforestry techniques? How do these techniques work, and what have the results been? Can you describe how (if at all) you have changed your approach as a result of learning new agroforestry techniques? 9. Are you familiar with soil and water erosion control techniques? Which techniques have you applied in your community, and what are the results? 10. Since the beginning of the restoration process, has there been any change in terms of green and vegetation cover? What have you observed? 11. Have you gained new knowledge and enhanced your capacity for landscape restoration with this project?
2	Identify good practices, lessons learned, and opportunities for improvement of the restoration activities.	<ol style="list-style-type: none"> 12. What aspects of the restoration program need further improvement? Can you identify any problems with particular approaches or techniques and how the problems can be addressed? 13. What are the barriers to effectively applying restoration activities in your community? 14. What operational lessons have you acquired from this project? 15. What good practices can be replicated for a long-term investment project?
3	Draw conclusions and recommendations from the demonstration activities and come up with a restoration model that can be applied to other sites in Cambodia.	<ol style="list-style-type: none"> 16. How would you describe the impact of your community's restoration activities? Can you describe any quantitative impacts (e.g., number of new plants/ new varieties); capacity impacts (e.g., what new skills have the community learned?); resilience impacts (e.g., is the community more resilient to changing climate, disasters, extreme weather?) 17. Prepare a case study highlighting good practices for replication in other areas for potential long-term investment project(s) in Cambodia.




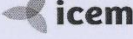

Annex 7. 3. Daily schedule

Date	Activity	Location	Responsible team member
7 Jan.	Travel to Battambang	Phnom Penh to Battambang	TA team
8 Jan.	Meeting with MJP	Battambang town	MJP and TA team
9 Jan.	Survey and discussion at Anakut Koma Samaki community	Samlout	TA team, MJP, community members, PA and FA representation
10 Jan.	Survey and discussion at Takhes Meanchey community	Samlout	TA team, MJP, community members, PA and FA representation
11 Jan.	Survey and discussion at Dontret community and Ou Rotkrast nursery	Samlout	TA team, MJP, community members, PA and FA representation
12 Jan.	Rapid visit O'slave restoration site, PA. Consultation meeting with PDs and MJP	Samlout	TA team, MJP, and PDs
13 Jan.	Return travel	Battambang to Phnom Penh	TA team

Annex 7. 4. Restoration maps



Annex 7. 5. Participant list




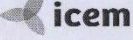







TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME: _____
Date: 8/11/2024
Venue: MJP Office

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	Khun Buneth	Consultant	ICEM	✓		012263647	<i>Khuneth</i>
2	ឧបនាយករដ្ឋមន្ត្រី	ACI	MJP	✓		077935642	<i>[Signature]</i>
3	Lon Praseth	DCD	MJP	✓		081444544	<i>Lon Praseth</i>
4	Voan Samel	NRM officer	MJP	✓		093 382 382	<i>[Signature]</i>
5	MUMICHAN HUNGA	ZIR	MJP	✓		016 592850	<i>[Signature]</i>
6	Lay Chantky	Consultant	ICEM	✓			
7							
8							
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TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME: _____
Date: 7/11/24
Venue: Anasutha

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	ឃុំ ប្រាសាទ	ល. ឃ	អគ្គនាយកដ្ឋាន		ន	0962049588	<i>[Signature]</i>
2	ឃុំ ឃ	+	+		ន	0962049588	<i>[Signature]</i>
3	ឃុំ ឃ	+	+		ន		<i>[Signature]</i>
4	ឃុំ ឃ	+	+		ន		<i>[Signature]</i>
5	ឃុំ ឃ	+	+		ន		<i>[Signature]</i>
6	ឃុំ ឃ	+	+		ន	0965102866	<i>[Signature]</i>
7	ឃុំ ឃ	+	+		ន		<i>[Signature]</i>
8	ឃុំ ឃ	+	+		ន		<i>[Signature]</i>
9	ឃុំ ឃ	+	+		ន		<i>[Signature]</i>
10	ឃុំ ឃ	+	+		ន		<i>[Signature]</i>












TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME: _____
Date: 9/11/24
Venue: Anakute

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	ស្រី	អ្នកបង្កើន	សហគមន៍	♂	♀	0927205	[Signature]
2	សេងស៊ី ក្រី	គ្រូបង្រៀន	អង្គការស្រាវជ្រាវ	♂		0719372558	[Signature]
3	ស៊ីម ធឿន	ស.ប	អង្គការ	♂		012763076	[Signature]
4	ស៊ីម ធឿន	ស.ប	អង្គការ	♂		0979588085	[Signature]
5	ស៊ីម ធឿន	ស.ប	អង្គការ	♂		0888363849	[Signature]
6	ស៊ីម ធឿន	ស.ប	អង្គការ	♂	♀	0966315653	[Signature]
7	ស៊ីម ធឿន	ស.ប	អង្គការ		♀	0886480744	[Signature]
8	ស៊ីម ធឿន	ស.ប	អង្គការ		♀		[Signature]
9	ស៊ីម ធឿន	ស.ប	អង្គការ	♂			[Signature]
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


TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME: _____
Date: 9/11/24
Venue: Anakute

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	ស៊ីម ធឿន	សហគមន៍			✓		[Signature]
2	ស៊ីម ធឿន	ACI	MJP	✓		077935642	[Signature]
3	ស៊ីម ធឿន	DCD	NJP	✓		081444544	[Signature]
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









total = 22p / 14 females












TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME: _____
Date: 10/11/24
Venue: Takhe Meanchey

LIST OF ATTENDANCE







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				Male	Femal		
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2	ក្រុម វិសិណ	បច្ចេកជន	សហគមន៍កសិកម្ម ស្រែចម្ការ	ស		0979600037	
3	ក្រុម ស្រែចម្ការ	ប្រឹក្សា		ស		0717747759	
4	ស៊ុន វិសិណ	សមាជិក		ស		092794287	
5	ស៊ុន វិសិណ	សមាជិក		ស		099762854	
6	ស៊ុន វិសិណ	សមាជិក		ស		017521800	
7	ក្រុម វិសិណ	សមាជិក		ស		0888838325	
8	ស៊ុន វិសិណ	សមាជិក		ស		0972573084	
9	ស៊ុន វិសិណ	សមាជិក		ស		0716643137	
10	ស៊ុន វិសិណ	សមាជិក		ស		068314185	

TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME: _____
Date: 10/11/24
Venue: Takhe Meanchey

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	ស៊ុន វិសិណ	សមាជិក			ស	0718120665	
2	ស៊ុន វិសិណ	សមាជិក		ស		0717242936	
3	ស៊ុន វិសិណ	សមាជិក	សហគមន៍ ស្រែចម្ការ	ស		0964555842	
4	ស៊ុន វិសិណ	សមាជិក	សហគមន៍ ស្រែចម្ការ	ស		081444544	
5	ស៊ុន វិសិណ	សមាជិក	សហគមន៍ ស្រែចម្ការ	ស		012761976	
6	ស៊ុន វិសិណ	សមាជិក	សហគមន៍ ស្រែចម្ការ		ស	069856569	
7							
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Total: 16 P/4 females



TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME:

Date: 11/01/24
Venue: Dantreat

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	គនី ឌី	ប្រធានសហគមន៍កសិកម្ម	សហគមន៍កសិកម្ម	ប		0715724737	Sm
2	ស៊ុយ វ៉ាវ	លេខ.	សហគមន៍កសិកម្ម	ប		067676427	It
3	ស៊ុយ ឈ័យ	ប្រធាន		ប		0969377383	It
4	គាន ច័ន	លេខ		ប		0973666893	It
5	ស៊ុយ ឌី	សហគមន៍		ប		069490940	It
6	ហេង គុន	សហគមន៍		ប		គុន	cong
7	ស៊ុយ ឌី	សហគមន៍			ស	0888672462	It
8	គុំ វ៉ិស	ប្រធានសហគមន៍		ប		0714362747	cong
9	គុំ វិធាន	ប្រធានសហគមន៍		ប		0887004043	cong
10	ហេង គុន	ប្រធានសហគមន៍		ប		គុន	cong



TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME:

Date: 11/01/24
Venue: Dantreat

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	ស៊ុយ វ៉ិ	ប្រធានសហគមន៍	សហគមន៍កសិកម្ម	ប		0978775988	cong
2	គុំ វ៉ិស	ប្រធានសហគមន៍	សហគមន៍កសិកម្ម	ប		0718990844	cong
3	គុំ វ៉ិស	ប្រធានសហគមន៍		ប		0987000043	cong
4	គុំ វ៉ិស	ប្រធានសហគមន៍		ប		0887004043	cong
5	គុំ វ៉ិស	ប្រធានសហគមន៍		ប		0885573977	cong
6	គុំ វ៉ិស	ប្រធានសហគមន៍		ប		0312224868	cong
7	គុំ វ៉ិស	ប្រធានសហគមន៍			ស	គុំ	cong
8	ហេង គុន	ប្រធានសហគមន៍			ស	គុំ	cong
9	គុំ វ៉ិស	—			ស	គុំ	cong
10	គុំ វ៉ិស	—			ស	គុំ	cong



TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME:

Date: 11/01/24
Venue: Dountreak

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	អ៊ុំ ឌីន	សមាជិក	សម្រាប់ ប្រជាជន		ស	១៧៥	<i>[Signature]</i>
2	ស៊ីន ឌី	—	—		ស	១៧៥	<i>[Signature]</i>
3	អ៊ុំ ឌីន	—	—		ស	១៧៥	<i>[Signature]</i>
4	អ៊ុំ ឌីន	—	—		ស	១៧៥	<i>[Signature]</i>
5	អ៊ុំ ឌីន	—	—		ស	១៧៥	<i>[Signature]</i>
6	ស៊ីន ឌី	—	—		ស	១៧៥	<i>[Signature]</i>
7	អ៊ុំ ឌីន	—	—		ស	១៧៥	<i>[Signature]</i>
8	លក់ ប្រធាន	នាយកស្រី	មូលនិធិសម្រាប់ស្ត្រី	✓		081444544	<i>[Signature]</i>
9	អ៊ុំ ឌីន	នាយកស្រី	មូលនិធិសម្រាប់ស្ត្រី	✓		012761976	<i>[Signature]</i>
10	អ៊ុំ ឌីន	នាយកស្រី	មូលនិធិសម្រាប់ស្ត្រី	✓		069856569	<i>[Signature]</i>

Total = 20p / 13 females



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EVENT NAME:

Date: 12/01/24
Venue: Oroutkrose PA

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	អ៊ុំ ឌីន	នាយកស្រី	1227	✓		089792307	<i>[Signature]</i>
2	អ៊ុំ ឌីន	NRM-MJP	MJP	✓		093382382	<i>[Signature]</i>
3	អ៊ុំ ឌីន	នាយកស្រី	មូលនិធិសម្រាប់ស្ត្រី	✓		088976447	<i>[Signature]</i>
4	អ៊ុំ ឌីន	នាយកស្រី	មូលនិធិសម្រាប់ស្ត្រី	✓		016818410	<i>[Signature]</i>
5	អ៊ុំ ឌីន	—	—	✓		017453067	<i>[Signature]</i>
6	អ៊ុំ ឌីន	—	—	✓		030205326	<i>[Signature]</i>
7	អ៊ុំ ឌីន	—	—	✓	✓	0963219500	<i>[Signature]</i>
8	អ៊ុំ ឌីន	—	—	✓		077618230	<i>[Signature]</i>
9	អ៊ុំ ឌីន	—	—	✓		082949543	<i>[Signature]</i>
10	លក់ ប្រធាន	នាយកស្រី	MJP	✓		081444544	<i>[Signature]</i>



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EVENT NAME:

Date: 12/01/24
 Venue: Oradk Kroze PA

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	ស៊ីម ចាន់ថុល	ប្រធានគម្រោង	ស្ថាប័នស្រូវ		✓	0692097114	[Signature]
2	ស៊ីម ចាន់ថុល	ប្រធានគម្រោង	ស្ថាប័នស្រូវ	✓		081230388	[Signature]
3	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.	✓		011116363	[Signature]
4	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.	✓		089715617	[Signature]
5	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.	✓		075469210	[Signature]
6	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.	✓		061233360	[Signature]
7	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.	✓		017520645	[Signature]
8	លោក គង់	ប្រធានគម្រោង	MOE/PA	✓		012700506	[Signature]
9							
10							

Total = 18p/2 females.



TA-6539 REG Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-Based Solution for Climate Resilience

EVENT NAME:

Date: 12/01/2024
 Venue:

LIST OF ATTENDANCE

No	Name	Position	Organisation/Department	Gender		Tel/Email	Signature
				Male	Femal		
1	MONICHAN KUNG	DIR	MJP	M		016 992850	[Signature]
2	Meel Sameth	ACI-PO	MJP	M		077935642	[Signature]
3	Lon Praseth	DCD	MJP	M		081444544	[Signature]
4	Prom Sreymon	Assistant CF	MJP		F	069856569	[Signature]
5	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.			0833761147	[Signature]
6	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.	M		012799757	[Signature]
7	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.	M		012899140	[Signature]
8	លោក គង់	ប្រធានគម្រោង	MOE/PA	M		012700506	[Signature]
9	Khun Bunnet	Consultant	ICEM	M		012263647	[Signature]
10	លោក គង់	ប្រធានគម្រោង	ស្ថាប័នស្រូវ-ប.ប.			01290236	[Signature]

Annex 7. 6. Mission photos

Anakot Koma Samaki nursery



Anakot Koma Samaki community meeting





Takhes Meanchey community meeting



O'Ratkros PA nursery site



Dontret nursery and community meeting



Reflection meeting with stakeholders at MJF, Samlout Office







Anakot Komasmak Community Forest, Samlaut district, Battambang province, Cambodia. TA
drone survey (photo by Quang Phung, ICEM).



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