

Mid-term Evaluation Report



Tanintharyi Nature Reserve Project – TNRP Phase IV (April 2017 – March 2019)

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Executive Summary

The TNR project was designed of four years Phase by Phase (1st phase was in 2005-2009) and now in the Phase IV (2017-2021). In each phase, the mid-term and final evaluations were conducted by taking technical services of national consultants to be able to effectively and efficiently implement the project and support for the planning of the next phase. In this regard, TNRP asked the external consultant team to conduct mid-term evaluation for Phase IV (2017-2019) for having an independent review of TNRP performance.

The evaluation team agreed to fulfil the following consultancy objectives within a period of 30 working days;

- To examine the relevance, scope and design of the project
- To review the implementation arrangements
- To review the progress of project activities against objectives as stated in each year
- To formulate recommendation for any corrective actions or changes
- To provide a written report to Project Director on the completion of the mid-term evaluation

To understand well on scope and design of the project, work and budget planning, staffing, the capacity of existing staff, effectiveness and efficiency of project performance, progress against logical framework/ OMP and encountered challenges/ constraints/ limitations, the evaluation team learned from the presentations delivered by TNRP Director and Park Warden Offices and reviewed project reports, OMP and other consultants reports, meeting with key stakeholders (Project Staff, FD, KNU, NMSP, Officers from gas companies, Government Army, local-based CSOs and communities' representatives).

In evaluating the performance of the TNRP, the Management Effectiveness Tracking Tool (METT) developed by the WWF international and adopted by the Nature and Wildlife Conservation Division – NWCD of FD was applied. In addition to using the METT, the evaluation team developed six evaluation questions based on six management objectives/ actions, which are evaluated against five evaluation criteria; relevance, effectiveness, efficiency, impact and sustainability.

In detecting forest cover change of the TNR area, the Normalized Different Vegetation Index – NDVI mapping for 2015-2019 was developed using the methodology of the high carbon stock (HCS) approach and Landsat 8 imageries of respective years. The main purpose of the methodology is to group the land cover into homogenous classes in order to indicate potential HCS forest areas by using respective NDVI values (see section 3.8 for more detail).

As per METT assessment scores on TNRP's performance, it was found that the overall performance of TNRP is at satisfactory level with the score percentage (79%) which is falling in the range of 71% - 85% (Satisfactory level). Looking at the detail management elements; context, planning, inputs, processes and outputs are relatively good – meant that TNRP is legally/ officially recognized according to the existing legal instruments and has clear management objectives and well designed with the Operational Management Plan – OMP.

Identified key activities of management objectives/ actions are evaluated against the criteria of relevance, effectiveness, efficiency, impact and sustainability. Overall law enforcement activities are highly relevant with the overall objectives of the TNR and somewhat effective and efficient since there were security issues to be able to increase the patrol coverage. The extent of patrol coverage is related to the impact of control hunting, commercial logging and fishing. Hence Reserve Management Team – RMT has been trying to coordinate and cooperate with key stakeholders for effective law enforcement.

The TNR is categorized into the Core Zone – CZ with the area of 336,912 acres (80% of total TNR area), the Buffer Zone – BZ with the area of 79,952 acres (19%) and the Transportation Zone – TZ with the area of 3,213 acres (1%). On ground boundary demarcation for CZ and BF has not been completed yet because of security issues to do so. The RMT should consider how it would be completed in collaboration with ethnic organizations or local based CSOs. It was observed that the establishment of CFs and piloted VUZs valued and contributed a lot to the conservation of TNR and livelihood development of local communities. However only 12 communities out of 44 villages within/ around TNR area are benefited from CFs, livelihood supported activities and piloted VUZs by the time of mid-evaluation.

The TNRP has a strong and very motivated extension team which is comprised of locally recruited staff with the lead of Range Officer under close supervision of Park Warden. The extension team has been conducting a series of extension and awareness events with different topics, but there are still some small issues such as delay financial approval, insufficient staff, limited knowledge and skills on how to effectively and efficiently organize extension and awareness-raising events.

The capacity of existing project staff is well enough to effectively and efficiently implement the project activities since they have been equipped a wide range of capacity, knowledge and skills through organizing technical training, field implementation and national/ international study tour. Staff instability is one issue since staff from FD often move back to mother department after their term working for TNRP. It is hard to build trust with key stakeholders for better coordination and cooperation.

In terms of budget allocation and expenditure, the TNRP management team could effectively and efficiently use budget as planned in overall, but there are some activities for

which a bit beyond the planned budget is used. It was observed that budget allocations among six management actions are not well distributed, but looking at three main activities (livelihood development, conservation/ law enforcement and project management) budget allocation for each activity are highly reasonable with 51% for conservation/ law enforcement, 20% for livelihood development and 29% for project management. For the project permanence, more budget allocation should be considered for sustainability.

TNR project team is supported by Technical Committee - TC and Project Steering Committee – PCC at the national level, while monthly meeting with all project staff and site-level meeting with managers of MGTC, TPC and ATL are organized at the site level. The evaluation team noticed that there is no direct linkage between the site-level meeting and national level meeting. In addition, site-level meeting could not bring representatives from KNU and NMSP who are key stakeholders for effective conservation of TNR.

As per land use land cover change data through using two years of ndvi 2015 and 2019 and calculating with ArcGIS software, forest to other classes change data is 0.30 % within the period of 4 years, hence, annual deforestation rate will be round about **0.075%**. That means deforestation rate is reducing **22 times** less than country level annual deforestation rate **1.7%** as per FRA 2015 (FAO). It was also noticed that restoration speed is better than deforestation rate due to the fact that forest to other changes percent **(0.30%)** (Deforestation) and other to forest changes percent **(0.40%)** (Reforestation or Afforestation). But there is noticeable forest degradation within the forested area within and 1 km around of TNR. That is why looking for better solution and/ or keeping up the current momentum of conservation actions is still needed though existing conservation actions are taken up to satisfaction stage.

To overall, TNR project is well designed with clear scope and objectives, and highly relevant with national protected area and biodiversity conservation law. All planned activities of six management objectives/ actions mentioned in logical framework are also relevant, effective and efficient, but there are still some spaces for impact and sustainability of project management objectives/ actions to be improved further in the years of the project period.

To have very effective and efficient performance, management, coordination and cooperation mechanisms which would be contributing to a great extent of impact and sustainability of the TNR, the practical recommendations are provided as follows;

- **Strengthen coordination and cooperation with local institutions:** For effective law enforcement and increase patrol coverage, there will not be other options rather than strengthening coordination and cooperation with local institutions namely; FD, KNU, NMSP, Government Army and TNR law enforcement team.

- **Scaling up of CFs and VUZs:** The impacts of existing CFs and piloted VUZs are highly remarkable with fulfilment of local communities' interest and reduce pressure on the dependency of TNR, so that establishment of CFs and VUZs for the remaining villages should be scaled up.
- **Conduct training impact evaluation:** It is hard to see the outcome/ impact of training delivered by the TNRP, hence training impact evaluation is recommended to conduct so as to know the constraints/ challenges why not apply the knowledge and skills gained from training.
- **Exploring communication and knowledge gaps:** To identify proper extension topics and effectively organize extension and awareness events, assessment on communication gaps and knowledge needs of target audiences should be considered. In addition, outreach which is two-way communication between the extension team and local communities to establish and foster mutual understanding, promote participation and influence behaviors, attitudes and actions should be practiced.
- **Support livelihood development for the villages inside TNR area:** It was clearly found that TNR livelihood supported activities for the villages around TNR area were very effective and beneficiaries were also satisfied. Likely, support livelihood development activities for over 10 villages inside TNR area should have been considered to widen the impact.
- **Project staff stability and staff benefits:** To build mutual trust and enhance coordination and cooperation for effective law enforcement, most key stakeholders suggested Project Director and Park Warden to stay at least for the whole phase.

Compare to the benefits of staff working for national and international organizations, staff benefits of TNR project are relatively low even though they are working at high risk. So current staff benefits should be reviewed and reconsidered.

- **Budget allotments among six management actions:** According to budget plan attached in the OMP, it seems budget allocation for project management is outstanding and looks like not reasonable as daily allowance and staff salaries of law enforcement team and extension team are accounted under the management rather than law enforcement, so that next OMP should consider this issue. But for project permanence, more budget allocation should be considered through effectively using surplus budget from the 1st two years of current phase and previous phases as well.
- **Partnership with local based CSOs and Ethnic Organizations:** To buy-in and share ownership sense to local-based CSOs and ethnic organizations, some project activities which cannot be done by RMT should be offered to them through building required capacities to do so.

- **Establishment of Protected Area Network in Myanmar:** Under one of six management objectives/ actions (Permanence), approaches and design of TNR project has to be shared and replicated to other PAs across Myanmar, hence TNRP should initiate to establish a PA network for learning and sharing, and also helpful in trying to establish biodiversity trust fund.

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List of acronyms

ATL	Andaman Transportation Limited
BF	Buffer Zone
CBNRM	Community Based Natural Resource Management
CBT	Community Based Tourism
CF	Community Forestry
CFE	Community Forest Enterprise
CFI	Community Forestry Instructions
CFMP	Community Forestry Management Plan
CFUGs	Community Forest User Groups
CSO	Civil Society Organization
CSR	Cooperative Social Responsibility
CZ	Core Zone
DG	Director General
ECD	Environmental Conservation Department
EEC	Environmental Education Center
FC	Forest Cover
FD	Forest Department
FRA	Forest Resource Assessment
GIS	Global Information System
HCS	High Carbon Stock
HDF	High-Density Forest
KNU	Karen National Union
LDF	Low-Density Forest
LOU	Local Operating Unit
LULC	Land Use Land Cover
NDVI	Normalized Different Vegetation Index
NMSP	New Mon State Party
NTFP	Non-Timber Forest Product
NWCD	Nature and Wildlife Conservation Division
MDF	Medium Density Forest
METT	Management Effectiveness Tracking Tool
MGTC	Mottama Gas Transportation Company
MMK	Myanmar Kyat
MOCAF	Ministry of Environmental Conservation and Forestry
MOGE	Myanma Oil and Gas Enterprise
MONREC	Ministry of Natural Resources and Environmental Conservation
OL	Open Land
OMP	Operational Management Plan

PAs	Protected Areas
PCC	Project Coordination Committee
PD	Project Director
PSD	Planning and Statistics Division
SMART	Spatial Monitoring and Reporting Tool
TC	Technical Committee
TNR	Taninthayi Nature Reserve
TNRP	Taninthayi Nature Reserve Project
ToR	Terms of Reference
TPC	Taninthayi Pipeline Company
TZ	Transportation Zone
UFES	University of Forestry and Environmental Sciences
USD	The United States Dollar
VCP	Village Conservation Plan
VUZ	Village Use Zone
WCPA	World Commission on Protected Areas
WCS	Wildlife Conservation Society
WWF	World Wildlife Fund
YRF	Young Regeneration Forest

1. Introduction

1.1 Background

The Taninthayi Nature Reserve (TNR) was established and legally notified by the Ministry of Environmental Conservation and Forestry – MOCAF (now the Ministry of Natural Resources and Environmental Conservation – MONREC) on the 30th of March 2005 with the aim of conserving tropical rainforest and their biodiversity along with taking into consideration the improvement of local communities' livelihoods towards conservation-oriented community development. Since 2005, the Taninthayi Nature Reserve Project (TNRP) has been implemented by Forest Department with the support of the Mottama Gas Transportation Company Limited (MGTC), Taninthayi Pipeline Company (TPC) and Andaman Transportation Limited (ATL).

The basic strategy of TNR project is to effectively use of environmental conservation fund derived from the operation of MGTC, TPC and ATL, so as to support the establishment and long term conservation of TNR through enhancing livelihoods of local communities for those who are living around and within TNR. As per the agreement with Myanma Oil and Gas Enterprise – MOGE and estimated life span of the gas pipelines' operation, funding provision could be expected up to 30 years (1998-2028).

TNR is one of the largest protected areas (PAs) in Myanmar with the total approximate area of 168,998 ha and is also a relatively large protected area compared to others in the region. There are a total of 44 villages, of which 11 villages are located within the TNR, and most communities living inside TNR are relying on the forests in somewhat and somewhat. Hence one objective of TNR is to support for the development of local communities' development through facilitating CF establishment, income generation, intensification of the existing home gardens, and others socio-economic development activities.

In terms of project management and implementation, staff of Nature and Wildlife Conservation Division (NWCD) of Forest Department and local project staff have been managing and implementing project activities through taking technical assistance of external consultants and guidance of Technical Committee (TC) and Project Coordination Committee (PCC) comprised of representatives from key stakeholders.

The project was designed as four years Phase by Phase (1st phase was in 2005-2009); hence it is now in the Phase IV (2017-2021). In each phase, the mid-term and final evaluations were conducted, with the assistance of external consultants, to be able to effectively and efficiently implement the project and support in the planning of the next phase. Like the previous three phases, TNRP asked the external consultant team to conduct mid-term evaluation for Phase IV (2017-2019) for having an independent review of TNRP activities.

1.2 Consultancy objectives

The following key objectives were agreed between TNRP and the Consultancy team within a period of 30 working days.

- To examine the relevance, scope and design of the project
- To review the implementation arrangements
- To review the progress of project activities against objectives as stated in each year
- To formulate recommendation for any corrective actions or changes
- To provide a written report to Project Director (PD) on the completion of the mid-term evaluation

1.3 Scope of work

This mid-term evaluation covered only for the first two years of project Phase IV (April 2017 to March 2019) as per ToR agreed by both parties, but looking for impact and sustainability of project interventions would be related, to some extent, with the implications of previous project phases.

As per the project log frame of operational management plan - OMP, the six major objectives were identified so as to address the encountered threats;

- **Law enforcement:** Protect natural habitats and populations of important species through reducing threats and enforcing the law
- **Land and resources:** Effectively engage local communities in sustainable land and resource use
- **Livelihoods:** Improve local livelihoods and support appreciation and understanding of biodiversity amongst key stakeholders
- **Research and monitoring:** Conduct targeted biological and social research to obtain relevant data that are essential for adaptive management
- **Management:** Effective administration, financial and logistical procedures to support management of the natural resources of TNR
- **Permanence:** Ensure that the reserve has long-term stability and contributes to Myanmar's national Protected Area system

Those six project management objectives are said to be key areas to evaluate against five criteria (relevance, effectiveness, efficiency, impact and sustainability). In addition, project log frame is thoroughly reviewed so as to clearly see if it is needed to be revised based on intermediate outcomes what TNRP could capture and lesson learned from two years of Phase IV.

1.4 Mid-term evaluation team

The evaluation team is comprised of two members as follows;

1. U Bo Ni (Team Leader)
2. U Aung Aung Myint (GIS Specialist)
3. U Aung Kyaw Naing (Natural Resources Management)

2. Evaluation method

2.1 Management Effectiveness Tracking Tool - METT

The Management Effectiveness Tracking Tool (METT) is used to know the progress of TNRP because this tool is adopted by the Nature and Wildlife Conservation Division – NWCD of the Forest Department – FD and tried to conduct an assessment on all PAs across the country by using this tool. By using assessment form, scores will be given against individual questions in consultation with key informants who have very much familiar with TNRP.

The original METT developed by the WWF international is comprised of 30 questions and 4 additional questions; hence the maximum score would be 102. In addition, the NWCD added 5 more questions so that the maximum total score is 117. Since TNRP is the unique one and not as same as other nature reserves where ecotourism can be considered for park development fund raising, three questions regarding ecotourism's from original METT's questions are not accounted in conducting this assessment. Hence a set of total questions would be 36 questions (27 main questions and 4 additional questions of original METT and 5 added questions of NWCD) and the maximum total score would be 108 points.

Based on the given score, the score percentage can be calculated as follow

$$\text{Score percentage} = \frac{\text{Given Scores}}{\text{Maximum Total Scores}} \times 100$$

To be able to evaluate generally on management performance of the TNR, five – score percentage scale can be identified as follows;

Table 1. Scale of score percentage for evaluation rating

Score %	Rating
< 40%	Unsatisfactory
41% – 55%	Moderately unsatisfactory
56% – 70%	Moderately satisfactory
71% - 85%	Satisfactory
> 85%	Highly satisfactory

If the score percentage is 68%, it can be easily concluded that the management performance is moderately satisfactory.

The METT is structured around the World Commission on Protected Areas (WCPA) under which there are six management elements; context, planning, inputs, processes, outputs and outcomes. The score percentage of each element can be calculated, and then it can be shown with the figure of the spider web so as to easily assess the current situation of a protected area. This analysis results would be helpful in planning for next year or phase.

2.2 Evaluation questions and criteria

2.2.1 Evaluation questions

Evaluation questions are structured based on the objectives of project operational management plan – OMP (2017-2021), as follows;

- Evaluation question 1: To what extent are natural habitats and populations of important species protected through reducing threats and enforcing the law?
- Evaluation question 2: To what extent do local communities effectively engage in sustainable land and resource use?
- Evaluation question 3: How far does TNRP improve local livelihoods and support appreciation and understanding of biodiversity amongst key stakeholders?
- Evaluation question 4: Have targeted biological and social researches been effectively conducted to obtain relevant data that are essential for adaptive management?
- Evaluation question 5: Are there effective administration, financial and logistical procedures to support management of the natural resources of TNR?
- Evaluation question 6: How does it ensure that the reserve has long-term stability and contributes to Myanmar's national Protected Area system?

2.2.2 Evaluation criteria

In responding to each evaluation question, five evaluation criteria will be used as follows;

- **Relevance:** gauges the degree to which the project at a given time is justified within the global, national and local environment and development priorities.
- **Effectiveness:** measures the extent to which the objective has been achieved or the likelihood that it will be achieved.
- **Efficiency:** assesses the outputs in relation to inputs, looking at cost, implementing time, and financial aspects.
- **Impact:** measures both the positive and negative, foreseen and unforeseen, changes to and effects on biophysical and socioeconomic environments caused by the project.
- **Sustainability:** measures the extent to which benefits of the project continue after the termination of external assistance.

In addition of describing the finding and analysis results based on the review of secondary documents, semi-structured interview with key informants and focus group discussion with local communities, each management objective will be assessed by giving a score of relevance, effectiveness, efficiency, impact and sustainability, and then show the results with the line graph. Scoring aspects and range of scores are adopted from the ones developed by the evaluation team of the University of Forestry in 2009 (Renamed: University of Forestry and Environmental Sciences – UFES).

Table 2. Scoring scheme for relevance

Aspects	Scores				
	5	4	3	2	1
Pertinence (objectives)	Highly pertinent	Mostly pertinent	Pertinent	Less pertinent	Not pertinent
Validity (activity)	Highly valid	Mostly valid	Valid	Less valid	Invalid
Feasibility (activity)	Highly feasible	Mostly feasible	Feasible	Less feasible	Infeasible
Consistency (output)	Highly consistent	Mostly consistent	Consistent	Less consistent	Inconsistent
Significance (outcome)	Highly significant	Mostly Significant	Significant	Less significant	Insignificant

Table 3. Scoring scheme for effectiveness

Aspects	scores				
	5	4	3	2	1
Adequacy (output)	Highly adequate	Mostly adequate	Adequate	Less adequate	Inadequate
Timeliness (output)	Highly accurate	Mostly accurate	Accurate	Less accurate	Inaccurate
Nature (outcome)	Highly positive	Mostly positive	Positive	Less negative	Negative
Extent (outcomes)	Extremely large	Very large	Large	Small	Very small

Table 4. Scoring scheme for efficiency

Aspects	scores				
	5	4	3	2	1
Adequacy (personal)	Highly adequate	Mostly adequate	Adequate	Less adequate	Inadequate
Adequacy (financial)	Highly adequate	Mostly adequate	Adequate	Less adequate	Inadequate
Adequacy (materials)	Highly adequate	Mostly adequate	Adequate	Less adequate	Inadequate
Timeliness (personal)	Highly accurate	Mostly accurate	Accurate	Less accurate	Inaccurate
Timeliness (financial)	Highly accurate	Mostly accurate	Accurate	Less accurate	Inaccurate
Timeliness (material)	Highly accurate	Mostly accurate	Accurate	Less accurate	Inaccurate
Schedule (works)	Highly accurate	Mostly accurate	Accurate	Less accurate	Inaccurate
Sequence (works)	Excellent	Very good	good	Fair	Poor
Method (operations)	Excellent	Very good	good	Fair	Poor
Procedure	Excellent	Very good	good	Fair	Poor
Real outputs	As planned target	75% of target	50% of target	25% of target	Nil
Cost-minimization	Extremely high	Very high	High	Low	None
Output-maximization	Extremely high	Very high	High	Low	None

Table 5. Scoring scheme for impact

Aspects	scores				
	5	4	3	2	1
Direct impact					
Nature	Highly positive	Mostly positive	Positive	Fairly negative	Negative
Extent	Extremely large	Very large	Large	Small	Very small
Capital enhancement	All 5 capital	4 capital	3 capital	2 capital	Only 1 capital
Equity	Highly well-balanced	Well-balanced	balanced	Fairly biased	biased
Diffusion	Very widely spread	Widely spread	spread	Less spread	None
Externalities					
Nature	Highly positive	Mostly positive	Positive	Fairly negative	Negative
Extent	Extremely large	Very large	Large	Small	Very small

Table 6. Scoring scheme for sustainability

Aspects	scores				
	5	4	3	2	1
Physical capability	Excellent	Very good	good	Fair	Poor
Personal capability	Excellent	Very good	good	Fair	Poor
Financial capability	Excellent	Very good	good	Fair	Poor
Political/ legal	Highly support	Mostly support	support	Less support	Not support
Continuity (outcome/impact)	Highly possible	Mostly possible	possible	Less possible	Impossible

3. Findings

3.1 Management Effectiveness Tracking Tool (METT) of TNRP

The scores of issues regarding PA management identified in METT are given by a group comprised of Project Director and two Staff Officer of TNRP and mid-term evaluation team. The assessment scores for the performance of the TNR project is described in Table 7.

The maximum score of 32 questions and 4 addition questions is 108 (96 + 12). According to the assessment result, TNRP's performance score is 86 ($86/117 \times 100 = 74\%$) which is meant that the performance of TNRP is satisfactory.

Table 7. Assessment scores (METT)

No.	Issues (questions)	Maximum Score	Given score (0-3)	Management elements
1	Legal status	3	3	Context
2	Protected area regulations	3	2	Planning
3	Law enforcement	3	2	Processes
4	Protected area objectives	3	3	Planning
5	Protected area design	3	2	Planning
6	Protected area boundary demarcation	3	2	Processes
7	Management plan	3	3	Planning
7 (a-c)	Planning process	3	3	Planning
8	Regular work plan	3	3	Planning
9	Resource inventory	3	2	Inputs
10	Protection systems	3	2	Outcomes
11	Research	3	3	Processes
12	Resource management	3	2	Processes
13	Staff numbers	3	2	Inputs
14	Staff training	3	3	Inputs
15	Current budget	3	3	Inputs
16	Security budget	3	3	Inputs
17	Management of budget	3	3	Processes
18	Equipment	3	3	Inputs
19	Maintenance of equipment	3	3	Processes
20	Education and awareness	3	3	Processes
21	Planning for land and water use	3	2	Planning
21 (a-c)	Land and water planning	3	1	Planning
22	State and commercial neighbors	3	3	Processes
23	Indigenous people	3	2	Processes
24	Local communities	3	2	Processes
24 (a-c)	Local communities/ Indigenous people	3	2	Processes
25	Economic benefit	3	2	Outcomes
26	Monitoring and evaluation	3	3	Processes

27	Condition of values	3	2	Outcomes
27 (a-c)	Condition assessment	3	2	Outcomes
28	Climate change	3	2	Processes
29	Carbon capture	3	2	Processes
30	Threats	3	2	Outputs
31	Status of key indicator species	3	2	Outcomes
32	Status of habitats	3	1	Outcomes
Total scores		108	85	
Total percentage		100%	79%	

As per Table 1 (5 scales score percentage for evaluation rating), the performance of TNRP is regarded at a satisfactory level since score percentage (79%) is at the range of 71%-85%. But there is still the room to improve performance as per the score percentages of each of the management elements.

Figure 1 shown that score percentages of context, planning, inputs, processes and outputs are relatively good – meant that TNRP is legally/ officially recognized according to the existing legal instruments. TNRP has clear management objectives and designed with the Operational Management Plan - OMP for 4-yrs Phase by Phase. In addition, TNRP has being implemented by the lead of NWCD of FD with the supports of Gas companies; MGTC, TPC and ATL. Hence, the current budget is sufficient and secure for the next phase (by 2028 as per official agreement between Gas companies and MOGE). It was also observed that the OMP is very clear and well-structured through having explicit consultation with multi-stakeholders. Identifying threats encountered in the TNP is a basis of developing a log frame with possible risks that may hinder achievements of management actions.

Amongst identified risks, security constraints are actually encountered in the field and adversely affect for having anticipated outputs and outcomes as shown in Figure 1. Due to this constraint, TNRP management team hard to extent the patrol coverage area to control illegal logging and hunting through setting up of camera trap. To overall, all six management elements over 60 % which means performance of TNR management team is highly effective and moving in the right way.

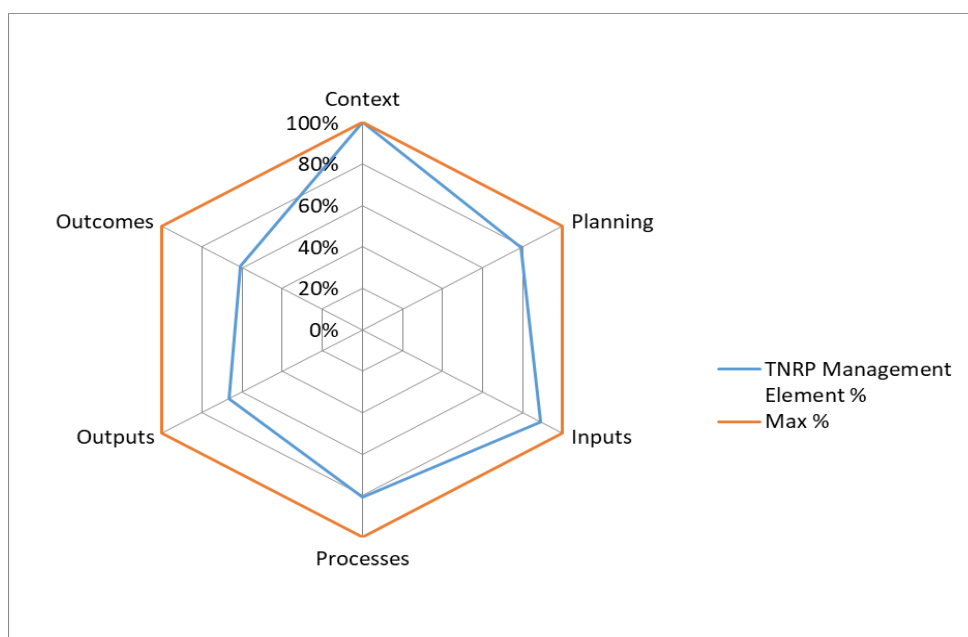


Figure 1. METT scores % against management elements (Oct 2019)

3.2 Evaluation question 1 (Law enforcement)

3.2.1 Regular patrols

The TNR has established 10 Local Operating Units (LOUs) to support effective conservation and management of TNR area. Each LOU led by Deputy Ranger conducts regular patrolling within designated territory of TNR. In addition, there is a Law Enforcement Team led by a Range Officer before and now led by Deputy Ranger of LOUs alternatively. This law enforcement team has a plan which area will be covered, when and how long it will take. Before conducting, the team has to negotiate with concerned Ethnic Organizations such as Karen National Union – KNU and New Mon State Party – NMSP for security issues.

Whenever the team found any illegal activities inform to relevant government departments, for instance, for illegal timber harvesting inform to Forest Department through Park Warden of TNR. It was observed that there are management limitations to be able to patrol covering the area of TNR because of security concerns, potential land-mines under the area controlled by Ethnic Organizations. However, the patrolling team could meet the targets of the work plan (2017-2019) as shown in the following Table 8.

Table 8. Completed and targeted activities under law enforcement

No.	Activities	Targets	Achievements
1	Regular patrols by law enforcement team	24	24
2	Regular patrols by LOUs	240	237
3	Control hunting	10	10
4	Control commercial logging	10	10
5	Control fishing	9	8

Patrol coverage is getting slightly increased from 35.15% in 2016-17 to 35.54% in 2018-19, but the observation of threats has been decreased from 306 in 2016-17 to 184 in 2018-19. Regarding decreasing number of threats, it can be assumed that there are positive implications of patrolling, conducting awareness-raising events and supporting livelihood development or patrolling team could not reach to the place where threats are happening because of security issues. However, it can be observed that the patrolling team invested their times for patrolling activities if compared to the number of patrols and days invested in 2016-17. The detail information of patrol summary data are described in the following Table 9.

Table 9. Comparison of patrolling data by LOUs

Year	No. of patrols	No. of days	Patrol coverage	No. of observations			
				Threats	Wildlife	Forest trees	Features
2016-17	122	634	35.15%	306	2965	1314	1341
2018-19	153	698	35.54%	184	2911	2025	1862

3.2.2 Control hunting, commercial logging and fishing

The LOUs and law enforcement team have been trying to control and prevent illegal hunting, commercial logging and fishing through conducting regular patrolling, awareness-raising and extension events, coordination/ cooperation with the Ethnic Organizations and supporting for local people's livelihood development.

According to activities report prepared by TNR, project management team could manage to complete the number of targeted activities within timeframe (see in Table 8), but there are many limitations to be effective and efficient.

3.2.3 Cooperation for law enforcement

In TNR area, there are key stakeholders; Forest Department – FD, Police Force, Government Military, Karen National Union – KNU, New Mon State Party – NMSP and local people, who affected and are affected to/by law enforcement regarding illegal hunting and logging. To be able to have effective law enforcement around/ within TNR, it was observed that the project management team has been conducting the following actions;

- Cooperation with local FD (one time in 2 months)
- Cooperation with Police and Military (one time in 3 months)
- Cooperation and engagement with KNU and NMSP ((one time in 2 months)
- Training for local volunteers (one time a year)
- Participatory patrolling (one time in 3 months)

In addition to targets mentioned above, it was noticed that the project management team led by Park Warden or Staff Officer coordinates and cooperates with FD, Police, Government Military and Ethnic Organizations whenever urgent cases happen.

3.2.4 Overall evaluation on management objective – 1 (Law Enforcement)

Based on field survey, meeting with key stakeholders and self-observation, it was found that the relevance, effectiveness and efficiency of three key actions for law enforcement are relatively good and at the satisfactory level, but there are the spaces for impact and sustainability, to be improved.

Evaluation team understood that there are many security issues and political constraints to improve the effectiveness and impact of regular patrols and control hunting, logging and fishing. Although TNR has enough capacity, resources and time to conduct effective and efficient regular patrols and control illegal activities within the whole TNR area, some issues/constraints are hindering to do that.

According to the interviews with key persons, coordination and cooperation among concerned stakeholders are still challenging for having effective law enforcement. Most key informants suggested that TNR management team should more emphasize on the roles of coordination and cooperation with key stakeholders such as the Forest Department, Government Army, Ethnic Organizations, and Myanmar Police Force.

The detail given score of three key actions; regular patrols, control hunting, logging and fishing and cooperation for law enforcement are described in the following Table 10.

Table 10. Evaluation scores of key activities for law enforcement

Evaluation criteria	Given score (1 – 5)			Total average
	Regular patrols	Control hunting, logging and fishing	Cooperation for law enforcement	
Relevance	3.2	3.0	3.4	3.2
Effectiveness	3.0	3.0	3.3	3.1
Efficiency	3.5	3.5	3.3	3.4
Impact	2.3	2.3	2.7	2.4
Sustainability	2.6	2.6	2.2	2.4
Total average	2.9	2.9	3.0	2.9

Figure 2 shows that relevance, effectiveness and efficiency of overall law enforcement are quite good even though patrol coverage could not reach over the whole TNR area. The highest score of efficiency at 3.4 shows that TNR management team could complete the targeted activities within the allocated budget and time frame. Regarding the impact and sustainability of law enforcement, it was acceptable results since patrol coverage is around 35.54% of total TNR area, by this it is hard to see good impact and sustainability. But, TNR management teams have many spaces and opportunities to increase coordination and cooperation with other key organizations as mentioned above.

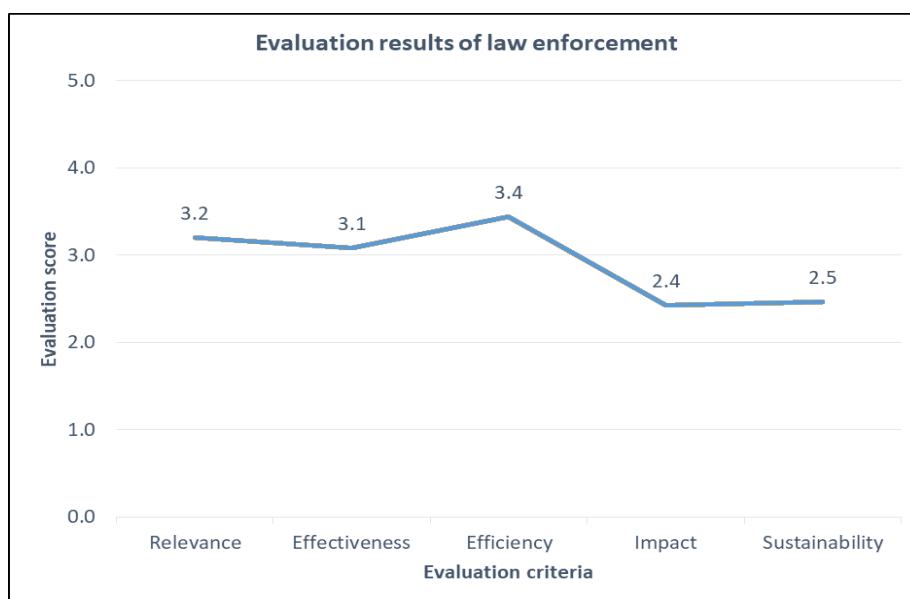


Figure 2. Evaluation results of law enforcement

3.3 Evaluation question 2 (Land and resources)

3.3.1 Boundary demarcation

TNR is categorized into different zones; the Core Zone - CZ with the area of 336, 912 acres (80% of total TNR area), the Buffer Zone - BZ with the area of 79,952 acres (19%) and the Transportation Zone – TZ with the area of 3,213 acres (1%) with the purpose of servicing gas pipelines and roads for transportation gas at low impact through forest areas.

The CZ is identified as the area where natural forests, habitats and biodiversity are dense and rich with the assistance of remote sensing, GIS technology and quick ground checking. The BZ was designated the area between one mile in and out of the TNR boundary. The TZ is the area between 100 meters left and right of along the gas pipelines where there were 216 boundary demarcation posts.

Regarding boundary demarcation of different management zones, TNR has already done on the paper, but on the ground has been completed in posting boundary demarcation posts, to some extent. For the evaluation period (2017 – 2019), TNR management team could finish the target numbers of boundary demarcation posts as planned, except the area of the CZ where 7 miles has been completed out of targeted 8 miles. The detail target and completed activities are mentioned in the following Table 11.

Table 11. Target and completed activities of boundary demarcation

No.	Activities	Target	Completed
1	TNR boundary pillars repairing (pillars)	45	50
2	Transportation corridor demarcation (miles)	30	28
3	The CZ boundary pillars setting up (miles)	8	7

4	The CZ boundary pillars repairing (miles)	10	27
5	Inspection road construction (miles)	120	123

3.3.2 Support for land-use and resource planning

In the vicinity of TNR area, there are many agro-business plantations such as rubber, betel nut and cashew nut. In addition, local communities living within TNR area are mainly relying on swidden agriculture for their livelihoods and basic needs. To reduce pressure on the TNR, particularly in the CZ, TNR has been trying to facilitate local communities to designate Village Conservation Plan – VCP and Village Use Zone – VUZ with the technical assistance of the Wildlife Conservation Society – WCS, Myanmar. During the evaluation period, four VUZs are developed in four villages as for piloting sites, from which there will be further replication in other villages.

As per interviews with local communities, developing VUZs in the village where Community Forestry – CF has been already established made local communities confuse. Even in their CF, there are different management zones; use zone, protection zone for water and plantation zone. Their existing area of CF is enough for the uses of local communities, hence they thought that they do not need to establish additional VUZ. In fact, the villages where there is no CF, VUZ is needed, but TNR should consider legal support for VUZ.

3.3.3 Support to Community Forestry

There are 12 CFs supported by TNR and 8 CFs supported by RECOFTC – The Center for People and Forests around TNR area with the aims of supporting timber and non-timber forest products for local communities and reducing the burdens of TNR area. It was noticed that most CF user groups are happy with their CFs and getting benefits, to some extent, from their CFs. Hence, supporting CFs can help in the conservation of TNR area and provide local communities' basic needs.

Within the evaluation period, the TNR extension team conducted CF awareness-raising in target communities for the establishment of new CF. According to revised CF Instruction – CFI (2019) local communities are allowed to establish CFs in the buffer zone of the protected area so that TNR extension team has been trying to have more CFs.

Some key informants said that most TNR supported CFs can be regarded as successful CFs because of continuous supports. There will be some concerns for long term sustainability without any support. In addition, some communities would like to revise their existing CF management plan – CFMP which was developed with the purposes of getting basic needs and conservation-oriented CFMP. With the changing context of policy and interests of all CFUGs, they would like to harvest timber for the commercial purposes to be in line with their CFMP and CFI (2019).

Out of 44 villages located around/ within TNR area, 12 villages are supported CF – meant that it is not enough to see the impact of CF on the TNR area. If TNR management team could facilitate to have more CFs or VUZs in the remaining villages, it would be better for the conservation of TNR area.

3.3.4 Ecological restoration

Ecological restoration is very important in some gaps in the protected area so as to support the habitat and corridor for wildlife. During the evaluation period, 3000 seedlings were planted in the degraded area of TNR and supported technical assistant in maintaining plantations. TNR management team has been implementing the Habitat Restoration Plan developed by the Forest Department – FD. Not only planting but releasing turtles and other key species are also conducted in TNR area.

According to field observation and interview with local communities, roads construction and gold mining are happening in the TNR area – resulted that the habitats for some wildlife species are shrinkage because of lack of corridors. TNR should consider in establishing corridors through ecological restoration and other appropriate ways. But anyway, most activities of TNR are on the right way to achieve the overall goal of TNRP.

3.3.5 Overall evaluation on management objective – 2 (Land and resources)

Boundary demarcation, support to land-use and resource planning, support to CF and ecological restoration are most relevant and very efficient, while the effectiveness of support to land-use and resource planning and ecological restoration are acceptable. Due to security issues and interest of local communities, it was understood that TNR has to take the time to develop land-use and resource plan for every community who are relying on TNR area and to restore native species in every gap of degraded area.

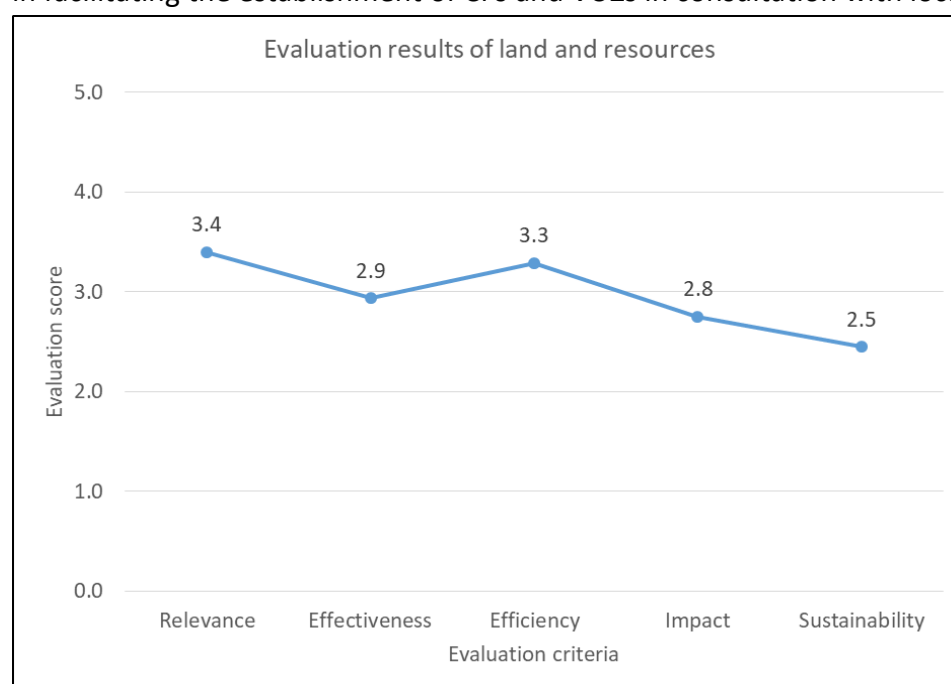
Among four key actions for land and resources, it was observed that support to CF is highly relevant, very effective, good efficiency and high impact, except sustainability after the end of TNRP. In this regard, TNR should try to have local communities' participation in establishing CFs so as to reduce the burden of TNR and provide local communities' livelihoods.

Likely boundary demarcation is also important to let everybody know where the boundary of the CZ, the BZ and TZ area because different management zones are designed of different rules and regulations. Sometimes illegal activities would be happened because of lack of information related to the zones of TNR, rules, regulations and rights. With taking positive supports of ethnic organizations, TNR should focus on the completion of boundary pillars along the bounder of the TZ and BF.

Table 12. Evaluation scores of key activities for land and resources

Evaluation criteria	Given score (1 – 5)				Total average
	Boundary demarcation	Support for land-use and resource planning	Support to CF	Ecological restoration	
Relevance	3.0	3.4	4.0	3.2	3.4
Effectiveness	3.0	2.8	3.3	2.8	2.9
Efficiency	3.3	3.3	3.2	3.3	3.3
Impact	2.6	2.7	3.3	2.4	2.8
Sustainability	2.4	2.4	2.6	2.4	2.5
Total average	2.9	2.9	3.3	2.8	3.0

As shown in Figure 3, overall evaluation results of land and resources, it was assumed that local communities are effectively and efficiently engaging in sustainable management of land and resources since relevance, effectiveness and efficiency of this management objective (land and resources) are at a satisfactory level. Hence TNR should keep moving up in facilitating the establishment of CFs and VUZs in consultation with local communities.

**Figure 3. Evaluation results of land and resources**

3.4 Evaluation question 3 (Livelihoods)

3.4.1 Support to local livelihoods

The overall goal of TNRP is to conserve tropical rainforest and their biodiversity along with taking into consideration the improvement of local communities' livelihoods towards conservation-oriented community development. Hence supporting in establishment of CF

for local communities was supposed as the best way to meet the overall goal of TNRP. Currently, TNRP has been supporting a total of 12 CFs (14,078 acres) established in 9 villages comprising of 711 CF user group members. Not only supporting facilitation process to have CF certificates from the FD and supporting seedlings, but TNRP has supported the revolving fund to CFUGs. CFUGs are managing these funds as revolving among villagers for helping their livelihood development. During the evaluation period, TNRP provided 16,000,000 MMK. When meeting with CFUGs, they said revolving fund provided by TNRP is very helpful in addressing financial issues at the beginning of planting and weeding season in their home garden. In a total, 71,000,000 MMK has been provided to 11 CFUGs out of 12 CFUGs, as revolving fund. The evaluation team observed that the revolving fund supporting program could directly support the livelihood of local communities.

In addition to supporting revolving fund to CFUGs, TNRP provided a series of livelihood related capacity building training during the evaluation period as shown in the following Table 13. The evaluation team observed that the TNR team is following up post-training activities to make sure to apply the knowledge and skills gained from the training program. However, local communities have some issues to apply the training knowledge and skills, for instance; value-added NTFPs training – they do not know where their market is for their value-added products and most communities are hand to mouth people to invest their time.

Table 13. Livelihood related activities

No.	Activities	Target	Completed
1	Supporting revolving fund to CFUGs	4	4
2	Value-added NTFPs training	4	4
3	Off-farm (e.g. home garden, income generation, etc.) supporting	4	4
4	Market survey for value-added NTFPs	1	1
5	Local products improvement training	4	4
6	Provision of water supply for local communities	4	4
7	Support to permanent farming system from shifting cultivation	2	2

3.4.2 Education and awareness program supports positive behavior change

TNRP has established the extension team comprising of local staff with the lead of Range Officer under close supervision of Park Warden. The extension team has been conducting a series of extension topics; forest fire prevention, control hunting, shifting cultivation, encroachment, wildlife conservation, chain saw act, CF and related law/ policies/ rules/ regulations. Being local staffs involved in the extension team, there are no language barriers when conducting awareness-raising events. It was noticed that the extension team could cover over all villages located around/ within TNR area.

However, the extension team has some small issues such as delay financial approval and insufficient staff, limited knowledge and skills, to effectively and efficiently organize extension and awareness-raising events. The evaluation team observed that power point and verbal presentations have been applied in conducting events rather than using visualization and poster presentations. Most local communities are at the primary education level and some will be illiterate, it was supposed that visualization and poster presentations would be more effective and can learn any time by looking at posters.

In addition to directly dealing with local communities, TNR has conducted many awareness and advocacy events during the evaluation period (2017-2019) as per Table 14.

Table 14. Information, education and communication activities conducted by TNRP

No.	Activities	Target	Completed
1	Press media to increase awareness at the local and regional level	2	2
2	Broadcasting media (TV channel)	1	1
3	Dissemination of IEC materials at regional project launching ceremony	1	1
4	Awareness-raising on Forest Law and Biodiversity and Conservation of Protected Areas Law	8	9
5	Exhibition in events	4	6
6	Cooperate with other agencies in awareness-raising	4	4
7	Engage with local schools for sharing wildlife conservation knowledge to students	4	9
8	Cooperate with religious groups	6	5
9	Annual project review with community	2	1

3.4.3 Overall evaluation on management objective – 3 (Livelihoods)

Livelihood supported activities such as providing revolving funds to CFUGs, delivering livelihood related training and provision of water supply for local communities are relevant, effective, efficiency and have also some degree on impact and sustainability. What the evaluation team observed is that livelihood supported activities are mostly contributing to the villages which are located in a very accessible area and have CFs. If TNRP could expand such livelihood supported activities to other remaining villages which are inside of TNR area with taking the great supports of ethnic organizations. It was obvious that the way of livelihood support program being practised by TNRP is the right approach as there are many differences in social, physical and financial situations between local communities who received livelihood supports and local communities without support.

Regarding the livelihood related training, training impact monitoring should be further assessment so as to clearly know whether delivering training can really contribute to the livelihood development of local communities.

The TNR extension team are very motivated and running to be in line with their plan, but they are needed much technical support to be able to organize extension and awareness-raising events effectively and efficiently.

Table 15. Evaluation scores of key activities for livelihood development

Evaluation criteria	Given score (1 – 5)		Total average
	Support to local livelihoods	Education and awareness program support	
Relevance	3.4	3.4	3.4
Effectiveness	3.0	3.3	3.1
Efficiency	3.2	3.1	3.2
Impact	2.9	3.0	2.9
Sustainability	2.6	2.6	2.6
Total average	3.0	3.1	3.0

The overall evaluation results on improve local livelihoods and support appreciation and understanding of biodiversity amongst key stakeholders are very remarkable and at a satisfactory level, but still challenging and questioning on the impact and sustainability. The evaluation results shown in Figure 4 are based on the villages which received livelihood support program. The approach in supporting livelihoods of local communities are highly appropriate and it would be better to see the impact if the TNRP could expand the supports to other remaining villages.

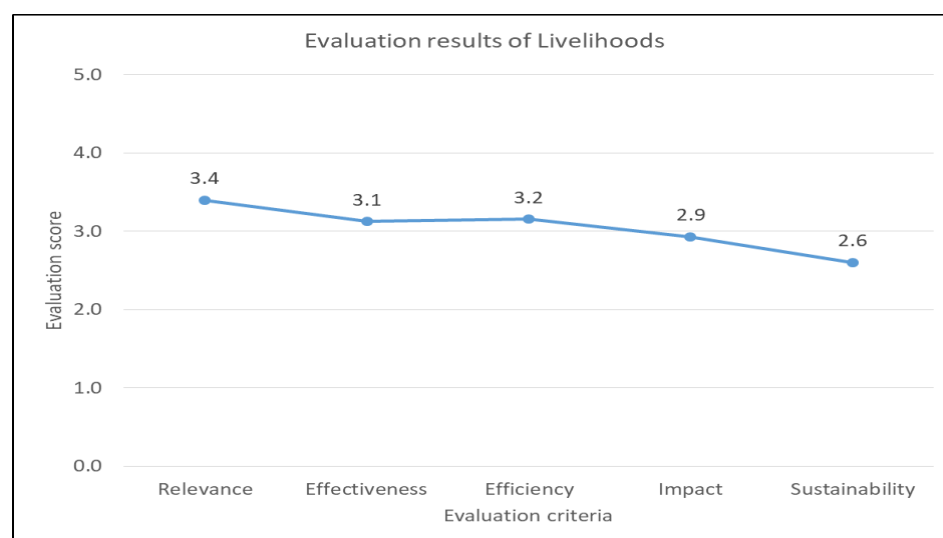


Figure 4. Evaluation results of livelihoods

3.5 Evaluation question 4 (Research and monitoring)

3.5.1 Conduct applied research on biological and socio-economic trends

The TNR Project is well designed of both conducting researches to explore biological and socio-economic trends and doing interventions based on research findings. During the evaluation period, TNR asked national consultants for potential production of NTFPs, market

assessment of NTFPs, and local communities' well-being assessment in TNR area. In addition, training for collecting information on biodiversity and setting up camera traps and community-based monitoring on threats were materialized.

In terms of research and monitoring, it was found that the TNR has been trying to develop protocols for long-term monitoring of key biodiversity through hiring national consultants or assistance of international consultant (WCS – Myanmar), building/ enhancing skills of project's staff in the field of collecting and analyzing data and getting involvement of local communities.

Regarding socio-economic development researches, it was noticed that the project team applied some recommendations of the National Consultants and observed visible outputs/ outcome, to some extent, in the ground. The validity of researches' findings would be based on the nature of the research and how much relying on external circumstances such as climate, disturbance, market, political landscape and population. Hence, some researches should conduct yearly or periodically, but some would be enough time for the whole project phase. Considering such a way would be helpful the effectiveness and efficiency of the project implementation.

3.5.2 Monitor and evaluate project impacts

The results-based approach with the use of SMART patrolling for ongoing monitoring on patrolling effort and threat hotspots has been practised by the project team. Moreover, through engaging with a GIS specialists and purchasing satellite images, regular analysis and display of Remote Sensing data are being applied to know the changes of forest cover and land use land cover changes as well.

It was observed that the TNR project is trying to develop long-term monitoring protocols for five components of habitat, biodiversity, livelihoods, governance and protected area management.

In terms of monitoring and evaluating project impacts, the project well prepared the plan for regular monitoring by the assistance of national consultants, the project team themselves and local communities' involvement, for mid-term and final evaluation, and for external audit for the project budget.

The mid-term evaluation team highly impressed on the ongoing and planning for project impacts' monitoring and evaluation and could see the evident results of biodiversity observation and threats, forest and LULC changes and patrolling coverage – resulted from the effective monitoring and evaluation being practised by the TNR project team.

3.5.3 Overall evaluation on management objective – 4 (Research and monitoring)

Out of six management objectives embedded in the design of the TNR project, it was clear that planned and implemented activities for research and monitoring are highly relevant, effective and well efficient. Impact and sustainability of researches, monitoring and evaluation activities are also at the great position to be improved further.

Regarding monitoring and observation of biodiversity and threats, it was sure that the TNR project staff are well equipped how to collect the data/ information, data store and analyze, hence it was assumed that it can be sustainable even after the project end. But for socio-economic research like community well-being assessment, exploring market opportunity and identifying promising enterprise forest products, it is needed to improve the skills and knowledge of project team so as to see the impact of socio-economic development activities such as livelihood development training, community forestry enterprise – CFE and community-based tourism - CBT.

Table 16. Evaluation scores of key activities for research and monitoring

Evaluation criteria	Given score (1 – 5)		Total average
	Applied research	M&E for project impacts	
Relevance	3.8	3.6	3.7
Effectiveness	4.0	4.0	4.0
Efficiency	3.5	3.5	3.5
Impact	3.3	3.3	3.3
Sustainability	2.8	2.8	2.8
Total average	3.5	3.4	3.5

Responding to the evaluation question “Have targeted biological and social research been effectively conducted to obtain relevant data that are essential for adaptive management?”, Figure 5 showed, to overall, that the TNR project could manage planned biological and social researches to effectively conduct through receiving national and international consultants for some research and evaluation, and also developing the skills and knowledge of project staff. In addition, the project simply followed the results/ findings and actions recommended or suggested by international and national consultants.

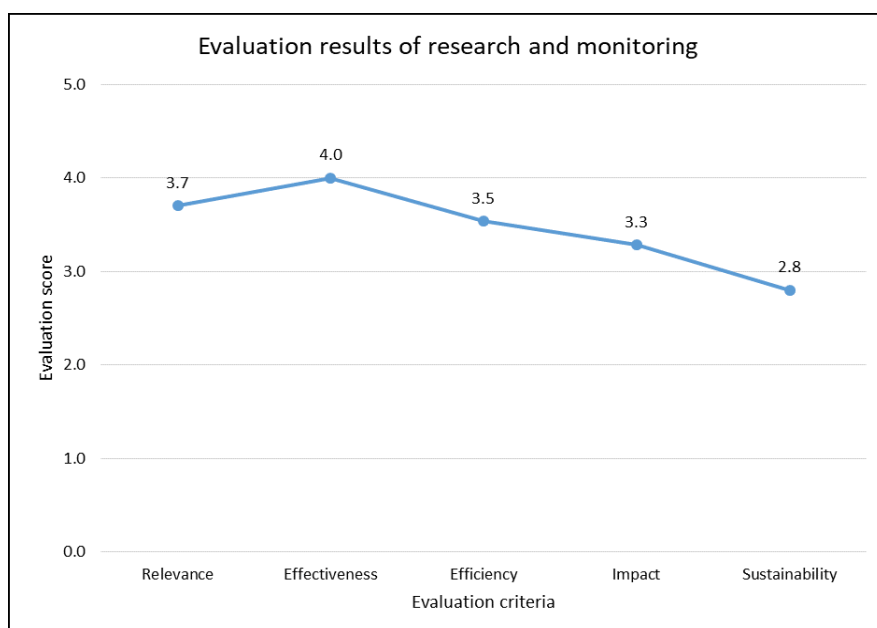


Figure 5. Evaluation results of research and monitoring

3.6 Evaluation question 5 (Management)

Under this management objective/ action (Management), effective administration, financial and logistical procedures to support management of the natural resources in TNR are mainly considered through implementing specific activities; strengthen the capacity of existing staff, effective staff management and career development, information management, project committees actively support management, provide vehicles and equipment suitable for all activities and maintain and enhance existing infrastructure.

The evaluation team mainly observed to evaluate key activities of strengthening the capacity of existing staff; effective financial management and effective support of project steering committees as follows;

3.6.1 Strengthen the capacity of existing staff

The TNP project team is comprised of permanent staff of national park under Forest Department, temporary staff from FD and locally recruited staff. The TNR project has been building and enhancing the capacity of project staff since the phase I, but some project staff are not stable and transferred to other national park or back to FD once after their term for TNR project. Hence both technical and operational training for staff are needed to organize even in this phase.

According to checking the training schedule of the evaluation period, a series of technical and operational training is well enough to earn the skills and knowledge of project staff. Regarding law enforcement, training of conservation-related legal instruments, conflict resolution, evidence collection and investigation and SMART – monitoring protocols were organized for project staff. In terms of technical training program, training on biodiversity, GIS, community engagement and extension were delivered through hiring external consultants.

In addition to capacity enhancement training, national and international study tour to Vietnam, Cambodia, India and Thailand were arranged through bringing project staff, but not all – to spread learning knowledge, sharing back to project staff who have limited chance to accompany with the study trip were organized.

As per interview with key staff at management and operation levels, the evaluation team assumed that project staff capacity is well enough to effectively and efficiently implement the project.

3.6.2 Actual budget allocation and expenditure

The TNR project is designed of 4 years in a phase to implement the Operation Management Plan – OMP which was developed through having full perspectives of multi-stakeholders, with the budget of 1,800,000 USD for a phase (450,000 USD a year).

Based on interview with key management and operation staff of TNRP and review on financial documents, the evaluation team observed that the project could effectively and efficiently use the planned/ allocated budget so as to achieve the anticipated outputs. There are some activities for which the project team used a bit beyond the planned budget, but all management actions' expenditures were within the allocated budget as shown in the following figure 6.

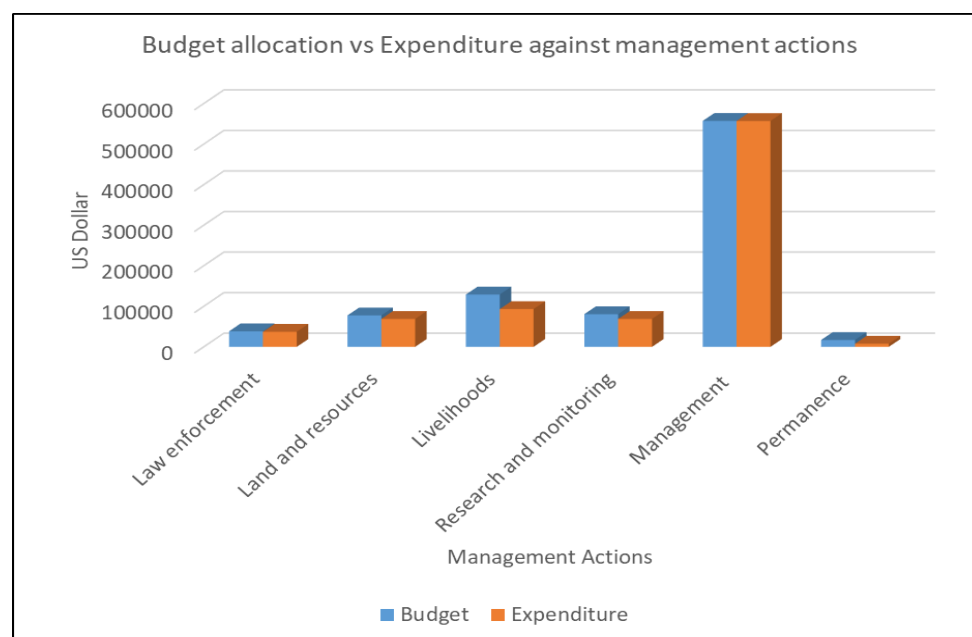


Figure 6. Allocated budget and actual expenditure against management actions

The evaluation team explored what specific activities are under each of management actions and view analytically whether the budget allocations are appropriate so as to meet the overall objective of the TNR.

Law enforcement: To protect natural habitats and populations of important species through reducing threats and enforcing the law, the budgets are allocated for the activities of regular patrols, control hunting, control commercial logging, control deforestation, control commercial fishing, monitor law enforcement and cooperation for law enforcement. As per interview with project management team, the budget allotments are only for activities cost of law enforcement, but not calculated daily allowance/ salaries of law enforcement team which are mentioned under the cost of management.

Land and resource: To be able to effectively engage local communities in sustainable and resource use, the project allocated budgets for activities of boundary demarcation, control encroachment and shifting cultivation, support to land use and resource planning, support to CF and community-based natural resource management – CBNRM, respond to forest fires and ecological restoration.

Livelihoods: To improve local livelihoods and support appreciation and understanding of biodiversity amongst key stakeholders, project budgets are allocated for support to local livelihoods, education and awareness program supports positive behavior change.

Research and monitoring: To conduct targeted biological and social research for having relevant data that are essential for adaptive management, the TNR project budgeted for two key activities of conduct applied research on biological and socio-economic trends, and project impacts' monitoring and evaluation. There will be some costs for national and international service providers for researches and evaluation.

Management: For effective administration, financial and logistical procedures to support management of the natural resources in the TNR, strengthen the capacity of existing staff, effective staff management and career development, information management, project committees actively support management, provide vehicles and equipment suitable for all activities and maintain/ enhance existing infrastructure are budgeted for. This management action is regarded as an important one which was crossing cutting to others and allocated more budget than others. In particular, all allowances and salaries of law enforcement team are allocated under this.

Permanence: To ensure that the reserve has long-term stability, and contributes to Myanmar's national Protected Area system, four key activities of stakeholders engagement, reserve infrastructure and staff development, support best-practice in other PAs in Myanmar's PA network and long-term strategy for financial, social and political sustainability are planned to take action, but budget allocation for this management action is the lowest amongst others.

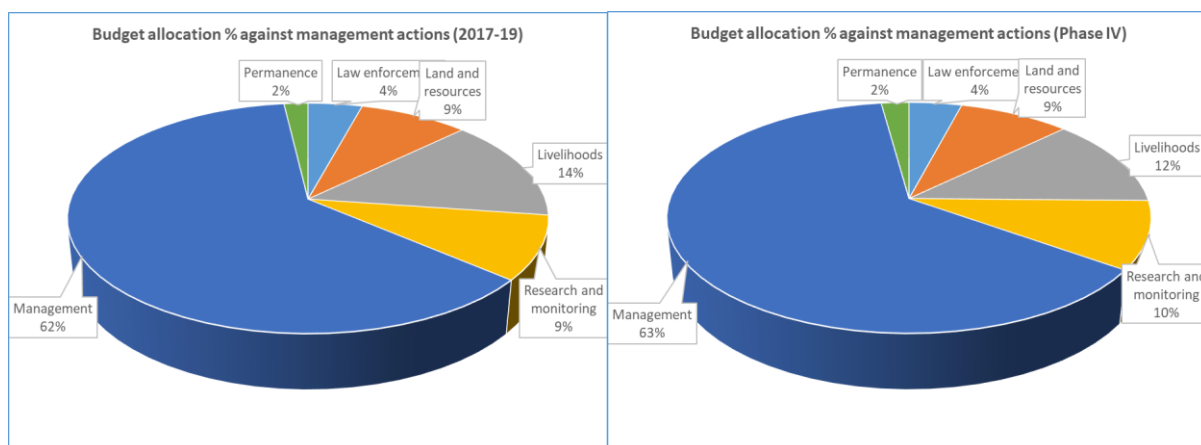


Figure 7. Percentage of budget allocation against management actions for 2017-19 and the whole phase (based on OMP)

Looking at budget allocation percentages for different management actions shown in figure 7, more budget proportion go for the management, followed by livelihoods and research and monitoring. Management actions of permanence and law enforcement are allocated at the budget of 2% and 4% of the total budget (450,000 USD). When looking at the whole phase, budget allocations are much similar to the first two years (evaluation period).

However, it was observed that budget allocation are highly reasonable when two main activities (livelihood development and conservation/ law enforcement) are categorized to be in line with the ultimate goal of TNR and calculated budget allocation for each and project management which is supporting to effectively and efficiently implement project activities. As shown in Figure (8), budget allocation for conservation and law enforcement is at about 51%, whereas 20% for livelihood development activities and 29% for project management.

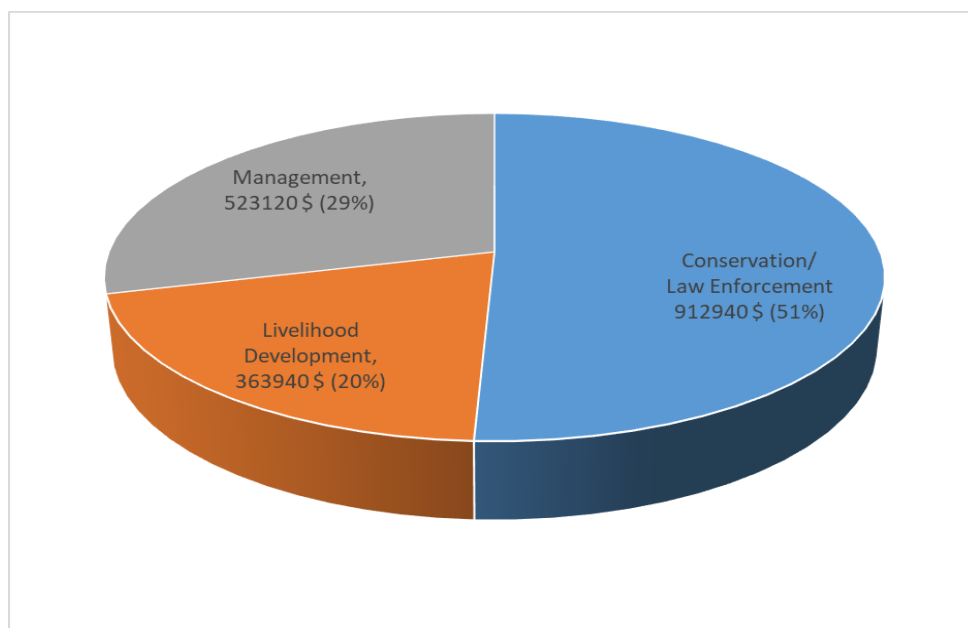


Figure 8. Budget allotments for three main activities of TNR

The evaluation team noticed that there are surplus budgets from the previous phases and even from the first two years of the current phase. If the current budget for law enforcement and permanence could be topped up with the surplus budget, it would be very efficient and effective for better performance of the TNR project team.

3.6.3 Effective support of project steering committees

TNR Project Director is managing the project with the assistance of project administration team based in Yangon and reserve management team based in field site (Gangkawtaung), through taking advice/ guidance of Technical Committee and Project Coordination Committee. At the operation level, Park Warden is closely supervising to extension team, nursery works, law enforcement team and 10 local management units, as shown in the following Figure 9.

The management structure of the TNR project team is pretty clear in communicating, taking responsibility and accountability. The evaluation team also observed that there is no communication gap between the project director's office and field office, and among different LOUs. In addition, Reserve Management Team simply followed suggestions/ recommendations of biological and socio-economic researches conducted by National and International consultants. Regarding the stability of project staff for those who temporarily come from FD, there will be some considerations to stay longer term (the whole phase).



Note: PCC – Project Coordination Committee, TC – Technical Committee, NWCD – Nature and Wildlife Conservation Division

Figure 9. Management structure of the TNR project team

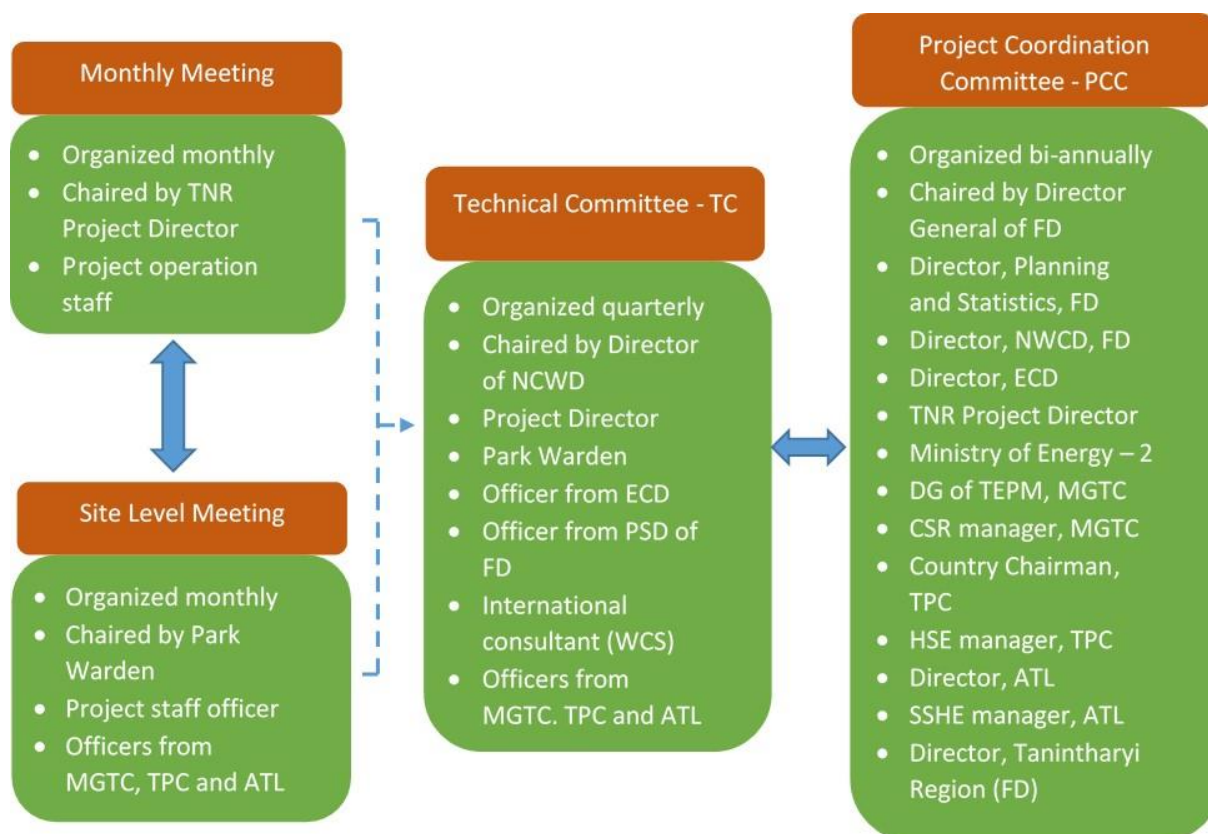


Figure 10. Structure of the TNR project supporting meetings

TNR project team is supported by Technical Committee - TC chaired by Director of Nature and Wildlife Conservation Division - NWCD of Forest Department – FD and Project Coordination Committee – PCC chaired by Director General of FD. TC meeting is organized quarterly and Director of NWCD, Deputy Director of Planning and Statistics Division, Deputy Director of Training and Research Development Division – TRDD, TNR Project Director, international consultants from WCS – Myanmar, and officers from MGTC, TPC and ATL are members of TC. TC meeting mostly discussed technical issues upon the topics submitted by TNR Project Director. If TC couldn't decide some management issues, Project Director brings these issues to PCC.

Bi-annually organized PCC meeting is chaired by Director General of FD and Directors of PSD, NWCD and Taninthayi Region, Director of ECD, Project Director, 2 Officers from Ministry of Energy, DG of TEPM and CSR manager from MGTC, country chairman and HSE manager from TPC and Director and SSHE manager from ATL are members of PCC. PCC mostly discussed project progress/ challenges, budget request/ approval, alternative funding opportunities and coordination mechanisms.

In addition to TC and PCC meeting, Park Warden leads in organizing monthly meeting and site-level meeting. For monthly meeting, all project staff presented progress, challenges and inputs needed from Park Warden and Project Director Offices. Site-level meeting is chaired by Park Warden and brought site-level managers from MGTC, TPC and ATL.

As per observation and key informant interview, the evaluation team noticed that there was no direct link between monthly meeting/ site level meeting and TC/ PCC meeting. In fact, it should be effective linkage through bringing issues/ challenges to TC, then PCC. Regarding the involvement of key stakeholders, monthly meeting should bring community representatives to share their concerns and learn what TNR project is doing for. For site level meeting and PCC meeting, representatives from Ethnic Organizations (KNU and NMSP) should be formal members so as to have their supports in patrolling and other field implementations.

3.6.4 Overall evaluation on management objective – 5 (Management)

To overall, conducting training for staff capacity enhancement, budget allocation to different management actions and support of project steering committees are highly relevant, efficient and effective to meet overall objectives of the TNR project, but like other management actions, there are some space to be improved in the field of impact and sustainability.

Apart from hiring national consultants for conducting biological and socio-economic researches and delivering some technical training, the TNR project team directly implements the project activities. For sustainability and having ownership sense, calling sub-contracts to local based development organizations and ethnic organizations should be considered.

Table 17. Evaluation scores of key activities for management

Evaluation criteria	Given score (1 – 5)			Total average
	Strengthen existing staff capacity	Allocated budget and expenditures	Effective support of project steering committees	
Relevance	3.4	3.8	3.8	3.7
Effectiveness	3.3	3.5	3.8	3.5
Efficiency	3.5	3.5	3.8	3.6
Impact	3.3	3.1	3.3	3.2
Sustainability	2.8	2.8	2.8	2.8
Total average	3.2	3.4	3.5	3.4

Reviewing the OMP of phase IV, all management actions should be considered at the same level of effort, but it was observed that less budget allocation to law enforcement and project permanence. The evaluation team was impressed by the fact that TC and PCC effectively supported to TNR Project Director and Reserve Management Team in coordinating, budgeting, managing and implementing project activities. However, the evaluation team could see the better opportunities which are persuading to have participation of ethnic organizations at the site level and PCC meeting.

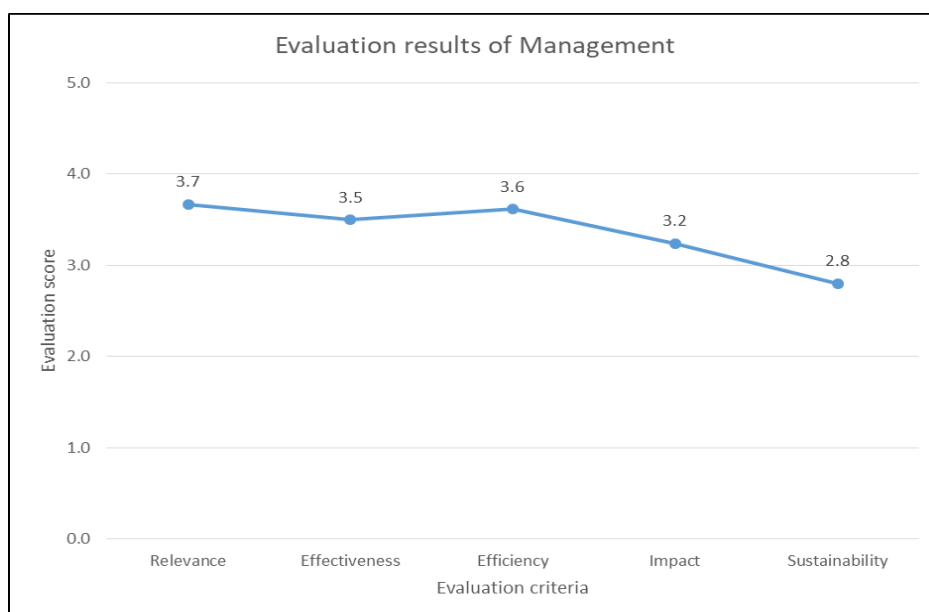


Figure 11. Evaluation results of management

3.7 Evaluation question 6 (Permanence)

To ensure that the TNR has long-term stability and contributes to Myanmar's national Protected Area systems, stakeholder engagement to have effective support for TNRP, reserve/ maintain infrastructure and staff development, support best-practice to other PAs of Myanmar and long-term strategy for financial, social and political sustainability are planned to be materialized.

3.7.1 Stakeholders engagement to have effective support for TNRP

For having effective engagement with key stakeholders, TNR planned to coordinate with all relevant government agencies and with local civil society groups, develop coordination mechanisms with KNU and NMSP and conduct policy workshop with national and regional governments, KNU and NMSP.

In spite of having informal meetings with government agencies and ethnic organizations, the TNR project team should invest more effort and budget as well to have effective stakeholders' engagement. Otherwise, it will be difficult to ensure the long-term stability of the TNR and to have better performance. The evaluation team met with representatives from KNU, NMSP, CSOs and Government Army and received some suggestions which will be shared in the recommendation sections.

3.7.2 Reserve infrastructure and staff development

Regarding infrastructure, Park Warden office, Environmental Education Center – EEC, permanent nursery, 10 Local Management Unit offices, vehicles and other office accessories are very well equipped and enough for future project implementation. However, the TNR project team should consider maintenance and cost for this for long-term viability.

Looking at staff ratio, TNR project team is composed of 70 project staff, of which 68% are locally recruited staff. Hence it was concluded that TNR already considered project long-term stability through hiring local staff and built their capacity.

3.7.3 Support best-practice in other PAs of Myanmar

During the evaluation period, TNRP arranged three learning and exchange visits by bringing staff working for other PAs of Myanmar. Out of 44 PAs in Myanmar, TNR is regarded as the one of best PAs because many supported opportunities (such as financial, infrastructure, efficient staff and well political supports even though there are still security issues) are in place. Hence TNR should lead to having networking among PAs across Myanmar so as to learn, share and discuss for better performance.

3.7.4 Overall evaluation results of management objective – 6 (Permanence)

All activities for project permanence are relevant, but not well effective and efficient like other project activities for management actions. But out of three key activities regarding project sustainability, reserve infrastructure and staff development is highly relevant, efficient and effective.

It was noticed that budget allocation for this management action (Project Permanence) is less than others. Since project implementation is entering into Phase IV, it is the right time to consider for long-term stability of the TNR and the way how the TNR approach should be replicated to other PAs of Myanmar.

Table 18. Evaluation scores of key activities for permanence

Evaluation criteria	Given score (1 – 5)			Total average
	Stakeholders engagement	Reserve infrastructure and staff development	Support best-practice to other PAs	
Relevance	2.2	3.6	3.0	2.9
Effectiveness	2.5	3.3	2.5	2.8
Efficiency	2.2	3.2	2.8	2.7
Impact	2.7	2.7	2.7	2.7
Sustainability	2.2	2.8	2.4	2.5
Total average	2.4	3.1	2.7	2.7

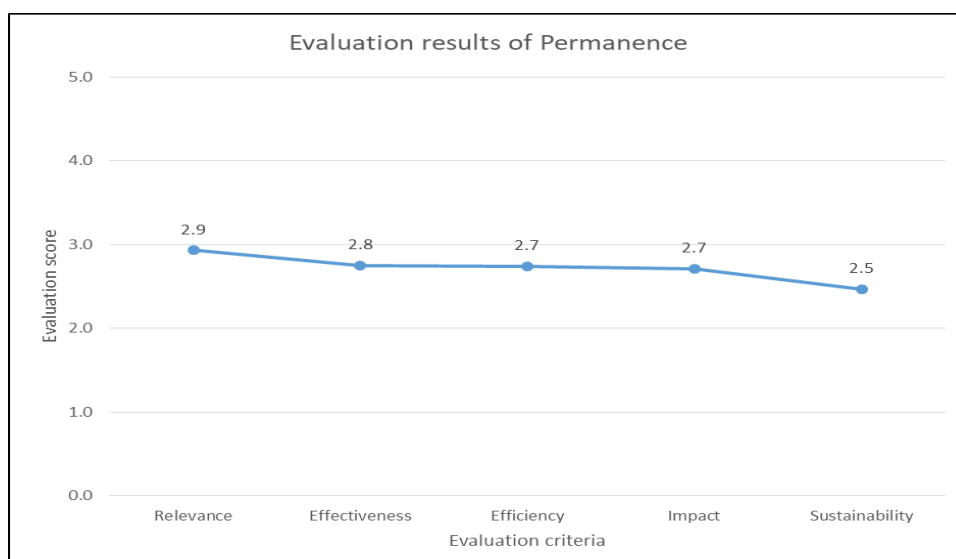


Figure 12. Evaluation results of permanence

Figure 12 showed that overall evaluation results against different evaluation criteria are above average. Planned activities for this management action (Permanence) are very clear and relevant. Although gas companies (MGTC, ATL and TPC) agreed with Myanmar Oil and Gas Enterprise – MOGE by 2028, there will be some possibilities to terminate the contract because of different reasons such as political landscape change, less marginal benefits for companies. Hence the TNR project team should more focus on the planned activities for project sustainability if financial support ends before 2028.

3.8 Forest cover change detecting the TNRP area by using NDVI (Normalized Different Vegetation Index) maps of 2015 and 2019

3.8.1 Methodology

The NDVI mapping for 2015 and 2019 were developed using methodology of the high carbon stock (HCS) approach and Landsat 8 imageries of respective years. The main purpose of the methodology is to group the land cover into homogenous classes in order to indicate potential HCS forest areas by using respective NDVI values (see Table 19).

The exercise is to differentiate:

- Low, medium, and high density forest (LDF, MDF, HDF);
- Young regeneration forest (YRF);
- Cleared and degraded former forest including scrub (S) and open land (OL); and
- Non-HCS areas such as roads, water bodies, and settlements.

As shown in Figure 13, the potential HCS forest cut-off lies between the scrub and young regeneration forest categories, where YRF, LDF, MDF, and HDF are considered potential HCS forest and Scrub and OL are not. For detailed methodology see the HCS Approach Toolkit, Version 1.0 (HCS Approach Steering Group 2015). Actually this methodology was used to make quick assessment of geospatially changes.

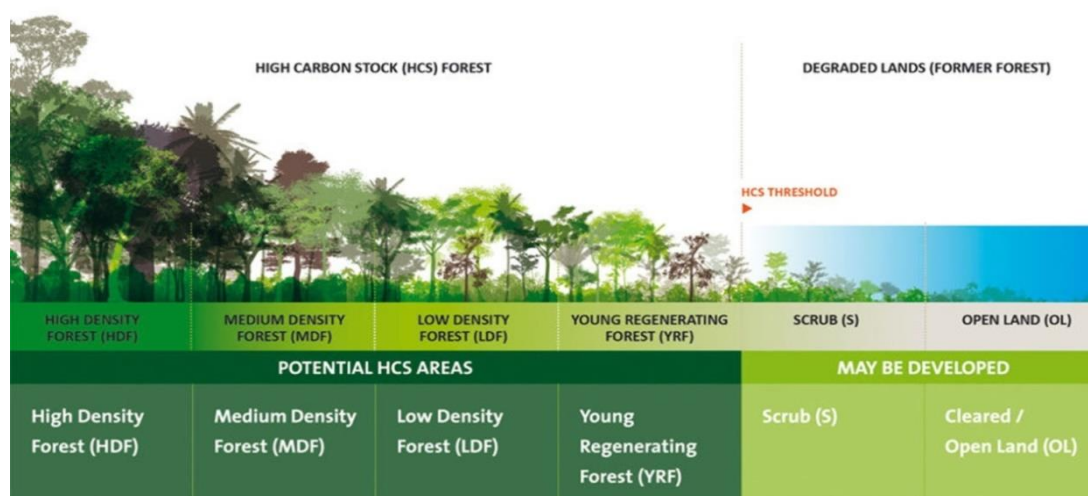


Figure 13. High Carbon Stock (HCS) classification diagram

Table 19. Homogenous classes of HCS using respective ndvi values

Sr. No.	Class	NDVI
1	Water	< 9
2	Open land - OL	10
3	Scrub	11
4	Young regenerating forest - YRF	12
5	Low-density forest - LDF	13
6	Medium-density forest - MDF	14
7	High-density forest - HDF	15–20

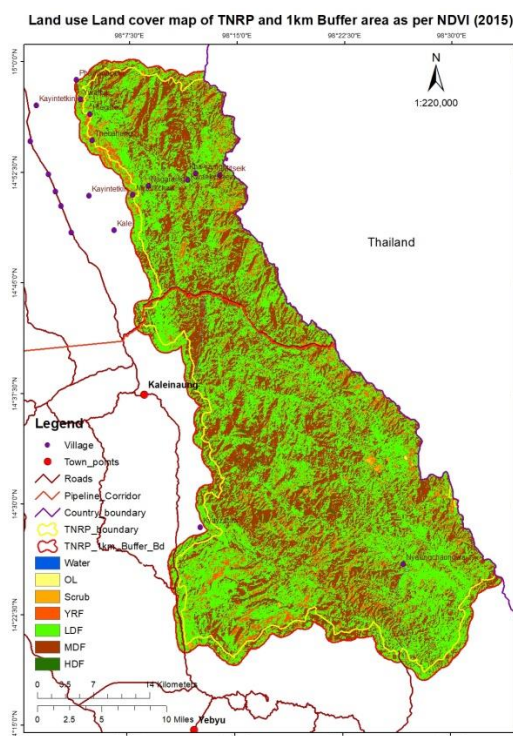


Figure 14. LULC map of TNRP and 1 km buffer zone area as per ndvi (2015)

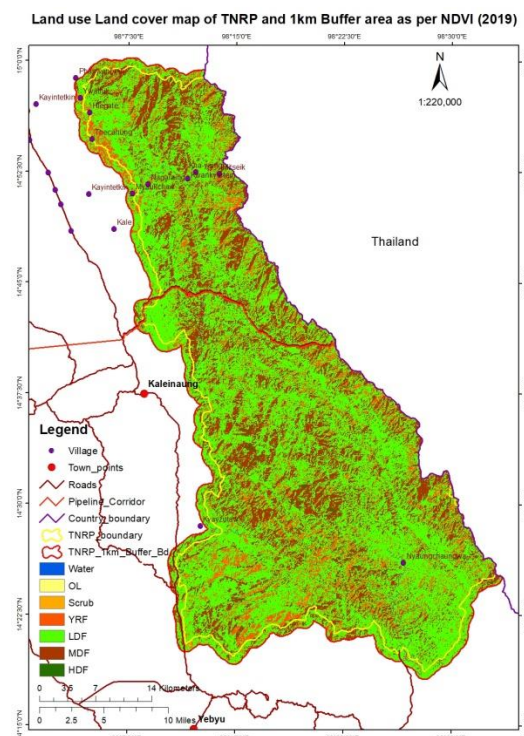


Figure 15. LULC map of TNRP and 1 km buffer zone area as per ndvi (2019)

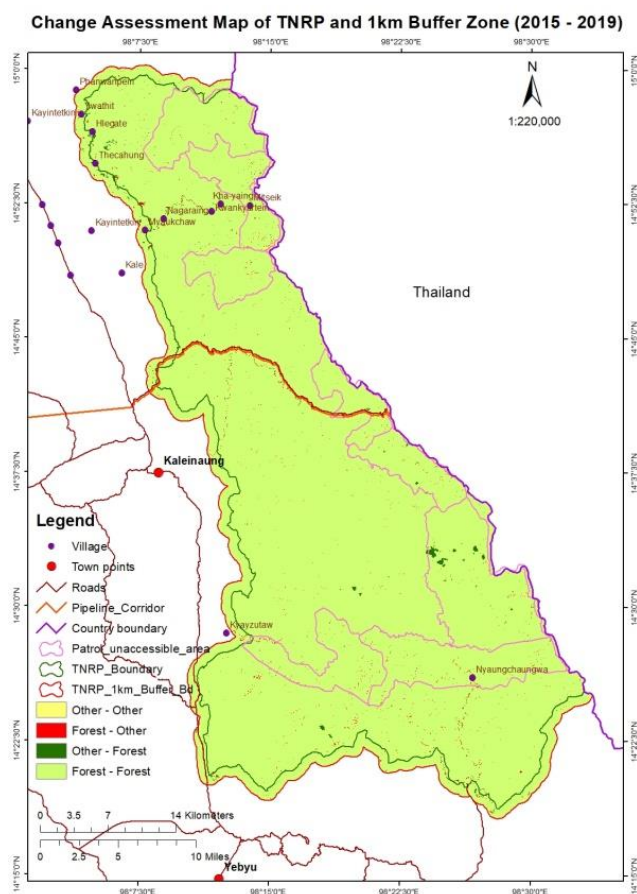


Figure 16. Change Assessment Map of TNRP Core and 1 km Buffer zone area (2015-2019)

3.8.2 Results/ Findings

Table 20. Land use/cover status of TNRP and its 1 km Buffer zone as per NDVI (2015)

Sr.	NDVI class (2015)	Area (ha)	% of total TNRP & Buffer area
1	Water	291.86	0.16
2	Open land - OL	51.23	0.03
3	Scrub-S	1016.47	0.56
4	Young regenerating forest - YRF	15276.63	8.47
5	Low-density forest - LDF	97421.01	54.00
6	Medium-density forest - MDF	65463.02	36.29
7	High-density forest - HDF	879.76	0.49
		180400.00	100.00

Table 21. Land use/cover status of TNRP and its 1 km Buffer zone as per NDVI (2019)

Sr.	NDVI class (2019)	Area (ha)	% of total TNRP & Buffer area
1	Water	317.21	0.18
2	Open land - OL	19.26	0.01
3	Scrub-S	862.59	0.95
4	Young regenerating forest - YRF	20024.17	11.10
5	Low-density forest - LDF	111016.82	61.54
6	Medium-density forest - MDF	47689.06	26.44
7	High-density forest - HDF	470.90	0.26
		180400.00	100.00

Table 22. Change Matrix of TNRP and its 1 km Buffer zone as per NDVI (2015 & 2019)

Change Matrix of Core and Buffer Zone Area

		2015							Total (ha)
		Water	OL	Scrub	YRF	LDF	MDF	HDF	
2019	Water	291.86	25.34						317.20
	OL		19.26						19.26
	Scrub			862.59					862.59
	YRF		6.63	153.88	15276.64		4587.02		20024.17
	LDF					97421.01	13186.95	408.86	111016.82
	MDF						47689.06		47689.06
	HDF							470.90	479.90
		291.86	51.23	1016.47	15276.64	97421.01	65463.03	879.76	180400.00

Table 23. Change assessment data of TNRP Core, Buffer and Both area in Ha (2015 – 2019)

	LULC Change		Core	Buffer	Both	Percent
1	Other - Other		549.14	97.72	646.86	0.36
2	Forest - Other		485.63	66.48	552.11	0.30
3	Other - Forest		602.04	110.67	712.71	0.40
4	Forest - Forest		168363.19	10125.13	178488.32	98.94
	TOTAL		170000.00	10400.00	180400.00	100.00

According to the group homogenous matrix of NDVI values 2015 and 2019 (Table 22), young regeneration forest (YRF) has increased from scrub and open land (other land) in 2019. Some of Medium-density forest (MDF) and High-density forests (HDF) have apparently degraded into Low-density forests (LDF) and Young regeneration forest (YRF). It is clearly seen that dark brown colour area of MDF in the map of 2015 is prominently reduced in the map of 2019. That means forest cover of TNRP has been obviously degraded between 2015 and 2019, but it does not make seriously deforestation (see figure 14, 15 and table 22). Open Lands (Other lands) and Scrub lands are changed to YRF and water area. That means some bare lands are becoming covered with tree canopies. That is a result of rubber plantations and some CF activities along mostly in buffer zones.

Here, definitions of main land cover categories are as follow:

HDF, MDF, LDF:	High Density Forest, Medium Density Forest, and Low Density Forest Close canopy natural forest ranging from high density to low density. Inventory data indicates presence of trees with diameter > 30cm and dominance of climax species.
YRF:	Young Regeneration Forest Highly disturbed forest or forest areas regenerating to their original structure. Diameter distribution dominated by trees 10-30cm and with higher frequency of pioneer species compared to LDF. This land cover class may contain small areas of smallholder agriculture.
S:	Scrub Land areas that were once forest but have been cleared in the recent past. Dominated by low scrub with limited canopy closure. Includes areas of tall grass and fern with scattered pioneer tree species. Occasional patches of older forest may be found within this category.
OL:	Open land Recently cleared land with mostly grass or crops. Few woody plants.

As per land use land cover change data of table 23, forest to other classes change data is 0.30 % within the period of 4 years. This is the change assessment by using two years of ndvi

2015 and 2019 and calculating of ArcGIS software. That is why annual deforestation rate will be round about **0.075%**. That means deforestation rate is reducing **22 times** less than country level annual deforestation rate **1.7%** as per FRA 2015 (FAO) (See table 22 and 23). In addition, because of Forest to Other changes percent **(0.30%)** (Deforestation) and Other to Forest changes percent **(0.40%)** (Reforestation or Afforestation), restoration speed is better than deforestation rate. But there is noticeable forest degradation within the forested area. That is why although conservation actions are taken up to satisfaction stage, finding the ways of reducing forest degradation is still needed.

4. Conclusion and recommendations

4.1 Conclusion

The evaluation team reviewed the Operation Management Plan – OMP, particularly logical framework and other relevant documents and met with TNRP staff, communities and key stakeholders (KNU, NMSP, MGTC, ATL, TPC, Government Army, and Forest Department – FD). In addition of reviewing documents and meeting with key stakeholders, the evaluation team did self-observation during field visit, detected forest cover change by using NDVI (Normalized Different Vegetation Index) and assessed the performance of the TNR by using METT (Management Effectiveness Tracking Tool) and evaluation criteria against management objectives/ actions.

According to METT assessment result, TNR's performance score is 85 ($85/108 \times 100 = 79\%$) – meant that the performance of TNRP is at satisfactory level and score percentages of context, planning, inputs and processes are relatively good since TNRP has clear management objectives and designed with the OMP which is very clear and well-structured through having explicit consultation with multi-stakeholders. Despite the plan is pretty good and inputs are sufficient to implement the plan, there are security constraints which underperform in patrolling, controlling illegal logging and hunting and setting up of camera trap.

When evaluating different management objectives/ actions against criteria; relevance, effectiveness, efficiency, impact and sustainability, the evaluation team observed as follows;

Law enforcement: Overall law enforcement activities are relevant, effective and efficient, albeit patrol coverage could not reach over the whole TNR area. Regarding the impact and sustainability of law enforcement activities, the evaluation results are highly acceptable in the situation of patrol coverage (35.54%) of total TNR area. However, TNR management team should find more opportunities to increase the coordination and cooperation with key stakeholders such as KNU and NMSP.

Land and resources: Overall evaluation results of land and resources showed that local communities are effectively and efficiently engaging in sustainable management of land and resources as support to CF, support to land-use and resource planning such as VUZs, ecological restoration and boundary demarcation are relevant, effective and efficient, except impact and sustainability. However, it is still needed to complete boundary pillars setting up along the boundary of the Core Zone – CZ and Buffer Zone – BZ. In addition, facilitation of having CFs and VUZs for the remaining villages are also needed to take urgent actions.

Livelihoods: Livelihood supported activities; providing revolving funds to CFUGs, delivering livelihood related training and provision of water supply for local communities are highly relevant, but 30% of total villages directly or indirectly relying on TNR area are benefited and remaining are still needed to have livelihood support so as to reduce the burden of TNR area. In terms of livelihood related training, training impact monitoring and following up should be conducted to clearly know whether delivering training can really contribute to the livelihood development of local communities.

Research and monitoring: Compared to other evaluation results of management objectives/ actions, the evaluation team highly impressed on the activities of research and monitoring which are highly relevant, effective and well efficient. Even the impact and sustainability of researches, monitoring and evaluation activities are also at a great position to be improved further. Overall, the TNR project could manage planned biological and social researches to effectively conduct through taking assistance of national and international consultants. Moreover, it was found that the project team simply followed the results/ findings and actions recommended/ suggested by international and national consultants.

Management: Conducting training for staff capacity enhancement, budget allocation for different management actions and effective support of project steering committees (TC and PCC) are considered for the management action “Effective administration, financial and logistical procedures to support management of the natural resources of TNR”. Providing capacity building program, project staff’s competencies are well enough to effectively and efficiently implement the project if TNP could manage to get staff stability. Budget allocation to law enforcement and project permanence should be considered to top up in the next two years of Phase IV. Project steering committees (TC and PCC) are supporting to Project Director and Reserve Management Team, but key stakeholders (KNU and NMSP) should consider as formal members of PCC and site-level meeting so as to have their supports.

Permanence: To ensure TNR has long-term stability and contributes to Myanmar’s national PA systems, effective stakeholder engagement, reserve/ maintain infrastructure and staff development (particularly for locally recruited staff), support best-practice to other PAs and long-term strategy for financial, social and political sustainability have been already planned in the OMP. However, the evaluation team observed that less efforts are given to this project permanence. Since project implementation is in Phase IV, it is appropriate time to start to consider for long-term stability of the TNR.

Regarding forest cover status, the group homogenous matrix of NDVI values 2015 and 2019 showed that young regeneration forest (YRF) and low-density forest (LDF) have increased in 2019, while high-density forest (HDF) and medium-density forest (MDF) have apparently decreased. With this, it can be concluded that forest cover of TNRP has been obviously

degraded between 2015 and 2019, but not seriously deforested. As per LULC change data, annual deforestation rate is around 0.17% which is at 10 times less than country annual deforestation rate 1.7% (FRA, 2015). Nonetheless, it is urgently needed to find solutions for effective conservation and law enforcement in order to prevent forest degradation.

4.2 Recommendations

The evaluation team tried to understand work and budget planning, staffing, the capacity of existing staff, effectiveness and efficiency of project performance, progress against logical framework/ OMP and encountered challenges/ constraints/ limitation through different ways such as learning from the presentation delivered by TNRP Director Office and Park Warden Office, reviewing project reports, OMP and other consultants reports, meeting with key stakeholders (project staff, FD, KNU, NMSP, Gas Companies, Government Army and communities), and self-observation.

The practical recommendations provided in this section are based on observation and findings of the evaluation team. Providing recommendations does not mean that there were some weaknesses in project performance, but mainly intended to have very effective and efficient performance, management, coordination and cooperation mechanism which would be contributing to a great extent of impact and sustainability of the TNR.

- **Strengthen coordination and cooperation with local institutions:** For effective law enforcement and increase patrol coverage, it was observed that there were some security issues and different situations to seize and prevent illegal activities such as gold mining and logging. In this regard, there will not be other options rather than strengthening coordination and cooperation with local institutions namely; FD, KNU, NMSP, Government Army and TNR law enforcement team. Albeit TNR management team is trying to coordinate and cooperate with key stakeholders, TNR management team should have a strategic plan to strengthen coordination and cooperation with key local institutions.
- **Scaling up of CFs and VUZs:** The impacts of existing CFs and pilot VUZs through discussing with local communities and Forest Department – FD of Taninthayi Region are highly remarkable with fulfilment of local communities' interest and reduce pressure on the dependency of TNR. At the time of the evaluation period, there were 12 CFs and two pilot VUZs which would not be enough to get a bigger impact. Hence the establishment of CFs and VUZs should be scaled up, but overlapping each other in the same village should be avoided not to cause confusion to local people.
- **Conduct training impact evaluation:** It was found that a series of training were delivered to build and/or strengthen the capacity of project staff and local communities. Based on discussion with people who were trained, it is hard to see the outcome/ impact of

training delivered by the TNR. Hence training impact evaluation is recommended to conduct so as to know the constraints/ challenges why trainees could not apply the knowledge and skills gained from training.

- **Exploring communication and knowledge gaps:** It was observed that the extension team is too strong and very dedicated to their works. Conducting extension and awareness events are very important to change the behavior of people and take actions. Since the beginning of TNR project Phase 1 in 1995, extension and awareness events have been conducted in each of villages around and within TNR area so that it can be assumed that most communities were aware of many topics covered by extension team. Hence assessment on communication gaps and knowledge needs should be considered so as to identify proper topics and organize extension and awareness events effectively and efficiently. In addition, outreach which is two-way communication between the extension team and local communities to establish and foster mutual understanding, promote participation and influence behaviors, attitudes and actions should be practiced.
- **Support livelihood development for the villages inside TNR area:** TNR project has been supporting livelihood development for the villages around TNR area through providing revolving fund to CFUGs, water supply (particularly supporting PVC pipe for transporting water into the villages) and delivering a series of livelihood supported training. It was clearly found that TNR livelihood supported activities were very effective and beneficiaries were also satisfied. Hence, there are over 10 villages inside of TNR area, which should have been considered to support livelihood development activities.
- **Project staff stability and staff benefits:** Upon meeting with key stakeholders (particularly with KNU, NMSP, MGTC, ATL and TPC), they perceived that building mutual trust can enhance the coordination and cooperation mechanism for effective law enforcement. To build and maintain mutual trust among key stakeholders, Project Director and Park Warden should be assigned to serve for the whole project Phase (4 years) rather than transferring back to FD after a couple of years.

TNR project staff are working at the high risk in travelling and implementing project activities such as law enforcement mission, patrolling, setting up camera trap and boundary pillars so that provision of life and medical insurance should be considered for the project staff if not in place so far. Compare to the benefits of staff who are working for national and international organizations in TNR area, staff benefits of TNR project are relatively low. Hence current staff benefits (particularly for locally recruited project staff) should be reviewed and reconsidered.

- **Budget allotments among six management actions:** According to budget plan attached in the OMP, the budget allocation to management action is about 62%, but in fact daily

allowance and staff salaries of law enforcement team and extension team are accounted under the management rather than law enforcement. It seems budget allocation for project management is outstanding and looks like not reasonable. But for project permanence, more budget allocation should be considered through effectively using surplus budget from the 1st two years of current phase and previous phases as well.

- **Partnership with local based CSOs and Ethnic Organizations:** Most project activities were mainly implemented by TNR management team, except hiring national and international consultants for researches and some capacity building programs. Although there is coordination with ethnic organizations, TNR management team has very limited strategic coordination with local based CSOs. To get interest and effective participation of local-based CSOs and ethnic organizations, TNR management team should consider those stakeholders as both strategic and implementing partners, through building their capacities and offering some project activities such as income generation works (both on-farm and off-farm livelihood options), patrolling, setting up camera trap and establishment of CFs and VUZs.
- **Establishment of Protected Area Network in Myanmar:** Under one of management objectives/ actions (Permanence), approaches/ process/ design of TNR project has to be shared and replicated to other PAs across Myanmar. Although TNRP is advanced to others, TNRP itself may have many things to be learned from other PAs. Hence TNRP is suggested to initiate to establish a network of Protected Area in Myanmar as a platform for learning and sharing, and would also helpful in trying to establish biodiversity trust fund.

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Appendix I

Logical Framework for Taninthayi Nature Reserve Project Phase IV

	Objective & management Actions	Measurable Indicators	Means of Verifications	Risks
	Goal: to effectively conserve and maintain the biodiversity of the nature reserve, while contributing to the sustainable livelihood of local communities through involvement in conservation activities, and to contribute to Myanmar's Protected Area network.	<u>Impact Indicators</u> By the year 2035, forest cover unchanged Total forest cover in 2016: 135,208 ha (79.5%). 999705 ha of primary forest. 35,503 ha of secondary forest	Forest Cover assessment	Political instability Funding instability
1.	Protect natural habitats and populations of important species through reducing threats and enforcing the law.	Biodiversity target species are stable or increasing in extent or occupancy	Biodiversity surveys (occupancy of key species across the reserve)	
1.1	Regular patrolling	Number of short and long patrols	SMART data	Security constraint
1.2	Control hunting	Increase in detections and prosecutions	SMART data	Security constraint
1.3	Control commercial logging	Increase in detections and prosecutions	SMART data	Security constraint
1.4	Control deforestation	Increase in detections and prosecutions	SMART data	Security constraint
1.5	Control commercial fishing	Increase in detections and prosecutions	SMART data	Weak criminal justice system
1.6	Monitor law enforcement	SMART monthly reports completed throughout	SMART data	Staff shortage

1.7	Cooperation for law enforcement	Information sharing active between law enforcement agencies, both regional and international	Meeting minutes Prosecution data.	Poor interagency cooperation Border conflict Thai agencies non-cooperative
2.	Effectively engage local communities in sustainable land and resource use.	Area of land under improved management	GIS data	
2.1	Boundary demarcation	All relevant boundaries demarcated by 2019	GIS data	Security constraint, infrastructure funding restrictions
2.2	Control encroachment and shifting cultivation	New clearance reduced, Agroforestry development	GIS data and satellite imagery	Increase demand for land or cash crops, Security land-use laws are delayed, constraints
2.3	Support land use and resource planning	Number of Land Use Plans delivered	GIS data	Security constraints, land use laws are slow
2.4	Support to community forestry (CF) and community based natural resource management (CBNRM)	Number of CF supported Number of NRM committees supported	GIS data Committee minutes	High demand for land, poor land governance
2.5	Respond to forest fires	Number of successful responses	Fire data (GIS) and fire incident reports	Funding shortage. Security constraints, climate change
2.6	Ecological restoration	Number of hectares of restoration Number of individuals release	GIS analysis Reports on confiscations and release Habitat restoration reports	Funding constraint, climate change, invasive species
3.	Improve local livelihoods, and support appreciation and understanding of biodiversity	Improvement in wellbeing of local communities	Household surveys using relevant poverty	

	among key stakeholders		indicators	
3.1	Support local livelihoods	Number of households supported	Training and outreach records	Microeconomic factors, security constraints, cultural constraints
3.2	Education and awareness program supports positive behaviour change	Number of educational events	Outreach records	Security constraints, cultural constraints
4.	Conduct targeted biological and social research to obtain relevant data that are essential for adaptive management	Improved access to scientific information reflected in management actions	Research database	
4.1	Conduct applied research on biological and socioeconomic trends	Number of scientific reports, papers or data collections	Research database	Security issues, data storage issues, staff availability
4.2	Monitor and evaluate project impacts	Number of monitoring and feedback events	Research database	
5.	Effective administration, financial and biological procedures to support management of the natural resources of TNRP	Reserve management team delivers regular satisfactory reports to PCC	PCC minutes	
5.1	Strengthen the capacity of existing staff	Number of training and monitoring events	Training reports	Staff availability, funding constraints
5.2	Effective staff management and career development	Number of staff evaluated	Staff evaluations	Staff availability, funding constraints, staff retention
5.3	Information management	Staff have access to the information database	Research database	
5.4	Project committees actively support management (PCC, TC)	Number of meetings	Meeting minutes	
5.5	Provide vehicles and equipment suitable for all activities	Vehicles available for all key staff	Vehicle records	
5.6	Maintain and enhance existing	Vehicles and infrastructure	Maintenance logs	Natural disasters

	infrastructure	maintained		
6.	Ensure that the reserve has long-term stability, and contribute to Myanmar's national Protected Area System	TNRP provides an example of management at National Level for Protected Area development	Natural Protected Area System documents	
6.1	Stakeholders engaged and supportive	Number of stakeholder meetings	Meeting minutes	Security and political conflicts
6.2	Reserve infrastructure and staff development	Staff available and willing to stay in TNRP for 2 – 4 years	Staff records and staff evaluations	Staff hiring and transfer policies
6.3	Support best-practice in other PAS in Myanmar's PA network	Number of exchange events	Training and exchange records	National policy supports exchanges with FD/NWCD

Appendix II

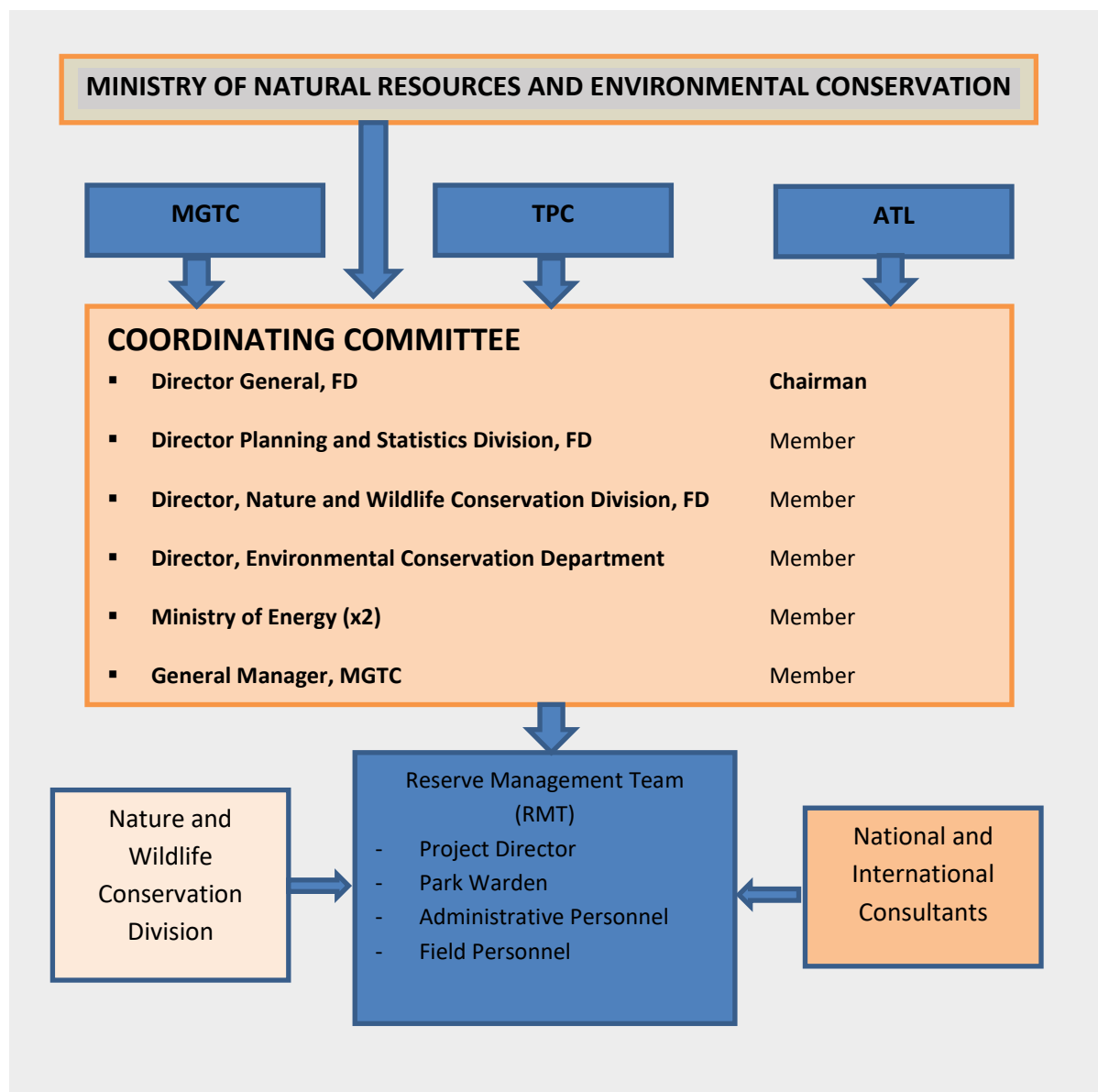
Budget for Phase IV

No.	Objective & management Actions	Year 1	Year 2	Year 3	Year 4	Total Budget
1	Protect natural habitats and populations of important species through reducing threats and enforcing the law.	17,920	20,520	17,920	17,920	74280
1.1	Regular patrolling	11040	11040	11040	11040	44160
1.2	Control hunting	400	400	400	400	1600
1.3	Control commercial logging	800	800	800	800	3200
1.4	Control deforestation	400	2900	400	400	4100
1.5	Control commercial fishing	600	700	600	600	2500
1.6	Monitor law enforcement	400	400	400	400	1600
1.7	Cooperation for law enforcement	4280	4280	4280	4280	17,120
2	Effectively engage local communities in sustainable land and resource use.	36,600	41,000	40,100	39,100	156,800
2.1	Boundary demarcation	4550	4950	4550	3050	17,100
2.2	Control encroachment and shifting cultivation	22350	22350	22350	22350	89,400
2.3	Support land use and resource planning	2000	2000	2000	2000	8,000
2.4	Support to community forestry (CF) and community based natural resource management (CBNRM)	2600	3600	3100	3600	12,900
2.5	Respond to forest fires	2100	2100	2100	2100	8,400
2.6	Ecological restoration	3000	6000	6000	6000	21,000
3.	Improve local livelihoods, and support appreciation and understanding of biodiversity among key stakeholders	74,250	52,750	52,250	40,750	220,000
3.1	Support local livelihoods	37750	39750	37750	27750	143,000
3.2	Education and awareness program supports positive behavior change	36500	13000	14500	13000	77,000
4	Conduct targeted biological and social research to obtain relevant data that are	48,300	32,300	32,300	58,300	171,200

	essential for adaptive management					
4.1	Conduct applied research on biological and socioeconomic trends	22400	11600	17600	16400	68,000
4.2	Monitor and evaluate project impacts	25900	20700	14700	41900	103,200
5	Effective administration, financial and biological procedures to support management of the natural resources of TNRP	264,930	29,2430	29,9430	27,7930	1,134,720
5.1	Strengthen the capacity of existing staff	6200	20200	6200	12200	44,800
5.2	Effective staff management and career development	205880	205880	205880	205880	823,520
5.3	Information management	3250	1250	3250	1250	9,000
5.4	Project committees actively support management (PCC, TC)	10600	10600	10600	10600	42,400
5.5	Provide vehicles and equipment suitable for all activities	32000	48000	67000	41500	188,500
5.6	Maintain and enhance existing infrastructure	7000	6500	6500	6500	26,500
6	Ensure that the reserve has long-term stability, and contribute to Myanmar's national Protected Area System	8,000	11,000	8,000	16,000	43,000
6.1	Stakeholders engaged and supportive	1000	1000	1000	1000	4000
6.2	Reserve infrastructure and staff development	4000		4000		8,000
6.3	Support best-practice in other PAS in Myanmar's PA network	3000	10000	3000	15000	31,000
Total Budget		450000	450000	450000	450000	1,800,000

Appendix III

Organization Chart for the Project Coordinating Committee



Appendix IV

TNRP Operational Management Plan for 2017-18 to 2020-21

No.	Objectives and Management Actions	Specific activities
1.	Forest and Wildlife Laws are understood and followed	
1.1	Regular patrolling	Regular patrols active for both long and short patrols Patrol coverage increases across a greater proportion of TNRP area, with regular review of the security situation
1.2	Control hunting	Mobile patrols target poaching hotspots Snare awareness and direct removal program Firearms control (also controls on ammunition and poisons) Market monitoring and enforcement (Collaborate with Municipal administration)
1.3	Control commercial logging	Mobile patrols target logging hotspots Chain saw controls (registration, FD checks, market enforcement)
1.4	Control deforestation	Mobile patrols target deforestation and encroachment hotspots Formalize VUZ for all relevant villages and demarcate
1.5	Control commercial fishing	Boat-based patrols target illegal fishing hotspots areas Cooperate with DoF to implement fisheries law, destroy fishing gear and impound equipment
1.6	Monitor law enforcement	SMART data used effectively to optimize and evaluate patrolling in each LOU SMART training twice per year (including refresher training, new staff orientation training, SMART Connect, training for community members.)
1.7	Cooperation for law enforcement	Cooperation with local FD in Dawei District, Taninthayi Region, and also cooperation with Mon State FD Cooperation with Police and Military, also joint patrolling Cooperation and engagement with Ethnic Organizations Community based law enforcement; local involvement with patrol teams Informant network given incentives for information leading to prosecution; confidential hotline Cooperation with Thailand enforcement agencies(DNP, Police, Military)
2.	Effectively engage local communities in sustainable land and resource use.	
2.1	Boundary demarcation	Demarcate key boundaries, including VUZ, and maintain border signage
2.2	Control encroachment and shifting cultivation	Awareness with local groups, CSOs, and plantation Community agreements, registration, and restrictions on expanding VUZ (including demarcation)
2.3	Support land use and resource planning	VUZ process for all relevant villages (including peer-trainers)

		GIS and mapping exercise supports local land use
		Engage with refugee resettlement planning (and donors)
		Engage with other departments to mitigate local infrastructure (access roads, small mines, etc.)
		Legalize the role of Buffer Zone, and consult with the community on all legal activities permitted (including any licensed extraction)
2.4	Support to community forestry (CF) and community based natural resource management (CBNRM)	
		CF awareness in target communities (new CF instructions)
		CF support in buffer zone areas (follow-up existing CF, and develop model CF area)
		Community management and agreements (Related to encroachment etc.)
		Engage with traditional hunting practices (for sustainability, restrict in breeding season)
2.5	Respond to forest fires	
		Preparation and protection against fires; drills, fire breaks, fire tracks etc.
		Cooperation with the Fire Department
		Community based fire management: capacity building and awareness
		Fire Monitoring System (MODIS, UAV, and, and other satellites as relevant)
		Engage with plantation owners, pipeline company, railway department, etc.
		Engage with plantation owners, pipeline company, railway department, etc.
2.6	Ecological restoration	
		Rehabilitation of deforested areas (including inside CF areas, NMSP area)
		Technical assistance to increase tree planting success rate, and to control exotic and invasive species where problematic
		Implement FD habitat Restoration plan (reforestation, assisted and natural regeneration, restoration of rivers and wetlands, artificial salt-licks)
		Trial release of turtles or other key native species
3.	Improve local livelihoods, and support appreciation and understanding of biodiversity among key stakeholders	
3.1	Support local livelihoods	
		Microfinance program continued and directly targeted to conservation positive actions (Collaborate directly with CSO for delivery)
		Livelihood training program (eg. NTFPs, beyond CF members, off-firm income, market links and market access)
		Community-based ecotourism product development
		Provision of water supply for local communities (linked to conservation agreements)
		Support to agricultural development (permanent cultivation) collaborate with MoALI)
		Engage with "Social Eco" fund to coordinate activities, and provide local employment opportunities
3.2	Education and awareness program supports positive behaviour change	
		Increase awareness at local and regional level (direct with local communities, and using media)
		Raise awareness of Wildlife and Forest laws to local communities
		Signboards at entrance points (including Mon, Karen, Burmese languages)
		Cooperation with other agencies to ensure awareness (e.g. govt, courts, military, national events)

		Engage local schools, youth groups with innovative approaches (film, drama, songs, sports, etc.)
		Engage with cultural institutions for awareness and education (Churches, Pagodas, etc.)
		Annual project review with community
4.	Conduct targeted biological and social research to obtain relevant data that are essential for adaptive management	
4.1	Conduct applied research on biological and socioeconomic trends	
		Develop protocols for long-term monitoring of key biodiversity (eg. Occupancy)
		Consider community-based monitoring (e.g. for threats)
		Conduct targeted research to improve management, e.g. medicinal plants, invasive plants, salt licks, climate change impacts
		Access livelihoods and “wellbeing” of surrounding communities as this relates to nature conservation
4.2	Monitor and evaluate project impacts	
		Result-based approach to patrolling (SMART review)
		Regular analysis and display of Remote Sensed data for forest cover and emerging threats
		Consider monitoring of Habitat, Biodiversity, Livelihoods, Governance, and PA Management
		Annual project review
5.	Effective administration, financial and biological procedures to support management of the natural resources of TNRP	
5.1	Strengthen the capacity of existing staff	
		Law enforcement training (legal, conflict resolution, evidence, investigation, SMART)
		Technical training program (biodiversity, GIS, community work, extension, etc.)
		Exposure visits to overseas Pas (esp. Thailand) with follow up activities and on-training)
		Annual staff retreat with training and teambuilding opportunities
5.2	Effective staff management and career development	
		Effective management team in place in TNRP and in Yangon
		Staff selection ensures motivated and capable staff who want to stay at least 2-4 years
		Local staff are provided with contracts, insurance, and understand their responsibilities
		Staff working-time is managed effectively, to provide for religious and family balance (long service)
		Staff management structure, orientation, task management, and annual review and evaluations
		Staff allowances and incentives encourage improved performance and retention
5.3	Information management	
		Project documentation and data available for staff and managers (e.g. database)
5.4	Project committees actively support management (PCC, TC)	
		Regular meetings held and project supported
5.5	Provide vehicles and equipment suitable for all activities	
		Procurement of vehicles and motorbikes
		Procurement of GPS, communications, field equipment, first-aid equipment,

		uniforms
		Procurement of computers, office equipment
5.6	Maintain and enhance existing infrastructure	
		Nursery expansion (to support habitat restoration)
		Inventory and regular maintenance schedule for existing infrastructure and equipment
6.	Ensure that the reserve has long-term stability, and contribute to Myanmar's national Protected Area System	
6.1	Stakeholders engaged and supportive	
		Coordination with all relevant government agencies and regional government
		Coordination with local society groups
		Coordination with local civil society groups
		Coordination mechanism with Ethnic Organizations (regular scheduled formal meetings)
		Coordinate policy on CF, forest etc. between national, regional and Ethnic Organizations
		Annual project progress review with key stakeholders
6.2	Reserve infrastructure and staff development	
		Ensure adequate infrastructure for future staffing needs and long-term management actions
		Increase the proportion of locally-hired staff, with a transition of responsibilities
6.3	Support best-practice in other Pas in Myanmar's PA network	
		Study tours for other Pas to visit and learn from TNRP, and invite key staff from other Pas to join relevant training courses
		Exchange visit to other PAs, with both long term and short term visits in both directions
		Coordinate with Myanmar Forest School/ University of Forestry in Yezin to support research and capacity building
		Ensure that TNRP's legal structure is compatible with national developments
6.4	Long term strategy for financial, social, and political sustainability	
		Identify long-term sustainable finance mechanisms
		Coordinate with national sustainability mechanisms (e.g. Trust Fund)
		Ecotourism investment, e.g. Arboretum
		Long-term exit planning for pipeline etc.

Appendix V

List of organizations/ department consulted with

1. Director General Office, Forest Department, Nay Pyi Taw
2. Nature and Wildlife Conservation Division, Forest Department, Nay Pyi Taw
3. Director, Forest Department, Mon State (Former Project Director of TNRP)
4. Director, Forest Department, Taninthayi Region
5. Project Director, Yangon Office
6. Assistant Director, Forest Department, Dawe District, Taninthayi Region
7. Staff Officer, Forest Department, Dawe Township, Taninthayi Region
8. Staff Officer, Forest Department, Yephyu Township, Taninthayi Region
9. Staff Officer, TNR Park Warden Office, Forest Department
10. Staff Officer, Project Director Office, Forest Department
11. General and Captain, Government Army
12. Liaison Officer, New Mon State Party - NMSP
13. Liaison Officer, Karen National Union - KNU
14. Extension Team Members, TNRP
15. Site Manager, Andaman Transportation Limited - ATL
16. Security Manager, Taninthayi Pipeline Company - TPC
17. Kanbauk Program Leader, Yadanar CSR, TOTAL
18. Agro-Vet Team Leader, Yadanar CSR, TOTAL
19. 7 Community representatives, Yebon Village
20. 10 Community representatives, Michaunglaung Village
21. 5 Community representatives, Yaphu Village
22. 9 Community representatives, Kyaukadin Village
23. Dawei Development Association – DDA
24. Wildlife Conservation Society – WCS, Dawei Office
25. RECOFTC – The Center for People and Forests

Appendix VI

Photo session



Meeting with Director of FD, Taninthayi Region



Meeting with Project Director of TNRP at Park Warden



Meeting with Liaison Officer of New Mon State Party - NMSP



Meeting with Liaison Officer of Karen National Union - KNU



Meeting with Community Representatives of Thayarmon Village



Meeting with Community Representatives of Yebone Village



Meeting with Site Managers/ Officers of Gas Pipeline Companies



Meeting with Extension Team Members of TNRP



Meeting with Officer of Dawei Development Association - DDA



Meeting with Field Officers (former TNRP staff) of Wildlife Conservation Society - WCS



Meeting with Director of Mon State (former Project Director of TNRP)



Meeting with In-charge of LOU