Ministry of Forestry

Forest Department

Taninthayi Nature Reserve Project

REPORT ON NEED ASSESSMENT FOR ENVIRONMENTAL EDUCATION

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Executive Summary

This assessment was carried out to define the needs for formulating long term strategic plan of environmental education as a requirement of management planning for Taninthayi Nature Reserve (TNR). It consists of three parts: assessment on existing awareness programme of TNR Project, assessment on formal environmental education and assessment on non-formal environmental education.

The strength and weaknesses of the existing awareness program of TNRP was assessed through the discussions with key educators who are involved in awareness talks along with questionnaire survey. Although the existing programme has some positive impact in enhancing environmental knowledge of local people, it was observed that the institutional strengthening such as formation of environmental education team, capacity building of project staff, development and dissemination of printed media, objective setting and post-evaluation of awareness talk/discussion are needed for further improvement.

Assessment on formal environmental education includes reviewing existing curriculum related to environmental themes, assessing knowledge of students and effectiveness of audio-visual aids by organizing environmental quiz and assessment on environmental knowledge, skill of teachers and use of teaching aids in environmental lessons by using questionnaire survey method. According to the findings, environmental themes are mainly integrated with natural science, basic science, general science and life skill subjects in the existing curriculum and it was found to be quite sufficient. It has been observed that the use of audio-visual aid could promote understanding and knowledge of the students. The majority of school teachers, especially 85% of primary school teachers, were inadequate in environmental knowledge and 37% of the teachers were observed untrained. The use of teaching aids was found insufficient and out-door activities were very few.

Need assessment for non-formal environmental education covers assessment on knowledge, attitude of the general audience, assessment on knowledge, attitude and practice of targeted audience and need assessment for local decision-makers. Assessment among general audience was carried using secondary data collected by Buffer Zone Management Consultant in 9 villages and first-hand data collected from additional 4 villages. The questionnaire-cum-interview method was used in this study. Among ethnic minorities, Mon people were found poorer in knowledge level than other ethnic groups. Similarly, females were poorer than males, and the age group of 40 yrs and above was poorer than that of under 40 yrs. Almost 60% of general audience do not know the TNR boundary very well and 71% was unaware of the prohibitions. The attitude of general audience was generally found to be positive on the constitution of TNR. The negative attitude that TNR causes problems to their families accounts for 11% among the general audience and over 60% disagree on the statements that TNRP creates the job opportunities and helps the local people. Scoring and ranking were performed based on the knowledge level and attitudes of villagers (general audience). Michaunglaung(New), Mayanchaung, Kyaukshat,

Wunpo, Hnankye, Karen Shinhtabi, Michaunglaung(Old), Kaleinaung, Tharyarmon, Kawhlaing, Yebon, Yarphu and Zinba villages were in order with respect to the overall ranking based on the knowledge level and attitudes. Apart from general audience, targeted groups causing threats to TNR were selected from Zinba, Michaunglaug and Hnankye villages. Altogether, there were five targeted groups representing shifting cultivators*, taungya*-based orchard cultivators, hunters, timber and bamboo cutters (Zinba) and timber and bamboo cutters (Hnankye). Assessment on fire-use practice showed that 73% of shifting cultivators and 54% of *taungya*-based orchard cultivators were in poor condition. Generally, soil conservation practice was not carried out by shifting cultivators and *taungya*-based orchard cultivators. Illegal logging in Zinba links with social norms of the villagers, immigration of outsiders and inadequate livelihood options. Hunters are lack of knowledge in legal proceedings for protection of wildlife. Most of the timber and bamboo cutters from Hnankye, 93% held negative attitude that their families faced with difficulties because of TNR. Among the targeted audience, shifting cultivators, timber and bamboo cutters (Zinba), hunters, *taungya*-based orchard cultivators, timber and bamboo cutters (Hnankye) stood in order with respect to overall rank based on the knowledge level and attitudes. Need assessment for local decision-makers showed that 46% of the local decision-makers stood at “poor” level in general environmental knowledge. Concerning knowledge on environmental related policy and law, 62% was also found to be poor. Similarly, 54% was belonged to “poor” level pertaining knowledge on Taninthayi Nature Reserve Project. But, with regard to taking into consideration of environmental protection when they made a decision or implemented environmental related matters, the percent of the decision-makers who stood at “good “ level was observed relatively higher, representing 46%.

Report on Need Assessment for Environmental Education

1.0. Introduction

Taninthayi Nature Reserve area is mainly occupied by tropical rain forest and possesses a variety of flora and fauna. It forms part of a critical area for tigers, Asian elephants and Asian Tapir (*Tapirus indicus*) in Myanmar (A. J. Lynam and M. Rao, 2008). The tropical rain forests in the region are mainly threatened by illegal logging, shifting cultivation and forest fires. Consequences of loss and fragmentation of the rain forest may lead to loss of habitats and biodiversity in the area. Another threat to large mammals is hunting for subsistence and trade. Therefore, it is a need to conserve and manage the tropical rain forest ecosystem in an ecologically sound manner. Taninthayi Nature Reserve has been one of the protected areas established in Myanmar since 2005 with compliments of Forest Department as implementing agency and Mottama Gas Transportation Company (MGTC) and Taninthayi Pipeline Company (TPC) as funding agencies. The major goal of the project is to conserve tropical rain forests and its constituent biodiversity in the Taninthayi region while formulating the comprehensive management plan in a holistic approach. In order to achieve objectives of the project, environmental education is also considered as an important role in the management of the reserve in a sustainable manner and put together since formulating the project document (TNRP Project Document, 2001) . For designing effective environmental education program, the foremost activity to be carried out is to assess the needs for strategic planning for long term environmental education. Therefore, this assessment was performed to identify the needs and to formulate the appropriate strategies for launching an effective environmental education program in the Tanintharyi Nature Reserve Project area.

2.0. Profile of Tanintharyi Nature Reserve

2.1. Demographic profile

The majority of Taninthayi Nature Reserve falls under Kaleingaung Township and the remaining under Yepyu Township. Kaleingaung Township consists of 4 blocks and 7 village tracts of 19 villages. In the north, there are 8 villages of ceasefire group of Mon ethnic minorities. Those villages are situated inside the nature reserve. According to the statistics obtained from the Immigration and National Registration Department, the total population of 14,541 belonged to 2823 households are residing in Kaleinaung Township. This figure accounts for also those living in the ceased fire villages and the detailed demographic information by age and gender is mentioned in appendix- 2.

2.2. Socio-economic profile

The main economy of the area depends on the income from horticulture crops. The main cash crop species are cashew nut, betel nut, citrus species and rubber trees. Currently, the extent of rubber plantations are expanding at an amazing rate as the government is encouraging

establishment of rubber plantations and the non-resident investors in this business intrude the area very significantly. Even local people with limited capital gradually change the trend of species choice, i. e. cashew nut to rubber. However, the marginal farmers are earning their living by means of shifting cultivation and some are solving their livelihood problem through hunting, timber and bamboo cutting.

Since mid 1990s, two oil and gas companies, Total and Premier (now Petronas) made investments in this area and has been selling natural gas to Thailand. The two gas companies contributed their efforts to the socio-economic development of the villages along their pipeline corridor. There are 25 project villages covered by the Total pipeline corridor. The major interventions by Total Company involve health care, education, micro-finance, agriculture and animal husbandry. Out of 25, 6 villages namely Micjaunglaung (old), Michaunglaung (new), Kaleinaung, Zinba, Kawhlaing and Kyaukshut fall in TNRP area (Annual Report, 2007, Socio-eco (MGTC).

2.3. Cultural Profile

Ethnicity in the project area is relatively diverse comprising of Dawei, Mon, Karen and Bamar. Dawei is the most dominant ethnic group among them, representing approximately 37 % in racial composition and followed by Mon, Karen and Bamar with 26%, 22% and 15% respectively (Min Thant Zin, 2008). Zinba, Kawhlaing and Mayanchaung are heterogeneous in ethnicity with a mix of Karen, Mon and Dawei. Lawthaing, Michaunglaung (new) and Yebon are the villages in which Karen and Dawei are residing, but Mon and Dawei are found in Yarpu(old) village. On the other hand, Kyaukkadin, Kywetalin, Ahlesakhan are homogeneous with the presence of only Mon people. Similarly, Yarphu (New), Michaunglaung(Old) and Karen Shinhtabi villages are all Karen villages and Dawei people are mainly living in Kaleinaung, Kyaukshat, Heinze, Hnankye and Myanmar Shinhtabi village.

2.4. Environmental Profile

The project area enjoys tropical monsoon climatic condition with highest annual rainfall in Myanmar. The average annual rainfalls for the periods of 1926-36 and 1950-1990, were 5465 mm (215 inches) and 5412 mm (213 inches) respectively. The minimum and maximum temperature between1950-1990 was recorded as 18.1˚ C and 34.3˚ C. Three geological formations namely, granite intrusion, Mergui series of sedimentary rocks and alluvial deposits, are found in the area. (Working Plan for the Kaleinaung and Heinze Reserves by Smith, 1926 and Forest Management Plan: Volume-1, Dawei District, Taninthayi Division by Ba Maw (1997).

Tropical evergreen forest type is the most common forest type in the area. A total of 257 species were recorded during the flora survey and the order of most common tree species were Taung thayet (*Sweintonia floribunda*), Kyetmauk (*Nephelium* spp), Kywe thwee (*Myristica spp.)*, Thit sho (*Pentace griffithi*), Kadut (*Parashorea stellata*), Thabye spp. (*Syzygium* spp), Zinbyun (*Dillenia parviflora*) and Kalagi (*Barringtonia spp.*) (Hla Maung Thein, 2007)

According to mammal survey report, altogether 76 species of mammals have been recorded in Taninthayi Nature Reserve and it includes endangered mammal species such as Asian elephant, tiger, tapir, serow, gibbons, gaur and bears (Ye Htut, 2008).

A total of 244 bird species belonged to 50 families have been recorded and more than 300 bird species were expected in the nature reserve area. Of which, 3 species were vulnerable (Vu) and 13 species were near threatened (NT) (Nay Myo Shwe, San San Nwe and Lay Lay Khaing, 2008).

3.0. Objectives

The objectives of the assessment are as follows:

- to review the existing environmental awareness program of TNRP
- to identify the needs for designing appropriate environmental education (EE) program
- to provide baseline information required for long term EE strategic planning

4.0. Literature Review

4.1. Concept of Environmental Education (EE)

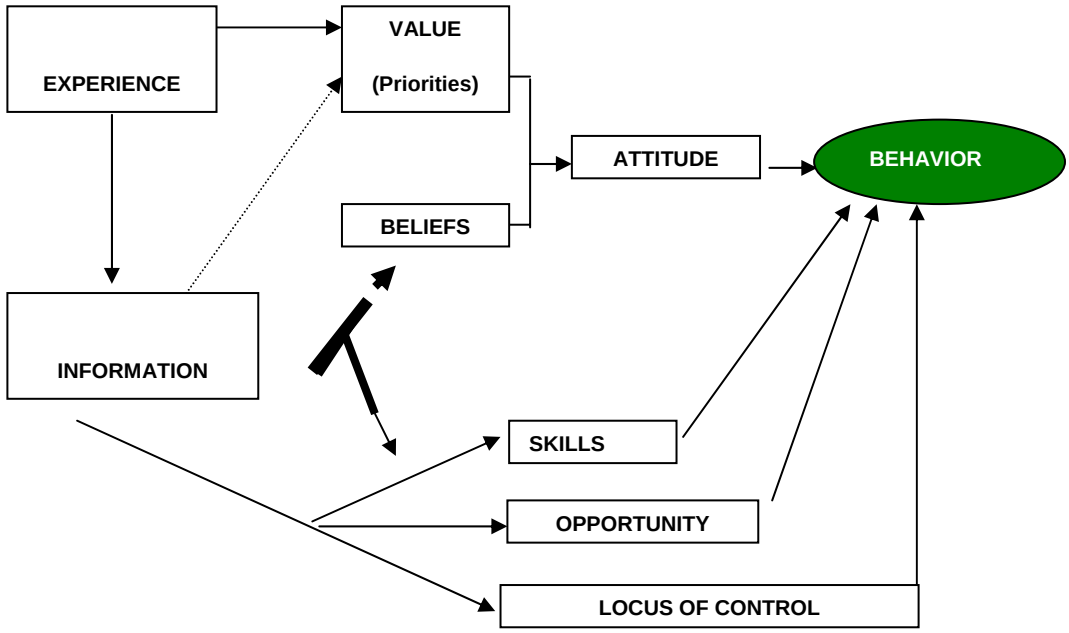
"Environmental Education (EE) is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitude, motivation, commitment, and skill to work individually and collectively toward solutions of current problems and the prevention of new ones". (Michael Matarasso and Nguyen Viet Dung (http://assets.panda.org) cited the definition of EE identified at UESCO Conference, 1977).

EE encompasses the areas of knowledge about environment and the inter-relationship between humans and the environment; aware of environmental problems, encouraging individuals and communities to value the environment; enhancing skill to identify, predict, prevent and solve environmental problems; and allowing chance to actively participate in solving environmental problems and making educated decisions about environment.

Michael Matarasso and Nguyen Viet Dung (http://assets.panda.org) have stated the behavior of people as interface between ecological system and social system with reference to Bruce Byers (2000). Therefore, although certain goals of environmental education are stated, the major one is to effectively organize the people to be capable and willing to implement behaviors which improve and/or maintain environmental health and quality.

There are many factors which influence the behaviors of the people and fig.(1) illustrates some major factors which can influence the behaviors regarding the environmental matters. As illustrated in the figure (1), Information can influence the attitudes and thus behavior, but information actually works by impacting on beliefs, and this may or may not result in attitude shift (Peyton et al., 1995, UNESCO-UNEP, IEEP). Attitude, a combined product of what people perceive as reality (belief) and standards of importance which are held by individual (value), is the precursor of change in behavior and may influence the behavior. However, although

someone has positive attitude to change behavior, the action does not take place due to lack of skill, opportunities, and internal “locus of control” regarding lobbying for the environmental laws.



(Adopted from UNESCO-UNEP, IEEP, 1995)

Note:

1) Information : facts and details 2) Experience: knowledge and skill gaining trough doing 3) Value: standards of importance which are held by an individual 4) Belief: what an individual perceives to be true about a situation 5) Skills: ability to do well 6) Opportunity: a time when a particular situation makes it possible to do on achievement 7) Locus of control: Someone’s perception of their own ability to influence the outcome of a situation 8) Attitudes: The way you think and feels about 8) Behavior: The collective pattern of decisions, practices, and actions of people.

Fig.(1) A model of factors which influence environmental behaviors of people

4.2. Approaches of Environmental Education

Environmental education approaches can be categorized into three types. Canadian Environmental Grantmakers’ Network- CEGN (2006), described those three approaches as follows:

1) Formal environmental education

Formal environmental education is linked with the formal education system and generally takes place in a school context.

2) Non-formal environmental education

Non-formal environmental education is organized educational activity outside the formal school system, and includes environmental education activities or programs provided by community organizations, youth groups, museums, zoos, and nature/interpretative centres, etc.

3) Informal environmental education.

Informal environment education is the provision of information without an organized educational /institutional structure and typically includes learning about the environment through the media, personal reading, every day experience and interactions with other people.

4.3. Environmental Education in Myanmar

The major impetus for environmental education in non-formal settings came from United Nations agencies (such as UNDP) and non-governmental agencies (NGOs), who were working with the Myanmar Education Research Bureau (MERB) and the Department of Basic Education (DBE) to implement projects. “Education for All,” an environmental education programme started in some thirty townships in1996, has expanded to become nationwide. This programme covers the environmental topics as population control, energy problems, consumption of natural resources, soil conservation, health care, and home economy as a way to help people solve the environmental problems faced in daily life (Hla Hla Win, .http://members.ncss.org).

Another important programme, “Improving Access of Children, Women and Men of the Poorest Communities to Primary Education for All,” began in eleven townships in 1996. The environmental aims of this project are to promote respect and appreciation for environment; to teach environmental principles such as the need to conserve natural resources and biodiversity; to teach about environmental issues; and to provide the knowledge and skills necessary to solve environmental problems (UNESCO, MYA/96/004).

In addition, Forest Department has implemented the projects on Environmentally Sustainable Food Security and Micro-income Opportunities in Shan State, Dry Zone and Ayeyawaddy Delta in cooperation with UNDP since 1996. The project activities included extension works on agro-forestry, soil and water conservation, forest conservation, utilization of energy efficient stoves etc. Non-governmental organizations like Wildlife Conservation Society (WCS), Forest Resource Environment Development Association (FREDA), have been cooperating with Forest Department in the field of biodiversity / environmental conservation and education programme from non-environmental education setting (Source: P & S Division, Forest Department).

Yin Yin Lay (1998) has described that the first step to such public awareness in Myanmar was in the form of the *Patwinkyin* (surroundings) programme at the primary level and natural science courses at lower secondary level since about twenty years ago. The surroundings programme, which fell into disuse over time, was reintroduced into the curriculum in 1998.

The new curriculum places special emphasis on fostering good citizenship, in which the development of environmental awareness is one of the components. Within general studies (i.e. moral and civic education, aesthetic education, and lifelong skills), environmental education themes stress the relationship between human life and natural phenomena, the importance of traditional festivals and cultural heritages, and the importance of cooperation within a community. At the secondary level, environmental education themes emphasize personal hygiene and family health, respect for and curiosity about the natural environmental, and understanding the importance of natural resources for daily life (Hla Hla Win, .http://members.ncss.org).

5.0. Methodology

The adopted methodology for the assessment consists of three parts as mentioned below.

1) Review on the existing environmental awareness program of TNRP
2) Review on environmental education in schools and identifying needs
3) Assessment of needs for Non- formal Environmental Education

5.1. Review on the existing environmental awareness program of TNRP

The Taninthayi Nature Reserve Project has been launching an environmental awareness program since 2006. The program includes two types: awareness talks held in schools and awareness discussion with villagers. By the end of November, 2008, 21 environmental awareness talks have been organized in the schools. Similarly, altogether 29 awareness discussions were held in 20 villages, 4 quarters in Kaleinaung and three military forces during the period (appendix-3.1 and 3.2). Besides, annual tree planning program were organized with the participation of school children, teachers as well as local communities and organizations.

The strength and weakness of the program was assessed through the discussions with key educators who are involved in awareness talks and discussions, along with questionnaire (appendix- 4.1).

The main strength of the program is that this is initiative to the long-term environmental education program and, could make the local community and school children aware of TNRP to certain extent. In addition, the program has established a link between the project and villages along the project corridor although dedicated contact person has not been assigned in the villages for this particular purpose. Analysis on effectiveness of the awareness program has been mentioned under assessment of needs for non-formal environmental education.

According to the discussions with educators, the following weaknesses in the program have been observed.

1) There is no predetermined goal and objectives for the whole talk and discussion. Some speaker set up the objectives, but some didn't yet. This could result in overlapping focus area and facts.
2) As educational materials such as printed materials, audiovisual aids were not sufficient, talks and discussions were mostly delivered and organized without EE materials.
3) Talks and discussions mostly focused on knowledge, awareness and value of environment, but rarely on skills in problem identification and solving.
4) There is no dedicated environmental education team which was formed for this particular purpose only. The educators are responsible for carrying out other tasks of the project and they could not concentrate the awareness program.
5) Specific education program with respect to different target audience still could not be developed.

6) Effectiveness of individual awareness talks / discussions and the whole program as well has not been evaluated.

5.2. Review on formal environmental education in school and identifying needs

5.2.1. Review on existing curriculum

Formal environmental education plays an important role in producing environmentally literate citizens. In addition, children will help educate their parents and more easily influence their parents' action. In Myanmar, environmental themes are integrated to mostly science and general studies (e.g. lifelong skills) at the primary and middle school level and, to biology at high school level. Generally, the environmental themes infused in the existing curriculum were found to be quite sufficient, especially at primary and middle school level. In particular, "lifelong skills" is intended for preparing school-children to be not only moral and civic citizens but also environmentally literate ones. The curricula are developed by the Ministry of Education (MoE) and environmental themes covered by the curriculum of each grade are mentioned as below:

Sr.	Grade	Environmental Related Topics	Subject
1	Grade 1	-Living things from our environment -Requirements of living things -Relationship between living things and their environment	Natural Science
		Conserve our environment forever - Dispose of waste properly for cleaning - Value beauty of plants	Lifelong skills
2	Grade 2	-Living things from our environment -Requirements of living things -Relationship between living things and their environment	Natural Science
		Conserve our environment forever - Proper waste disposal - Will make alive (usefulness and conservation of trees)	Lifelong skills
3	Grade 3	-Living things from our environment -Requirements of living things -Relationship between living things and their environment	Natural Science
		Conserve our environment forever - Let's segregate and dispose of waste - Reduce the use of plastic - Value of trees	Lifelong skills

4	Grade 4	Study on living things by dividing - General observation - Sensitivity to environment Animals - Invertebrates - Vertebrate - Getting and use of energy - Getting and use of food - Reproduction Plants - Flowering plants and non flowering plants	Basic Science
		Conserve our environment forever - Keep air clean - How to dispose of waste - Conserve for green environment	Lifelong skills
5	Grade 5	Study on living things by dividing - General observation - Characteristics of living things Animals - Animals with soft and elongated body, snails, animals with segments, fish, amphibians, reptiles, birds and mammals etc. Plants - Study on cultivated and natural plants - Edible parts of plants	Basic Science
		Conserve our environment forever - Proud of being dutiful (waste disposal) - It can be reused	Lifelong skills
6	Grade 6	- Living Things (food chain) About the environment(air, water, soil and living things)	General Science
		Conservation of Natural Environment - Waste disposal	Lifelong skills
7	Grade 7	- Living Things (movement of living thing, flora, fauna) - Man and Environment (environmental deterioration by human beings, causes of environmental deterioration) - environmental conservation for the human life	General Science

		Conservation of Natural Environment - Air pollution	Lifelong skills
8	Grade 8	- Living things (variation, adaption, direct benefits and indirect benefits of living things) - Protection of Earth Environment (environmental protection, air pollution and global warming, water pollution and scarcity of fresh water)	General Science
		Conservation of Natural Environment - Good drainage (to control the water pollution) - Greening	Lifelong skills
9	Grade 9	- Living Things(growth, natural balance, nutrient cycle) - Protection of Earth Environment (environmental protection: deforestation, soil erosion)	General Science
		Conservation of Natural Environment - Forest conservation	Lifelong skills
10	Grade 10	- No specific environmental theme is infused.	Biology
11	Grade 11	- Environmental Biology - Cycles in an Ecosystem (water Cycle, Nitrogen cycle and Carbon Cycle) - Pollution	Biology

5.2.2. Assessment on knowledge of students and effectiveness of using Adio-visual Aid

An environmental awareness talk was initiated at Kaleinaung BEHS using audio-visual aids and the audience was targeted to the school children of middle and high school level. The program included a brief introduction by the Project Director and the following three environmental related topics by the three speakers.

- Our Environment

- Ecosystem Deterioration and its Impact

- Taninthayi Nature Reserve Project and Biodiversity Conservation

At the end of the talk, environmental quiz contest was organized by dividing into five groups, each having three participants and prizes were awarded to winner groups. The content in the

quiz was prepared based on the environmental themes extracted from curriculum for middle school level and some facts included in the talks by individual speaker.

The overall goal of the program is to promote the awareness and environmental knowledge of the students. The specific objectives were also set up to meet the predetermined goal as follows:

- to enhance basic knowledge on environment
- to aware about TNRP and value of its biodiversity
- to evaluate how much students understood the contents of the individual talks and environmental knowledge covered in the school curricula
- to get the practice of collaborative action in environmental related matters
- to evaluate the effectiveness of audio-visual aid

After that, the effectiveness of whole program was assessed to identify the needs for the improvement of school program in future. The questionnaires were developed and distributed to participants of quiz contest and 15 school teachers presented (appendix-4.2). The evaluation made by the individual recipient of questionnaire, was analyzed.

Out of 21 questions raised in the quiz, 5 groups gave 81%, 76%, 71%, 67%, 62% of correct answers to the questions respectively.

According to the evaluation made by the students, all of them mentioned that the awareness talk promoted their knowledge; they preferred collaborative action in answering environmental quiz rather than individual response; and they would like to know more about environment. Concerning the duration of the whole program, 23% of the student expressed that the duration was very long and the remaining 77% mentioned that it was just right. 92 % of the students gave answer that the use of audio-visual aid helped them promote their understanding where as 8 % replied that this did not so.

An analysis on the evaluation made by the teachers showed that all respondents thought the awareness program was interesting and it could promote environmental knowledge and slide shows helped the audiences more understandable on the contents of individual talk. Additional and frequent talks were recommended by 60 % of the respondents; expanding the program to villages and quarters by 7%; educating through field visit and out-door studies by 26%; and the remaining 7% suggested that it would be more effective if the number of audience was not more than 500 with the same environment or level.

5.2.3. Assessment on environmental knowledge of teachers, teaching skills and teaching aids

As the curricula are centrally developed in formal education, the realistic way is just to assess the way forward to make the existing formal environmental education more effective. Keeping in this view, questionnaire survey was conducted among the school teachers from the primary, post primary and middle school teachers who are involved in teaching subjects containing environmental education themes.

The questionnaire consists of two parts: environmental knowledge; teaching skills, methods and teaching aids (appendix-4.3). The questionnaires were sent to primary, post primary and middle schools of 15 villages in Kaleinaung township, namely Yaphu (Old), Kyaukshat, Yaphu (New), Mile 60, Mayanchaung, Kawhlaing, Michaunglaung (Old), Michaunglaung (New), Kaleingaung, Zinba, Heinze, Hnankye, Karen Shinhtabi, Myanmar Shinhtabi and mile 60.

Altogether 46 respondents had returned the questionnaires. Out of the 20 environmental knowledge questions raised, the corrected answers were calculated in percent and grouped into three levels- Level 1 (less than 50%), Level 2 (between 50-65%), and Level 3 (more than 65%). The result is mentioned as follows:

Group	**Knowledge level**	**Description (Correct answer %)**	**Frequency**	**Percent**	Remarks
Primary school teachers	1	<50	33	84.60	Inadequate
	2	50-65	5	12.80	Just enough
	3	>65	1	2.60	Sufficient
	Sub-total		**39**	**100.00**	
Middle school teachers	1	<50	3	42.80	Inadequate
	2	50-65	2	28.60	Just enough
	3	>65	2	28.60	Sufficient
	Sub-total		**7**	**100.00**	
Total			**46**		

To know the teaching skills, the status of training received by the teachers was analyzed. Out of total 46, 63% of the teachers have received some pre-service and in-service trainings such as Post Graduate Diploma Course in Teaching –PGDT, training courses on PAT, JAT, Quality of Basic Education-QBE, Lifelong Skill etc. conducted by Ministry of Education, UNICEF and Central Institute of Civil Service. The remaining 37% still remain untrained as mentioned below. Those includes 9 teachers (2 middle school teachers and 7 primary school teachers) hired by the villages.

Receiving Training	Middle School Teacher	Primary school Teacher	Total	%
Yes	5	24	29	63.00
No	2	15	17	37.00
Total	**7**	**39**	**46**	

Among the 29 teachers who had already received various types of trainings, 16 teachers (i.e. 55%) gave the answer that they obtained environmental knowledge from the trainings, but the other 13 (i.e.45%) expressed that they did not.

Apart from training, analysis on the sources from which teachers gain environmental knowledge showed that printed media was the first most highlighted source with highest frequency and followed by TV, radio, talks and self observation as mentioned in the following table.

Source of knowledge gain	frequency	%
Printed media	27	42.19
Radio	12	18.75
TV	17	26.56
Talks	7	10.94
Self observation	1	1.56
Total frequency	**64**	**100.00**

Note: some respondents gave more than one source

Concerning the teaching method, 41 teachers (89%) described their response that they have been using learner (student) centered approach, 7% teacher centered approach and 2% both. The remaining 2% did not express the response.

The results of self satisfaction on teaching environmental lessons by teachers, use of teaching aids in environmental lessons and Learning Outside the Classroom (LOtC) (Malone. K, 2008) regarding environmental themes, such as littering campaign, tree planting, excursion and study tours, are observed as follows:

Particulars	not at all	a few/little	moderate	quite	many/much
Self satisfaction on teaching environmental lessons	28.26%	21.74%	39.13%	6.52%	4.35%
Use of teaching aids in teaching environmental lessons	17.39%	36.96%	36.96%	6.52%	2.17%
Learning Outside the Classroom (LOtC)	13.33%	46.67%	31.11%	6.67%	2.22%

5.3. Assessment of needs for Non- formal Environmental Education

5.3.1. Evaluating level of knowledge, and attitudes of general audience

To make the EE program more successful, it is essential to know the knowledge level of different audiences. In education, the concept of one-size-fits-all is not a practical one. It is needed to adjust the level of information, methods of information dissemination, training techniques with respect to various audiences.

The socio-economic survey conducted by the consultant for buffer zone management covers environmental knowledge and attitudes of the local people. Those secondary data was used in analysis for assessing environmental knowledge and attitude of general audience, and to find out whether there is difference among the ethnic groups, gender, and age groups. It was known

that the secondary data was collected through interviews-cum-questionnaire to altogether 103 respondents from 9 villages by using random sampling method. Stokking, H., *et al.* (1999) advised to remove the certain respondents from data base if they have left a lot of questions unanswered or illegible. Out of 103, 5 respondents were omitted when analyzing because of no response to several questions. Ellen Taylor-Powell (1998) suggested that the recommended sample size to be 99 for the population of 7000-15000 at 10% precision level. Therefore, it can be assumed that the sample size of the secondary data was enough for the population of the TNRP area at 10% precision level, In order to make the data more representative, first-hand data was collected from 51 respondents of additional 4 villages, Kaleingaung, Michaunglaung (new), Kawhlaing and Kayinshinhtabi/Shanphan by using the same questionnaires (appendix-4.4) and method. Thus, the total sample size was 149 from 13 villages after omitting 5 respondents from the secondary data, (i.e. sample size of secondary data = 98, that of primary data=51). The composition of ethnicity, gender, age group in the sample is mentioned in the following tables.

Sr.	Ethnic group	No. sample	Remark
1	Dawei	68	
2	Karen	35	
3	Mon	30	
4	Bamar	10	
5	Other	6	Hybrid and 2 Rakhine
	Total	**149**	

Sr.	Gender	No. sample	Remark
1	Male	87	
2	Female	62	
	Total	**149**	

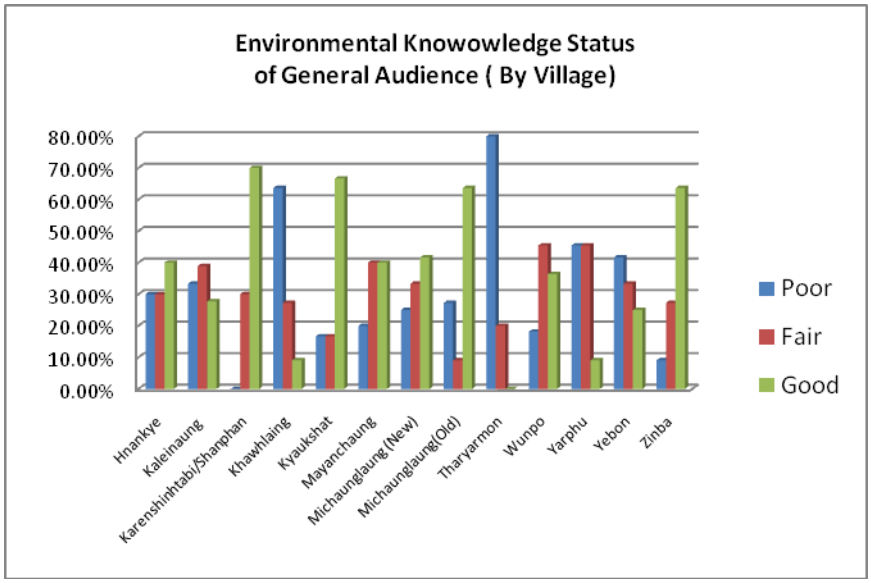
Sr.	Age group	No. sample	Remark
1	Below 40 years old	55	
2	40 years old and above	94	
	Total	**149**	

5.3.1.1. Environmental knowledge of general audience

To assess the basic environmental knowledge, the six statements (question No. 2 to 7) mentioned in the questionnaire (appendix-4.4) were read before them and asked for their response: “Yes” or “No” or “Don’t know”. Scoring was exercised by using binary system - each correct answer was given score “1” and the others “0”. The maximum score will be 6 because there are 6 questions (statements). As the statements are very fundamental, only the ones who obtained score 6 were assigned to level 3 (good) , the ones getting score 5 to level 2 (fair) and

below score 5 to level 1 (poor) . The results are expressed in percent with respect to the each level as follows:

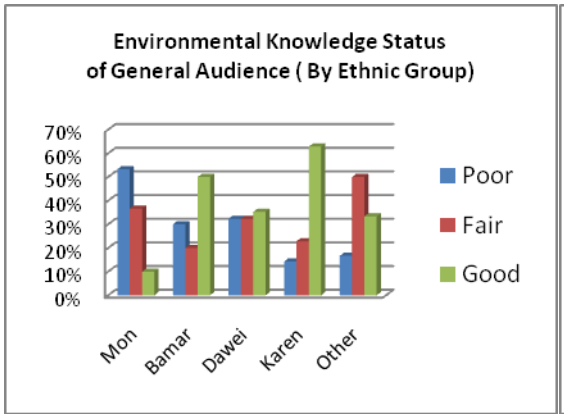
Sr.	Village	Knowledge level			Total
		1	2	3	
		Poor	Fair	Good	
1	Hnankye	30.00%	30.00%	40.00%	100.00%
2	Kaleinaung	33.33%	38.89%	27.78%	100.00%
3	Karenshinhtabi/Shanphan	0.00%	30.00%	70.00%	100.00%
4	Khawhlaing	63.64%	27.27%	9.09%	100.00%
5	Kyaukshat	16.67%	16.67%	66.67%	100.00%
6	Mayanchaung	20.00%	40.00%	40.00%	100.00%
7	Michaunglaung (New)	25.00%	33.33%	41.67%	100.00%
8	Michaunglaung(Old)	27.27%	9.09%	63.64%	100.00%
9	Tharyarmon	80.00%	20.00%	0.00%	100.00%
10	Wunpo	18.18%	45.45%	36.36%	100.00%
11	Yarphu	45.45%	45.45%	9.09%	100.00%
12	Yebon	41.67%	33.33%	25.00%	100.00%
13	Zinba	9.09%	27.27%	63.64%	100.00%
	Grand Total	**31.54%**	**30.87%**	**37.58%**	**100.00%**

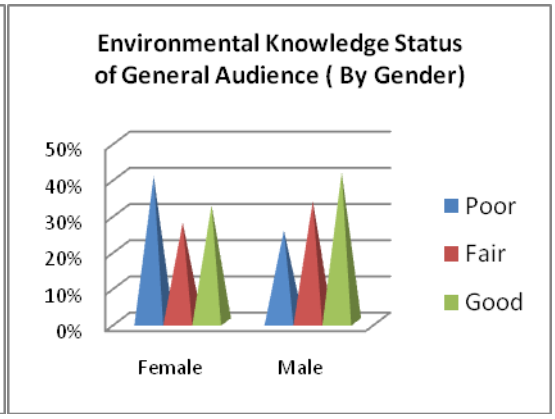


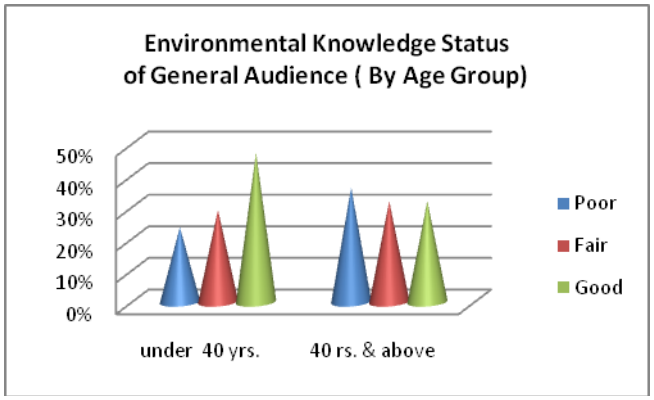
r.	Ethnic group	Knowledge level			Total
		1	2	3	
		Poor	Fair	Good	
1	Mon	53.33%	36.67%	10.00%	100.00%
2	Bamar	30.00%	20.00%	50.00%	100.00%
3	Dawei	32.35%	32.35%	35.29%	100.00%
4	Karen	14.29%	22.86%	62.86%	100.00%
5	Other	16.67%	50.00%	33.33%	100.00%
	Grand Total	**31.54%**	**30.87%**	**37.58%**	**100.00%**

Sr.	Gender	Knowledge level			Total
		1	2	3	
		Poor	Fair	Good	
1	Female	40.32%	27.42%	32.26%	100.00%
2	Male	25.29%	33.33%	41.38%	100.00%
	Grand Total	**31.54%**	**30.87%**	**37.58%**	**100.00%**

Sr.	Age group	Knowledge level			Total
		1	2	3	
		Poor	Fair	Good	
1	Under 40 years old	23.64%	29.09%	47.27%	100.00%
2	40 years old & above	36.17%	31.91%	31.91%	100.00%
	Grand Total	**31.54%**	**30.87%**	**37.58%**	**100.00%**







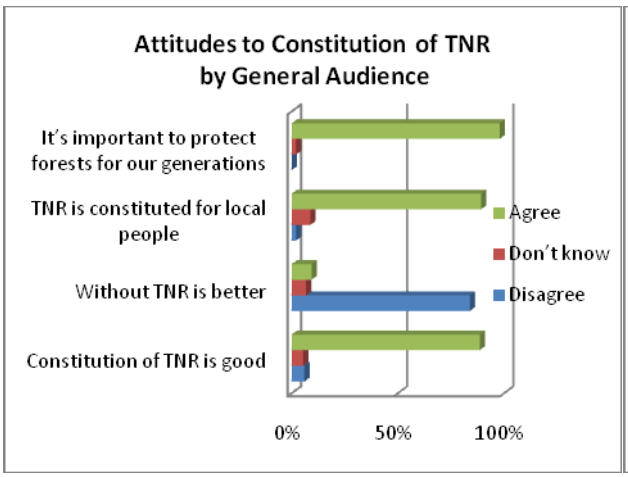
5.3.1.2. Aware of TNR boundary and prohibitions by general audience

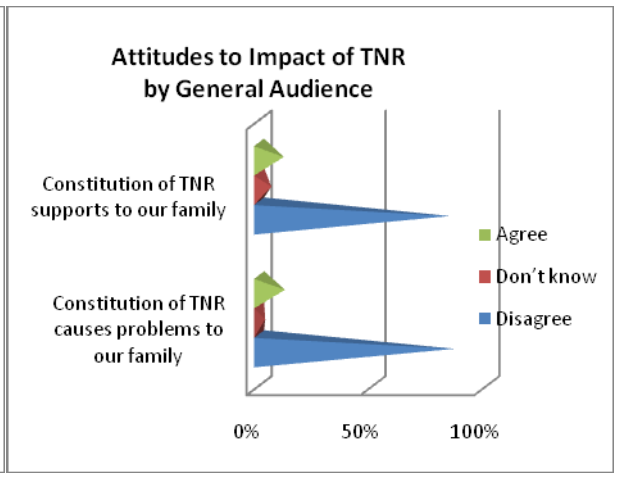
Concerning on being aware of TNR boundary and prohibitions, the result indicated that 40.94% of respondents knew very well about that there was TNR near their village and its boundary, but the remaining 59.06% did not so. Similarly, it was observed that 29.25% were quite aware of prohibitions of TNR, but 70.75% were not. Probably, this is partially because of being late in completion of boundary demarcation activities under some constraints and another probable reason may be the awareness talks/ discussions less emphasized on this portion. The details result by villages is mentioned in appendix1.1.

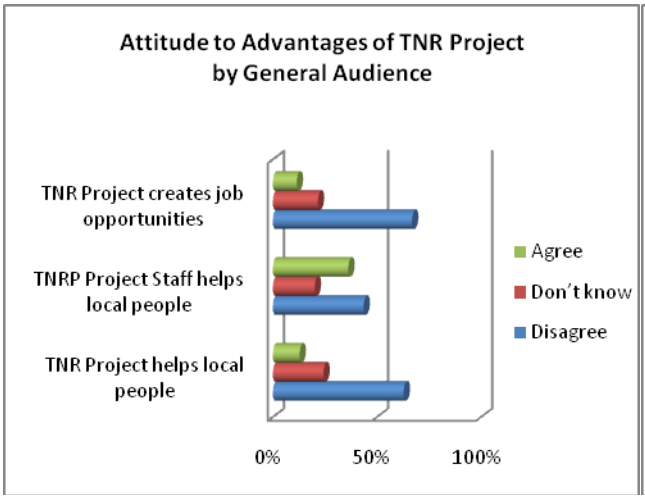
5.3.1.3. Attitudes of general audience

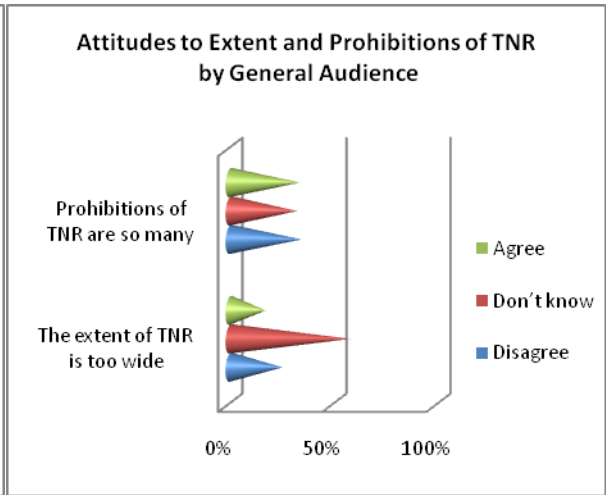
The questionnaire (appendix-4.4) consists of five parts related to attitudes. They are attitudes to constitution of TNR, impact of TNR, advantages of TNR, resource use and extent and prohibitions of TNR. Altogether, there are 16 statements reflecting attitudes in five parts. The summary of responses reflecting attitudes by local people is described in the following table and the attitudes in detail by village, by ethnic group, by gender, by age group is provided in the appendix-1.2.

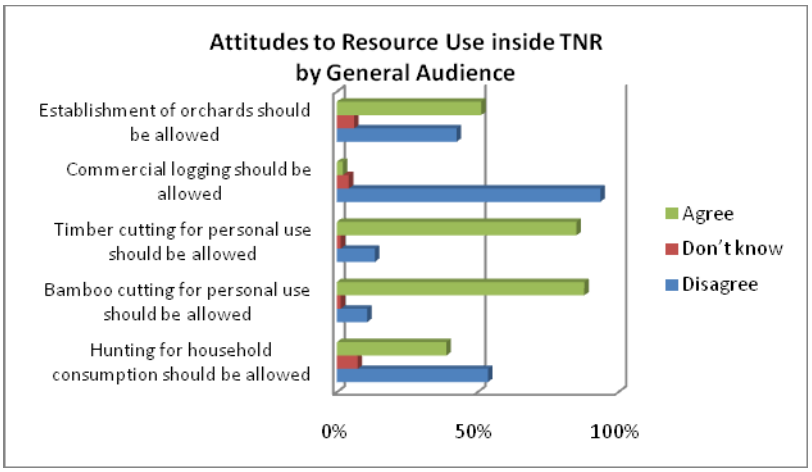
Sr.	Statement	Disagree	Don't know	Agree
1.0	***Attitudes to constitution of TNR***			
1.1	Constitution of TNR is good	6.04%	5.37%	88.59%
1.2	Without TNR is better	83.89%	6.71%	9.40%
1.3	TNR is constituted for local people	2.03%	8.78%	89.19%
1.4	It's important to protect forests for our generations	0.00%	2.04%	97.96%
2.0	***Attitude to impact of TNR***			
2.1	Constitution of TNR causes problems to our family	85.91%	2.68%	11.41%
2.2.	Constitution of TNR supports to our family	83.78%	5.41%	10.81%
3.0	***Attitude to Advantages of TNR Project***			
3.1	TNR Project helps local people	62.84%	24.32%	12.84%
3.2	TNRP Project Staff helps local people	43.62%	20.13%	36.24%
3.3	TNR Project creates job opportunities	66.89%	21.62%	11.49%
4.0	***Attitudes to resource use inside TNR***			
4.1	Hunting for household consumption should be allowed	53.69%	7.38%	38.93%
4.2	Bamboo cutting for personal use should be allowed	10.74%	1.34%	87.92%
4.3	Timber cutting for personal use should be allowed	13.51%	1.35%	85.14%
4.4	Commercial logging should be allowed	93.66%	4.23%	2.11%
4.5	Establishment of orchards should be allowed	42.57%	6.08%	51.35%
5.0	***Attitudes to extent and prohibitions of TNR***			
5.1	The extent of TNR is too wide	25.17%	57.82%	17.01%
5.2	Prohibitions of TNR are so many	34.25%	32.19%	33.56%


Attitudes to Constitution of TNR
by General Audience
It's important to protect forests for our generations
TNR is constituted for local people
Without TNR is better
Constitution of TNR is good
Agree
Don't know
Disagree
0%
50%
100%


Attitudes to Impact of TNR
by General Audience
Constitution of TNR supports to our family
Constitution of TNR causes problems to our family
Agree
Don't know
Disagree
0%
50%
100%


Attitude to Advantages of TNR Project
by General Audience
TNR Project creates job opportunities
TNRP Project Staff helps local people
TNR Project helps local people
Agree
Don't know
Disagree
0%
50%
100%


Attitudes to Extent and Prohibitions of TNR
by General Audience
Prohibitions of TNR are so many
The extent of TNR is too wide
Agree
Don't know
Disagree
0%
50%
100%


Attitudes to Resource Use inside TNR
by General Audience
Establishment of orchards should be allowed
Commercial logging should be allowed
Timber cutting for personal use should be allowed
Bamboo cutting for personal use should be allowed
Hunting for household consumption should be allowed
Agree
Don't know
Disagree
0%
50%
100%

5.3.1.4. Analysis on variance

Statistical analysis was performed to assess whether there is difference on general environmental knowledge between different ethnic groups, gender and age groups using student's *"t"* test. The tables below reveal the mean score of environmental knowledge and standard deviation with respect to ethnic groups, gender, age groups.

Sr.	Ethnic group	Mean score on environmental knowledge	Standard deviation
1	Dawei	4.66	1.43
2	Karen	5.26	1.36
3	Mon	4.07	1.34
4	Bamar	5.00	1.33
5	Other	5.17	0.75

Sr.	Gender	Mean score on environmental knowledge	Standard deviation
1	Female	4.44	1.58
2	Male	4.93	1.25

Sr.	Age group	Mean score on environmental knowledge	Standard deviation
1	Below 40 years old	5.05	1.24
2	40 years old and above	4.53	1.48

The findings of analysis on variance using student's *"t"* test is mentioned in the following tables.

Sr.	Comparison	*d.f*	*"t"* value	"p" value	Remark
1	Karen vs Dawei	147	2.069	0.042	* significance
2	Karen vs Mon	147	3.553	0.001	** significance
3	Karen vs Bamar	147	0.536	0.600	no significance
4	Bamar vs Dawei	147	0.742	0.472	no significance
5	Bamar vs Mon	147	1.916	0.074	no significance
6	Dawei vs Mon	147	1.987	0.052	*significance

Sr.	Comparison	*d.f*	*"t"* value	"p" value	Remark
1	Male vs Female	147	2.031	0.043	* significance

Sr.	Comparison	*d.f*	*"t"* value	"p" value	Remark
1	< 40 yrs vs 40 yrs & >	147	2.311	**0.022**	* significance

The result indicated that there were significant differences on basic environmental knowledge of Karen vs Dawei, Dawei vs Mon ethnic group at 95% confidence level, and between Karen and Mon at 99.9% confidence level. However, there is no significance between Karen vs Bamar, Bamar vs Dawei and Bamar Vs Mon. With respect to gender and age groups, it was observed that there were significant differences between knowledge of the male and female; between age groups of < 40 years old Vs 40 years and above at 95% confidence level.

The main probable reason of difference may arise from poor access to the formal education. Analytical statistics of educational access can be seen below.

Ethnic /gender/Age group	Accessibility to Formal Education			
	Basic Education (Primary, Middle, High)	Advanced (University)	Not accessible	Total
Ethnic group				
Mon	33.33%	0.00%	66.67%	100.00%
Bamar	80.00%	0.00%	20.00%	100.00%
Dawei	54.41%	4.41%	41.18%	100.00%
Karen	62.86%	0.00%	37.14%	100.00%
Gender				
Female	51.61%	4.84%	43.55%	100.00%
Male	57.47%	1.15%	41.38%	100.00%
Age group				
< 40 yrs	65.45%	5.45%	29.09%	100.00%
40 yrs & >	48.94%	1.06%	50.00%	100.00%

Generally, the rate of lack of access to formal education was found much higher in Mon ethnic group than others, representing 66.67% in Mon, 20.00% in Bamar, 41.18% in Dawei and 37.14% in Karen. Another possible reason may be the intervention under the socio-economic program of MGTC. Mon villages are located out of the pipeline corridor and they did not enjoy the educational care, like some Karen villages of Michaunglaung and Zinba, under the development programme of the said company. Although the rate of lack of access to formal education is not different between female and male, it was found quite different between age groups of < 40 yrs vs 40 yrs and above, representing 29.09% and 50.00% respectively. This may also one of the contributing factors affecting on difference in environmental knowledge between two age groups.

The another statistical analysis has been done to know the impact of awareness programme of TNRP by analyzing whether there is significance between knowledge of people who have attended the awareness talks/discussions and those who have not. The result has shown that it is statistically significant between the two groups at 95% confidence level. Therefore, it can be concluded that the awareness programme of TNRP has some positive impacts on the enhancement of knowledge of local people at 95% confidence level.

Sr.	Comparison	*d.f*	*"t"* value	"p" value	Remark
1	Attendees to awareness program vs those without attendance	146	2.223	0.028	* significance

Note: d.f = 146, because one respondent did not give response

5.3.1.5. Coefficient of correlation between knowledge and attitude

This analysis was carried out to assess whether there was correlation between knowledge and attitudes to constitution of TNR; impact of TNR; advantages of TNR; and the extent and prohibitions of TNR. The attitudes to natural resource use were excluded in this statistical analysis and just descriptive analysis was done for that. The attitudes of the respondents were given score: "-1" was given to negative attitude, "0" to neutral or don't know and "1" to positive attitude. Then, the coefficient of correlation between knowledge and attitude was worked out and it was found to be 0.31. According to the finding, it could be concluded that knowledge was not strongly correlated with attitude. Thus, just improving the knowledge is not enough for the desired attitudes leading to the better behaviors.

5.3.1.6. Ranking the villages based on knowledge level and attitudes of the villagers (General Audience)

In order to assign ranks to the villages based on the knowledge and attitudes of villagers, the scoring exercise was performed. Firstly, the weighed scores were worked out by multiplying the percent representing the each knowledge level and the respective assigned weight (1 for "poor", 2 for "fair" and 3 for 'good"). Then, the total weighed scores for the individual village were worked out and the ranks were also assigned based on the total weighed scores (appendix-1.3).

Similarly, attitudes of villagers were also assigned the scores in such a way that "-1" was given to negative attitude, "0" to neutral or don't know and "1" to positive attitude. The weighed scores were calculated by multiplying the percents representing the attitudes of villagers and the respective scores. Then total weighed scores of attitudes for the individual villages were computed and the ranking was also given in appendix-1.4.

Finally, the summation of total weighed scores of knowledge and attitudes were worked out and the overall ranks were given to the individual village based on the knowledge and attitude. The ranking based on knowledge level and attitude by villages were provided in appendix-1.5.

5.3.2. Need Assessment among targeted villages with major threats

Like other protected areas, Taninthayi Nature Reserve also encounters several threats and issues. A workshop on the Management Framework and Conservation Workplan for the Taninthayi Nature Reserve was organized in early 2008. The workshop had formulated the management framework and component conservation strategies. The following threats were identified as major ones to the nature reserve during the workshop:

1) Hunting for subsistence
2) Hunting for trade
3) Forest fires causing landslides
4) Illegal logging
5) Shifting cultivation causing landslides
6) Village encroachment

Environmental education is the one of the intervention strategies in addressing the issues encountered in the TNRP area and in mitigating the above mentioned threats. Although several threats have been identified, some are interrelated to each other and have a very narrow margin to distinguish one from another. For example, some villagers are living on shifting cultivation while they are hunting. Although their intention is primarily for subsistence hunting, they usually sell the some surplus bush meat after family consumption. In addition, shifting cultivators use fire for burning vegetation cut down for agricultural purpose and this also contribute to forest fire. For this reason, the main targeted threats are regrouped into two in this assessment.

1) Shifting cultivation/ forest fire/ hunting

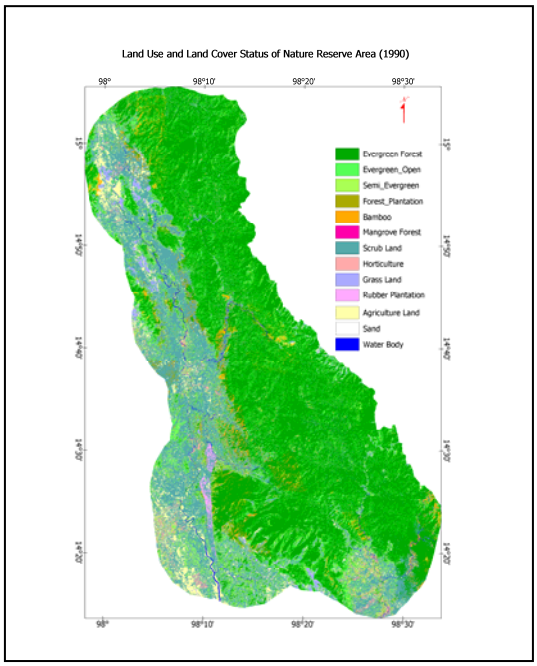
2) Illegal logging

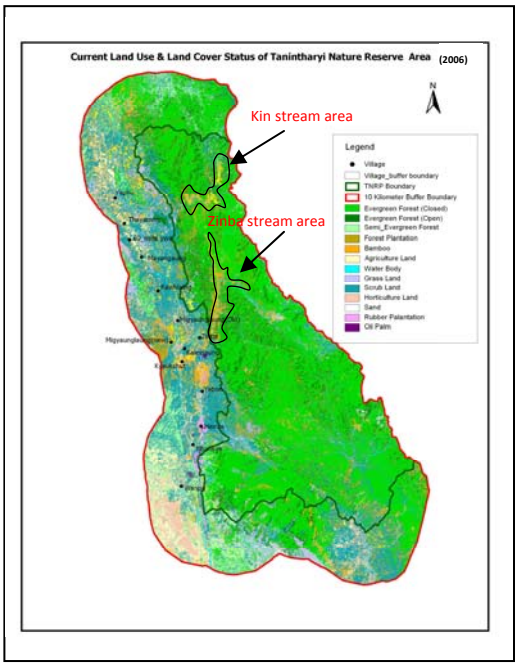
Firstly, the prioritized target villages with the major threats were selected to identify the need for EE. Based on the data recorded and information available at TNRP office, the following selection criteria were set up:

1) The area with distinct land use change between a particular period (1990-2006)

2) The highest frequency in forest offences against illegal logging

The information on shifting cultivation and land use change were obtained not only through comparison between the land use maps of 1990 and 2006 but also from field observation. In the northern part of the nature reserve area, significant land use changes occurred along the Kin stream is visually noticeable on the classified land use map between the said periods. In fact, Mon ceasefire group (New Mon State Party) is dwelling in this area and the access is limited in term of security concern. According to the information received through discussion with some villagers from Yaphu village, those villages are widely involved in illegal logging, agricultural expansion and hunting as well. Usually, the extracted logs and timber are transported by means of water along the Kin stream during the rainy season to reach the landing at Dawei River, and trucked them out by road transport. However, trucks are mainly used for carrying timber to Mawlamyaing during the dry season. Similarly, another significant change occurs along Zinba stream. The villagers practicing their livelihood in this area are from Michaunglaung and Zinba villages.





According to the data obtained from TNRP office, the forest offences against illegal logging were summarized in the table. The highest frequency of illegal logging case and amount of seized timber are linked with Zinba and Hnankye villages.

Sr.	Village	No. of case	Ton	Remark
1	Kaleinaung (Block -1)	1	1.53	
2	Michaunglaung (New)	1	0.84	
3	Hnan Kye	2	9.14	
4	Ziba	3	4.49	One case of unidentified owner in the vicinity of Zinba
5	Yebon	2	2.13	
6	Kyaukshat	1	4.15	Donated timber to Monastry
	Total	**10**	**22.29**	

Based on the above mentioned criteria, the three targeted villages with high threats to nature reserve were selected as follows:

Sr	Village	Main threats
1	Zinba	Shifting cultivation/taungya, forest fire, hunting, illegal logging
2	Michaunglaung (Old)	Shifting cultivation, forest fire, hunting,
3	Hnankye	Illgeal logging

But, this study does not cover the Mon villages established by NMSP because of security concern although it is believed that there are high threats to the TNR.

A suggested procedure for conducting a participatory assessment of problems and needs is through a baseline survey on beneficiaries' Knowledge, Attitude and Practice (KAP) with respect to specific and critical forms of behaviors and key factors (OECD, 1999).Therefore, this study has been carried out to evaluate the knowledge, attitude and practice of above mentioned targeted groups using prepared questionnaires (appendix-4.4, 4.5, 4.6, 4.7) along with interview method.

In order to assess the knowledge and attitude of the *taungya* cutters, the list of shifting cultivators in the village was collected. According to the data collected from head of the old Michaunglaung village, there are 21 shifting cultivators including three from new Michaunglaung village who are currently practicing *taungya* in the old Michaunglaug area. Through the discussion with villagers, it was noted that this year the number of shifting cultivators decline in Michaunglaung because some villagers engaged in preparation for religious affairs *(Dha-ma-tha-bin)* and they could not afford for t*aungya* cutting in time. Out of 21 shifting cultivators, interview was made to 16 for the assessment of their environmental knowledge, attitudes and the practices which they adopted. The remaining cultivators could not be interviewed because they are reaping *taungya* paddy by that time. One of issues related to the shifting cultivation is forest fire. Improper use of fire in slash and burn practice could lead to forest fire by spreading to the adjacent forests exerting high risks to the forest ecosystem. In addition, there is a potential to extend and encroach the practice towards or inside the nearby forest when the fallow period is relatively short resulting soil fertility declines. For this reasons, the attention was paid to assess the practice on fire use, fallow period, maintaining soil fertility when interview was made to shifting cultivators.

Information on livelihood options of Zinba villagers was collected through the head of village. According to the discussion made with head of Zinba village, the number of shifting cultivator using fallow system is very few in Zinba and the majority of *taungya* cutters used the *taungya* method for cultivating and extending their orchards rather than shifting cultivation with fallow system. It is noted that are over 40 *taungya*-based orchard cultivators from Zinba who practice inside or at the edge of the TNR boundary. Of them, 13 were interviewed for assessing their knowledge, attitude and practices.

Concerning the illegal logging, 13 timber and bamboo cutters from Zinba and 15 from Hnankye were made interviews. Those two groups were separately analyzed because Zinba and Hnankye villages are different in livelihood background and racial composition (i.e. Zinba is heterogeneous in ethnicity-Karen, Dawei, Mon, Bamar, where as Hnankye is a Dawei village).

The hunters were selected from the groups of shifting cultivators, *taungya*-based orchard cultivators and timber and bamboo cutters. Altogether, 12 hunters from those groups were asked some questions related to hunting practices.

The number of respondents with respect to different target groups was summarized as follows:

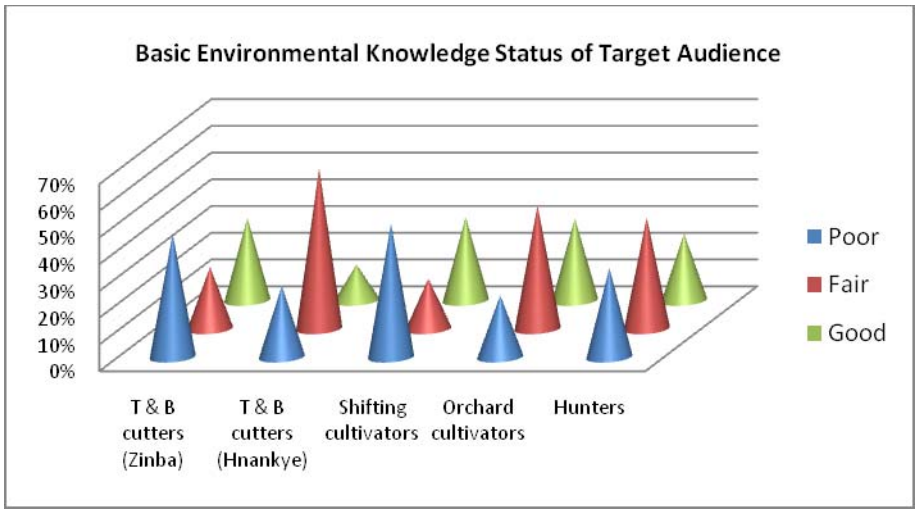
Target Goups	Number of interviewee	Remarks
Timber and Bamboo cutters (Zinba)	13	
Timber and Bamboo cutters (Hnankye)	15	
Shifting cultivators (Michauglaung)	16	
Taungya-based orchard cultivators (Zinba)	13	
Hunters (Zinba and Michaunglaung)	12	Selected from above groups

5.3.2.1 Assessment on environmental knowledge and attitudes by targeted audience

The same questionnaire and scoring exercise used in assessment on general audience was applied for evaluating knowledge level of targeted groups. But, no statistical analysis was performed and the descriptive results in percent with respect to the knowledge level and attitude perceived by targeted groups are shown in the following tables.

Basic environmental knowledge of targeted audience

Target Goups	Knowledge level		
	1	2	3
	Poor	Fair	Good
Timber and Bamboo cutters (Zinba)	46.15%	23.08%	30.77%
Timber and Bamboo cutters (Hnankye)	26.67%	60.00%	13.33%
Shifting cultivators (Michauglaung)	50.00%	18.75%	31.25%
Taungya-based orchard cultivators (Zinba)	23.08%	46.15%	30.77%
Hunters (Zinba and Michaunglaung)	33.33%	41.67%	25.00%



Aware of TNR boundary and prohibitions by targeted audience

Particulars	Timber and Bamboo cutters (Zinba)			Timber and Bamboo cutters (Hnankye)		
	Don't know	Have heard (or) know little	Know well	Don't know	Have heard (or) know little	Know well
Aware of TNR boundary	7.69%	30.77%	61.54%	26.67%	13.33%	60.00%
Aware of prohibitions inside the TNR	-	46.15%	53.85%	26.67%	26.67%	46.67%

Particulars	Shifting cultivators (Michauglaung)			*Taungya*-based orchard cultivators (Zinba)		
	Don't know	Have heard (or) know little	Know well	Don't know	Have heard (or) know little	Know well
Aware of TNR boundary	37.50%	56.25%	6.25%	7.69%	92.31%	-
Aware of prohibitions inside the TNR	62.50%	25.00%	12.50%	23.08%	76.92%	-

Particulars	Hunters (Zinba and Michaunglaung)		
	Don't know	Have heard (or) know little	Know well
Aware of TNR boundary	8.33%	75.00%	16.67%
Aware of prohibitions inside the TNR	33.33%	41.67%	25.00%

Attitudes of targeted audience (Timber and Bamboo cutters)

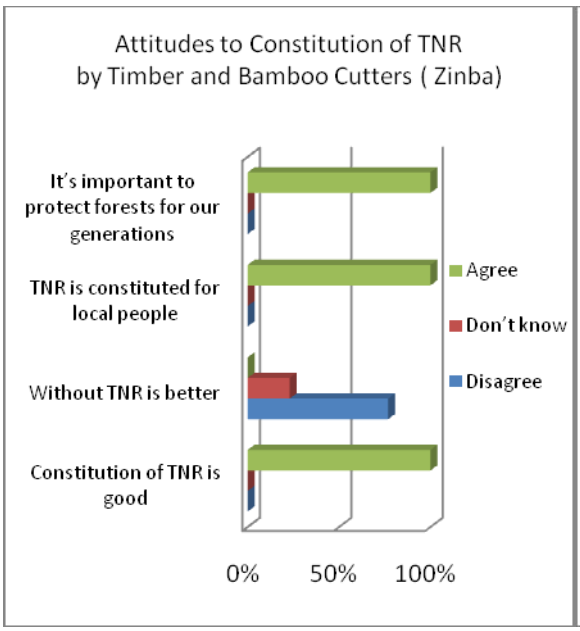
Sr.	Statement	Timber and Bamboo cutters (Zinba)			Timber and Bamboo cutters (Hnankye)		
		Disagree	Don't know	Agree	Disagree	Don't know	Agree
1.0	***Attitudes to constitution of TNR***						
1.1	Constitution of TNR is good	-	-	100.00%	40.00%	13.33%	46.67%
1.2	Without TNR is better	76.92%	23.08%	-	46.67%	26.67%	26.67%
1.3	TNR is constituted for local people	-	-	100.00%	6.67%	6.67%	86.67%
1.4	It's important to protect forests for our generations	-	-	100.00%	-	-	100.00%
2.0	***Attitude to impact of TNR***						
2.1	Constitution of TNR causes problems to our family	69.23%	-	30.77%	6.67%	-	93.33%
2.2.	Constitution of TNR supports to our family	100.00%	-	-	100.00%	-	-
3.0	***Attitude to Advantages of TNR Project***						
3.1	TNR Project helps local people	76.92%	23.08%	-	100.00%	-	-
3.2	TNRP Project Staff helps local people	53.85%	15.38%	30.77%	93.33%	-	6.67%
3.3	TNR Project creates job opportunities	76.92%	7.69%	15.38%	100.00%	-	-
4.0	***Attitudes to resource use inside TNR***						
4.1	Hunting for household consumption should be allowed	53.85%	-	46.15%	20.00%	6.67%	73.33%
4.2	Bamboo cutting for personal use should be allowed	-	-	100.00%	-	-	100.00%
4.3	Timber cutting for personal use should be allowed	-	-	100.00%	-	-	100.00%
4.4	Commercial logging should be allowed	83.33%	8.33%	8.33%	40.00%	6.67%	53.33%
4.5	Establishment of orchards should be allowed	15.38%	-	84.62%	-	13.33%	86.67%
5.0	***Attitudes to extent and prohibitions of TNR***						
5.1	The extent of TNR is too wide	15.38%	76.92%	7.69%	13.33%	33.33%	53.33%
5.2	Prohibitions of TNR are so many	15.38%	69.23%	15.38%	-	6.67%	93.33%

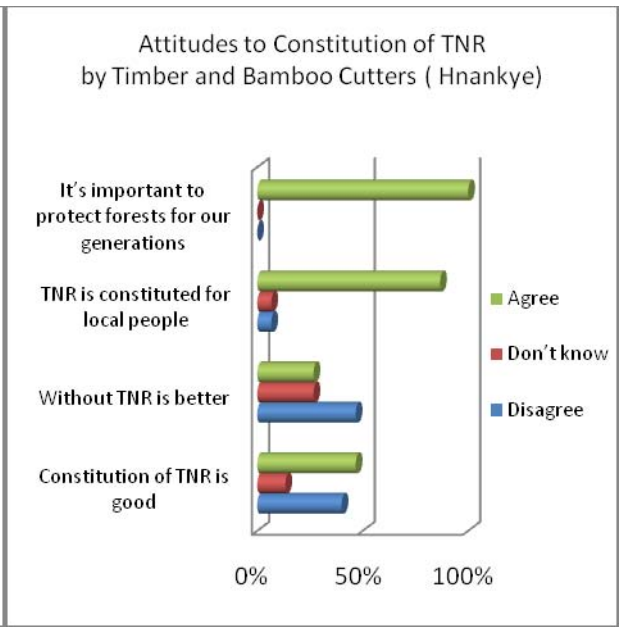
Attitudes of targeted audience (shifting cultivators and taungya-based orchard cultivators)

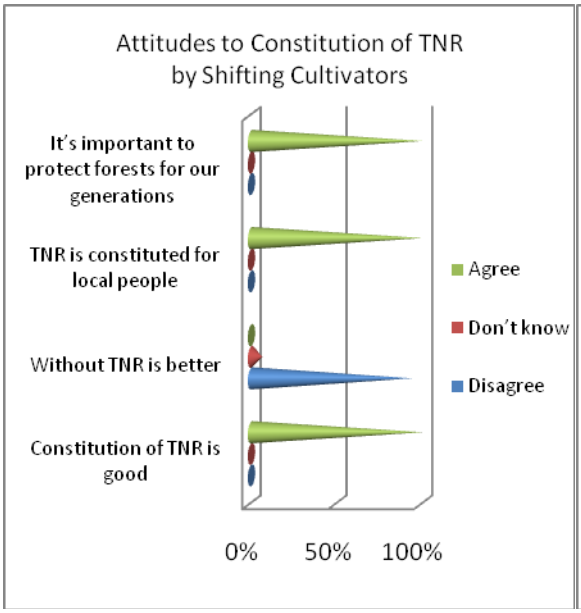
Sr.	Statement	Shifting cultivators (Michauglaung)			*Taungya*-based orchard cultivators (Zinba)		
		Disagree	Don't know	Agree	Disagree	Don't know	Agree
1.0	***Attitudes to constitution of TNR***						
1.1	Constitution of TNR is good	-	-	100.00%	7.69%	7.69%	84.62%
1.2	Without TNR is better	93.75%	6.25%	-	84.62%	15.38%	-
1.3	TNR is constituted for local people	-	-	100.00%	7.69%	-	92.31%
1.4	It's important to protect forests for our generations	-	-	100.00%	-	-	100.00%
2.0	***Attitudes to impact of TNR***						
2.1	Constitution of TNR causes problems to our family	93.75%	-	6.25%	69.23%	-	30.77%
2.2.	Constitution of TNR supports to our family	93.75%	-	6.25%	92.31%	7.69%	-
3.0	***Attitudes to Advantages of TNR Project***						
3.1	TNR Project helps local people	87.50%	6.25%	6.25%	100.00%	-	-
3.2	TNRP Project Staff helps local people	56.25%	12.50%	31.25%	100.00%	-	-
3.3	TNR Project creates job opportunities	68.75%	6.25%	25.00%	100.00%	-	-
4.0	***Attitudes to resource use inside TNR***						
4.1	Hunting for household consumption should be allowed	56.25%	-	43.75%	15.38%	7.69%	76.92%
4.2	Bamboo cutting for personal use should be allowed	12.50%	-	87.50%	7.69%	-	92.31%
4.3	Timber cutting for personal use should be allowed	12.50%	-	87.50%	7.69%	-	92.31%
4.4	Commercial logging should be allowed	93.75%	-	6.25%	92.31%	-	7.69%
4.5	Establishment of orchards should be allowed	43.75%	6.25%	50.00%	30.77%	-	69.23%
5.0	***Attitudes to extent and prohibitions of TNR***						
5.1	The extent of TNR is too wide	12.50%	87.50%	-	53.85%	30.77%	15.38%
5.2	Prohibitions of TNR are so many	18.75%	81.25%	-	46.15%	38.46%	15.38%

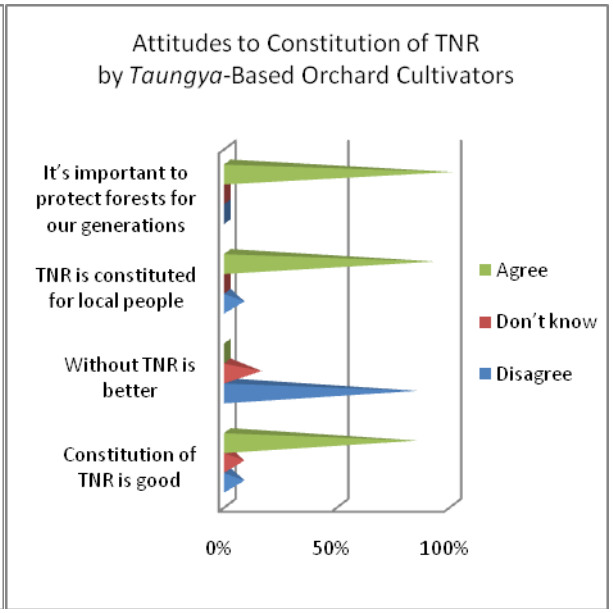
Attitudes of targeted audience (Hunters)

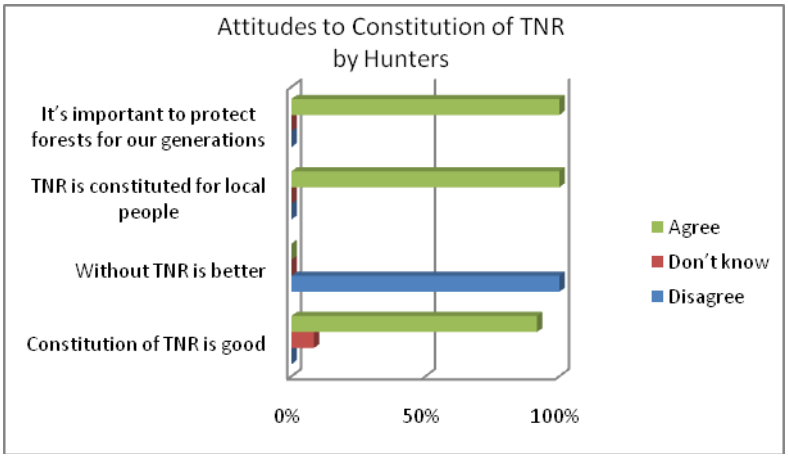
Sr.	Statement	Hunters (Zinba and Michaunglaung)		
		Disagree	Don't know	Agree
1.0	***Attitudes to constitution of TNR***			
1.1	Constitution of TNR is good	-	8.33%	91.67%
1.2	Without TNR is better	100.00%	-	-
1.3	TNR is constituted for local people	-	-	100.00%
1.4	It's important to protect forests for our generations	-	-	100.00%
2.0	***Attitudes to impact of TNR***			
2.1	Constitution of TNR causes problems to our family	69.23%	-	30.77%
2.2.	Constitution of TNR supports to our family	92.31%	7.69%	-
3.0	***Attitudes to Advantages of TNR Project***			
3.1	TNR Project helps local people	83.33%	-	16.67%
3.2	TNRP Project Staff helps local people	83.33%	-	16.67%
3.3	TNR Project creates job opportunities	100.00%	-	-
4.0	***Attitudes to resource use inside TNR***			
4.1	Hunting for household consumption should be allowed	25.00%	-	75.00%
4.2	Bamboo cutting for personal use should be allowed	-	-	100.00%
4.3	Timber cutting for personal use should be allowed	-	-	100.00%
4.4	Commercial logging should be allowed	91.67%	-	8.33%
4.5	Establishment of orchards should be allowed	33.33%	-	66.67%
5.0	***Attitudes to extent and prohibitions of TNR***			
5.1	The extent of TNR is too wide	33.33%	66.67%	-
5.2	Prohibitions of TNR are so many	33.33%	58.33%	8.33%

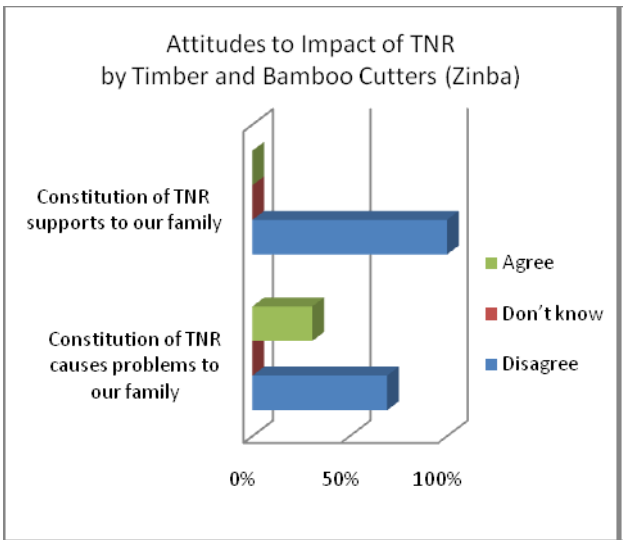

Attitudes to Constitution of TNR
by Timber and Bamboo Cutters (Zinba)
It's important to protect forests for our generations
TNR is constituted for local people
Without TNR is better
Constitution of TNR is good
Agree
Don't know
Disagree
0%
50%
100%

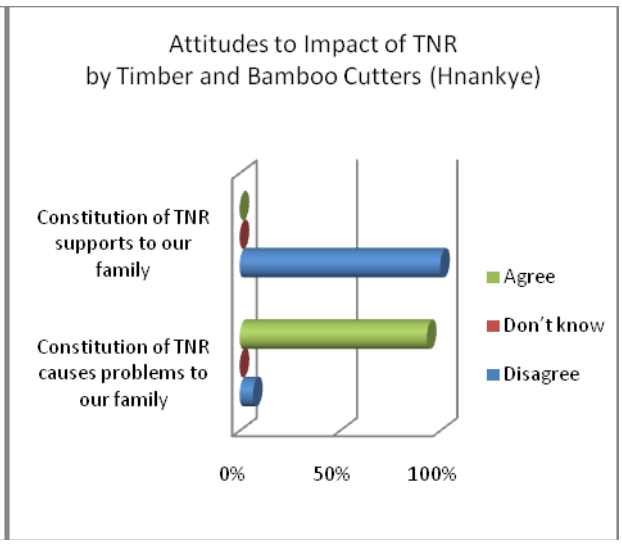

Attitudes to Constitution of TNR
by Timber and Bamboo Cutters (Hnankye)
It's important to protect forests for our generations
TNR is constituted for local people
Without TNR is better
Constitution of TNR is good
Agree
Don't know
Disagree
0%
50%
100%

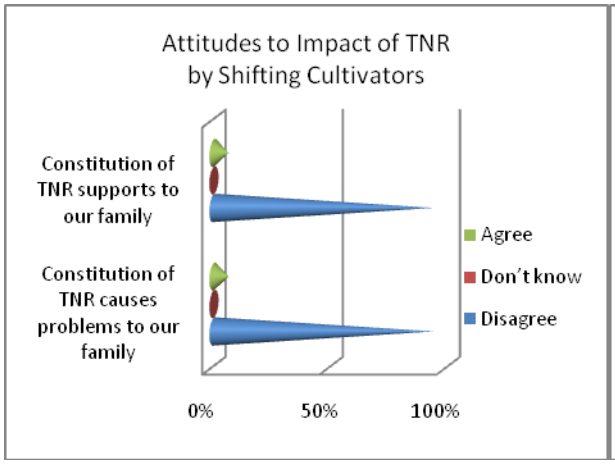

Attitudes to Constitution of TNR
by Shifting Cultivators
It's important to protect forests for our generations
TNR is constituted for local people
Without TNR is better
Constitution of TNR is good
Agree
Don't know
Disagree
0%
50%
100%

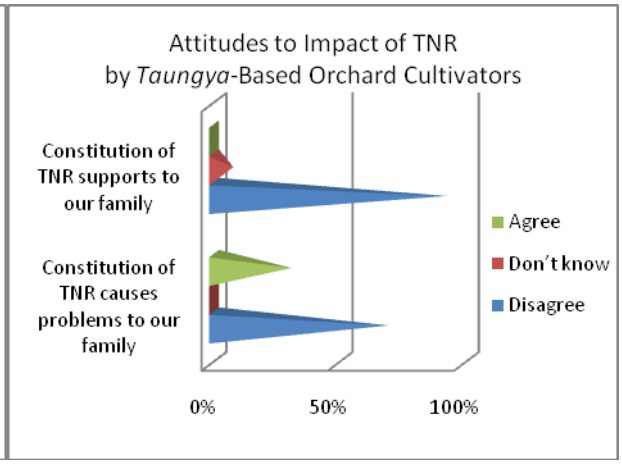

Attitudes to Constitution of TNR
by Taungya-Based Orchard Cultivators
It's important to protect forests for our generations
TNR is constituted for local people
Without TNR is better
Constitution of TNR is good
Agree
Don't know
Disagree
0%
50%
100%

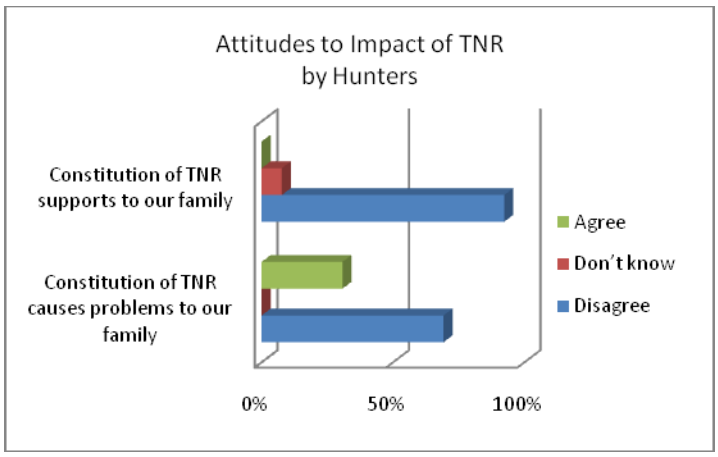

Attitudes to Constitution of TNR
by Hunters
It's important to protect forests for our generations
TNR is constituted for local people
Without TNR is better
Constitution of TNR is good
Agree
Don't know
Disagree
0%
50%
100%

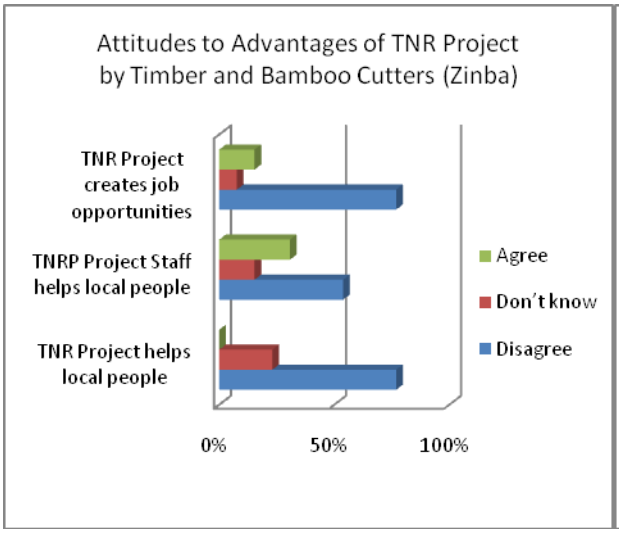

Attitudes to Impact of TNR
by Timber and Bamboo Cutters (Zinba)
Constitution of TNR supports to our family
Constitution of TNR causes problems to our family
Agree
Don't know
Disagree
0%
50%
100%

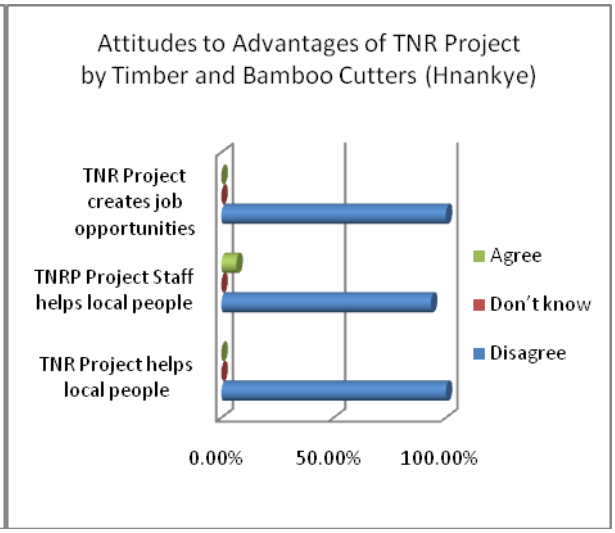

Attitudes to Impact of TNR
by Timber and Bamboo Cutters (Hnankye)
Constitution of TNR supports to our family
Constitution of TNR causes problems to our family
Agree
Don't know
Disagree
0%
50%
100%

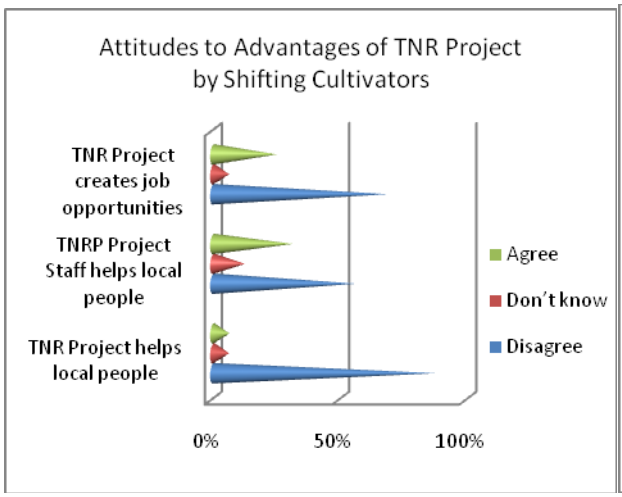

Attitudes to Impact of TNR
by Shifting Cultivators
Constitution of TNR supports to our family
Constitution of TNR causes problems to our family
Agree
Don't know
Disagree
0%
50%
100%

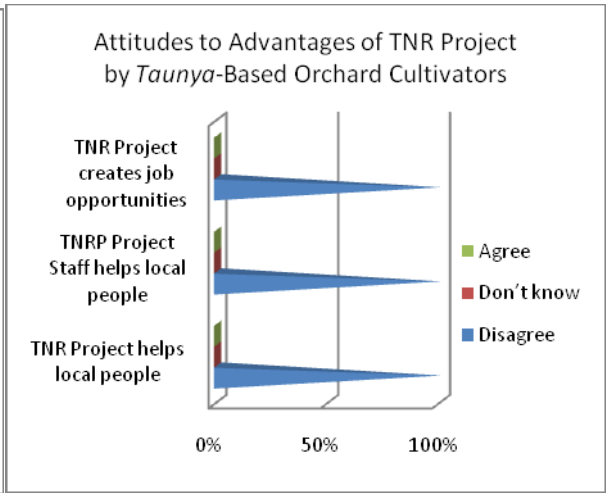

Attitudes to Impact of TNR
by Taungya-Based Orchard Cultivators
Constitution of TNR supports to our family
Constitution of TNR causes problems to our family
Agree
Don't know
Disagree
0%
50%
100%

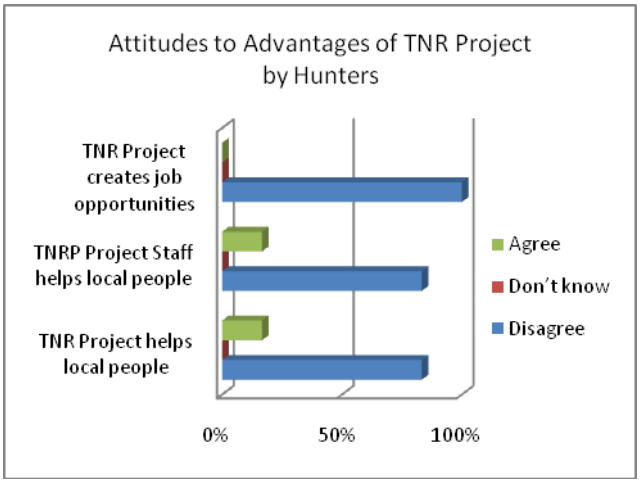

Attitudes to Impact of TNR
by Hunters
Constitution of TNR supports to our family
Constitution of TNR causes problems to our family
Agree
Don't know
Disagree
0%
50%
100%

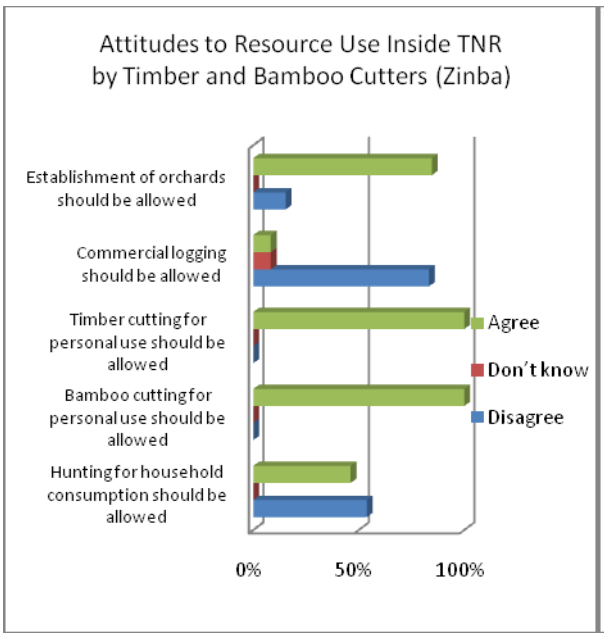

Attitudes to Advantages of TNR Project by Timber and Bamboo Cutters (Zinba)
TNR Project creates job opportunities
TNRP Project Staff helps local people
TNR Project helps local people
Agree
Don't know
Disagree
0%
50%
100%

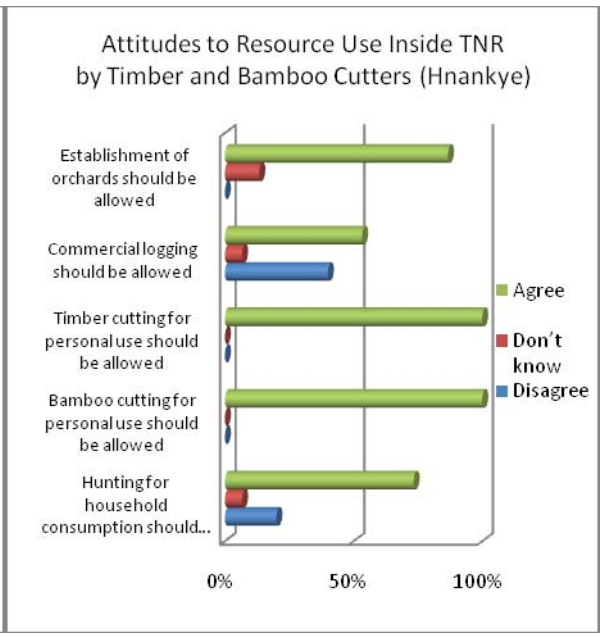

Attitudes to Advantages of TNR Project by Timber and Bamboo Cutters (Hnankye)
TNR Project creates job opportunities
TNRP Project Staff helps local people
TNR Project helps local people
Agree
Don't know
Disagree
0.00%
50.00%
100.00%

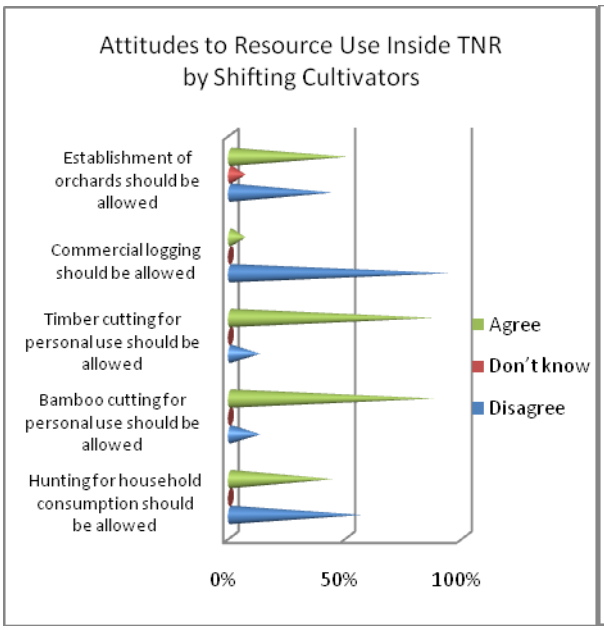

Attitudes to Advantages of TNR Project by Shifting Cultivators
TNR Project creates job opportunities
TNRP Project Staff helps local people
TNR Project helps local people
Agree
Don't know
Disagree
0%
50%
100%

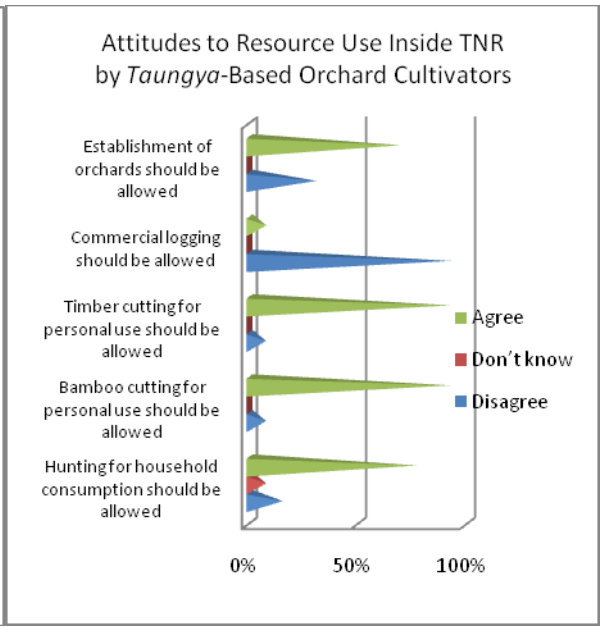

Attitudes to Advantages of TNR Project by Taunya-Based Orchard Cultivators
TNR Project creates job opportunities
TNRP Project Staff helps local people
TNR Project helps local people
Agree
Don't know
Disagree
0%
50%
100%

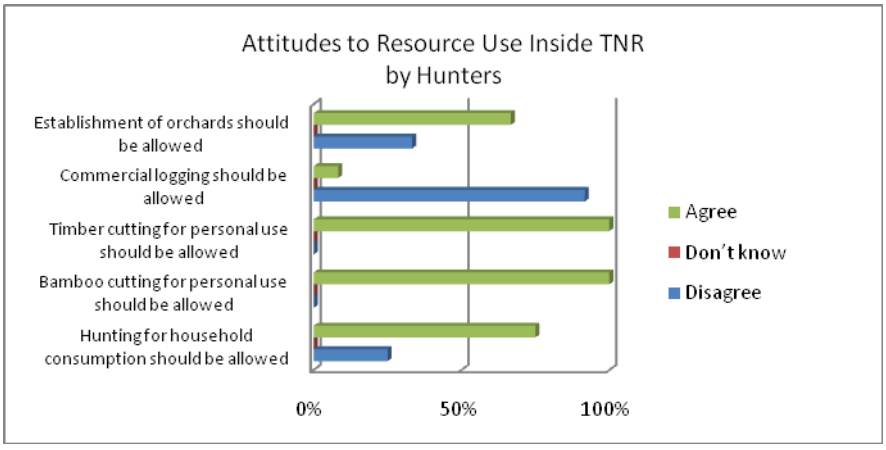

Attitudes to Advantages of TNR Project by Hunters
TNR Project creates job opportunities
TNRP Project Staff helps local people
TNR Project helps local people
Agree
Don't know
Disagree
0%
50%
100%

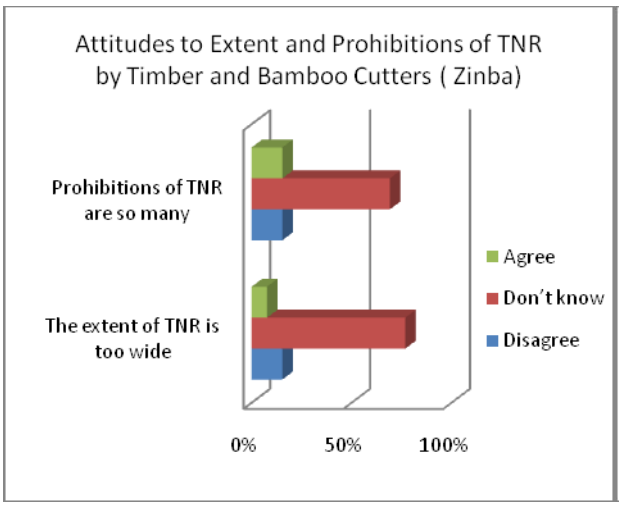

Attitudes to Resource Use Inside TNR
by Timber and Bamboo Cutters (Zinba)
Establishment of orchards should be allowed
Commercial logging should be allowed
Timber cutting for personal use should be allowed
Bamboo cutting for personal use should be allowed
Hunting for household consumption should be allowed
Agree
Don't know
Disagree
0%
50%
100%

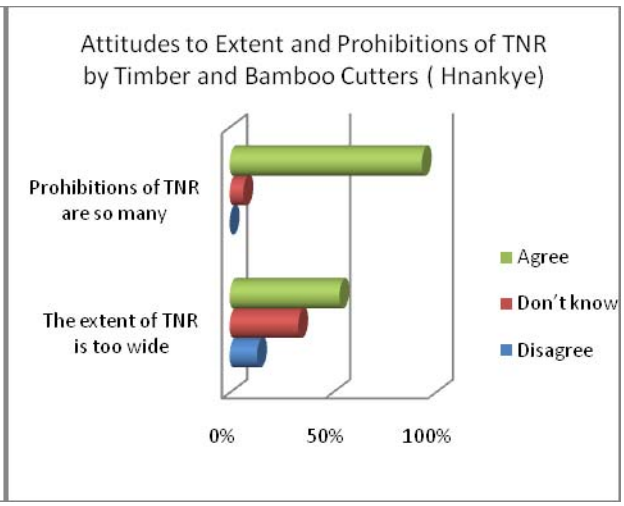

Attitudes to Resource Use Inside TNR
by Timber and Bamboo Cutters (Hnankye)
Establishment of orchards should be allowed
Commercial logging should be allowed
Timber cutting for personal use should be allowed
Bamboo cutting for personal use should be allowed
Hunting for household consumption should...
Agree
Don't know
Disagree
0%
50%
100%

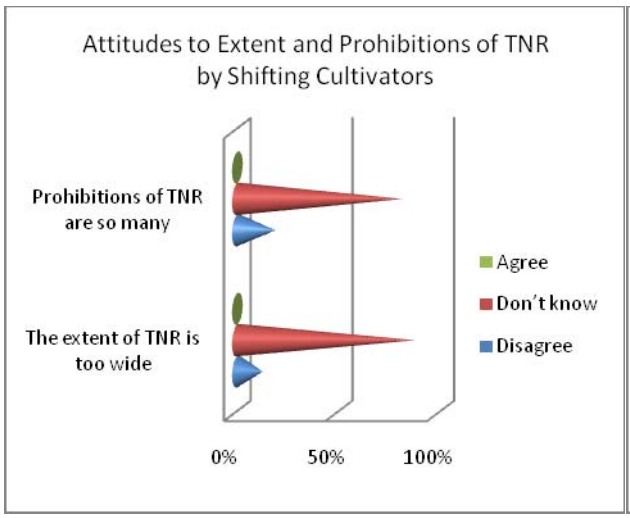

Attitudes to Resource Use Inside TNR
by Shifting Cultivators
Establishment of orchards should be allowed
Commercial logging should be allowed
Timber cutting for personal use should be allowed
Bamboo cutting for personal use should be allowed
Hunting for household consumption should be allowed
Agree
Don't know
Disagree
0%
50%
100%

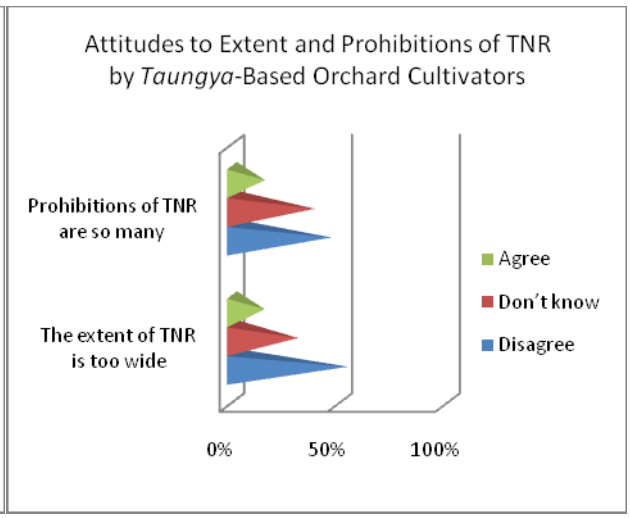

Attitudes to Resource Use Inside TNR
by Taungya-Based Orchard Cultivators
Establishment of orchards should be allowed
Commercial logging should be allowed
Timber cutting for personal use should be allowed
Bamboo cutting for personal use should be allowed
Hunting for household consumption should be allowed
Agree
Don't know
Disagree
0%
50%
100%

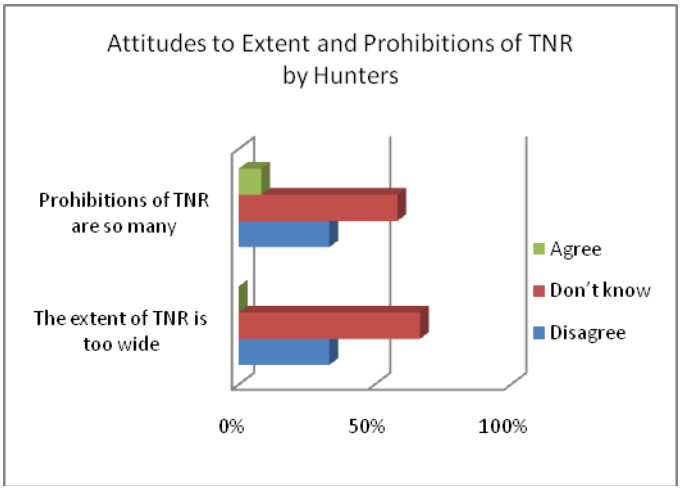

Attitudes to Resource Use Inside TNR
by Hunters
Establishment of orchards should be allowed
Commercial logging should be allowed
Timber cutting for personal use should be allowed
Bamboo cutting for personal use should be allowed
Hunting for household consumption should be allowed
Agree
Don't know
Disagree
0%
50%
100%


Attitudes to Extent and Prohibitions of TNR by Timber and Bamboo Cutters (Zinba)
Prohibitions of TNR are so many
The extent of TNR is too wide
Agree
Don't know
Disagree
0%
50%
100%


Attitudes to Extent and Prohibitions of TNR by Timber and Bamboo Cutters (Hnankye)
Prohibitions of TNR are so many
The extent of TNR is too wide
Agree
Don't know
Disagree
0%
50%
100%


Attitudes to Extent and Prohibitions of TNR by Shifting Cultivators
Prohibitions of TNR are so many
The extent of TNR is too wide
Agree
Don't know
Disagree
0%
50%
100%


Attitudes to Extent and Prohibitions of TNR by *Taungya*-Based Orchard Cultivators
Prohibitions of TNR are so many
The extent of TNR is too wide
Agree
Don't know
Disagree
0%
50%
100%


Attitudes to Extent and Prohibitions of TNR by Hunters
Prohibitions of TNR are so many
The extent of TNR is too wide
Agree
Don't know
Disagree
0%
50%
100%

5.3.2.2. Ranking the targeted audiences based on knowledge level and attitudes

The targeted audiences were also ranked by following the same method which was used in ranking the villages based on knowledge level and attitudes. The targeted groups in order of overall ranking based on knowledge and attitudes were shifting cultivators, timber and bamboo cutters (Hnankye), hunters, orchard cultivators and timber and bamboo cutters (Hnankye). The details results were provided in appendix-.1.6, 1.7 and 1.8.

5.3.2.3. Assessment on belief and preference by shifting cultivators and taungya-based orchard cultivators

Traditional belief on taungya cultivation

As almost all the *taungya* cutters are Karen ethnic group, their beliefs were assessed to know whether *taungya* or shifting cultivation is concerned with their tradition practice by their ancestors. The 62.50 % believed that shifting cultivation was their traditional practice but 12.50% answered not concerned with tradition. The remaining 25.00% could not distinguish whether it was related to their tradition or not. On the other hand, 50.00% of *taungya*-based orchard cultivators perceived that traditional belief.

Particular	Shifting cultivators (Michauglaung)			*Taungya*-based orchard cultivators (Zinba)		
	Disagree	Don't know	Agree	Disagree	Don't know	Agree
Taungya cultivation is concerned with tradition	12.50%	25.00%	62.50%	20.00%	30.00%	50.00%

Belief on advantage of burning

In addition, response to the question regarding the belief on advantages of burning in *taungya* is described in the following table. 81.25% of the shifting cultivators have a belief that burning can increase the soil fertility and 6.25 % expressed that it can reduce the weed growth in the field and the remaining 12.50 % gave the other reasons such as they do not need too much afford for collecting partially burnt materials *(kyun-kwe).*The response by *taungya*-based orchard cultivators is mentioned in the table.

Particular	Shifting cultivators (Michauglaung)			*Taungya*-based orchard cultivators (Zinba)		
	increase soil fertility	reduce weed growth	others	increase soil fertility	reduce weed growth	others
Advantage of burning	81.25%	6.25%	12.50%	69.23%	7.69%	23.08%

Belief on reason for shifting the taungya

Regarding the reason for shifting from one place to another, 56.25 % of shifting cultivators gave the reason of declining soil fertility after one year, 31.25% due to vigorous weed growth and 12.50% gave the both reasons. *Taungya*-based orchard cultivators are not relevant to this question because they do not apply shifting practice with rotational fallow system.

Particular	low soil fertility	weed growth	Both
Reason for shifting	56.25%	31.25%	12.50%

Preference on paddy vs perennial crops

Concerning preference on growing paddy and perennial crop, 31.25% of shifting cultivators gave a response that they prefer the paddy to perennial crop, but 68.75% perennial crop to paddy. On the other hand, 15.38% of orchard cultivators using *taungya* method preferred paddy, 76.92% perennial crops and 7.69% both.

Particular	Shifting cultivators (Michauglaung)		*Taungya*-based orchard cultivators (Zinba)		
	paddy	perennial crop	paddy	perennial crop	Both
Preference on crop	31.25%	68.75%	15.38%	76.92%	7.69%

Difficulties for growing perennial crop

The responses to the difficulties for growing perennial crop are mentioned in the following table. 23.08 % describes the land tenure is main constraint, 30.77% capital and 46.15 % highlighted the accessibility is the problem for them because their plots are quite far from the village. However, 75.00 % of *taungya*-based orchard cultivators expressed the capital investment as main constraint where as 25.00% did accessibility as follows:

Particular	Shifting cultivators (Michauglaung)			*Taungya*-based orchard(Zinba)		
	land	capital investment	accessibility	land	capital investment	accessibility
Difficulty for growing perennial crop	23.08%	30.77%	46.15%	-	75.00%	25.00%

5.3.2.4. Assessment on fire use practice by shifting cultivators and taungya-based orchard cultivators

In this assessment, it was assumed that the followings are the most important practices to be adopted while using fire. If the above practices are properly adopted while burning, the risk of fire will be minimal.

1) Preparation of firebreak
2) Fire crew
3) Time of fire set up
4) Period of observation
5) Cooling down status

In practice, the width of firebreak varies from place to place. External firebreaks usually have a width of 6 to 12 m (18 - 36 ft). Internal firebreaks vary between 3 to 6 m (9-18 ft). In general, dimension of these firebreaks can be considered as adequate in order to confine a surface fire (FAO/UNDP, 1986). In addition, M. J. D. Hancock (1988) had described in the report on “Forest Fire management for the Pilot Demonstration Area, Pilot Watershed Management for Kinda Dam” that interior firebreaks needed to be constructed only to a width of 10 ft. for their purpose as control lines. Similarly, Tin Nyunt (1992) defined the width of fire line to be 10 ft. as well.

The size of the fire crew may vary depending on the needs. However, Tin Nyunt (1992) described an illustration of organization set up, which represented a typical range from simple arrangement for small fire to those applicable to fairly large fire. In the illustration, the simplest typical organization consists of one leader and 5 crew members.

Another factor that should be taken into consideration for fire control in slash and burn practice is time of fire set up. In the noon time weather may often be unstable with lower relative humidity, higher temperature and stronger wind and these changes may affect the fire behavior (Tin Nyunt, 1992). Therefore, it is important to avoid setting fire in the noon and afternoon time. Evening time is more appropriate for setting fire as temperature gradually declines and relative humidity increases in the evening.

A report on forest fire management by FAO /UNDP (1986) highlighted that fires which were driven by strong wind might cross the firebreaks by spotting and the spotting distance might even exceed 20 m (60 ft) or more. But, It is not practical to construct the fire freaks or fire lines to ensure the spotting distance. For this reason, careful observation throughout the burning process is one of the most appropriate practices in burning. Extinguishing burning logs, hot spots along the fire line ensures that these places cannot ignite the unburned ground at later hours (Tin Nyunt, 1992). Therefore, it is required to observe the fire till it is totally suppressed out and cooling down process using water or something else is also necessary.

So the standards for each practice under proper use of fire were subjectively developed as follows:

Particulars	Poor	Acceptable	Good
Firebreak width	Below 10 ft	10 ft-15 ft	Above 15 ft
Fire crew	Less than 5	5-10	More than 10
Time of fire set up	Before 15:00 p.m	15:00-16:00 p.m	After 16:00 p.m
Observation period	Less than 3 hours	3-4 hours	More than 4 hours
Cooling down	Cooling down using water or something else is necessary for the proper fire use		

Then, scores were given to each practice as follows to perform the overall assessment on the fire use practice.

Particulars	Score (Poor)	Score(Acceptable)	Score (Good)
Fire break (Fb)	1	2	3
Fire crew(Fc)	1	2	3
Time of fire set up(St)	1	2	3
Observation period(Op)	1	2	3
Cooling down (Cd)	If **Yes** = 3 (score) If **No**= 0 (score)		

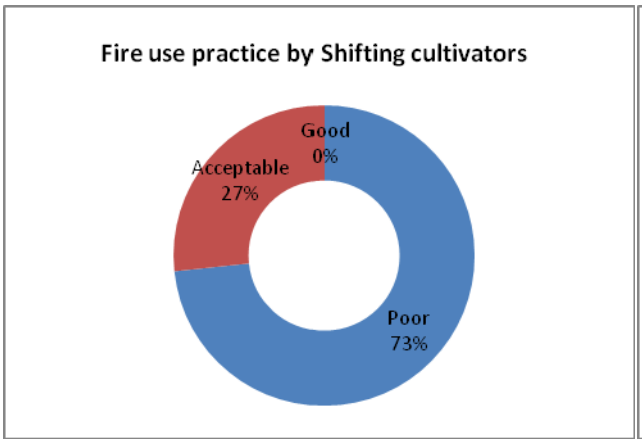
After that, the total score is worked out by summing the scores obtained in each practice.

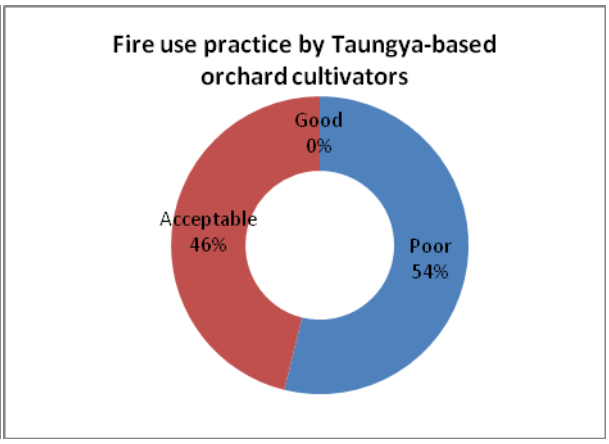
Total Score = Fb + Fc + St + Op + Cd

The total score is between 4 and 15. The score 8-12 is subjectively predetermined as threshold limit (i.e. acceptable score). The practice is considered as poor if the score below the threshold, where as good above the threshold. Then, overall fire use practice is assessed. The result of assessment is described in the following tables.

Particulars	Shifting cultivators (Michaunglaung)			*Taungya*-based orchard cultivators (Zinba)		
	Poor	Acceptable	Good	Poor	Acceptable	Good
Fire break	46.70%	26.70%	26.70%	66.67%	33.33%	
Fire crew	53.30%	46.70%	0.00%	61.54%	38.46%	
Time of fire set up	60.00%	33.30%	6.70%	7.14%	50.00%	42.86%
Observation period	86.70%	13.30%	0.00%	92.31%	7.69%	
Cooling down	Yes =26.67%, No=73.33%			Yes=38.46%, No= 61.54%%		

Over all Fire use practice	Poor (score 4- 8)	Acceptable (score 8-12)	Good (score > 12)
Shifting cultivators (Michaunglaung)	73.33%	26.67%	0.00%
Taungya-based orchard cultivators (Zinba)	53.85%	46.15%	0.00%





According to the finding on overall assessment of fire use practice, 73.33% of shifting cultivators in Michaunglaung were found in poor condition and 26.67% under acceptable condition. On the other hand, 53.85% of *taungya*-based orchard cultivators from Zinba were poor condition and 46.15 % acceptable.

5.3.2.5. Assessment on practice on maintaining soil fertility and protection by shifting cultivators and taungya-based orchard cultivators

According to the finding, all the shifting cultivators in Michauglaung applied no practice for maintaining soil fertility. Both chemical and natural fertilizer were not used. No training on maintaining soil fertility was received by the shifting cultivators. The main disturbance to *taungya* is wild boars. At present, they are protecting them by frightening, trapping and some uses the smell to keep them away.

On the other hand, some *taungya*-based orchard cultivators applied chemical fertilizers and herbicides, especially in the rubber plantations. But they had not attended any training related on handling chemical fertilizers and herbicides. The common disturbances are wild boars to *taungya* paddy and rats, moles, sometimes sambar to the orchard. Almost 50% of the villagers are solving the wild boar disturbance in t*aungya* by shooting, and there was no protective or control measures for the rats and moles.

5.3.2.6. Assessment on timber and bamboo cutting practice

Timber and bamboo cutters in Zinba

According to the interviewees, it is estimated that about 70 % of the household in the village depends totally or partially on earning from timber and bamboo resources. The timber cutting season usually starts from the end of May and finished in November. The season depends on level of water in the stream. G*at-ni (Amoora wallichi), Ka-dut (Parashorea stellata)*, *Kye-se(Phoebe tavoyana), Kanyin (Diterocarpus spp)., Tagu (Litsea spp.)* are the most common timber species cut by the villagers. An average monthly timber cut for local trade purpose by household is found to be about 2 tons throughout the cutting season. During the cutting season, the estimated monthly income per household from timber cutting varies K 20000 to K 160000, with an average of K 82000 depending on the frequency of cutting and capacity. Some villagers earned their living as cycle-taxi service providers and odd job workers, but sometimes they carried out logging as well. Therefore, they did not earn from timber cutting as much as those who totally depend on only timber cutting. The buffalos are usually used for skidding logs to the rafting station. The transportation of timber depends on the level of water in the stream and legal enforcement status. The final depot is Kaleinaung and some portion of timber proceeded to Kanbauk.

With decrease in water level in the stream after the timber cutting season, the livelihood pattern of villagers changes from timber cutting to bamboo cutting. The two marketable bamboo species are *ta-bin-daing-wa (Bambusa longispiculata)* and *wa-nwe (Melocalamus compactiflorus),* and they are usually bought by the brokers from Dawei. The monthly average cut is found to be 900 stems per cutter. About 58% of the timber cutters are earning their income from bamboo cutting after the timber season and the livelihood pattern of the remaining portion (i.e. about 42%) shifts to the alternative options: *taungya*, hunting and orchards. An estimated monthly income of bamboo cutters ranges from K 60000-120000 with an average of about K 87000. This average figure is a little bit higher than that from timber cutting (i.e K 82000). The probable reason may be that some villagers are involved in timber cutting and other jobs as their livelihood option.

The following tables reveal the livelihood calendar of the villagers and the prevailing price of timber offered by buyer and extraction cost.

Livelihood calendar of the villagers

Livelihood option	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Remark**
Shifting Cultivation/ *taungya*	X	X	X	X	X					X	X	X	
Hunting	X	X	X	X	X	X	X	X	X	X	X	X	
Timber cutting					X	X	X	X	X	X	X		
Bamboo cutting	X	X	X	X	X						X	X	

The prevailing price of timber offered by buyer and extraction cost

Particular	Offered price / ton (K)		Particular	Cost / ton (K)
Log	60000		Skidding cost	20,000
			Rafting (transport) charge	35,000
Sawn timber	130000		Chain saw operating charge	600,000
			Total cost (except. ration)	**115,000**

Timber and bamboo cutters in Hnankye

Hnankye village is situated on the east bank of Dawei River, about 2-3 miles far from the western boundary of Tanintharyi nature reserve. Unlike Zinba, the ethnicity in the village is quite homogeneous and inhabitants are Dawei group. The major portion of household (i.e. 46%) is landless. According to respondents, about 60% of the household totally or partially relies on timber and bamboo cutting. Under the normal situation, i.e. no flood and no legal intervention etc., one timber cutter was able to cut approximately 3 tons per season during last years. The timber cutting season generally starts in June and ends in October depending on the stream flow. The most commonly cut species was Pyinkado *(Xylia xylocarpa)* and the other were Thit-sho *(Pentace griffithii)*, Gat-ni *(Amoora wallichi)* , Pyinma (*Lagerstroemia spp.*) and unspecified species (locally known as mixed species) at 3 -4.5 ft in girth. Heinze is the main stream through which logs were transported by mean of water. The cut timbers were bought by the brokers from Dawei and by 2-3 local buyers with some capital. Normally, they were sold to those who issued money in advance in Hnankye. The final destinations are Dawei and Yebyu.

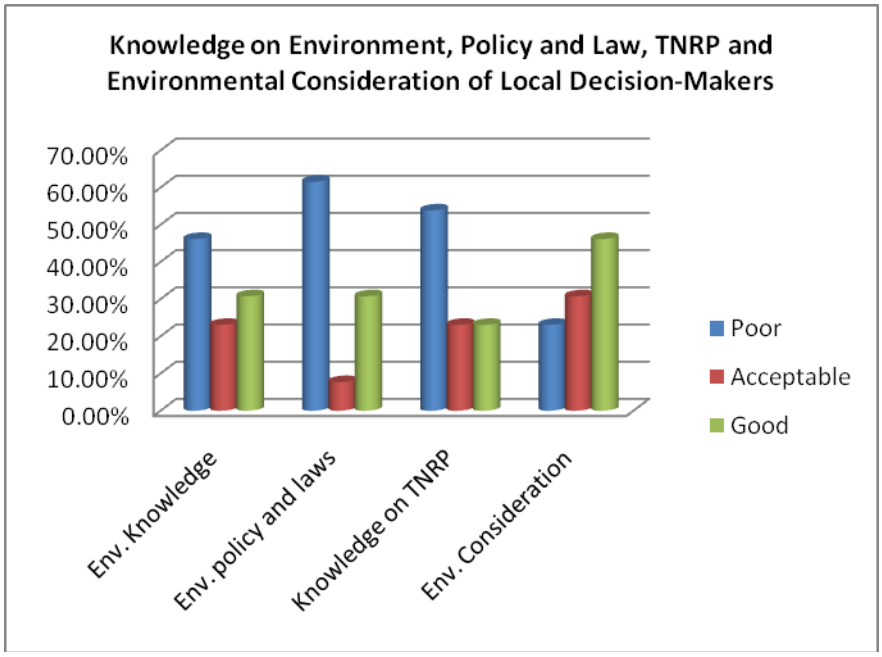
According to the respondents, they were not able to cut the timber as many tons as last year and the seasonal cut of timber was estimated to be 1-2 ton/ cutter this season. Some villagers were taken action against illegal logging due to the legal enforcement operations of TNRP. In addition, getting permission to enter the forest from security forces and frequent calling them back by the Head of the village during their stay in forest were also constraints for timber cutters. Due to those difficulties, it was noted that all timber cutters owed debts ranging from 50,000-1,000,000 K during those years.

Generally, bamboo cutting is started after logging season. However, there are some villagers who cut the only bamboo throughout the year. Although bamboo is available all round the year, the price usually fall down during the rainy season (i.e. logging season) because of low demand. Average monthly cut of bamboo per cutter was found to be approximately 900 stems. The price is ranging from K 70-100 per stem. The common bamboo species cut by the villagers is Wa-nwe *(Melocalamus compactiflorus)*.

5.3.3. Need Assessment among Local Decision-Makers

The local decision-makers play an important role not only in encouraging environmental conservation activities but also in solving problems. For this reason, environmental awareness of the local decision-makers is essential for the success of TNRP activities. To identify the needs for raising awareness among local decision makers, the questionnaire was developed and distributed to 16 departmental heads or in-charge of Kaleingaung Township (appendix-4.8). Among them, 13 returned the completed questionnaires. The objective of the survey is to assess how much knowledge on environment they learnt; how much they know about environmental related policy and laws; what extent they know about TNRP and whether they usually take into consideration environmental conservation in decision making. In this study, self assessment has to be made by local decision makers using the scale (minimum =1 to maximum=10), which was given in the questionnaire. The results were regrouped into three levels: Poor (scale 1-4), Acceptable (scale 5-6) and Good (scale 7-10). The table below shows the result of assessment among local decision makers.

Particulars	Poor (scale1-4)	Acceptable (scale5-6)	Good (scale7-10)
General environmental knowledge	46.15%	23.07%	30.76%
Knowledge on environmental related policy and law	61.54%	7.69%	30.76%
Knowledge on Taninthayi Nature Reserve Project	53.84%	23.08%	23.07%
Taking into consideration of environmental protection when decision making or implementing environmental related matters	23.07%	30.76%	46.15%



According to the findings, 46.15 % of the local decision makers stood at “poor” level in general environmental knowledge. Concerning knowledge on environmental related policy and law, 61.54% was also found to be poor. Similarly, 53.84% was belonged to “poor” level pertaining knowledge on Taninthayi Nature Reserve Project. But, with regard to taking into consideration of environmental protection when they made a decision or implemented environmental related matters, the percent of the decision-makers who stood at “good “ level was observed relatively higher, representing 46.15%.

Concerning the media from which they obtained the environmental knowledge, the first most recommended one is printed media followed by TV, discussion and radio.

6.0. Discussion and Recommendation

6.1. Institutional strengthening, EE material and associated facilities

Based on the findings of review on existing awareness programme of TNRP, the following recommendations are made for the further improvement.

1) It needs to form an EE team for intensifying the programme and assign a team leader with clearly specified responsibilities of the team.

2) Capacity of the project staff needs to be improved through relevant trainings/ workshops (e.g. environmental education and communication, public relation and environmental related trainings).

3) As printed media are inadequate, it is suggested to develop more posters and pamphlets depicting about TNRP, value of forest and biodiversity, causes and consequences of environmental deterioration, about endangered / threatened wildlife and plants especially found in TNR area, environmentally sound practices in resource use etc.

4) Majority of signboards are set up in the southern part of TNR western boundary along the roadside. Therefore, it will need to erect more signboards at villages in the northern part, mentioning TNR is located near the village, along with location maps, prohibitions and mottos as well. TNR signboard, signboards with prohibitions and mottos should be set up at the cross point of TNR boundary and pipeline service track to make the company personnel, military personnel and subcontractors aware of.

5) Use of visual aids and projector has been introduced in the awareness programme and these electronic files/ media will need to improve and modify depending on the audience.

6) In order to enhance public awareness, knowledge and skill of local people, it is advised to establish an Information, Education and Communication Centre fully equipped with education materials and associate facilities, and demonstration sites. It is advised to upgrade the Michaunglaung nursery as education centre.

7) Annual awareness programme should be planned with prior objectives and post evaluation should be made after completion of individual talk / discussion so that effectiveness could be evaluated and further improvement could be made.

6.2. Formal Environmental Education

The environmental themes prescribed in the existing curricula were found to be quite sufficient both at primary and middle school levels. In particular, “Lifelong skills” as general studies is very useful for the conservation of natural environment. Similarly, environmental themes such as foundation of ecology, environmental problems and problems solving are also infused to General Science and Lifelong Skill subjects at the middle school level.

As the prescribed text books are printed for the mass production to meet the demand of students from the whole country, some illustrations in the books are found unclear. Some schools have been using only the prescribed text books in teaching environmental related chapters and the teaching aids are inadequate for the better understanding on objectives of curriculum. Inadequate of quality teaching aids relevant to the subject, lack or very few out-door studies relevant to nature conservation are the main weaknesses in formal environmental education.

In addition, fresh environmental information is not accessible to the school teachers because of limited information sources. This may lead to constraint for the teachers in improving their environmental knowledge and in teaching with broader explanations to the students.

The following recommendations are provided for making formal environmental education more effective.

1) The awareness talks should be continued in the schools.

2) The use of audiovisual aids is more effective and it is recommended to organize the talks using audiovisual aids, printed media, games and environmental stories to attract the audience’s interest and to promote their awareness and knowledge.

3) As competitions, contests can attract the audience and participants, quiz contest, essay writing competition, drawing competition etc. should be organized on the remarkable occasions or days for raising awareness of the students.

4) Arrangement for Learning Outside the Classroom (LOtC) such as excursions, field visits, participation in collective actions like tree planting, waste cleaning should be encouraged to promote the environmental awareness, knowledge , participation and to value the environment.

5) General knowledge on environmental literacy of teacher should be improved through short-term training and workshops because most of them especially primary teachers are inadequate in this area. Therefore, first priority should be given to the primary school teachers and then middle school teachers. Environmental information in the form of printed media should be provided to schools to promote the knowledge of the teachers so that they can share in turn to the students.

6) The posters and other relevant teaching aids depicting / describing the environmental themes prescribed in the curricula (e.g lifelong skill, natural science / general science) should be developed and disseminated in schools.

7) Fresh environmental information obtained from various sources should be shared to the school libraries and environmental information notice boards should be set up in schools as well.

6.3. Non-formal Environmental Education

According to the result of assessment on the knowledge, attitudes of the general audience, some suggestions are provided as follows:

1) The awareness discussion / talks in the villages should be continued as there is some positive impact on the enhancing knowledge of local people.

2) More attention needs to pay to Mon ethnic group, female and age group of > 40 years old group as their knowledge level is found lower than others'.

3) As there is language barrier in some Karen and Mon villages, it is recommended to appoint some qualified villagers as village environmental educators or communication staff to overcome the constraint and to facilitate the awareness programme.

4) Educational care programme should be considered to help the villagers for better access to formal education.

5) As majority of general audience do not know very well about TNR boundary and prohibitions, it is essential to make the local people and all subsistence users aware of boundary demarcation and prohibitions inside the TNR through the awareness talks / discussion using maps and through setting up signboards mentioning TNR boundary is located near the village, along with prohibitions, mottos and location map.

Based on the result of the assessment in three villages with major threats, some discussions and recommendations with respect to the threats are given as follows:

Shifting cultivation

Michaunglaung (old) is a Karen village and the villagers are earning their living by shifting cultivation, orchards, and hunting. Since long period, shifting cultivation had been existing as a traditional practice and it is also a typical livelihood option of Karen people. For this reason, it was observed in the Working Plan of Heinze and Kaleinaung Reserves (1926-1936) that the Michaunglaung was given privilege of the Karen area in which *taungya* cultivation was allowed. Altogether about one third of villagers depend on the shifting cultivation (i.e typical shifting cultivation with fallow system and excluding orchard cultivators using taungya method). The number of shifting cultivators decreased in this year because some villagers were engaged in the religious affairs.

According to the result of assessment, the attitude of shifting cultivators towards the constitution of Taninthayi nature reserve was found more positive than other groups-timber cutters, taugya based orchard cultivators and hunters. However, 50% of them were under poor condition in general environmental knowledge. It will need to improve the basic environmental knowledge of shifting cultivators through the awareness talks/ discussion as a priority target group.

The majority of shifting cultivator (62%) believes that *taungya* cultivation is concerned with their tradition. Although they prefer to establish perennial crops, the plots are quite far away from the village (approximately 3-5 miles away), which becomes the main constraint for maintenance of the orchards in long run. As they are struggling for the subsistence, lack of capital investment can be considered as another constraint in growing perennial crops.

Due to the above mentioned difficulties and traditional belief, it is impossible to convert their livelihood strategy immediately or totally: from shifting cultivation to permanent orchard. It is generally accepted that traditional shifting cultivation with adequately long fallow periods is a sound method of soil management, well adapted to the local ecological and social environment (P.K.R. Nair, 1993).

At present, fallow period adopted by shifting cultivators in Michaunglaung is generally found to be 3- 5 years. The shifting plots are located both inside and adjacent to the TNR boundary. However, the soil fertility may decline with the shorter fallow period due to increasing population pressure and encroachment by outsiders. So far, no shifting cultivator used to maintain the soil fertility in the plots. Therefore, it is suggested to introduce improved fallow system as an initial intervention for sustainability in such a case related to traditional belief and difficulties to alter livelihood option immediately. And then it needs to modify and upgrade the practice gradually by introducing appropriate agroforestry techniques. Thus, it is also recommended to provide trainings on improved fallow system and agroforestry to shifting cultivators.

Taungya-based horticulture

This is the most common practice in the vicinity of TNRP area and inside the TNR as well. The difference between shifting cultivation and *taungya*-based horticulture is that the latter does not use the fallow system with rotation. In the first year, farmers cut down the forests, burn the area, and cultivate the *taungya* paddy intercropped with perennial crops such cashew nut, betel nut and rubber. Next year, they extend another plot which is adjacent to the previous one so that they can grow and harvest the paddy every year and extend their orchards. Weeding operation is carried out in the previous plots. Unlike shifting cultivators, some farmers who cultivate the rubber plantation use the chemical fertilizers, and herbicides even though they do not have any training on handling them. Training on handling of pesticide, herbicide and compost fertilizer making and application should be given to them.

The result on the assessment of knowledge and attitudes of *taungya*-based orchard cultivators showed that 23.08% were poor in environmental knowledge and 46.15% fair, 30.77% good. Therefore, it could be concluded that they have better basic environmental knowledge than shifting cultivator, but it still needs to promote their knowledge level. Although it was observed that the attitude to constitution of nature reserve was positive, 30.77% of the respondents expressed that nature reserve caused negative impact to their family because of prohibitions. It is suggested to change their negative attitudes by setting aside some areas for the village use zone so that they can grow their crops there, and harvest bamboo and timber for personal use as well under prescribed conditions in a sustainable manner. Similarly, it needs to disseminate the information on prescriptions within the village use zone to villagers.

The major portion (76.92%) of the respondents preferred to grow perennial crop. But the main constraint to do so is lack of capital investment and followed by accessibility. Some technical assistance on agroforestry practices should be provided for earning seasonal income before harvesting stage of orchards.

Fire use practice in shifting cultivation and taungya-based horticultiture

An associated problem with “slash and burn” practice is forest fire. Improper use of fire in “slash and burn” practice may spread out the fire to the adjacent forests and result in depletion of ecosystem and its constituent biodiversity. According to the result of assessment, the fire use practice by shifting cultivators was found to be poor. The practice in *taungya*-based horticulture was observed better than that in shifting cultivation. The probable reason is that they need to prevent their juvenile orchards from fire risk while burning vegetation in adjacent *taung-ya* plot. Therefore, they perform the practice better than shifting cultivators. But 53.85% of *taungya*-based orchard cultivators was still poor in fire use practice. The following recommendations are provided for the improvement of fire use or burning practice in shifting cultivation and *taungya*-based horticulture.

1) The fire use practice should be improved through the training, awareness talks and dissemination of printed media for the both target groups.

2) It is also suggested to introduce the community-based fire management and fire control programme.

3) Prescribed burning practice should be exercised.

In fact, burning in *taungya* cultivation is one of the causes of forest fires. In rural areas, smoking of cheroots is very common while working or travelling in agricultural and forested areas. Sparks of the cheroot and careless disposal of cheroot’s butts, debris burning, intentionally set fire and camp fires are other causes of wild fire other than slash and burn practice. Most of the villagers believed that the fire occurred in integrated farm of Zinba in 2006 and 2007 was intentionally set. In addition It has been reported that some area were deliberately to facilitate hunting. The burnt areas seem to attract game, making them easy targets for hunters (Samsudin Musa & Ismail Parlan, www.peat-portal.net). Therefore, just improving practice of fire use by *taungya* cutters is not enough for reducing risk of forest fire.

4) It is also essential to pay attention for general public education concerning the threats and consequences of the forest fire.

Illegal logging (Timber and bamboo cutting)

The assessment on general environmental knowledge showed that 46.15% of timber cutters from Zinba were poor where as those from Hnankye village have better knowledge with 26.67% poor, 60.00% fair and 13.33 % good. According to this assessment, all the timber cutters have much more knowledge on TNR boundary and prohibitions inside the nature reserve than shifting cultivators and *taungya*-based orchard cultivators. Although those from Zinba have positive attitude on constitution of nature reserve, 46.67% of respondents from Hnankye hold negative attitude on that. Similarly, 93.33% from Hnankye agreed on that constitution of nature reserve

caused problems to their families and 53.33% have an attitude towards resource use that commercial logging should be allowed.

In fact, the villagers from Hnankye have been living on the forest resources near the villages by cutting timber and bamboo since long time. For this reason, they did not have any interest on the horticulture. During those days, some companies and private entrepreneurs are gradually penetrating in the vicinity of the nature reserve area through their investment in oil palm and rubber plantation. Some companies such as Yaung Ni Oo, Shwe Padonmar are allotted the surrounding area of Hnankye, where previously the villagers traditionally accessed. As most of the villagers are landless, they usually enter inside the nature reserve, cut the timber and bamboo as a major livelihood option for them, consequently increasing pressure on the nature reserve. The legal enforcement activities by the TNRP affect on their livelihood adversely. The clear evidence could be seen in that only 10% of villagers held negative attitude that TNR caused the difficulties to their families in the assessment on general audience (i.e. before intense legal enforcement), but the 93.33% of timber and bamboo cutters in Hnankye showed negative in the assessment on targeted groups (i.e after legal enforcement). Therefore, prohibitions and lack of alternative livelihood option might be main causes for holding negative attitude rather than knowledge.

1) Thus, allotment for village use zone for cutting bamboo and timber with prescribed conditions should be taken into consideration while promoting knowledge and awareness.

2) On the other hand, alternative income generation programs should be created. Bamboo based industry is potential for alternative income generation. But, it will need to conduct the feasibility study and market survey.

In contrast, majority of villagers from Zinba lived on the earning from smuggling and providing service to the smugglers on the way to Myanmar-Thai boarder till 1990s. By that time, migration in Zinba gradually increased because of easy money making. By mid 1990s, the government controlled the smuggling strictly and the villagers lost their livelihood option. Then they changed their livelihood by cutting timber and bamboos in the near by forest. About 50% of timber cutters were found to be immigrants from other places. Zinba is also one of the project villages under socio-economic program of MGTC. Although MGTC has developed the integrated farm of perennial crop in Zinba since 2004, success is so far not satisfactory. The major constraints are lack of regular or continuous maintenance operations such as weeding, fire protection etc. On the other hand, villagers mainly emphasized on their day to day livelihood problems by cutting timber/bamboo and by hunting. It was noted that fire occurred in the farm in two successive years, 2006 and 2007. Among the timber cutter, 15% is landless and 85% are traditionally land holders of juvenile orchard and land without cultivation. The average land holding among this group is found to be 5.6 acre per villager (1.9 acre of orchard and 3.7 acre of land without cultivation). Therefore, illegal timber cutting in Zinba village is considerably linking with their social norms that the villagers follow to what the others practice, immigration of outsiders and inadequate alternative livelihood.

1) Therefore, it should be allowed for cutting bamboo and timbers under prescribed conditions in the village use zone so that they can partially solve their livelihood before the harvest stage of orchards. In the mean time, they should be encouraged to grow the perennial crops in their bare

lands while improving their environmental knowledge through awareness programme. On the other hand, legal enforcement should be gradually intensified.

2) Any education program without alternative livelihood option and/ or legal enforcement will not change the behaviors of people. It will need to fully cooperate with local Forest Department in legal enforcement activities against illegal logging. Prior information / notice should be provided to sawmill in the project area not to buy the timber illegally extracted.

3) Cooperation with socio-economic program of MGTC is highly recommended to reinforce the integrated farm and to provide technical and micro-finance assistance not only to farmers in integrated farm but also to those outside of the farm.

4) Although there are interventions by the oil and gas companies in Zinba, the number of villagers getting jobs in their sub-contract companies and associated programs is relatively low compared to other villages. For example, although there are 24 villagers from old Michaunglaung (i.e approx. 10% of total working force, of over 18 years old population) get the job in the sub-contract companies of MGTC and TPC, only 5 villagers from Zinba(i.e 1.2% of total working force, of over 18 years old population) obtain the jobs, four villagers in those companies and one in TNRP. Therefore, it should be considered to create more job opportunities for Zinba villagers. This could reduce the pressure on the TNR. To do so, TNRP will need to negotiate and cooperate with MGTC, TPC and as well as PTTEP, a forthcoming oil and gas company, when it comes into operation. Also TNRP itself should employ those forest dwellers with priority as many as possible so that community participation promotes in conservation activities while mitigating negative impact by TNR on their livelihood.

Hunting on bush meat

In this assessment the hunters were reselected from the shifting cultivators, timber and bamboo cutter because there was no villager who totally depended only bush meat hunting. Altogether 12 hunters including 3 from old Michaunglaung and 9 from Zinba village, were interviewed. It was observed that all hunters fell in the age group of under 40 years old.

1) Therefore, more attention should be paid to this age group for educating concerning bush meat hunting.

According to the result, 25% of hunters knew that it needs license for hunting legally, but 16.67% responded no license is needed and other 58.33% do not know exactly. All the hunters do not know whether the barking deer is seasonally protected or not. Concerning the attitude towards tiger, 41.67% of hunters responded they would keep away if they saw a tiger in trap because of being afraid, 8.33% keep away if only one but shoot if two, 50% of respondents answered that they would shoot. They gave the reasons- because of hunters, because of good price and because they wanted. This attitude indicates that there is threat to the tigers.

2) It needs to improve their knowledge and attitude by disseminating information on protected mammals and birds especially focusing on the animals found in TNR. Alternative livelihood options which were recommended for the above mentioned groups should be applied to the hunters as they were selected from those groups.

According to interviewees, the most frequently bush meat are wild boars, monkeys and sambars. Approximately 1-2 wild boars per month are available in Michaunglaung. But the respondents said that it had been long time they did not see sambar meat in the village that year. In Zinba, 2-3 sambars per year, 1-2 wild boars and 4-5 monkeys per month are available. The surplus bush meat after family consumption is usually sold to the brokers in Michaunglaung, Zinba and final markets are Kaleinaung, Kanbauk and Yebyu.

3) Thus, it needs to make aware of that hunting, selling and transportation of wildlife is illegal. It has been suggested to erect the signboards mentioning this information in Kaleinaung and Yebyu, and implemented by TNRP in both places. But it is recommended to erect one more signboard in Kanbauk as well.

Apart from the local villagers, it has been observed that security forces along the service are involved in bush meat hunting and surplus meats are usually sold to company's workers on site and as well as in Nat-ain-taung village, Myanmar-Thai border. According to experience in raising awareness to military personnel, awareness discussions were organized at base camp, but the main targeted audiences involved in hunting were missing because they were at frontier camps.

4) Therefore it is suggested to visit frequently to frontier military camps along the service track, to provide information on value of biodiversity, to promote awareness of soldiers and to persuade them for participating in biodiversity survey and conservation activities. It will be more effective for educating the right targeted audience.

For Local Decision-Makers

According to the result of assessment, it could be concluded that awareness by local decision-makers were quite satisfactory as over 70% of them were observed within acceptable and good level with regards to taking into consideration when they made a decision or implemented. But, the majority of decision makers were found in poor level concerning knowledge on general environmental knowledge, policy and law, and knowledge on TNRP. Therefore, the following recommendations are made for enhancing knowledge of decision makers so that they could make their decision more effectively from the point of environmental conservation and they could provide more supports to nature conservation and TNRP activities.

1) It is highly recommended to establish a regular communication system (e.g. monthly or quarterly or biannually etc.) with local decision-makers, to discuss on real time issues and activities of TNRP and to advocate them in the field of environment.

2) The project souvenirs (e.g calendar, note book, diary etc.) having some information on TNRP and environmental protection should be developed and disseminated among the local decision-makers so that they aware of TNRP and environment.

3) It is essential to make copy of environmental related laws and policy, and distributed them to the decision-makers for promoting their knowledge in this matter.

4) Some TV programs aiming at decision-makers at different level should be broadcast to make them more aware of TNRP and its nature conservation activities.

General Discussion

Although the attitude to constitution of nature reserve is generally found to be positive, the attitude towards advantage of TNRP is surprisingly negative. Those who have positive attitude to advantage of TNRP gave the reasons for educational care in Kaleinaung Township and distributing some gifts (T-shirts) by project during awareness talks. In fact, educational care program was personally initiated by the Deputy Project Director of TNRP in cooperation with the social activists and heads of some relevant organizations. These lessons should be learnt to change the attitude on advantages of TNRP and the project should adopt such kind of activities to enhance the community participation.

Regarding resource use inside TNR, majority of the villagers has an attitude to allow timber and bamboo cutting for their personal use, but most of the respondents, except some villagers from Hnankye and Yebon, disagreed on allowing commercial logging. This indicated that the project should take into consideration when allotments are made for the village-use zone in the Buffer zone Management program. After determination of the specific zones, information should be provided concerning “DOs and DONTs inside respective zones” for the villagers.

Among the 13 villages, overall ranking in ascending order (from the poorest to the best), in terms of knowledge level and attitudes of the villagers were found to be low in Zinba, Yarphu, Yebon, Kawhlaing and Tharyarmon village (see appendix 1.5) . Of them, Yarphu, Yebon and Kawhlaing are poor both in knowledge and in attitude. Although knowledge level of Zinba was found to be good, their attitudes are poor. Therefore, those villages need to be given the first priority for raising awareness and promoting knowledge of the villagers. In addition, it is necessary to ensure the education program that emphasizes for valuing nature by the villagers so that their attitudes tend to change gradually into desirable ones.

Sr.	Village	Knowledge(K)	Attitude(A)	KA-Rank	Priority
1	Zinba	good	poor	13	First priority
2	Yarphu	poor	poor	12	First priority
3	Yebon	poor	poor	11	First priority
4	Kawhlaing	poor	poor	10	First priority
5	Tharyarmon	poor	fair	9	First priority

Kaleinaung, Michaunglaung(Old), Karen Shinhtabi and Hnankye should be considered as second priority villages in education program. It could be said that Kaleinaung and Hnankye villagers stood fair both in knowledge and in attitude. On the other hand, Michaunglaung(Old) and Karen Shinhtabi were found to be good at knowledge, but fair in attitude.

Sr.	Village	Knowledge(K)	Attitude(A)	KA-Rank	Priority
1	Kaleinaung	fair	fair	8	Second priority
2	Michaunglaung(Old)	good	fair	7	Second priority
3	Karen Shinhtabi	good	fair	6	Second priority
4	Hnankye	fair	fair	5	Second priority

Wunpo, Kyaukshat, Mayanchaung and Michaunglaung(New) village should be treated as third priority villages. Among them, Kyaukshat village is found to be good both at knowledge and attitude. Although attitude of remaining three villages was observed to be good, their knowledge was just at intermediate level.

Sr.	Village	Knowledge(K)	Attitude(A)	KA-Rank	Priority
1	Wunpo	fair	good	4	third priority
2	Kyaukshut	good	good	3	third priority
3	Mayanchaung	fair	good	2	third priority
4	Michaunglaung(New)	fair	good	1	third priority

Based on the findings, it could be concluded that there was no strong relationship between knowledge and attitude. Basically, although dissemination of information could promote the knowledge, it could not be expected that just promoting knowledge alone would lead to desirable attitude definitely. As described in the behavior model, organizing the people to value the environment is much more vital to form good attitudes. Thus, education program will need to be much more emphasized on value rather than awareness.

Besides, it can be seen in overall ranking that Migyaunglaung (New) village stood at “rank 1” where as Zinba at “rank 13”. Both two villages are under the Socio-Economic programme of MGTC and road access is also not so different. One outstanding fact is that, attitudes of these villagers are found to be quite different. Zinba villagers hold more negative attitudes than Michaunglaung (New). In addition, livelihood options are also quite different: Zinba villagers highly depend on natural capital (forest resource base) where as Michaunglaung (New) villagers are less dependent on natural capital (forest resource base) compared to Zinba. In particular, main livelihood in Michaunglaung (New) is based on orchard cultivation and some villagers earn their living as company workers. These differences in livelihood strategies may lead to perceiving more negative attitude by Zinba villagers due to the fact that majority of the villagers are more inclined to illegal logging activities although they have sizable amount of available land for cropping. Therefore, TNRP should create more job opportunities and encourage alternative livelihood options for Zinba villagers.

For the targeted audiences, the education program needs to be encompassed not only knowledge and attitudes but also skills in solving environmental problems. Even though attitudes of the people are good, the behavior cannot be changed due to lack of skills and opportunity. Thus it is essential to support environmentally sound practices of fire use, soil conservation, agro-forestry and handling chemicals to the respective targeted groups in addition to promoting knowledge and attitudes. In addition, job opportunities and income generation activities need to be developed as motivation for changing behavior.

Regarding the micro-income opportunities, cultivation of non timber forest products such as wa-u *(Tacca leontopetaliodes)* and Phar-lar(cardamomum) is found to be potential. There is wa-u market even in Kanbauk. The buyers purchase them at a local price of K 300-400 per viss and send to export market after processing for semi-finished products-slicing and drying. The space

is not too much problem for growing wa-u as it can tolerate to shade and can be grown as understorey in the orchards. Similarly, some people are interested in collecting phar-lar inside TNR and some villagers (e.g. villagers from Yebon) are introducing phar-lar in their orchards. According to the collectors, phar-lar cannot tolerate fire injury. So, the villagers need to protect the forest from fire where phar-lar will be collected. This can benefit both TNR and loca collectors. Therefore, collection of phar-lar should be encouraged in village-use zone of TNR and cultivation in orchards should be encouraged. In addition, some villages in the vicinity of TNR produce several kinds of fruit such as pine apples, durian, pumelo, lemon and banana etc. However, those fruits are perishable and there is no wide local market. It was observed in Michaunglaung that some fruits like pumelo, lemons were spreading on the ground as waste due to the diseases. It will be more beneficial to the villagers if information on disease and pest control for some horticulture species and market information could be provided. According to one villager from Mayanchaung, they fed the cattle on pine apple plants because of no market value. So, it should be considered for conducting food processing training, for example jam making, to women in the villages. Bamboo / Rattan based industries also have potential because the bamboo / rattan are still abundant in the project area.

Regarding strategies for dissemination of message among the villagers, TV programs will not be effective as the majority cannot access to such kind of extension facilities. On the other hand, language barrier is encountered for educating ethnic minorities. So, awareness discussion with the help of ethnic communication staff or educators and use of printed materials (in multi-languages if possible) is the best way for dissemination of information. In addition, the role of project staff in local operation units (LOUs) are very important for improving practices of targeted audience and they should keep in touch with them and provide technical assistance as extension staff.

Concerning threats, the major challenge to the TNRP will be the development of Mon ceasefire villages inside the nature reserve. Main threats such as illegal logging, hunting, village encroachment etc, are expected to concentrate in this area, In fact, as this issue is political, racial and socio-economic related one, it will have to take time to solve it. It is advisable to monitor the severity of threats and need to seek effective ways for solutions.

6.4. Summary of Need for Environmental Education and Recommendation

No.	Need for Environmental Education	Current status	Recommendation
1.	***Need for Institutional strengthening***		
	- Organizing an EE team	-No dedicated team for EE purpose; educators are responsible for multi-tasks of the project.	-Form an EE team for concentrating EE programme and assign a team leader, with clearly defined responsibilities of the team.
	- Capacity building on EE	-Project staffs have received only a very short training on basic concept of EE.	-Provide more trainings/ workshops on Environmental Education and Communi-cation.
2	***Deployment of EE materials and facilities***		
	EE materials		
	- Printed materials	-Inadequate	- Develop printed media (Pamphlet on TNR, posters on protected mammals, birds in TNR, value of biodiversity, consequences of biodiversity loss etc.)
	- Audio-visual aids	-Inadequate	- Modify existing power point presentation and develop new ones to be relevant with specific target audience.
	- Signboards with prohibition/ slogans	- Erected signboards with prohibitions and mottos, mostly on the roadside along the southern part of TNR western boundary. Two signboard prohibiting hunting, transportation and illegal wildlife trade has been recommended and erected at Kaleinaung and Yebyu.	- Erect signboards at villages in the northern part, mentioning TNR is located near the village, along with location maps, prohibitions and mottos as well. - Set up TNR signboard, Boundary pillar, signboards with prohibitions and mottos should be set up at the cross point of TNR boundary and pipeline

No.	Need for Environmental Education	Current status	Recommendation
			service track to make the company personnel, subcontractors and military personnel aware of. - One more signboard prohibiting illegal wildlife trade should be erected at Kanbauk.
	<u>*Other associated facilities*</u> - Establishment of Information, Education and Communication Centre	No specific Information Education and Communi-ation Centre.	-Upgrade Michaunglaung nursery as Information, Education and Communi-cation Centre fully equipped with educational materials and associated facilities.
	- Demonstration sites	-No demonstration sites	-Establish the demonstration sites for soil conservation, agroforestry techniques, community forestry.
3.	***Need for Non-formal EE (Village EE program)*** <u>*General audience*</u>		
	- Promoting knowledge, and aware of TNR boundary, prohibitions	- TNRP has been organizing awareness discussion since 2006.	- Continue awareness discussion to promote the environmental knowledge
		- Most of the people do not know the TNR boundary very well and are not aware of restrictions.	- Attention should be paid to make the people more aware of TNR boundary and restrictions using maps or relevant materials at awareness discussion and erect signboard with prohibitions at the villages.
		- Mon; female; ≥40 yrs groups are observed lower in environmental knowledge than others' groups.	- Pay more attention on Mon villages, age group of ≥40 yrs, and females.

No.	Need for Environmental Education	Current status	Recommendation
	- Changing negative attitude	- Most of the villagers have negative attitude towards advantage of TNR; Formal education links to environmental knowledge.	- Consider educational care programme for helping the villagers for better access to formal education.
	- Need to overcome language barrier	- Encounter language barrier in awareness programme.	- Assign village environmental educators or communication staff of Mon and Karen to facilitate the EE programe.
	- Evaluating EE programme	- No evaluation on effectiveness of individual progamme.	- Evaluate on effectiveness of talks / discussions whenever completion of individual programme.
	Targeted Audience		
	- Need for promoting knowledge, practice - Changing negative attitude - Need for creating job opportunity and alternative livelihood options	- Not yet organized awareness programme for targeted audience.	- Initiate the awareness programme for targeted groups related to major threat to TNR.
		- Shifting cultivators and timber cutters in Zinba are low in environmental knowledge.	- Priority should be paid attention to those groups while promoting knowledge of targeted groups.
		- Both shifting cultivator and *taungya*-based orchard cultivators are poor in fire use practice.	- Improve the practice through the training and awareness programme. More attention pay to shifting cultivators - Community-based fire management should be introduced. - Provide training on prescribed burning practice.

No.	Need for Environmental Education	Current status	Recommendation
		- Most of Shifting cultivators in MCL believe that Shifting cultivation is concerned with Karen tradition; accessibility and land availability are major constraints to grow perennial crops.	- Introduce improved fallow system. Provide them training to shifting cultivators with constraints to adopt agro-forestry immediately. Gradually induce appropriate agro-forestry system.
		- Generally, maintaining soil fertility was not carried out by Shifting cultivators and orchard cultivators as well. - Some orchard cultivators are using chemical fertilizer in rubber plantations.	- Provide training on soil conservation and agro-forestry practices. Demonstrate the practices. - Organize awareness discussions on handling chemicals. Provide trainings on compost/ natural fertilizer making and application. Demonstrate the advantage of using compost/natural fertilizer.
		- Poor alternative livelihood option for timber cutters in Zinba; this practice links with social norms and immigrants.	- Define the village use zone and allow timber and bamboo cutting under certain conditions. Provide information on village use zone. Gradually intensify legal enforcement in cooperation with local Forest Department.
		- Some timber cutters in Zinba traditionally hold the land without cultivation and some have the plots in integrated farm. - Low employment of Zinba villagers, compared to others.	- Encourage for growing perennial crops. Cooperate socio-eco department of TEPM. Provide relevant trainings on horticulture. - Negotiate with MGTC, TCP and their sub-contractors. Should absorb by TNRP itself.

No.	Need for Environmental Education	Current status	Recommendation
		- Hunters lack knowledge on protected wildlife. - Security forces along the service track are involved in bush meat hunting. - Timber cutters in Hnankye perceive negative attitude that TNRP causes problems to their families. Majority has no alternative livelihood options. - Low in knowledge on TNRP and environmental related law and policy.	- Provide information using posters and pamphlets. - Visit frequently military camps, provide information on value of biodiversity, raise awareness and persuade to participate in biodiversity survey and conservation activities. - Define the village use zone and allow timber & bamboo cutting under certain conditions. Provide information on village use zone. Consider alternative income generation scheme. - Disseminate information on income opportunities to all targeted groups. - Establish regular communication system with decision-makers. - Advocate on environ-mental matters. - Disseminate copy of relevant policy and law. - Develop and disseminate printed media and project souvenirs having informa-tion on TNRP. - TV programme for decision-makers at different level.
	<u>*Decision-makers*</u> - Enhancing knowledge on TNRP and environmental related laws & policy		
4	***Needs for making formal EE more effective*** -Raising awareness	- TNRP has been giving The awareness talks in schools.	- Continue awareness talk programme. - Use more audio-visual aids. - Organize quiz contest, essay writing competition, drawing competition etc.

No.	Need for Environmental Education	Current status	Recommendation
	- Teaching aids facility	- Generally, environmental themes infused in curricula are found to be sufficient.	- Provide some appropriate teaching aids (e.g. posters, audio-visual packages etc.) suited to environmental lessons in existing curricula.
		- Mostly use the prescribed text books and inadequate teaching aids.	- Organize excursion visit to parks, nature reserve, zoo and environmental education center.
	- Encouraging out-door studies relevant to EE themes	- Tree planting ceremonies are being organized by the TNRP in the schools. - Out-door activities are very few.	- Continue collaborative activities for the environmental protection, organizing waste cleaning day, tree planting day.
	- Promoting capacity of teachers	- MoE is giving pre-service and in-service trainings - Environmental knowledge of teacher is inadequate.	- Enhancing participation of teachers in relevant trainings, workshops, seminars etc. whenever necessary. - Priority should be given to primary school teachers followed by middle school teachers. - Provide current and fresh environmental information to school libraries.

7.0. Conclusion

The major goal of the environmental education is to change the behaviors of the people towards environmentally sound practices while raising awareness, providing knowledge and information, making people skillful. However, behavior change depends not only on the awareness, knowledge, attitude and skill but also on the other factors from their social environment such as social norms, tradition, alternative livelihood option, legal enforcement and so on. These all factors should be integrated in holistic approach. Any environmental education program without integrating these factors will not be successful in meeting overall goal of EE. According to principle itself, EE is life long process and it needs to take time for changing towards environmentally sound behavior. During the process, it has to hand over from generation to generation. For this reason, future generations could not be left without educating. Only when future generations become environmentally literate citizens, the natural environment will exist in sustainable manner. Therefore, a combined approach of formal and non-formal environmental education is the most effective way in nature conservation for the long term.

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Photo plates showing environmental awareness programme

Awareness talk at Kaleinaung B.E.H.S

Environmental Quiz at Kaleinaung B.E.H.S

Awareness talk and post-evaluation using quiz at Yarphu B.E.M.S

Villagers after Attending Awareness Discussion in Shanphan

Awareness Programme for Local Decision - Makers and Village Heads at TPDC Office, Kaleinaung

Awareness Discussion at Military Infantry

Photo plates showing data collection for need assessment, capacity building and signboards with prohibitions

Reviewing Existing Curriculum in Formal Education

Interview with Villagers for Need Assessment

Training on Basic Concept of Environmental Education for Project Staff

Group Works for Problem Identification and EE intervention in TNRP area

Signboard erected at Kaleinaung Market ,
(Noticing prohibition to hunting & wildlife trade)

Signboards with Prohibitions and Mottos, erected along the southern part of western TNR boundary

Photo plates showing potential non-timber forest produces for income generation

Cultivated *Pha-lar* Plants in Zardi Village

Green *Pha-lar* Fruits

Pha-lar fruits under sun drying for marketing

Wa-U cultivation in orchards (Zardi

Harvesting Cultivated *Wa-U in* Zardi Village

Harvested Wa-U in Zardi Village

Appendix-1.1

Basic Environmental Knowledge by Village

Sr.	Village	Knowledge level			Total
		1	2	3	
		Poor	Fair	Good	
1	Hnankye	30.00%	30.00%	40.00%	100.00%
2	Kaleinaung	33.33%	38.89%	27.78%	100.00%
3	Karen Shinhtabi/Shanphan	0.00%	30.00%	70.00%	100.00%
4	Khawhlaing	63.64%	27.27%	9.09%	100.00%
5	Kyaukshat	16.67%	16.67%	66.67%	100.00%
6	Mayanchaung	20.00%	40.00%	40.00%	100.00%
7	Michaunglaung (New)	25.00%	33.33%	41.67%	100.00%
8	Michaunglaung(Old)	27.27%	9.09%	63.64%	100.00%
9	Tharyarmon	80.00%	20.00%	0.00%	100.00%
10	Wunpo	18.18%	45.45%	36.36%	100.00%
11	Yarphu	45.45%	45.45%	9.09%	100.00%
12	Yebon	41.67%	33.33%	25.00%	100.00%
13	Zinba	9.09%	27.27%	63.64%	100.00%
	Grand Total	**31.54%**	**30.87%**	**37.58%**	**100.00%**

Basic Environmental Knowledge by Ethnic Group

Sr.	Ethnic group	Knowledge level			Total
		1	2	3	
		Poor	Fair	Good	
1	Mon	53.33%	36.67%	10.00%	100.00%
2	Bamar	30.00%	20.00%	50.00%	100.00%
3	Dawei	32.35%	32.35%	35.29%	100.00%
4	Karen	14.29%	22.86%	62.86%	100.00%
5	Other	16.67%	50.00%	33.33%	100.00%
	Grand Total	**31.54%**	**30.87%**	**37.58%**	**100.00%**

Basic Environmental Knowledge by Gender

Sr.	Gender	Knowledge level			Total
		1	2	3	
		Poor	Fair	Good	
1	Female	40.32%	27.42%	32.26%	100.00%
2	Male	25.29%	33.33%	41.38%	100.00%
	Grand Total	**31.54%**	**30.87%**	**37.58%**	**100.00%**

Basic Environmental Knowledge by Age Group

Sr.	Age group	Knowledge level			Total
		1	2	3	
		Poor	Fair	Good	
1	Under 40 years old	23.64%	29.09%	47.27%	100.00%
2	40 years old & above	36.17%	31.91%	31.91%	100.00%
	Grand Total	**31.54%**	**30.87%**	**37.58%**	**100.00%**

Appendix-1.1

Aware of TNR Boundary by Village

Sr.	Village	Don't know (or) Have heard	Know well	Total
1	Hnankye	10.00%	90.00%	100.00%
2	Kaleinaung	100.00%	0.00%	100.00%
3	Karen Shinhtabi/Shanphan	100.00%	0.00%	100.00%
4	Khawhlaing	100.00%	0.00%	100.00%
5	Kyaukshat	25.00%	75.00%	100.00%
6	Mayanchaung	40.00%	60.00%	100.00%
7	Michaunglaung (New)	91.67%	8.33%	100.00%
8	Michaunglaung(Old)	54.55%	45.45%	100.00%
9	Tharyarmon	90.00%	10.00%	100.00%
10	Wunpo	9.09%	90.91%	100.00%
11	Yarphu	45.45%	54.55%	100.00%
12	Yebon	16.67%	83.33%	100.00%
13	Zinba	63.64%	36.36%	100.00%
	Grand Total	**59.06%**	**40.94%**	**100.00%**

Aware of TNR Boundary by Ethnic Group

Sr.	Ethnic group	Don't know (or) Have heard	Know well	Total
1	Mon	66.67%	33.33%	100.00%
2	Bamar	60.00%	40.00%	100.00%
3	Dawei	58.82%	41.18%	100.00%
4	Karen	62.86%	37.14%	100.00%
5	Other	0.00%	100.00%	100.00%
	Grand Total	**59.06%**	**40.94%**	**100.00%**

Aware of TNR Boundary by Gender

Sr.	Gender	Don't know (or) Have heard	Know well	Total
1	Female	67.74%	32.26%	100.00%
2	Male	52.87%	47.13%	100.00%
	Grand Total	**59.06%**	**40.94%**	**100.00%**

Aware of TNR Boundary by Age Group

Sr.	Age group	Don't know (or) Have heard	Know well	Total
1	Under 40 years old	61.82%	38.18%	100.00%
2	40 years old & above	57.45%	42.55%	100.00%
	Grand Total	**59.06%**	**40.94%**	**100.00%**

Appendix-1.1

Aware of Prohibitions inside TNR by Village

Sr.	Village	Don't know (or) Have heard	Know well	Total
1	Hnankye	40.00%	60.00%	100.00%
2	Kaleinaung	100.00%	0.00%	100.00%
3	Karen Shinhtabi/Shanphan	20.00%	80.00%	100.00%
4	Khawhlaing	90.91%	9.09%	100.00%
5	Kyaukshat	75.00%	25.00%	100.00%
6	Mayanchaung	100.00%	0.00%	100.00%
7	Michaunglaung (New)	41.67%	58.33%	100.00%
8	Michaunglaung(Old)	72.73%	27.27%	100.00%
9	Tharyarmon	90.00%	10.00%	100.00%
10	Wunpo	45.45%	54.55%	100.00%
11	Yarphu	90.91%	9.09%	100.00%
12	Yebon	50.00%	50.00%	100.00%
13	Zinba	81.82%	18.18%	100.00%
	Grand Total	**70.75%**	**29.25%**	**100.00%**

Aware of Prohibitions inside TNR by Ethnic Group

Sr.	Ethnic group	Don't know (or) Have heard	Know well	Total
1	Mon	93.33%	6.67%	100.00%
2	Bamar	60.00%	40.00%	100.00%
3	Dawei	68.18%	31.82%	100.00%
4	Karen	60.00%	40.00%	100.00%
5	Other	66.67%	33.33%	100.00%
	Grand Total	**70.75%**	**29.25%**	**100.00%**

Aware of Prohibitions inside TNR by Gender

Sr.	Gender	Don't know (or) Have heard	Know well	Total
1	Female	80.00%	20.00%	100.00%
2	Male	64.37%	35.63%	100.00%
	Grand Total	**70.75%**	**29.25%**	**100.00%**

Aware of Prohibitions inside TNR by Age Group

Sr.	Age group	Don't know (or) Have heard	Know well	Total
1	Under 40 years old	62.96%	37.04%	100.00%
2	40 years old & above	75.27%	24.73%	100.00%
	Grand Total	**70.75%**	**29.25%**	**100.00%**

Appendix-1.2

Attitude to constitution of TNR by village

Sr.	Village	Constitution of nature reserve is good			Total
		Disgree	Don't know	Agree	
1	Hnankye	0.00%	0.00%	100.00%	100.00%
2	Kaleinaung	0.00%	11.11%	88.89%	100.00%
3	Karen Shinhtabi/Shanphan	0.00%	0.00%	100.00%	100.00%
4	Khawhlaing	0.00%	0.00%	100.00%	100.00%
5	Kyaukshat	0.00%	0.00%	100.00%	100.00%
6	Mayanchaung	0.00%	0.00%	100.00%	100.00%
7	Michaunglaung (New)	0.00%	8.33%	91.67%	100.00%
8	Michaunglaung(Old)	0.00%	9.09%	90.91%	100.00%
9	Tharyarmon	0.00%	20.00%	80.00%	100.00%
10	Wunpo	9.09%	0.00%	90.91%	100.00%
11	Yarphu	9.09%	18.18%	72.73%	100.00%
12	Yebon	25.00%	0.00%	75.00%	100.00%
13	Zinba	36.36%	0.00%	63.64%	100.00%
	Grand Total	**6.04%**	**5.37%**	**88.59%**	**100.00%**

Attitude to constitution of TNR by ethnic group

Sr.	Ethnic group	Constitution of nature reserve is good			Total
		Disgree	Don't know	Agree	
1	Mon	3.33%	13.33%	83.33%	100.00%
2	Bamar	10.00%	0.00%	90.00%	100.00%
3	Dawei	7.35%	2.94%	89.71%	100.00%
4	Karen	5.71%	5.71%	88.57%	100.00%
5	Other	0.00%	0.00%	100.00%	100.00%
	Grand Total	**6.04%**	**5.37%**	**88.59%**	**100.00%**

Attitude to constitution of TNR by gender

Sr.	Gender	Constitution of nature reserve is good			Total
		Disgree	Don't know	Agree	
1	Female	6.45%	3.23%	90.32%	100.00%
2	Male	5.75%	6.90%	87.36%	100.00%
	Grand Total	**6.04%**	**5.37%**	**88.59%**	**100.00%**

Attitude to constitution of TNR by age group

Sr.	Age group	Constitution of nature reserve is good			Total
		Disgree	Don't know	Agree	
1	under 40 years old	5.45%	5.45%	89.09%	100.00%
2	40 years and above	6.38%	5.32%	88.30%	100.00%
	Grand Total	**6.04%**	**5.37%**	**88.59%**	**100.00%**

Appendix-1.2

Attitude to constitution of TNR by village

Sr.	Village	It is better if nature reserve is not			Total
		Disgree	Don't know	Agree	
1	Hnankye	80.00%	0.00%	20.00%	100.00%
2	Kaleinaung	88.89%	11.11%	0.00%	100.00%
3	Karen Shinhtabi/Shanphan	100.00%	0.00%	0.00%	100.00%
4	Khawhlaing	100.00%	0.00%	0.00%	100.00%
5	Kyaukshat	91.67%	8.33%	0.00%	100.00%
6	Mayanchaung	100.00%	0.00%	0.00%	100.00%
7	Michaunglaung (New)	91.67%	8.33%	0.00%	100.00%
8	Michaunglaung(Old)	90.91%	9.09%	0.00%	100.00%
9	Tharyarmon	70.00%	30.00%	0.00%	100.00%
10	Wunpo	81.82%	0.00%	18.18%	100.00%
11	Yarphu	54.55%	18.18%	27.27%	100.00%
12	Yebon	75.00%	0.00%	25.00%	100.00%
13	Zinba	63.64%	0.00%	36.36%	100.00%
	Grand Total	**83.89%**	**6.71%**	**9.40%**	**100.00%**

Attitude to constitution of TNR by ethnic group

Sr.	Ethnic group	It is better if nature reserve is not			Total
		Disgree	Don't know	Agree	
1	Mon	73.33%	16.67%	10.00%	100.00%
2	Bamar	90.00%	0.00%	10.00%	100.00%
3	Dawei	86.76%	2.94%	10.29%	100.00%
4	Karen	82.86%	8.57%	8.57%	100.00%
5	Other	100.00%	0.00%	0.00%	100.00%
	Grand Total	**83.89%**	**6.71%**	**9.40%**	**100.00%**

Attitude to constitution of TNR by gender

Sr.	Gender	It is better if nature reserve is not			Total
		Disgree	Don't know	Agree	
1	Female	82.26%	6.45%	11.29%	100.00%
2	Male	85.06%	6.90%	8.05%	100.00%
	Grand Total	**83.89%**	**6.71%**	**9.40%**	**100.00%**

Attitude to constitution of TNR by age group

Sr.	Age group	It is better if nature reserve is not			Total
		Disgree	Don't know	Agree	
1	under 40 years old	83.64%	7.27%	9.09%	100.00%
2	40 years and above	84.04%	6.38%	9.57%	100.00%
	Grand Total	**83.89%**	**6.71%**	**9.40%**	**100.00%**

Appendix-1.2

Attitude to constitution of TNR by village

Sr.	Village	Nature reserve is constituted			Total
		Disgree	Don't know	Agree	
1	Hnankye	0.00%	0.00%	100.00%	100.00%
2	Kaleinaung	0.00%	5.56%	94.44%	100.00%
3	Karen Shinhtabi/Shanphan	0.00%	0.00%	100.00%	100.00%
4	Khawhlaing	0.00%	18.18%	81.82%	100.00%
5	Kyaukshat	0.00%	8.33%	91.67%	100.00%
6	Mayanchaung	0.00%	10.00%	90.00%	100.00%
7	Michaunglaung (New)	0.00%	8.33%	91.67%	100.00%
8	Michaunglaung(Old)	0.00%	18.18%	81.82%	100.00%
9	Tharyarmon	0.00%	30.00%	70.00%	100.00%
10	Wunpo	0.00%	0.00%	100.00%	100.00%
11	Yarphu	9.09%	18.18%	72.73%	100.00%
12	Yebon	0.00%	0.00%	100.00%	100.00%
13	Zinba	18.18%	0.00%	81.82%	100.00%
	Grand Total	**2.03%**	**8.78%**	**89.19%**	**100.00%**

Attitude to constitution of TNR by ethnic group

Sr.	Ethnic group	Nature reserve is constituted			Total
		Disgree	Don't know	Agree	
1	Mon	3.33%	23.33%	73.33%	100.00%
2	Bamar	0.00%	0.00%	100.00%	100.00%
3	Dawei	0.00%	4.48%	95.52%	100.00%
4	Karen	5.71%	8.57%	85.71%	100.00%
5	Other	0.00%	0.00%	100.00%	100.00%
	Grand Total	**2.03%**	**8.78%**	**89.19%**	**100.00%**

Attitude to constitution of TNR by gender

Sr.	Gender	Nature reserve is constituted			Total
		Disgree	Don't know	Agree	
1	Female	1.64%	9.84%	88.52%	100.00%
2	Male	2.30%	8.05%	89.66%	100.00%
	Grand Total	**2.03%**	**8.78%**	**89.19%**	**100.00%**

Attitude to constitution of TNR by age group

Sr.	Age group	Nature reserve is constituted			Total
		Disgree	Don't know	Agree	
1	under 40 years old	0.00%	7.27%	92.73%	100.00%
2	40 years and above	3.23%	9.68%	87.10%	100.00%
	Grand Total	**2.03%**	**8.78%**	**89.19%**	**100.00%**

Appendix-1.2

Attitude to constitution of TNR by village

Sr.	Village	Protection of forest is important			Total
		Disgree	Don't know	Agree	
1	Hnankye	0.00%	0.00%	100.00%	100.00%
2	Kaleinaung	0.00%	0.00%	100.00%	100.00%
3	Karen Shinhtabi/Shanphan	0.00%	0.00%	100.00%	100.00%
4	Khawhlaing	0.00%	0.00%	100.00%	100.00%
5	Kyaukshat	0.00%	0.00%	100.00%	100.00%
6	Mayanchaung	0.00%	0.00%	100.00%	100.00%
7	Michaunglaung (New)	0.00%	0.00%	100.00%	100.00%
8	Michaunglaung(Old)	0.00%	0.00%	100.00%	100.00%
9	Tharyarmon	0.00%	10.00%	90.00%	100.00%
10	Wunpo	0.00%	0.00%	100.00%	100.00%
11	Yarphu	0.00%	18.18%	81.82%	100.00%
12	Yebon	0.00%	0.00%	100.00%	100.00%
13	Zinba	0.00%	0.00%	100.00%	100.00%
	Grand Total	**0.00%**	**2.04%**	**97.96%**	**100.00%**

Attitude to constitution of TNR by ethnic group

Sr.	Ethnic group	Protection of forest is important			Total
		Disgree	Don't know	Agree	
1	Mon	0.00%	6.67%	93.33%	100.00%
2	Bamar	0.00%	0.00%	100.00%	100.00%
3	Dawei	0.00%	0.00%	100.00%	100.00%
4	Karen	0.00%	0.00%	100.00%	100.00%
5	Other	0.00%	20.00%	80.00%	100.00%
	Grand Total	**0.00%**	**2.04%**	**97.96%**	**100.00%**

Attitude to constitution of TNR by gender

Sr.	Gender	Protection of forest is important			Total
		Disgree	Don't know	Agree	
1	Female	0.00%	0.00%	100.00%	100.00%
2	Male	0.00%	3.45%	96.55%	100.00%
	Grand Total	**0.00%**	**2.04%**	**97.96%**	**100.00%**

Attitude to constitution of TNR by age group

Sr.	Age group	Protection of forest is important			Total
		Disgree	Don't know	Agree	
1	under 40 years old	0.00%	1.85%	98.15%	100.00%
2	40 years and above	0.00%	2.15%	97.85%	100.00%
	Grand Total	**0.00%**	**2.04%**	**97.96%**	**100.00%**

Appendix-1.2

Attitude to impact of TNR by village

Sr.	Village	Constitution of nature reserve causes			Total
		Disgree	Don't know	Agree	
1	Hnankye	80.00%	10.00%	10.00%	100.00%
2	Kaleinaung	100.00%	0.00%	0.00%	100.00%
3	Karen Shinhtabi/Shanphan	100.00%	0.00%	0.00%	100.00%
4	Khawhlaing	100.00%	0.00%	0.00%	100.00%
5	Kyaukshat	91.67%	0.00%	8.33%	100.00%
6	Mayanchaung	100.00%	0.00%	0.00%	100.00%
7	Michaunglaung (New)	91.67%	0.00%	8.33%	100.00%
8	Michaunglaung(Old)	100.00%	0.00%	0.00%	100.00%
9	Tharyarmon	100.00%	0.00%	0.00%	100.00%
10	Wunpo	72.73%	27.27%	0.00%	100.00%
11	Yarphu	81.82%	0.00%	18.18%	100.00%
12	Yebon	41.67%	0.00%	58.33%	100.00%
13	Zinba	54.55%	0.00%	45.45%	100.00%
	Grand Total	**85.91%**	**2.68%**	**11.41%**	**100.00%**

Attitude to impact of TNR by ethnic group

Sr.	Ethnic group	Constitution of nature reserve causes			Total
		Disgree	Don't know	Agree	
1	Mon	90.00%	0.00%	10.00%	100.00%
2	Bamar	90.00%	0.00%	10.00%	100.00%
3	Dawei	80.88%	5.88%	13.24%	100.00%
4	Karen	88.57%	0.00%	11.43%	100.00%
5	Other	100.00%	0.00%	0.00%	100.00%
	Grand Total	**85.91%**	**2.68%**	**11.41%**	**100.00%**

Attitude to impact of TNR by gender

Sr.	Gender	Constitution of nature reserve causes			Total
		Disgree	Don't know	Agree	
1	Female	83.87%	4.84%	11.29%	100.00%
2	Male	87.36%	1.15%	11.49%	100.00%
	Grand Total	**85.91%**	**2.68%**	**11.41%**	**100.00%**

Attitude to impact of TNR by age group

Sr.	Age group	Constitution of nature reserve causes			Total
		Disgree	Don't know	Agree	
1	under 40 years old	87.27%	0.00%	12.73%	100.00%
2	40 years and above	85.11%	4.26%	10.64%	100.00%
	Grand Total	**85.91%**	**2.68%**	**11.41%**	**100.00%**

Appendix-1.2

Attitude to impact of TNR by village

Sr.	Village	Constitution of nature reserve supports to			Total
		Disgree	Don't know	Agree	
1	Hnankye	50.00%	10.00%	40.00%	100.00%
2	Kaleinaung	100.00%	0.00%	0.00%	100.00%
3	Karen Shinhtabi/Shanphan	100.00%	0.00%	0.00%	100.00%
4	Khawhlaing	100.00%	0.00%	0.00%	100.00%
5	Kyaukshat	100.00%	0.00%	0.00%	100.00%
6	Mayanchaung	70.00%	20.00%	10.00%	100.00%
7	Michaunglaung (New)	75.00%	16.67%	8.33%	100.00%
8	Michaunglaung(Old)	90.91%	0.00%	9.09%	100.00%
9	Tharyarmon	90.00%	0.00%	10.00%	100.00%
10	Wunpo	72.73%	27.27%	0.00%	100.00%
11	Yarphu	70.00%	0.00%	30.00%	100.00%
12	Yebon	66.67%	0.00%	33.33%	100.00%
13	Zinba	90.91%	0.00%	9.09%	100.00%
	Grand Total	**83.78%**	**5.41%**	**10.81%**	**100.00%**

Attitude to impact of TNR by ethnic group

Sr.	Ethnic group	Constitution of nature reserve supports to			Total
		Disgree	Don't know	Agree	
1	Mon	86.21%	0.00%	13.79%	100.00%
2	Bamar	80.00%	10.00%	10.00%	100.00%
3	Dawei	83.82%	5.88%	10.29%	100.00%
4	Karen	88.57%	2.86%	8.57%	100.00%
5	Other	50.00%	33.33%	16.67%	100.00%
	Grand Total	**83.78%**	**5.41%**	**10.81%**	**100.00%**

Attitude to impact of TNR by gender

Sr.	Gender	Constitution of nature reserve supports to			Total
		Disgree	Don't know	Agree	
1	Female	83.87%	9.68%	6.45%	100.00%
2	Male	83.72%	2.33%	13.95%	100.00%
	Grand Total	**83.78%**	**5.41%**	**10.81%**	**100.00%**

Attitude to impact of TNR by age group

Sr.	Age group	Constitution of nature reserve supports to			Total
		Disgree	Don't know	Agree	
1	under 40 years old	81.82%	5.45%	12.73%	100.00%
2	40 years and above	84.95%	5.38%	9.68%	100.00%
	Grand Total	**83.78%**	**5.41%**	**10.81%**	**100.00%**

Appendix-1.2

Attitude to advantage of TNRP by village

Sr.	Village	TNR project helps local people			Total
		Disgree	Don't know	Agree	
1	Hnankye	60.00%	20.00%	20.00%	100.00%
2	Kaleinaung	77.78%	11.11%	11.11%	100.00%
3	Karen Shinhtabi/Shanphan	80.00%	20.00%	0.00%	100.00%
4	Khawhlaing	72.73%	0.00%	27.27%	100.00%
5	Kyaukshat	41.67%	41.67%	16.67%	100.00%
6	Mayanchaung	70.00%	20.00%	10.00%	100.00%
7	Michaunglaung (New)	41.67%	33.33%	25.00%	100.00%
8	Michaunglaung(Old)	36.36%	45.45%	18.18%	100.00%
9	Tharyarmon	50.00%	40.00%	10.00%	100.00%
10	Wunpo	70.00%	20.00%	10.00%	100.00%
11	Yarphu	72.73%	27.27%	0.00%	100.00%
12	Yebon	58.33%	25.00%	16.67%	100.00%
13	Zinba	81.82%	18.18%	0.00%	100.00%
	Grand Total	**62.84%**	**24.32%**	**12.84%**	**100.00%**

Attitude to advantage of TNRP by ethnic group

Sr.	Ethnic group	TNR project helps local people			Total
		Disgree	Don't know	Agree	
1	Mon	66.67%	23.33%	10.00%	100.00%
2	Bamar	40.00%	30.00%	30.00%	100.00%
3	Dawei	68.66%	19.40%	11.94%	100.00%
4	Karen	57.14%	28.57%	14.29%	100.00%
5	Other	50.00%	50.00%	0.00%	100.00%
	Grand Total	**62.84%**	**24.32%**	**12.84%**	**100.00%**

Attitude to advantage of TNRP by gender

Sr.	Gender	TNR project helps local people			Total
		Disgree	Don't know	Agree	
1	Female	67.21%	27.87%	4.92%	100.00%
2	Male	59.77%	21.84%	18.39%	100.00%
	Grand Total	**62.84%**	**24.32%**	**12.84%**	**100.00%**

Attitude to advantage of TNRP by age group

Sr.	Age group	TNR project helps local people			Total
		Disgree	Don't know	Agree	
1	under 40 years old	56.36%	36.36%	7.27%	100.00%
2	40 years and above	66.67%	17.20%	16.13%	100.00%
	Grand Total	**62.84%**	**24.32%**	**12.84%**	**100.00%**

Appendix-1.2

Attitude to advantage of TNRP by village

Sr.	Village	TNR project staff helps local people			Total
		Disgree	Don't know	Agree	
1	Hnankye	10.00%	20.00%	70.00%	100.00%
2	Kaleinaung	66.67%	11.11%	22.22%	100.00%
3	Karen Shinhtabi/Shanphan	80.00%	0.00%	20.00%	100.00%
4	Khawhlaing	90.91%	0.00%	9.09%	100.00%
5	Kyaukshat	16.67%	33.33%	50.00%	100.00%
6	Mayanchaung	40.00%	10.00%	50.00%	100.00%
7	Michaunglaung (New)	16.67%	0.00%	83.33%	100.00%
8	Michaunglaung(Old)	36.36%	45.45%	18.18%	100.00%
9	Tharyarmon	60.00%	40.00%	0.00%	100.00%
10	Wunpo	36.36%	27.27%	36.36%	100.00%
11	Yarphu	54.55%	36.36%	9.09%	100.00%
12	Yebon	0.00%	8.33%	91.67%	100.00%
13	Zinba	54.55%	36.36%	9.09%	100.00%
	Grand Total	**43.62%**	**20.13%**	**36.24%**	**100.00%**

Attitude to advantage of TNRP by ethnic group

Sr.	Ethnic group	TNR project staff helps local people			Total
		Disgree	Don't know	Agree	
1	Mon	63.33%	23.33%	13.33%	100.00%
2	Bamar	20.00%	20.00%	60.00%	100.00%
3	Dawei	39.71%	17.65%	42.65%	100.00%
4	Karen	45.71%	22.86%	31.43%	100.00%
5	Other	16.67%	16.67%	66.67%	100.00%
	Grand Total	**43.62%**	**20.13%**	**36.24%**	**100.00%**

Attitude to advantage of TNRP by gender

Sr.	Gender	TNR project staff helps local people			Total
		Disgree	Don't know	Agree	
1	Female	46.77%	19.35%	33.87%	100.00%
2	Male	41.38%	20.69%	37.93%	100.00%
	Grand Total	**43.62%**	**20.13%**	**36.24%**	**100.00%**

Attitude to advantage of TNRP by age group

Sr.	Age group	TNR project staff helps local people			Total
		Disgree	Don't know	Agree	
1	under 40 years old	45.45%	21.82%	32.73%	100.00%
2	40 years and above	42.55%	19.15%	38.30%	100.00%
	Grand Total	**43.62%**	**20.13%**	**36.24%**	**100.00%**

Appendix-1.2

Attitude to advantage of TNRP by village

Sr.	Village	TNR project creates job opportunity			Total
		Disgree	Don't know	Agree	
1	Hnankye	80.00%	20.00%	0.00%	100.00%
2	Kaleinaung	66.67%	16.67%	16.67%	100.00%
3	Karen Shinhtabi/Shanphan	100.00%	0.00%	0.00%	100.00%
4	Khawhlaing	100.00%	0.00%	0.00%	100.00%
5	Kyaukshat	41.67%	41.67%	16.67%	100.00%
6	Mayanchaung	70.00%	30.00%	0.00%	100.00%
7	Michaunglaung (New)	16.67%	0.00%	83.33%	100.00%
8	Michaunglaung(Old)	45.45%	45.45%	9.09%	100.00%
9	Tharyarmon	60.00%	40.00%	0.00%	100.00%
10	Wunpo	80.00%	20.00%	0.00%	100.00%
11	Yarphu	72.73%	27.27%	0.00%	100.00%
12	Yebon	66.67%	25.00%	8.33%	100.00%
13	Zinba	81.82%	18.18%	0.00%	100.00%
	Grand Total	**66.89%**	**21.62%**	**11.49%**	**100.00%**

Attitude to advantage of TNRP by ethnic group

Sr.	Ethnic group	TNR project creates job opportunity			Total
		Disgree	Don't know	Agree	
1	Mon	76.67%	23.33%	0.00%	100.00%
2	Bamar	40.00%	10.00%	50.00%	100.00%
3	Dawei	64.18%	22.39%	13.43%	100.00%
4	Karen	74.29%	17.14%	8.57%	100.00%
5	Other	50.00%	50.00%	0.00%	100.00%
	Grand Total	**66.89%**	**21.62%**	**11.49%**	**100.00%**

Attitude to advantage of TNRP by gender

Sr.	Gender	Constitution of nature reserve supports to			Total
		Disgree	Don't know	Agree	
1	Female	62.30%	24.59%	13.11%	100.00%
2	Male	70.11%	19.54%	10.34%	100.00%
	Grand Total	**66.89%**	**21.62%**	**11.49%**	**100.00%**

Attitude to advantage of TNRP by age group

Sr.	Age group	TNR project creates job opportunity			Total
		Disgree	Don't know	Agree	
1	under 40 years old	58.18%	29.09%	12.73%	100.00%
2	40 years and above	72.04%	17.20%	10.75%	100.00%
	Grand Total	**66.89%**	**21.62%**	**11.49%**	**100.00%**

Appendix-1.2

Attitude to resource use inside TNR by village

Sr.	Village	Hunting for household consumption			Total
		Disagree	Don't know	Agree	
1	Hnankye	70.00%	10.00%	20.00%	100.00%
2	Kaleinaung	38.89%	5.56%	55.56%	100.00%
3	Karen Shinhtabi/Shanphan	60.00%	0.00%	40.00%	100.00%
4	Khawhlaing	27.27%	18.18%	54.55%	100.00%
5	Kyaukshat	58.33%	8.33%	33.33%	100.00%
6	Mayanchaung	90.00%	10.00%	0.00%	100.00%
7	Michaunglaung (New)	41.67%	0.00%	58.33%	100.00%
8	Michaunglaung(Old)	45.45%	18.18%	36.36%	100.00%
9	Tharyarmon	50.00%	10.00%	40.00%	100.00%
10	Wunpo	72.73%	9.09%	18.18%	100.00%
11	Yarphu	72.73%	9.09%	18.18%	100.00%
12	Yebon	41.67%	0.00%	58.33%	100.00%
13	Zinba	45.45%	0.00%	54.55%	100.00%
	Grand Total	**53.69%**	**7.38%**	**38.93%**	**100.00%**

Attitude to resource use inside TNR by ethnic group

Sr.	Ethnic group	Hunting for household consumption			Total
		Disagree	Don't know	Agree	
1	Mon	66.67%	10.00%	23.33%	100.00%
2	Bamar	60.00%	0.00%	40.00%	100.00%
3	Dawei	47.06%	7.35%	45.59%	100.00%
4	Karen	51.43%	5.71%	42.86%	100.00%
5	Other	66.67%	16.67%	16.67%	100.00%
	Grand Total	**53.69%**	**7.38%**	**38.93%**	**100.00%**

Attitude to resource use inside TNR by gender

Sr.	Gender	Hunting for household consumption			Total
		Disagree	Don't know	Agree	
1	Female	51.61%	9.68%	38.71%	100.00%
2	Male	55.17%	5.75%	39.08%	100.00%
	Grand Total	**53.69%**	**7.38%**	**38.93%**	**100.00%**

Attitude to resource use inside TNR by age group

Sr.	Age group	Hunting for household consumption			Total
		negative	neutral	positive	
1	under 40 years old	54.55%	7.27%	38.18%	100.00%
2	40 years and above	53.19%	7.45%	39.36%	100.00%
	Grand Total	**53.69%**	**7.38%**	**38.93%**	**100.00%**

Appendix-1.2

Attitude to resource use inside TNR by village

Sr.	Village	Bamboo cuting for personal use			Total
		Disagree	Don't know	Agree	
1	Hnankye	20.00%	0.00%	80.00%	100.00%
2	Kaleinaung	0.00%	0.00%	100.00%	100.00%
3	Karen Shinhtabi/Shanphan	0.00%	0.00%	100.00%	100.00%
4	Khawhlaing	9.09%	9.09%	81.82%	100.00%
5	Kyaukshat	16.67%	0.00%	83.33%	100.00%
6	Mayanchaung	20.00%	0.00%	80.00%	100.00%
7	Michaunglaung (New)	8.33%	0.00%	91.67%	100.00%
8	Michaunglaung(Old)	0.00%	9.09%	90.91%	100.00%
9	Tharyarmon	40.00%	0.00%	60.00%	100.00%
10	Wunpo	27.27%	0.00%	72.73%	100.00%
11	Yarphu	0.00%	0.00%	100.00%	100.00%
12	Yebon	8.33%	0.00%	91.67%	100.00%
13	Zinba	0.00%	0.00%	100.00%	100.00%
	Grand Total	**10.74%**	**1.34%**	**87.92%**	**100.00%**

Attitude to resource use inside TNR by ethnic group

Sr.	Ethnic group	Bamboo cuting for personal use			Total
		Disagree	Don't know	Agree	
1	Mon	16.67%	3.33%	80.00%	100.00%
2	Bamar	10.00%	0.00%	90.00%	100.00%
3	Dawei	10.29%	0.00%	89.71%	100.00%
4	Karen	2.86%	2.86%	94.29%	100.00%
5	Other	33.33%	0.00%	66.67%	100.00%
	Grand Total	**10.74%**	**1.34%**	**87.92%**	**100.00%**

Attitude to resource use inside TNR by gender

Sr.	Gender	Bamboo cuting for personal use			Total
		Disagree	Don't know	Agree	
1	Female	16.13%	1.61%	82.26%	100.00%
2	Male	6.90%	1.15%	91.95%	100.00%
	Grand Total	**10.74%**	**1.34%**	**87.92%**	**100.00%**

Attitude to resource use inside TNR by age group

Sr.	Age group	Bamboo cuting for personal use			Total
		Disagree	Don't know	Agree	
1	under 40 years old	9.09%	1.82%	89.09%	100.00%
2	40 years and above	11.70%	1.06%	87.23%	100.00%
	Grand Total	**10.74%**	**1.34%**	**87.92%**	**100.00%**

Appendix-1.2

Attitude to resource use inside TNR by village

Sr.	Village	Timber cuting for personal use			Total
		Disagree	Don't know	Agree	
1	Hnankye	20.00%	0.00%	80.00%	100.00%
2	Kaleinaung	0.00%	0.00%	100.00%	100.00%
3	Karen Shinhtabi/Shanphan	0.00%	0.00%	100.00%	100.00%
4	Khawhlaing	9.09%	9.09%	81.82%	100.00%
5	Kyaukshat	33.33%	0.00%	66.67%	100.00%
6	Mayanchaung	20.00%	0.00%	80.00%	100.00%
7	Michaunglaung (New)	8.33%	0.00%	91.67%	100.00%
8	Michaunglaung(Old)	10.00%	10.00%	80.00%	100.00%
9	Tharyarmon	40.00%	0.00%	60.00%	100.00%
10	Wunpo	27.27%	0.00%	72.73%	100.00%
11	Yarphu	0.00%	0.00%	100.00%	100.00%
12	Yebon	16.67%	0.00%	83.33%	100.00%
13	Zinba	0.00%	0.00%	100.00%	100.00%
	Grand Total	**13.51%**	**1.35%**	**85.14%**	**100.00%**

Attitude to resource use inside TNR by ethnic group

Sr.	Ethnic group	Timber cuting for personal use			Total
		Disagree	Don't know	Agree	
1	Mon	16.67%	3.33%	80.00%	100.00%
2	Bamar	20.00%	0.00%	80.00%	100.00%
3	Dawei	14.71%	0.00%	85.29%	100.00%
4	Karen	2.94%	2.94%	94.12%	100.00%
5	Other	33.33%	0.00%	66.67%	100.00%
	Grand Total	**13.51%**	**1.35%**	**85.14%**	**100.00%**

Attitude to resource use inside TNR by gender

Sr.	Gender	Timber cuting for personal use			Total
		Disagree	Don't know	Agree	
1	Female	18.03%	1.64%	80.33%	100.00%
2	Male	10.34%	1.15%	88.51%	100.00%
	Grand Total	**13.51%**	**1.35%**	**85.14%**	**100.00%**

Attitude to resource use inside TNR by age group

Sr.	Age group	Timber cuting for personal use			Total
		Disagree	Don't know	Agree	
1	under 40 years old	14.81%	1.85%	83.33%	100.00%
2	40 years and above	12.77%	1.06%	86.17%	100.00%
	Grand Total	**13.51%**	**1.35%**	**85.14%**	**100.00%**

Appendix-1.2

Attitude to resource use inside TNR by village

Sr.	Village	commercial logging			Total
		Disagree	Don't know	Agree	
1	Hnankye	90.00%	0.00%	10.00%	100.00%
2	Kaleinaung	94.44%	5.56%	0.00%	100.00%
3	Karen Shinhtabi/Shanphan	100.00%	0.00%	0.00%	100.00%
4	Khawhlaing	90.91%	9.09%	0.00%	100.00%
5	Kyaukshat	100.00%	0.00%	0.00%	100.00%
6	Mayanchaung	80.00%	20.00%	0.00%	100.00%
7	Michaunglaung (New)	100.00%	0.00%	0.00%	100.00%
8	Michaunglaung(Old)	90.91%	9.09%	0.00%	100.00%
9	Tharyarmon	100.00%	0.00%	0.00%	100.00%
10	Wunpo	90.00%	10.00%	0.00%	100.00%
11	Yarphu	100.00%	0.00%	0.00%	100.00%
12	Yebon	71.43%	0.00%	28.57%	100.00%
13	Zinba	100.00%	0.00%	0.00%	100.00%
	Grand Total	**93.66%**	**4.23%**	**2.11%**	**100.00%**

Attitude to resource use inside TNR by ethnic group

Sr.	Ethnic group	commercial logging			Total
		Disagree	Don't know	Agree	
1	Mon	96.55%	3.45%	0.00%	100.00%
2	Bamar	100.00%	0.00%	0.00%	100.00%
3	Dawei	93.65%	3.17%	3.17%	100.00%
4	Karen	94.12%	2.94%	2.94%	100.00%
5	Other	66.67%	33.33%	0.00%	100.00%
	Grand Total	**93.66%**	**4.23%**	**2.11%**	**100.00%**

Attitude to resource use inside TNR by gender

Sr.	Gender	commercial logging			Total
		Disagree	Don't know	Agree	
1	Female	93.22%	6.78%	0.00%	100.00%
2	Male	93.98%	2.41%	3.61%	100.00%
	Grand Total	**93.66%**	**4.23%**	**2.11%**	**100.00%**

Attitude to resource use inside TNR by age group

Sr.	Age group	commercial logging			Total
		Disagree	Don't know	Agree	
1	under 40 years old	94.44%	5.56%	0.00%	100.00%
2	40 years and above	93.18%	3.41%	3.41%	100.00%
	Grand Total	**93.66%**	**4.23%**	**2.11%**	**100.00%**

Appendix-1.2

Attitude to resource use inside TNR by village

Sr.	Village	Establishment of orchards			Total
		Disagree	Don't know	Agree	
1	Hnankye	30.00%	0.00%	70.00%	100.00%
2	Kaleinaung	66.67%	16.67%	16.67%	100.00%
3	Karen Shinhtabi/Shanphan	80.00%	0.00%	20.00%	100.00%
4	Khawhlaing	36.36%	18.18%	45.45%	100.00%
5	Kyaukshat	41.67%	0.00%	58.33%	100.00%
6	Mayanchaung	60.00%	0.00%	40.00%	100.00%
7	Michaunglaung (New)	66.67%	0.00%	33.33%	100.00%
8	Michaunglaung(Old)	0.00%	20.00%	80.00%	100.00%
9	Tharyarmon	30.00%	10.00%	60.00%	100.00%
10	Wunpo	63.64%	0.00%	36.36%	100.00%
11	Yarphu	9.09%	9.09%	81.82%	100.00%
12	Yebon	41.67%	0.00%	58.33%	100.00%
13	Zinba	9.09%	0.00%	90.91%	100.00%
	Grand Total	**42.57%**	**6.08%**	**51.35%**	**100.00%**

Attitude to resource use inside TNR by ethnic group

Sr.	Ethnic group	Establishment of orchards			Total
		Disagree	Don't know	Agree	
1	Mon	26.67%	13.33%	60.00%	100.00%
2	Bamar	40.00%	0.00%	60.00%	100.00%
3	Dawei	52.94%	4.41%	42.65%	100.00%
4	Karen	32.35%	5.88%	61.76%	100.00%
5	Other	66.67%	0.00%	33.33%	100.00%
	Grand Total	**42.57%**	**6.08%**	**51.35%**	**100.00%**

Attitude to resource use inside TNR by gender

Sr.	Gender	Establishment of orchards			Total
		Disagree	Don't know	Agree	
1	Female	49.18%	3.28%	47.54%	100.00%
2	Male	37.93%	8.05%	54.02%	100.00%
	Grand Total	**42.57%**	**6.08%**	**51.35%**	**100.00%**

Attitude to resource use inside TNR by age group

Sr.	Age group	Establishment of orchards			Total
		Disagree	Don't know	Agree	
1	under 40 years old	40.74%	5.56%	53.70%	100.00%
2	40 years and above	43.62%	6.38%	50.00%	100.00%
	Grand Total	**42.57%**	**6.08%**	**51.35%**	**100.00%**

Appendix-1.2

Attitude to extent and prohibitions of TNR by village

Sr.	Village	The area of TNR is too wide			Total
		Disgree	Don't know	Agree	
1	Hnankye	10.00%	60.00%	30.00%	100.00%
2	Kaleinaung	11.11%	88.89%	0.00%	100.00%
3	Karen Shinhtabi/Shanphan	50.00%	30.00%	20.00%	100.00%
4	Khawhlaing	0.00%	100.00%	0.00%	100.00%
5	Kyaukshat	8.33%	66.67%	25.00%	100.00%
6	Mayanchaung	77.78%	22.22%	0.00%	100.00%
7	Michaunglaung (New)	50.00%	41.67%	8.33%	100.00%
8	Michaunglaung(Old)	40.00%	50.00%	10.00%	100.00%
9	Tharyarmon	30.00%	60.00%	10.00%	100.00%
10	Wunpo	36.36%	45.45%	18.18%	100.00%
11	Yarphu	0.00%	63.64%	36.36%	100.00%
12	Yebon	16.67%	25.00%	58.33%	100.00%
13	Zinba	18.18%	72.73%	9.09%	100.00%
	Grand Total	**25.17%**	**57.82%**	**17.01%**	**100.00%**

Attitude to extent and prohibitions of TNR by ethnic group

Sr.	Ethnic group	The area of TNR is too wide			Total
		Disgree	Don't know	Agree	
1	Mon	26.67%	60.00%	13.33%	100.00%
2	Bamar	30.00%	60.00%	10.00%	100.00%
3	Dawei	14.71%	66.18%	19.12%	100.00%
4	Karen	38.24%	44.12%	17.65%	100.00%
5	Other	60.00%	20.00%	20.00%	100.00%
	Grand Total	**25.17%**	**57.82%**	**17.01%**	**100.00%**

Attitude to extent and prohibitions of TNR by gender

Sr.	Gender	The area of TNR is too wide			Total
		Disgree	Don't know	Agree	
1	Female	15.00%	76.67%	8.33%	100.00%
2	Male	32.18%	44.83%	22.99%	100.00%
	Grand Total	**25.17%**	**57.82%**	**17.01%**	**100.00%**

Attitude to extent and prohibitions of TNR by age group

Sr.	Age group	The area of TNR is too wide			Total
		Disgree	Don't know	Agree	
1	under 40 years old	33.96%	52.83%	13.21%	100.00%
2	40 years and above	20.21%	60.64%	19.15%	100.00%
	Grand Total	**25.17%**	**57.82%**	**17.01%**	**100.00%**

Appendix-1.2

Attitude to extent and prohibitions of TNR by village

Sr.	Village	so many prohibitions inside TNR			Total
		Disgree	Don't know	Agree	
1	Hnankye	28.57%	28.57%	42.86%	100.00%
2	Kaleinaung	11.11%	88.89%	0.00%	100.00%
3	Karen Shinhtabi/Shanphan	60.00%	20.00%	20.00%	100.00%
4	Khawhlaing	0.00%	100.00%	0.00%	100.00%
5	Kyaukshat	50.00%	16.67%	33.33%	100.00%
6	Mayanchaung	70.00%	0.00%	30.00%	100.00%
7	Michaunglaung (New)	75.00%	25.00%	0.00%	100.00%
8	Michaunglaung(Old)	36.36%	18.18%	45.45%	100.00%
9	Tharyarmon	30.00%	40.00%	30.00%	100.00%
10	Wunpo	54.55%	18.18%	27.27%	100.00%
11	Yarphu	18.18%	18.18%	63.64%	100.00%
12	Yebon	25.00%	8.33%	66.67%	100.00%
13	Zinba	0.00%	0.00%	100.00%	100.00%
	Grand Total	**34.25%**	**32.19%**	**33.56%**	**100.00%**

Attitude to extent and prohibitions of TNR by ethnic group

Sr.	Ethnic group	so many prohibitions inside TNR			Total
		Disgree	Don't know	Agree	
1	Mon	30.00%	30.00%	40.00%	100.00%
2	Bamar	40.00%	30.00%	30.00%	100.00%
3	Dawei	32.31%	43.08%	24.62%	100.00%
4	Karen	37.14%	17.14%	45.71%	100.00%
5	Other	50.00%	16.67%	33.33%	100.00%
	Grand Total	**34.25%**	**32.19%**	**33.56%**	**100.00%**

Attitude to extent and prohibitions of TNR by gender

Sr.	Gender	so many prohibitions inside TNR			Total
		negative	neutral	positive	
1	Female	28.33%	43.33%	28.33%	100.00%
2	Male	38.37%	24.42%	37.21%	100.00%
	Grand Total	**34.25%**	**32.19%**	**33.56%**	**100.00%**

Attitude to extent and prohibitions of TNR by age group

Sr.	Age group	so many prohibitions inside TNR			Total
		negative	neutral	positive	
1	under 40 years old	42.59%	18.52%	38.89%	100.00%
2	40 years and above	29.35%	40.22%	30.43%	100.00%
	Grand Total	**34.25%**	**32.19%**	**33.56%**	**100.00%**

Appendix-1.3

Ranked Village Based on Knowledge level of Villagers(General Audience)

Sr.	Village	Knowledge level(weighed score)			Total Score	Knowledge Rank
		1	2	3		
		Poor	Fair	Good		
1	Hnankye	0.30	0.60	1.20	2.10	8
2	Kaleinaung	0.33	0.78	0.83	1.94	9
3	Karen Shinhtabi/Shanphan	0.00	0.60	2.10	2.70	1
4	Khawhlaing	0.64	0.55	0.27	1.45	12
5	Kyaukshat	0.17	0.33	2.00	2.50	3
6	Mayanchaung	0.20	0.80	1.20	2.20	5
7	Michaunglaung (New)	0.25	0.67	1.25	2.17	7
8	Michaunglaung(Old)	0.27	0.18	1.91	2.36	4
9	Tharyarmon	0.80	0.40	0.00	1.20	13
10	Wunpo	0.18	0.91	1.09	2.18	6
11	Yarphu	0.45	0.91	0.27	1.64	11
12	Yebon	0.42	0.67	0.75	1.83	10
13	Zinba	0.09	0.55	1.91	2.55	2

Scoring system:

weighed score for "Poor"= 1 X Percent at "Poor" level/100

weighed score for "Fair"= 2 X Percent at "Fair" level/100

weighed score for "Good"= 3 X Percent at "Good" level/100

Total score is between 1 and 3

Appendix-1.4

Attitudes of Villagers(General Audience) on Taninthayi Nature Reserve Project

Sr.	Villages	Weighed Scores for Attitude of Villagers (General Audience)																Total Score	ATTITUDE RANK
		Attitudes to constitution of TNR				*Attitude to impact of TNR*		*Attitude to Advantages of TNR Project*			*Attitudes to resource use inside TNR*					*Attitudes to extent and prohibitions of TNR*			
		ATT1	ATT2	ATT3	ATT4	ATT5	ATT6	ATT7	ATT8	ATT9	ATT10	ATT11	ATT12	ATT13	ATT14	ATT15	ATT16		
1	Hnankye	1.00	0.60	1.00	1.00	0.70	-0.10	-0.40	0.60	-0.80	0.50	-0.60	-0.60	0.80	-0.40	-0.20	-0.14	2.96	5
2	Kaleinaung	0.89	0.89	0.94	1.00	1.00	-1.00	-0.67	-0.44	-0.50	-0.17	-1.00	-1.00	0.94	0.50	0.11	0.11	1.61	9
3	Karen Shinhtabi/SP	1.00	1.00	1.00	1.00	1.00	-1.00	-0.80	-0.60	-1.00	0.20	-1.00	-1.00	1.00	0.60	0.30	0.40	2.10	7
4	Khawhlaing	1.00	1.00	0.82	1.00	1.00	-1.00	-0.45	-0.82	-1.00	-0.27	-0.73	-0.73	0.91	-0.09	0.00	0.00	0.64	10
5	Kyaukshat	1.00	0.92	0.92	1.00	0.83	-1.00	-0.25	0.33	-0.25	0.25	-0.67	-0.33	1.00	-0.17	-0.17	0.17	3.58	3
6	Mayanchaung	1.00	1.00	0.90	1.00	1.00	-0.60	-0.60	0.10	-0.70	0.90	-0.60	-0.60	0.80	0.20	0.78	0.40	4.98	2
7	Michaunglaung (New)	0.92	0.92	0.92	1.00	0.83	-0.67	-0.17	0.67	0.67	-0.17	-0.83	-0.83	1.00	0.33	0.42	0.75	5.75	1
8	Michaunglaung(Old)	0.91	0.91	0.82	1.00	1.00	-0.82	-0.18	-0.18	-0.36	0.09	-0.91	-0.70	0.91	-0.80	0.30	-0.09	1.89	8
9	Tharyarmon	0.80	0.70	0.70	0.90	1.00	-0.80	-0.40	-0.60	-0.60	0.10	-0.20	-0.20	1.00	-0.30	0.20	0.00	2.30	6
10	Wunpo	0.82	0.64	1.00	1.00	0.73	-0.73	-0.60	0.00	-0.80	0.55	-0.45	-0.45	0.90	0.27	0.18	0.27	3.32	4
11	Yarphu	0.64	0.27	0.64	0.82	0.64	-0.40	-0.73	-0.45	-0.73	0.55	-1.00	-1.00	1.00	-0.73	-0.36	-0.45	-1.31	12
12	Yebon	0.50	0.50	1.00	1.00	-0.17	-0.33	-0.42	0.92	-0.58	-0.17	-0.83	-0.67	0.43	-0.17	-0.42	-0.42	0.18	11
13	Zinba	0.27	0.27	0.64	1.00	0.09	-0.82	-0.82	-0.45	-0.82	-0.09	-1.00	-1.00	1.00	-0.82	0.09	-1.00	-3.45	13

Note:

ATT1 Constitution of TNR is good
ATT2 Without TNR is better
ATT3 TNR is constituted for local people
ATT4 It's important to protect forests for our generations
ATT5 Constitution of TNR causes problems to our family
ATT6 Constitution of TNR supports to our family
ATT7 TNR Project helps local people
ATT8 TNRP Project Staff helps local people
ATT9 TNR Project creates job opportunities
ATT10 Hunting for household consumption should be allowed
ATT11 Bamboo cutting for personal use should be allowed
ATT12 Timber cutting for personal use should be allowed
ATT13 Commercial logging should be allowed
ATT14 Establishment of orchards should be allowed
ATT15 The extent of TNR is too wide
ATT16 Restrictions of TNR are so many

Scoring system:

Weighted score for attitude= (-1)*(%of Negative attitude)+ (0)* (% of Netural or Don't Know)+ (1)*(% of Positive attitude)

Score for each attitude will be between -1 & 1. The total score will be between -16 and 16

Appendix-1.5

Overall-Ranked Villages
(Based on Kowledge level & Attitude of Villagers)

Sr.	Village	Weighed Scores				Total Score	Overall Rank
		Knowledge		Attitude			
		Score	Rank	Score	Rank		
1	Hnankye	2.10	8	2.96	5	5.06	5
2	Kaleinaung	1.94	9	1.61	9	3.56	8
3	Karen Shinhtabi/Shanphan	2.70	1	2.10	7	4.80	6
4	Khawhlaing	1.45	12	0.64	10	2.09	10
5	Kyaukshat	2.50	3	3.58	3	6.08	3
6	Mayanchaung	2.20	5	4.98	2	7.18	2
7	Michaunglaung (New)	2.17	7	5.75	1	7.92	1
8	Michaunglaung(Old)	2.36	4	1.89	8	4.25	7
9	Tharyarmon	1.20	13	2.30	6	3.50	9
10	Wunpo	2.18	6	3.32	4	5.50	4
11	Yarphu	1.64	11	-1.31	12	0.33	12
12	Yebon	1.83	10	0.18	11	2.01	11
13	Zinba	2.55	2	-3.45	13	-0.91	13

Note
Weighed score of knowledge is between 1 and 3
Weighed score of Attitude is between -16 and 16

Appendix-1.6

Ranking targeted audiences (Based on Knowledge)

Sr.	Target Goups	Knowledge level(weighed score)			Total Score	Knowledge Rank
		1	2	3		
		Poor	Fair	Good		
1	T& B cutters (ZB)	0.46	0.46	0.92	1.85	4
2	T& Bcutters (HK)	0.27	1.20	0.40	1.87	3
3	Shifting cultivators (MCL)	0.50	0.38	0.94	1.81	5
4	Orchard cultivators(ZB)	0.23	0.92	0.92	2.08	1
5	Hunters (ZB&MCL)	0.33	0.83	0.75	1.92	2

Scoring system:

weighed score for "Poor"= 1 X Percent at "Poor" level/100

weighed score for "Fair"= 2 X Percent at "Fair" level/100

weighed score for "Good"= 3 X Percent at "Good" level/100

Total score is between 1 and 3

Attitudes of Villagers(Targeted Groups) on Taninthayi Nature Reserve Project

Sr.	Targeted Groups	Weighed Scores for Attitude of Villagers (Targeted Audience)																Total Score	ATTITUDE RANK
		Attitudes to constitution of TNR				*Attitude to impact of TNR*		*Attitude to Advantages of TNR Project*			*Attitudes to resource use inside TNR*					*Attitudes to extent and prohibitions of TNR*			
		ATT1	ATT2	ATT3	ATT4	ATT5	ATT6	ATT7	ATT8	ATT9	ATT10	ATT11	ATT12	ATT13	ATT14	ATT15	ATT16		
1	T& B cutters (ZB)	1.00	0.77	1.00	1.00	0.38	-1.00	-0.77	-0.23	-0.62	0.08	-1.00	-1.00	0.75	-0.69	0.08	0.00	-0.25	2
2	T& Bcutters (HK)	0.07	0.20	0.80	1.00	-0.87	-1.00	-1.00	-0.87	-1.00	-0.53	-1.00	-1.00	-0.13	-0.87	-0.40	-0.93	-7.53	5
3	Shifting cultivators (MCL)	1.00	0.94	1.00	1.00	0.88	-0.88	-0.81	-0.25	-0.44	0.13	-0.75	-0.75	0.88	-0.06	0.13	0.19	2.19	1
4	Orchard cultivators(ZB)	0.77	0.85	0.85	1.00	0.38	-0.92	-1.00	-1.00	-1.00	-0.62	-0.85	-0.85	0.85	-0.38	0.38	0.31	-1.23	4
5	Hunters (ZB&MCL)	0.92	1.00	1.00	1.00	0.38	-0.92	-0.67	-0.67	-1.00	-0.50	-1.00	-1.00	0.83	-0.33	0.33	0.25	-0.37	3

Note:

ATT1 Constitution of TNR is good
ATT2 Without TNR is better
ATT3 TNR is constituted for local people
ATT4 It's important to protect forests for our generations
ATT5 Constitution of TNR causes problems to our family
ATT6 Constitution of TNR supports to our family
ATT7 TNR Project helps local people
ATT8 TNRP Project Staff helps local people
ATT9 TNR Project creates job opportunities
ATT10 Hunting for household consumption should be allowed
ATT11 Bamboo cutting for personal use should be allowed
ATT12 Timber cutting for personal use should be allowed
ATT13 Commercial logging should be allowed
ATT14 Establishment of orchards should be allowed
ATT15 The extent of TNR is too wide
ATT16 Restrictions of TNR are so many

Scoring system:

Weighted score for attitude= (-1)*(%of Negative attitude)+ (0)* (% of Netural or Don't Know)+ (1)*(% of Positive attitude)

Score for each attitude will be between -1 & 1. The total score will be between -16 and 16

Appendix-1.8

Targeted Audiences with Overall Rank (Based on Knowledge & Attitude)

Sr.	Targeted Groups	Weighed Scores & Rank				Total Score	Overall Rank
		Knowledge		Attitude			
		Score	Rank	Score	Rank		
1	T& B cutters (ZB)	1.85	4	-0.25	2	1.60	2
2	T& B cutters (HK)	1.87	3	-7.53	5	-5.67	5
3	Shifting cultivators (MCL)	1.81	5	2.19	1	4.00	1
4	Orchard cultivators(ZB)	2.08	1	-1.23	4	0.85	4
5	Hunters (ZB&MCL)	1.92	2	-0.37	3	1.55	3

Note

Weighed score of knowledge is between 1 and 3

Weighed score of Attitude is between -16 and 16

Demographic Statistics of Kaleinaung Sub-township, May 2008

Sr.	Village/Quarter	Village Tract	Household	Population								
				under 18 years old			over 18 years old			Grand Total		
				Male	Female	Total	Male	Female	Total	Male	Female	Total
	Quarter (1)	Myoma	103	94	97	191	141	160	301	235	257	492
	Quarter (2)		96	80	55	135	66	107	173	146	162	308
	Quarter (3)		177	161	150	311	250	271	521	411	421	832
	Quarter (4)		125	153	132	285	183	205	388	336	337	673
	Kaleinaung Myoma Total		***501***	***488***	***434***	***922***	***640***	***743***	***1383***	***1128***	***1177***	***2305***
1	Lawthaing	Lawthaing	113	156	141	297	141	141	282	297	282	579
2	kyaukkadin		95	110	88	198	117	130	247	227	218	445
3	Kywetalin		100	103	122	225	151	186	337	254	308	562
4	Ahlesakhan		244	332	282	614	411	459	870	743	741	1484
5	Ywathit*		59	70	63	133	77	81	158	147	144	291
6	Hlegate*		24	31	31	62	39	39	78	70	70	140
7	Pa-nan-pon*		30	43	40	83	34	36	70	77	76	153
	Lawthaing Total		***665***	***845***	***767***	***1612***	***970***	***1072***	***2042***	***1815***	***1839***	***3654***
8	Yaphu(N)	Yaphu	67	123	114	237	72	81	153	195	195	390
9	Yaphu(O)		198	250	213	463	295	310	605	545	523	1068
10	Mayanchaung		106	92	122	214	145	136	281	237	258	495
11	Kawhlaing		65	48	45	93	96	86	182	144	131	275
12	60 mile village		28	30	16	46	35	36	71	65	52	117
13	Tharyarmon		113	102	84	186	149	147	296	251	231	482
14	Mon thone kwa*		13	18	14	32	22	20	42	40	34	74
15	Kunn kyar tein (Myopyanywa)*		29	32	34	66	51	40	91	83	74	157
16	Dawei kayai ywa*		80	137	134	271	81	70	151	218	204	422

Demographic Statistics of Kaleinaung Sub-township, May 2008

Sr.	Village/Quarter	Village Tract	Household	Population								
				under 18 years old			over 18 years old			Grand Total		
				Male	Female	Total	Male	Female	Total	Male	Female	Total
17	Saik pyo ye ywa (myauk chaw)*		83	100	103	203	137	130	267	237	233	470
18	Naga-ai*		39	45	27	72	52	66	118	97	93	190
	Yarphu Total		***821***	***977***	***906***	***1883***	***1135***	***1122***	***2257***	***2112***	***2028***	***4140***
19	Michaunghlaung(O)	Michaunghlaung	77	117	115	232	115	123	238	232	238	470
20	Michaunghlaung(N)		75	80	92	172	113	114	227	193	206	399
	Michaunghlaung Total		***152***	***197***	***207***	***404***	***228***	***237***	***465***	***425***	***444***	***869***
21	Zinba	Zinba	143	180	199	379	204	206	410	384	405	789
	Zinba Total		***143***	***180***	***199***	***379***	***204***	***206***	***410***	***384***	***405***	***789***
22	Kyaukshat	Kyaukshat	175	203	178	381	255	268	523	458	446	904
23	Yebon		115	159	149	308	169	178	347	328	327	655
24	Heinze		38	39	29	68	51	54	105	90	83	173
	Kyaukshat Total		***328***	***401***	***356***	***757***	***475***	***500***	***975***	***876***	***856***	***1732***
25	Hnankye	Hnankye	96	101	89	190	118	144	262	219	233	452
26	Bamar Shinhtabi		38	52	52	104	45	52	97	97	104	201
	Hnankye Total		***134***	***153***	***141***	***294***	***163***	***196***	***359***	***316***	***337***	***653***
27	Karen Shinhtabi	Kayin shinhtabi	79	101	95	196	91	112	203	192	207	399
	Kayin shinhtabi Total		***79***	***101***	***95***	***196***	***91***	***112***	***203***	***192***	***207***	***399***
	Grand Total		**2823**	**3342**	**3105**	**6447**	**3906**	**4188**	**8094**	**7248**	**7293**	**14541**

Source: Immigration and National Registration Department, Kaleinaung Sub-township, 2008

Remark * Mon ceasefire villages(8 villages);
Previously Nwelein, kyaukshtawa abandoned & move to Kyaukshat
Kawhlaing, 60 mile, tharyarmon: additional villages, tharyarmon established in 2004

Appendix-3.1

Awareness Discussions Organized in Villages (as to November, 2008)

Sr.	Village	Date	No. of attendee	Remark
1	Zinba	25-05-2006	63	
		13-08-2007	60	33 villagers had attended before
2	Kyaukshat	28-06-2006	86	
3	Heinze	16-07-2006	36	
4	Hnankye	24-08-2006	100	
5	Yebon	26-08-2006	113	
6	Michaunglaung (New)	16-09-2006	49	
7	Kawhlaing	17-09-2006	33	
8	Mayanchaung	11-10-2006.	48	
9	Tharyarmon	13-10-2006	91	
10	Mile 60	15-10-2006	38	
11	Yarphu	19-11-2006	126	
		19-09-2007	108	84 villagers had attended before
12	Quarter(4) ,Kaleinaung	24-12-2006	53	
13	Yarphu(New)	25-12-2006	62	
14	Michaunglaung (Old)	28-05-2007	56	
15	Thetkekut	15-08-2007	24	
16	Quarter(1) ,Kaleinaung	22-10-2007	38	
17	Karen Shinhtabi	03-11-2007.	61	
18	Wunpo	26-11-2007	76	
19	Ottayan	27-12-2007	128	
20	Myanmarshinhtabi	11-01-2008.	39	
21	Quarter(2) ,Kaleinaung	25-01-2008	46	
22	Lawthaing	17-03-2008	90	
23	No 282, Infantry	02-04-2008.	70	
24	No.307, Artillery	30-07-2008	57	
25	No. 409 & 410 Light Infantry	26-08-2008	114	Jointly organized at 409
26	Shanphan	25-09-2007	76	16 villagers from Kayinshinhtabi joined
27	Quarter(3) ,Kaleinaung	17-11-2008	42	

Source: TNRP Office, Gantgawtaung

Appendix-3.2

Awareness Talks Organized in Schools (as to November, 2008)

Sr.	Village	Date	No. of schoolchildren	Remark
1	Michaunglaung (New) B.E.P.S	20-07-2006	70	
2	Zinba B.E.P.S	21-07-2006	170	
3	Kyaukshat Post B.E.P.S	22-08-2006	178	
4	Michaunglaung (Old) B.E.P.S	30-08-2006	82	
5	Heinze B.E.P.S	13-09-2006	21	
6	Yebon B.E.P.S	14-09-2006	152	
7	Hnankye B.E.P.S	15-09-2006	89	
8	Mayanchaung B.E.P.S	19-10-2006	82	
9	Kawhlaing B.E.P.S	26-10-2006	73	
10	Mile 60 B.E.P.S	17-11-2006	18	
11	Tharyarmon B.E.P.S	22-11-2006	70	
12	Yarphu B.E.M.S	21-12-2006	207	
13	Yarphu(New) B.E.P.S	22-12-2006	76	
14	Kaleinaung Quarter 4, B.E.P.S	12-09-2007.	96	
15	Kaleinaung Quarter 1, B.E.P.S	21-10-2007	201	
16	Mile 30 B.E.P.S	27-11-2007	36	
17	Thetkekut B.E.P.S	12-12-2007.	36	
18	Wunpo B.E.P.S	14-01-2008	63	
19	Kaleinaung B.E.H.S	25-08-2008	679	
20	Yarphu B.E.M.S	06-10-2008.	205	
21	Yebon & Heinze B.E.P.S	07-11-2008.	151	Jointly organized at Yebon

Source: TNRP Office, Gantgawtaung

TANINTHAYI NATURE RESERVE PROJECT

Assessment on Existing Environmental Awareness Programme

(Please <u>CIRCLE</u> the number you choose) eg.(1) one year

1. How long has the environmental awareness programme been introduced in TNR project?
   (1) one year (2) two years (3) three years (4) Others(please specify)…….
2. Which type of the awareness programme is being performed and **how often**?
   (1) School programme (a) weekly (b) monthly (c) Others (please specify)……..
   (2) Village programme (a) weekly (b) monthly (c) Others (please specify)……...
   (3) Both (a) weekly (b) monthly (c) Others (please specify)……..
3. Is there an awareness campaign team which is formed for this particular purpose <u>ONLY</u>?
   (1) Yes (2) No

   If "Yes", *have the members of the team received any training?*
   (1) Yes (2) No
   If "Yes", *please mention the type of training.*
   ……
   ……

   If "No", please explain how to organize the program with whom.
   ……
   ……
   ……
   ……
4. Did you set up a plan and objectives prior to raising environmental awareness?
   (1) Yes (2) No
5. Did you identify the targeted audience with priority for raising awareness?
   (1) Yes (2) No
6. Please describe the area of environmental education on which the programme focused and frequency.

<u>Area</u>	<u>Frequency</u>
(1) Knowledge (*about environment, ecosystem & interrelationship etc.)*	(……)
(2) Awareness *(aware of environmental issues, problems& concerns etc.)*	(……)
(3) Skill (identification and solution of problems & issues, environmentally sound practices, laws etc.)	(……)
(4)Attitude (value of ecosystem, forests, wildlife etc.)	(……)
(5) General (not categorized & exclusively, includes more than one area mentioned above)	(……)

7. How were the awareness programmes conducted?
   (1)Talks/discussions without educational materials
   (2)Using education materials
   (3) Both

8. If you use the education materials, please indicate the materials you used. And to which extent did you use? (1= slightly, 2= moderately, 3= widely)
   (1) Printed materials (please specify)…….1 2 3
   (2) Audiovisual aids (please specify)……..1 2 3
   (3) Others (please specify)……...1 2 3

9. Do you assess whether the awareness programme meets the predetermined objectives or not?
   (1) Yes (2) No

   If "Yes", please indicate the effectiveness
   (1) none (2) little (3) moderately (4) fairly (5) very much

10. Have you shared information on the objectives, activities of TNR project and about the boundary demarcation among the local people and authorities?
    (1) Yes (2) No

    If "Yes" *which mean do you use?*
    (1) Verbally (2) printed materials (3) signboards (4) Others (please specify)……

11. Have you shared information on Forest Law and Wildlife Protection Law among the local people and authorities?
    (1) Yes (2) No

    If "Yes" *which mean do you use?*
    (1) Verbally (2) printed materials (3) signboards (4) Others (please specify)……

12. Is there contact person in each village and school, who was assigned to organize the awareness programme?
    (1) Yes (2) No

13. Please describe additional comments for improvement of environmental awareness programme.

    ……
    ……
    ……

သစ်တောဦးစီးဌာန
တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း

ကလိန်အောင်မြို့၊ အခြေခံပညာအထက်တန်းကျောင်း၌ (၂၅-၈-၀၈)ရက်နေ့တွင် ကျင်းပခဲ့သော "သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဟောပြောပွဲ" အပေါ်အကဲဖြတ်ဆန်းစစ်ခြင်း

ဟောပြောသူ	ဟောပြောသည့်အကြောင်းအရာ/အစီအစဉ်
၁။ ဦးသီရိတင်(စီမံကိန်းညွှန်ကြားရေးမှူး)	တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း
၂။ ဦးသန်းနိုင်(ဒုတိယစီမံကိန်းညွှန်ကြားရေးမှူး)	ကျွန်ုပ်တို့၏ပတ်ဝန်းကျင်
၃။ ဦးမျိုးမင်းလတ်(တောအုပ်ကြီး)	သဘာဝပတ်ဝန်းကျင်ဂေဟစနစ်ပျက်စီးရခြင်းနှင့်အကျိုးဆက်များ
၄။ ဦးနေမျိုးဌေ(စီမံကိန်းဦးစီးအရာရှိ)	တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်းနှင့် ဇီဝမျိုးစုံမျိုးကွဲများထိန်းသိမ်းရခြင်းအကြောင်း
၅။ ဦးငွေသီး(အမျိုးသားအကြံပေးအရာရှိ)	သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥာဏ်စမ်းပဟေဠိပြိုင်ပွဲ

ကလိန်အောင်မြို့၊ အခြေခံပညာအထက်တန်းကျောင်း၌ (၂၅-၈-၀၈)ရက်နေ့တွင် ကျင်းပခဲ့သော "သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဟောပြောပွဲ" အပေါ်အကဲဖြတ်ဆန်းစစ်နိုင်းရန် အောက်ပါမေးခွန်းများကို ဖြေဆိုပေးပါရန် မေတ္တာရပ်ခံအပ်ပါသည်။

၁။ ဟောပြောပွဲကြာမြင့်ချိန်သည်

(က) ကြာရှည်လွန်းသည်။ (ခ) တိုလွန်းသည်။ (ဂ) အနေတော်ဖြစ်ပါသည်။

၂။ ဥာဏ်စမ်းပဟေဠိမေးခွန်းတစ်ခုခြင်းအတွက် သတ်မှတ်ချိန်သည်

(က) နည်းသည်။ (ခ) များသည်။ (ဂ) သင့်လျော်သည်။

၃။ ဟောပြော၇ိုချချက်များသည် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ ဗဟုသုတ တိုးတက်ရရှိစေပါသလား။

(က) ရရှိစေပါသည်။ (ခ) မရရှိပါ။

၄။ ဟောပြော၇ိုချချက်များသည် တစ်ခုနှင့်တစ်ခုဆက်စပ်မှုရှိ/မရှိ။

(က) ရှိပါသည်။ (ခ) မရှိပါ။

၅။ ဟောပြော၇ိုချချက်များသည် ဥာဏ်စမ်းပဟေဠိဖြေဆိုရန် အထောက်အကူပြု/မပြု။

(က) အထောက်အကူပြုပါသည်။ (ခ) အထောက်အကူမပြုပါ။

၆။ ပြကွက်များပြသ၍ ဟောပြော၇ိုချခြင်းသည် နားလည်သဘောပေါက်ရန် အထောက်အကူပြု/မပြု။

(က) အထောက်အကူပြုပါသည်။ (ခ) အထောက်အကူမဖြစ်ပါ။ (ဂ) ထူးခြားမှုမရှိပါ။

၇။ ဥာဏ်စမ်းပဟေဠိ မေးခွန်းအရေအတွက်သည် များ/မများ။

(က) များပါသည်။ (ခ) နည်းပါသည်။ (ဂ) သင့်တော်ပါသည်။

၈။ ဥာဏ်စမ်းပဟေဠိပါမေးခွန်းများသည် လွယ်ပါသလား/ခက်ပါသလား။

(က) ခက်ပါသည်။ (ခ) လွယ်ပါသည်။ (ဂ) သင့်တော်ပါသည်။

၉။ ဥာဏ်စမ်းပဟေဠိမေးခွန်းများဖြေဆိုရာတွင်–

(က)တစ်ဦးတည်း စဉ်းစား၍ ဖြေဆိုခဲ့ပါသည်။

(ခ) အဖွဲ့နှင့် ညှိနှိုင်းတိုင်ပင်၍ ဖြေဆိုပါသည်။

၁၀။ ဥာဏ်စမ်းပဟေဠိဖြေဆိုရာတွင် မည်သို့ဖြေဆိုခြင်းကို ကြိုက်နှစ်သက်ပါသနည်း။

(က) တစ်ဦးချင်းဖြေဆိုခြင်းကို ကြိုက်နှစ်သက်ပါသည်။

(ခ) အဖွဲ့နှင့်ဖြေဆိုခြင်းကို ကြိုက်နှစ်သက်ပါသည်။

၁၁။ အစီအစဉ်များသည် စိတ်ဝင်စားဘွယ်ကောင်း/မကောင်း။

(က) ကောင်းပါသည်။ (ခ) မကောင်းပါ။

၁၂။ အစီအစဉ်အားလုံးအနက် မည်သည့်အစီအစဉ်ကို သင်ကြိုက်နှစ်သက်ဆုံး ဖြစ်သနည်း။ အဘယ်ကြောင့်နည်း။

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၁၃။ သင်မကြိုက်နှစ်သက်သောအစီအစဉ် ရှိပါသလား။ အဘယ်ကြောင့် မကြိုက်နှစ်သက်သည်ကို ရှင်းပြပါ။

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၁၄။ သဘာဝပတ်ဝန်းကျင်နှင့်ပတ်သက်သည့် အကြောင်းအရာ၊ ဗဟုသုတများကို ထပ်မံသိရှိလိုစိတ် ရှိ/မရှိ။

(က) ရှိပါသည်။ (ခ) မရှိပါ။

၁၅။ ထပ်မံသိရှိလိုသည့်အကြောင်းအရာများရှိပါက ဖော်ပြပေးနိုင်လျှင် ဖော်ပြပေးပါ။

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သစ်တောဦးစီးဌာန
တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း

ကလိန်အောင်မြို့၊ အခြေခံပညာအထက်တန်းကျောင်း၌ (၂၅-၈-၀၈)ရက်နေ့တွင် ကျင်းပခဲ့သော "သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဟောပြောပွဲ" အပေါ်အကဲဖြတ်ဆန်းစစ်ခြင်း

ဟောပြောသူ	ဟောပြောသည့် အကြောင်းအရာ/ အစီအစဉ်
၁။ ဦးသီရိတင်(စီမံကိန်းညွှန်ကြားရေးမှူး)	တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း
၂။ ဦးသန်းနိုင်(ဒုတိယစီမံကိန်းညွှန်ကြားရေးမှူး)	ကျွန်ုပ်တို့၏ပတ်ဝန်းကျင်
၃။ ဦးမျိုးမင်းလတ်(တောအုပ်ကြီး)	သဘာဝပတ်ဝန်းကျင်ဂေဟစနစ်ပျက်စီးရခြင်းနှင့်အကျိုးဆက်များ
၄။ ဦးနေမျိုးဇွေ(စီမံကိန်းဦးစီးအရာရှိ)	တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်းနှင့် ဇီဝမျိုးစုံမျိုးကွဲများထိန်းသိမ်းရခြင်းအကြောင်း
၅။ ဦးငွေသီး(အမျိုးသားအကြံပေးအရာရှိ)	သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥာဏ်စမ်းပဟေဠိပြိုင်ပွဲ

ကလိန်အောင်မြို့၊ အခြေခံပညာအထက်တန်းကျောင်း၌ (၂၅-၈-၀၈)ရက်နေ့တွင် ကျင်းပခဲ့သော "သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဟောပြောပွဲ" အပေါ်အကဲဖြတ်ဆန်းစစ်နိုင်းရန် အောက်ပါမေးခွန်းများကို ဖြေဆိုပေးပါရန် မေတ္တာရပ်ခံအပ်ပါသည်။

၁။ ဟောပြောပွဲကြာမြင့်ချိန်သည်

(က) ကြာရှည်လွန်းသည်။ (ခ) တိုလွန်းသည်။ (ဂ) အနေတော်ဖြစ်ပါသည်။

၂။ ဥာဏ်စမ်းပဟေဠိမေးခွန်းတစ်ခုခြင်းအတွက် သတ်မှတ်ချိန်သည်

(က) နည်းသည်။ (ခ) များသည်။ (ဂ) သင့်လျော်သည်။

၃။ ဟောပြောပို့ချချက်များသည် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ ဗဟုသုတ တိုးတက်ရရှိစေပါသလား။

(က) ရရှိစေပါသည်။ (ခ) မရရှိပါ။

၄။ ဟောပြောပို့ချချက်များသည် တစ်ခုနှင့်တစ်ခုဆက်စပ်မှုရှိ/မရှိ။

(က) ရှိပါသည်။ (ခ) မရှိပါ။

၅။ ဟောပြောပို့ချချက်များသည် ဥာဏ်စမ်းပဟေဠိဖြေဆိုရန် အထောက်အကူပြု/မပြု။

(က) အထောက်အကူပြုပါသည်။ (ခ) အထောက်အကူမပြုပါ။

၆။ ပြကွက်များပြသ၍ ဟောပြောပို့ချခြင်းသည် နားလည်သဘောပေါက်ရန် အထောက်အကူပြု/မပြု။

(က) အထောက်အကူပြုပါသည်။ (ခ) အထောက်အကူမဖြစ်ပါ။ (ဂ) ထူးခြားမှုမရှိပါ။

၇။ ဥာဏ်စမ်းပဟေဠိ မေးခွန်းအရေအတွက်သည် များ/မများ။

(က) များပါသည်။ (ခ) နည်းပါသည်။ (ဂ) သင့်တော်ပါသည်။

၈။ ဥဏှိစမ်းပဟေဠိပါမေးခွန်းများသည် လွယ်ပါသလား/ခက်ပါသလား။

(က) ခက်ပါသည်။ (ခ) လွယ်ပါသည်။ (ဂ) သင့်တော်ပါသည်။

၉။ အစီအစဉ်များသည် စိတ်ဝင်စားဘွယ်ကောင်း/မကောင်း။

(က) ကောင်းပါသည်။ (ခ) မကောင်းပါ။

၁၀။ အစီအစဉ်အားလုံးအနက် မည်သည့်အစီအစဉ်ကို သင်ကြိုက်နှစ်သက်ဆုံး ဖြစ်သနည်း။ အဘယ်ကြောင့်နည်း။

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၁၁။ သင်မကြိုက်နှစ်သက်သောအစီအစဉ် ရှိပါသလား။ အဘယ်ကြောင့် မကြိုက်နှစ်သက်သည်ကို ရှင်းပြပါ။

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၁၂။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးပညာပေးလုပ်ငန်း ပိုမိုထိရောက်အောင်မြင်ရန် သင်၏အကြံပြုချက် ဖော်ပြပေးပါ။

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သစ်တောဦးစီးဌာန

တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း

(ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးပညာပေးလုပ်ငန်းလိုအပ်ချက်ဆန်းစစ်မှု)

အမည်ဖော်ပြရန်မလိုပါ။

သင်ကြားသည့်ဘာသာ---------- ရက်စွဲ။----------

သင်ကြားသည့်အတန်း၊ ----------

ပညာရေးဌာနမှ ခန့် ထား / ရပ်ရွာအစီအစဉ်ဖြင့်ခန့် ထား----------

ပညာအရည်အချင်း----------

အပိုင်း(က)– ပတ်ဝန်းကျင်ဆိုင်ရာထွေထွေဗဟုသုတ လေ့လာဆန်းစစ်ချက်	
၁	လက်ရှိကမ္ဘာ့လူဦးရေမည်မျှရှိသနည်း။ (က) သန်း ၅၀၀၀ (ခ)သန်း ၅၀၀၀ နှင့် ၆၀၀၀ ကြား (ဂ) သန်း ၆၀၀၀ (ဃ) သန်း ၆၀၀၀ ကျော် (င)အတိအကျမသိပါ။
၂	မြန်မာနိုင်ငံ၏လူဦးရေတိုးနှုန်းမျာ----------ဖြစ်သည်။ (က) ၁ .၂၁ ရာခိုင်နှုန်း (ခ) ၂ . ၈၂ရာခိုင်နှုန်း (ဂ) ၂ . ၀၂ရာခိုင်နှုန်း (ဃ) ၂ . ၅၀ရာခိုင်နှုန်း (င)အတိအကျမသိပါ။
၃	လေထုထဲတွင်အများဆုံးပါဝင်သောဓါတ်ငွေ့ မှာမည်သည့်ဓါတ်ငွေ့ ဖြစ်သနည်း။ (က)အောက်စီဂျင် (ခ) ကာဗွန်ဒိုင်အောက်ဆိုဒ် (ဂ) အိုဇုန်း (ဃ) နိုက်ထြိဂျင် (င) မသိပါ။
၄	ခရမ်းလွန်ရောင်ခြည်ကိုကာကွယ်ပေးသောအိုဇုန်းသည် လေထု၏ မည်သည့်အလွှာတွင်တည်ရှိသနည်း။ (က) Thermosphere (ခ) Stratosphere (ဂ) Mesosphere (ဃ) Troposphere (င) မသိပါ။
၅	ဖန်လုံအိမ်အာနိသင်ရှိပြီး ရေခဲသေတ္တာများတွင် အသုံးပြုသောဓါတ်ငွေ့ မှာမည်သည့်ဓါတ်ငွေ့ ဖြစ်သနည်း။ (က) CO_2 (ခ) NH_3 (ဂ) CFC (ဃ) SO_2 (င) မသိပါ။
၆	ကမ္ဘာကြီးပူနွေးလာခြင်းကြောင့် ပင်လယ်တွင်းရှိရေများ ရေငွေ့ပျံပြီး ပင်လယ်ရေမျက်နှာပြင်နိမ့်ကျသွား မည်ဟု သိပ္ပံပညာရှင်များက လက်ခံထားကြသည်။ (က) မှန်ပါသည် (ခ) မှားပါသည်။ (ဂ) မသိပါ။
၇	ရာသီဥတုပြောင်းလဲခြင်း အကျိုးဆက်ကြောင့် ဝင်ရိုးစွန်းဒေသတွင် ကျက်စားရာဒေသလျော့နည်းသွားပြီး မျိုးသုဉ်းရန်အန္တရာယ် အများဆုံး ကြုံတွေ့ နေရသောသတ္တဝါမှာမည်သည့်သတ္တဝါဖြစ်သနည်း။ (က) ပင်ဂွင်းငှက် (ခ) ပိုလာဝက်ဝံ (ဂ) ရေခဲတောင်ဆိတ်များ (ဃ) ကျား (င) မသိပါ။
၈	စွန်ပစ်ပစ္စည်းဆိုသည်မှာမလိုအပ်၍စွန့်ပစ်လိုက်သည့်----------ဖြစ်သည်။ (က) အစိုင်အခဲ (ခ) အရည် (ဂ) အစိုင်အခဲနှင့်အရည် (ဃ) အစိုင်အခဲ၊ အရည်နှင့်အငွေ့အားလုံး (င) မသိပါ။
၉	အန္တရာယ်ရှိသောစွန့်ပစ်ပစ္စည်းကိုဖော်ပြပါ။ (က) ပလပ်စတစ် (ခ) သံချောင်း (ဂ) ဓါတ်ခဲ (ဃ) မှန်ကွဲ (င) မသိပါ။
၁၀	စွန့်ပစ်ပစ္စည်းပြဿနာကိုဖြေရှင်းရာတွင်အသုံးပြုသည့်ဗျူဟာတစ်ရပ်မှာ----------ဖြစ်သည်။ (က) 3 Rs (ခ) 4 Rs (ဂ) 5 Rs (ဃ) 6 Rs (င) မသိပါ။
၁၁	အစာကွင်းဆက်တွင် ကျားနှင့်ခြင်္သေ့တို့သည် ----------ဖြစ်သည်။ (က) ပထမအဆင့်စားသုံးသူ (ခ) ဒုတိယအဆင့်စားသုံးသူ (ဂ) ထုတ်လုပ်သူ (ဃ)ထုတ်လုပ်သူနှင့်စားသုံးသူ (င) မသိပါ။
၁၂	တောရိုင်းတိရစ္ဆာန်များသဘာဝအတိုင်းမွေးဖွားကျင်လည် ကျက်စားသည့်နေရာကိုငှင်းတို့၏ --------ဟုခေါ်သည်။ (က) စားကျက် (ခ) ဇာတိ (ဂ) သဘာဝတော (ဃ) နေရင်းဒေသ (င) မသိပါ။

၁၃	မြန်မာနိုင်ငံ၏ လက်ရှိသစ်တောဖုန်းလွှမ်းမှုဧရိယာမှာ----------ဖြစ်သည်။ (က) ၅၅ ရာခိုင်နှုန်း (ခ) ၅၀ ရာခိုင်နှုန်းအောက် (ဂ) ၆၀ ရာခိုင်နှုန်း (ဃ) ၇၅ ရာခိုင်နှုန်း (င) မသိပါ။
၁၄	ကမ္ဘာပေါ်တွင် ဇီဝမျိုးစုံမျိုးကွဲ အများဆုံးရှိသောဒေသမှာ- (က) အပူပိုင်းဒေသ (ခ) သမပိုင်းဒေသ (ဂ)သမပိုင်းဆန်သောဒေသ (ဃ) ဝင်ရိုးစွန်းဒေသ (င) မသိပါ။
၁၅	ဇီဝမျိုးစုံမျိုးကွဲထိန်းသိမ်းရာတွင် အပင်နှင့် တိရစ္ဆာန်မျိုးစိတ်များထိန်းသိမ်းခြင်း၊ မျိုးရိုးဗီဇထိန်းသိမ်းခြင်းနှင့် ---------- ဟူ၍အဆင့် ၃ ဆင့်ရှိပါသည်။ (က) ပတ်ဝန်းကျင် ထိန်းသိမ်းခြင်း (ခ) မျိုးကွဲများထိန်းသိမ်းခြင်း (ဂ)အပင်နှင့် တိရစ္ဆာန်အရေအတွက်ထိန်းသိမ်းခြင်း (ဃ) ဂေဟစံနစ်ထိန်းသိမ်းခြင်း (င) မသိပါ။
၁၆	သက်ရှိနှင့်သက်မဲ့ ခွဲခြားရာတွင် အဓိကအချက်----------ပေါ်တွင်အခြေခံ၍ခွဲခြားသည်။ (က) ၃ ချက် (ခ) ၄ ချက် (ဂ) ၅ ချက် (ဃ) ၇ ချက် (င) မသိပါ။
၁၇	သဘာဝဓါတ်ငွေ့သည်---------- ဖြစ်သည်။ (က)ပြန်လည်ပြည့်ဖြိုးနိုင်သည့်စွမ်းအင် (ခ) ပြန်လည်မပြည့်ဖြိုးနိုင်သည့်စွမ်းအင် (ဂ) ထာဝစဉ်တည်တံ့သောစွမ်းအင် (ဃ) အထက်ပါအချက်များအားလုံးမမှန်ပါ။ (င) မသိပါ။
၁၈	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့်အဓိကသက်ဆိုင်သည့်အဖွဲ့တစ်ခု၏အမည်မှာ-----ဖြစ်သည်။ (က) UNICEF (ခ) UNEP (ဂ) UNESCO (ဃ) UNHCR (င) မသိပါ။
၁၉	ဖန်လုံအိမ်အင်အာနိသင်ဓါတ်ငွေ့ထုတ်လွှတ်မှုလျော့ချရေးအတွက်ကမ္ဘာ့နိုင်ငံများတွေ့ဆုံဆွေးနွေး ခဲ့သည့်မြို့မှာ----------ဖြစ်သည်။ (က) ကျိုတို (ခ) ရီယိုဒီဂျနေးရို (ဂ) စတော့ဟုမ်း (ဃ) ဂျီနီဗာ (င) မသိပါ။
၂၀	ပိုးသတ်ဆေးများသုံးစွဲခြင်းကြောင့် မည်သည့် ပတ်ဝန်းကျင်ဆိုင်ရာပြဿနာဖြစ်ပေါ်စေသနည်း၊ (က) အက်စစ်မိုးရွာသွန်းမှု (ခ) ကမ္ဘာကြီးပူနွေးလာခြင်း (ဂ)အိုဇုန်းလွှာပျက်စီးမှု (ဃ)မြေဆီလွှာပျက်ဆီးမှု (င)မသိပါ။

အပိုင်း(ခ) – သင်ကြားမှုဆိုင်ရာလေ့လာဆန်းစစ်ချက်

၁	သင်အနေဖြင့်မည်သည့် သင်တန်းများ တက်ရောက်ခဲ့ဖူးပါသနည်း။ (၁) ..... (၂) ..... (၃) .....
၂	သင်တန်းများမှ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ အကြောင်းအရာများကို လေ့လာသင်ယူခွင့်ရရှိခဲ့ ပါသလား။ (က) ရရှိခဲ့ပါသည် (ခ) မရရှိပါ (ဂ) မမှတ်မိပါ
၃	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာဇဟုသုတများကို သင်တန်းများမှအပ အခြားမည်သည့်နည်းလမ်းများဖြင့် လေ့လာသိရှိခွင့် ရရှိပါသလဲ။ (ဥပမာ-စာဖတ်ခြင်း၊ TV ရုပ်မြင်သံကြားစသည်) .....

၄	မိမိလေ့လာသိရှိထားသော ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာဗဟုသုတများကို ကျောင်းသားများအား သင်ကြားရာတွင် ပြန်လည်ထည့်သွင်း သင်ကြားပေးပါသလား။ (က) သင်ကြားပေးပါသည်။ (ခ) သင်ကြားပေးခြင်းနိုင်ခြင်းမရှိပါ။
၅	ကျောင်းသားများအား ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ သင်ခန်းစာများသင်ကြားပေးနိုင်မှုအပေါ် မိမိကိုယ်မိမိ အားရကျေနပ်မှု အခြေအနေ။ (က) အားရကျေနပ်မှုမရှိပါ။ (ခ) အနည်းငယ်ရှိပါသည်။ (ဂ)အတော်အသင့်ရှိပါသည်။ (ဃ) အတော်များများရှိပါသည်။ (င) များစွာအားရကျေနပ်မှုရှိပါသည်။
၆	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးသင်ခန်းစာကို သင်ကြားရာတွင် မည်သည့်သင်ကြားမှုစနစ်မျိုးကို အသုံးပြုပါသနည်း။ (က) ဆရာအခြေပြုသင်ကြားသည့်စံနစ် (ဆရာမှသင်ကြားပေးသည့်စံနစ်) (ခ) ကျောင်းသားအခြေပြုသင်ကြားသည့်စံနစ် (ကျောင်းသားများကိုယ်တိုင်ပါဝင်ဆွေးနွေးသင်ကြားသည့်စံနစ်)
၇	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးသင်ခန်းစာကို သင်ကြားရာတွင် အသုံးပြုသည့်သင်ထောက်ကူပစ္စည်းများ– (က) အများဆုံးအသုံးပြုသည့် သင်ထောက်ကူပစ္စည်းကိုဖေါ်ပြပါ။ --- (ခ) ဒုတိယအများဆုံးအသုံးပြုသည့် သင်ထောက်ကူပစ္စည်းကိုဖေါ်ပြပါ။ --- (ဂ) တတိယအများဆုံးအသုံးပြုသည့် သင်ထောက်ကူပစ္စည်းကိုဖေါ်ပြပါ။ ---
၈	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးသင်ခန်းစာသင်ကြားရာတွင် သင်ထောက်ကူပစ္စည်းများ အသုံးပြုနိုင်မှုအခြေအနေ။ (က) မရှိပါ (ခ) အနည်းငယ်ရှိ (ဂ) အတော်အသင့်ရှိ (ဃ) အတော်များများရှိ (င) လုံလောက်စွာအသုံးပြု။
၉	ကျောင်းသားများအနေဖြင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ စာသင်ခန်းပြင်ပလှုပ်ရှားမှု ၊ လေ့လာရေး စသည်တို့တွင် ပါဝင်ဆောင်ရွက်နိုင်မှုအခြေအနေ။ (က)လုံးဝမရှိပါ။ (ခ) အနည်းငယ်ရှိ (ဂ) အတော်အသင့်ရှိ (ဃ)အတော်များများရှိ (င) များစွာရှိပါသည်။
၁၀	စာသင်ကျောင်းများတွင် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးသင်ခန်းစာသင်ကြားရာ၌ ပိုမိုထိရောက်စေရန် မည်သို့ အကြံပြုလိုပါ သနည်း။ --- --- --- --- --- --- --- ---

သဘာဝဝန်းကျင်ပြဿနာများ နှင့် သဘာဝကြီးဝိုင်းဆိုင်ရာဗဟုသုတ

ရက်စွဲ----------

ကျေးရွာအမည်----------

မေးမြန်းသူ----------

	၁	၂	၃	၄	၅	၆
၁။သဘာဝပတ်ဝန်းကျင်ဆိုသည်မှာ ---------- (က)နိမ့်ပါသည် (ခ)သင့်ပါသည် (ဂ)မြင့်ပါသည်						
၂။တောတောင်ပြုန်းတီးပါက မြစ်ရေကြီးခြင်း မကြာခဏ ဖြစ်ပေါ်မည်။ (က)မှားပါသည် (ခ)မသိပါ (ဂ)မှန်ပါသည်						
၃။တောတောင်ပြုန်းတီးပါက ငါးများပိုမိုဖမ်းဆီးရနိုင်ပါသည်။ (က)မှားပါသည် (ခ)မသိပါ (ဂ)မှန်ပါသည်						
၄။တောတောင်ပြုန်းတီးပါက ဥယျာဉ်ခြံမှ သီးနှံအထွက်နှုန်းကို ကျဆင်းစေပါသည်။ (က)မှားပါသည် (ခ)မသိပါ (ဂ)မှန်ပါသည်						
၅။တောတောင်ပြုန်းတီးသောနေရာများတွင် တောရိုင်းတိရစ္ဆာန်များကို ပိုမိုတွေ့နိုင်ပါသည်။ (က)မှားပါသည် (ခ)မသိပါ (ဂ)မှန်ပါသည်						
၆။တောရိုင်းတိရစ္ဆာန်များသည် ဒေသခံပြည်သူများကို အန္တရာယ်သာဖြစ်စေပါသည်။ (က)မှားပါသည် (ခ)မသိပါ (ဂ)မှန်ပါသည်						
၇။တောင်ယာခုတ်ခြင်းကြောင့် တောတောင်ပြုန်းတီးမှုမရှိပါ။ (က)မှားပါသည် (ခ)မသိပါ (ဂ)မှန်ပါသည်						
၈။သဘာဝကြီးဝိုင်း ကျေးရွာနားတွင်ရှိပါသည်။ (က)မသိပါ (ခ)ကြားဖူးပါသည် (ဂ) ကောင်းစွာသိရှိပါသည်						
၉။သဘာဝကြီးဝိုင်းအတွင်း ဥပဒေအရတားမြစ်ချက်များကို သိရှိနားလည်ပါသည်။ (က)မသိပါ (ခ)နည်းနည်းသာသိပါသည် (ဂ)ကောင်းစွာသိရှိပါသည်						

ဒေသခံပြည်သူများနှင့် သဘာဝကြိုးဝိုင်းဝန်ထမ်းများနှင့် ထိတွေ့ဆက်ဆံမှု

	၁	၂	၃	၄	၅	၆
၁။ကျေးရွာတွင် သဘာဝကြိုးဝိုင်းဒေသရုံးခွဲရှိပါသလား: **(Yes/No)**						
၂။သဘာဝကြိုးဝိုင်းဒေသရုံးခွဲသို့ရောက်ဖူးပါသလား: **(Yes/No)**						
၃။ကြိုးဝိုင်းမှကျင်းပသော ဟောပြောပွဲ/ အစည်းအဝေးသို့တက်ဖူးပါသလား: **(Yes/No)**						
၄။ကြိုးဝိုင်းမှ ဝန်ထမ်းများကိုမြင်ဖူးပါသလား: **(Yes/No)**						
၅။ကြိုးဝိုင်းမှ ဝန်ထမ်းနှင့်သိကျွမ်းခင်မင်ပါသလား: **(Yes/No)**						
၆။ကြိုးဝိုင်းမှဝန်ထမ်း အိမ်သို့အလည်လာဖူးပါသလား: **(Yes/No)**						

သဘာဝကြိုးဝိုင်းနှင့်ပတ်သက်သည့် ဒေသခံပြည်သူတို့၏ သဘောထား

	၁	၂	၃	၄	၅	၆
သဘာဝကြိုးဝိုင်းနှင့်သဘာဝသယံဇာတထိန်းသိမ်းမှုအပေါ်သဘောထားအမြင်						
(က)ဤနေရာကို သဘာဝကြိုးဝိုင်းအဖြစ်ဖွဲ့စည်းထားခြင်းသည် ကောင်းမွန်ပါသည်။						
(ခ)သဘာဝကြိုးဝိုင်းမရှိခြင်းကပိုကောင်းပါသည်။						
(ဂ)သဘာဝကြိုးသည် ဒေသခံများအတွက် ဖွဲ့စည်းပေးထားခြင်းဖြစ်ပါသည်။						
(ဃ)ကျွန်ုပ်တို့ကလေးများအတွက် သစ်တောများကိုကာကွယ်ရန် အရေးကြီးပါသည်။						
သဘာဝကြိုးဝိုင်းကြောင့် ပဂ္ဂိုလ်ရေးအကျိုးသက်ရောက်မှုအပေါ် သဘောထားအမြင်						
(က)သဘာဝကြိုးဝိုင်းဖွဲ့စည်းလိုက်ခြင်းကြောင့် ကျွန်ုပ်၏မိသားစုကို ပြဿနာများဖြစ်စေပါသည်။						
(ခ) သဘာဝကြိုးဝိုင်းဖွဲ့စည်းလိုက်ခြင်းကြောင့် မိသားစုကိုအထောက်အကူဖြစ်စေပါသည်။						
ဒေသခံပြည်သူများအတွက် ကြိုးဝိုင်းကြောင့်ရသည့်အကျိုးကျေးဇူးအပေါ် သဘောထားအမြင်						
(က)သဘာဝကြိုးဝိုင်းစီမံကိန်းက ဒေသခံပြည်သူများကို ကူညီပေးသည်။						
(ခ)သဘာဝကြိုးဝိုင်းဝန်ထမ်းများက ဒေသခံပြည်သူများကို ကူညီပေးသည်။						
(ဂ)သဘာဝကြိုးဝိုင်းစီမံကိန်းက ပြည်သူများကို အလုပ်အကိုင်ပေးသည်။						

(၁)သဘောမတူပါ **Disagree** **No**

(၂)မခွဲခြားတတ်ပါ **Don't know**

(၃)သဘောတူပါသည် **Agree** **Yes**

	၁	၂	၃	၄	၅	၆
သဘာဝတယဲဇာတအသုံးပြုမှုအပေါ်သဘောထားအမြင်						
(က)သဘာဝကြိုးဝိုင်းထဲတွင် ဒေသခံပြည်သူများအား **မိမိသုံးအတွက်** အမဲလိုက်ခွင့်ပြုသင့်သည်။						
(ခ)သဘာဝကြိုးဝိုင်းထဲတွင် **မိမိသုံးအတွက်** ဝါးခုတ်ခွင့်ပြုသင့်ပါသည်။						
(ဂ)သဘာဝကြိုးဝိုင်းထဲတွင် **မိမိသုံးအတွက်** သစ်ထုတ်လုပ်မှု ခွင့်ပြုသင့်ပါသည်။						
(ဃ)သဘာဝကြိုးဝိုင်းအတွင်းတွင် **စီးပွားဖြစ်** သစ်/ဝါးထုတ်လုပ်မှု ခွင့်ပြုသင့်ပါသည်။						
(င)သဘာဝကြိုးဝိုင်းထဲတွင် ဥယျာဉ်ခြံတည်ထောင်ခွင့် ပြုသင့်ပါသည်။						
တားမြစ်ချက်များအပေါ်သဘောထားအမြင်						
(က)သဘာဝကြိုးဝိုင်း၏ဧရိယာကျယ်လွန်းပါသည်။						
(ခ)သဘာဝကြိုးဝိုင်းအတွင်း တားမြစ်ချက်များ များပြားလွန်းပါသည်။						
(ဂ)ယခုအခါ ယခင်ဆယ်နှစ်ကထက် တောရိုင်းတိရိစ္ဆာန်များပေါများလာသည်။						

(၁)သဘောမတူပါ
Disagree
No

(၂)မခွဲခြားတတ်ပါ
Don't know

(၃)သဘောတူပါသည်
Agree
Yes

သစ်တောဦးစီးဌာန
တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း
(ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးပညာပေးလုပ်ငန်းလိုအပ်ချက်ဆန်းစစ်မှု)

မေးမြန်းသူ----------

ရက်စွဲ----------

ကျေးရွာအမည်----------

အမည်	ကျား၊ မ	အသက်	လူမျိုး	ဘာသာ	ပညာအရည်အချင်း	အလုပ်အကိုင်	ဖတ်နိုင်သည့်စာ
							မြန်မာစာ၊ ကရင်စာ၊ မွန်စာ

၁	တောင်ယာများ ရွှေ့ပြောင်းခုတ်ရခြင်း အကြောင်းအရင်းမှာ အဘယ့်ကြောင့်နည်း။ (က) မြေဩဇာကျဆင်းခြင်းကြောင့် (ခ) ပေါင်းမြက်များလာခြင်းကြောင့် (ဂ) အခြားအကြောင်းအရင်းများ(ဖေါ်ပြရန်)----------
၂	တောင်ယာကွက်တစ်ကွက်အား ပြန်လည်တောင်ယာခုတ်နိုင်ရန် ဘယ်နှစ်လောက်ကြာစောင့်ရပါသလဲ။ (က) ၃ နှစ် အောက် (ခ) ၃ နှစ် မှ ၄နှစ် (ဂ) ၅ နှစ်နှင့် အထက်
၃	တောင်ယာကွက်တစ်ကွက်တွင် ဘယ်နှစ်နှစ်စိုက်ပျိုးပါသလဲ။ (က) ၁ နှစ် (ခ) ၂ နှစ် (ဂ) ၃ နှစ်
၄	(က) တောင်ယာခုတ်ပြီး မီးမရှို့ မီတောင်ယာကွက်ပတ်လည်တွင် မီးတားလမ်းဖောက်လုပ်ပါသလား။ (က) ဖောက်ပါသည်။ (ခ) မဖောက်ပါ။ (ခ) ဖောက်လုပ်ပါက မီးတားလမ်းအကျယ် မည်မျှထားသနည်း။
၅	မီးရှို့ ရာတွင် မည်သည့်ပစ္စည်းများယူဆောင်သွားပါသလဲ။
၆	မီးရှို့ ရာတွင် လူဘယ်နှစ်ဦးအသုံးပြုပါသလဲ။
၇	မီးစတင်ရှို့ သည့်အချိန်မှ ပြီးစီးသည်အထိအချိန် မည်မျှယူရပါသလဲ။
၈	သစ်လုံးများတွင် မီးကျန်ပါက မည်သို့ ဆောင်ရွက်ပါသလဲ။
၉	တောင်ယာစိုက်ပျိုးခြင်းသည် သင်၏ရိုးရာဓလေ့နှင့်သက်ဆိုင်သည်ဟု ယုံကြည်ပါသလား။ (က) သက်ဆိုင်ပါသည်။ (ခ) မသက်ဆိုင်ပါ။

၁၀	မီးရှို့ခြင်းဖြင့် မည်သည့်အကျိုးကျေးဇူးများရသည်ဟု ယုံကြည်ပါသနည်း။ (က) မြေဩဇာပိုမိုကောင်းမွန်စေပါသည်။ (ခ) ပေါင်းမြက်အန္တရာယ်လျော့နည်းစေပါသည်။ (ဂ) ပိုးမွှား အန္တရာယ်လျော့နည်းသက်သာစေပါသည်။ (ဃ) အခြားအကျိုးကျေးဇူး----------
၁၁	တောင်ယာတွင်မည်သည့်သီးနှံများစိုက်ပျိုးပါသလဲ။ (က) စပါးတစ်မျိုးတည်းစိုက်ပါသည်။ (ခ) အခြားအပင်များနှင့်ရောစိုက်ပါသည်။ (ရောနှောစိုက်သည့်အပင်အမည်----------)
၁၂	တောင်ယာများတွင် စပါးနှင့် အခြားနှစ်ရှည်သီးနှံမည်သည်ကို ပိုမိုစိုက်ပျိုးလိုပါသလဲ။ (က) တောင်ယာစပါး (ခ) နှစ်ရှည်သီးနှံ
၁၃	တောင်ယာများတွင် နှစ်ရှည်ပင်စိုက်ပျိုးရန်အတွက် မည်သည့်အခက်အခဲများရှိသနည်း။ (က) မြေပိုင်ဆိုင်မှု (ခ) ငွေအရင်းအနှီး (ဂ) စိုက်ပျိုးထိန်းသိမ်းသည့်နည်းပညာ (ဃ)သွားလာရေးခက်ခဲမှု (င) အခြား----------
၁၄	တောင်ယာများတွင်ပေါင်းရှင်းလေ့ရှိပါသလား။ (က)ရှင်းပါသည်။ (အကြိမ်အရေအတွက်---------) (ခ) မရှင်းပါ။
၁၅	ဖုန်းဆိုးတောများ မြေဩဇာလျှင်မြန်စွာ ပြန်လည်ပြည့်ဖြိုးစေရန် တောင်ယာစိုက်ပျိုးခြင်းခေတ္တရပ်နားထားစဉ် အပင်တစ်မျိုးမျိုးကို စိုက်ပျိုးလေ့ရှိပါသလား။ စိုက်ပါကမည်သည့်အပင်မျိုးစိုက်ပျိုးပါသလဲ။ (က) စိုက်ပျိုးပါသည် (စိုက်သည့်အပင်အမည်----------) (ခ) မစိုက်ပါ
၁၆	တောင်ယာကွက်များတွင် မြေဆီလွှာတိုက်စားမှုမရှိစေရန်ထိန်းသိမ်းလေ့ရှိပါသလား။ (က) ထိန်းသိမ်းပါသည်။ (ထိန်းသိမ်းသည့်နည်းလမ်း----------) (ခ) ထိန်းသိမ်းလေ့မရှိပါ။
၁၇	တောင်ယာကွက်များတွင်မြေဩဇာသုံးစွဲပါသလား။ သုံးစွဲပါက မည်သည့်အမျိုးအစားကိုသုံးပါသလဲ။ (က) ဓါတ်မြေဩဇာ (ခ) သဘာဝမြေဩဇာ (ဂ) မသုံးစွဲပါ
၁၈	ပိုးသတ်ဆေး၊ ပေါင်းသတ်ဆေးများကို သုံးစွဲလေ့ရှိပါသလား။ (က) သုံးပါသည်။ (သုံးစွဲသည့်ဆေး----------။ သုံးစွဲနည်းသိ၊မသိ----------) (ခ) မသုံးပါ။
၁၉	ပိုးသတ်ဆေး၊ ပေါင်းသတ်ဆေးများကိုင်တွယ်အသုံးပြုခြင်း၊ မြေဆီလွှာထိန်းသိမ်းနည်း တို့ နှင့်ပတ်သက်၍ သင်တန်းများ၊ ပညာပေးဟောပြောပွဲများတက်ဖူးပါသလား။ (က) တက်ဖူးပါသည်။ (သင်တန်းအမျိုးအစား----------) (ခ) မတက်ဖူးပါ။
၂၀	စိုက်ပျိုးပင်များအားကို မည်သည့်ပိုးမွှား၊ ရောဂါ၊ တိရစ္ဆာန်များဖျက်စီးပါသလဲ။ မည်သို့ကာကွယ်ပါသလဲ။
၂၁	မြေရှားပါးမှုကြောင့်တောင်ယာအသစ်ရွှေ့ ပြောင်းခုတ်ရန် ခက်ခဲလာပါက သင်မည်သို့ ဖြေရှင်းမည်နည်း။
၂၂	ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့်စားဝတ်နေရေးနှိုင်းယှဉ်လျှင် မည်သည်က ပိုအရေးကြီးသည်ထင်ပါသလဲ။

သစ်တောဦးစီးဌာန
တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း
(ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးပညာပေးလုပ်ငန်းလိုအပ်ချက်ဆန်းစစ်မှု)

မေးမြန်းသူ----------

ရက်စွဲ----------

ကျေးရွာအမည်----------

အမည်	ကျား၊ မ	အသက်	လူမျိုး	ဘာသာ	ပညာအရည်အချင်း	အလုပ်အကိုင်	ဖတ်နိုင်သည့်စာ
							မြန်မာစာ၊ ကရင်စာ၊ မွန်စာ

၁	သစ်ခုတ်သည့်အဓိကအကြောင်းအရင်း- (က) အိမ်သုံး (ခ) စီးပွားရေး
၂	သစ်ခုတ်ရာသီ
၃	အဓိခုတ်ယူသည့်ဈေးကွက်ဝင်သစ်မျိုးများ
၄	သယ်ယူပို့ဆောင်သည့်နည်းလမ်း
၅	ရောင်းချသည့်နေရာ
၆	သစ်ခုတ်ခြင်းမှရရှိသည့်အကျိုးအမြတ် တစ်တန်လျှင်ရရှိသည့်အကျိုးအမြတ်---------- တစ်လရရှိသည့်ဝင်ငွေ----------
၇	သင်ရွာရှိ အိမ်ခြေမည်မျှခန့်သည် သစ်ခုတ်ခြင်းခြင့် အသက်မွေးဝမ်းကျောင်းပြုနေရပါသလဲ။
၈	သင်သည်စားဝတ်နေရေးအတွက်သစ်ခုတ်ခြင်းဖြစ်လျှင် အခြားအလုပ်အကိုင်တစ်ခုပေါ်လာပါက သစ်ခုတ်ခြင်းအလုပ်ကိုစွန့်လွှတ်၍ ပြောင်းလဲလုပ်ကိုင်ရန်ဆန္ဒရှိပါသလား။ (က)ရှိပါသည် (ခ) မရှိပါ

သစ်တောဦးစီးဌာန

တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း

(ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးပညာပေးလုပ်ငန်းလိုအပ်ချက်ဆန်းစစ်မှု)

မေးမြန်းသူ----------

ရက်စွဲ----------

ကျေးရွာအမည်----------

အမည်	ကျား၊ မ	အသက်	လူမျိုး	ဘာသာ	ပညာအရည်အချင်း	အလုပ်အကိုင်	ဖတ်နိုင်သည့်စာ
							မြန်မာစာ၊ ကရင်စာ၊ မွန်စာ

၁	သင့်အနေဖြင့်အမဲလိုက်လေ့ရှိပါက မည်သည့်အကြောင်းကြောင့် ပိုများသနည်း။ (က)စီးပွားရေး (ခ) အပျော်တမ်း (ဂ) အခြားအကြောင်း----------
၂	မည်သည့်သားကောင်များရဖူးပါသလဲ။
၃	အမဲလိုက်ရန်အတွက် အမဲလိုက်လိုင်စင်ရှိရန် လိုအပ်ပါသလား။ (က) လိုပါသည် (ခ) မလိုပါ (ဂ)မသိပါ
၄	အမဲလိုက်ရာတွင် မည်သည့်နည်းစနစ်များကို အသုံးပြုလေ့ရှိပါသလဲ။ (ဥပမာ-တူမီးသေနတ်၊ ဒူးလေး၊ ထောင်ချောက်၊ ကျတွင်းစသည်)
၅	သားကောင်ရပါက စားသုံးပြီးပိုလျှံလျှင် မည်သည့်နေရာတွင်ရောင်းချလေ့ရှိပါသလဲ။
၆	ဂျီ နှင့် ဒရယ်ကို ဥပဒေအရ-- (က) လုံးဝကာကွယ်ထားသည်။ (ခ) သားပေါက်ချိန်တွင်ကွယ်ထားသည်။ (ဂ) မသိပါ။
၇	သင်အမဲလိုက်သွားစဉ် ထောင်ချောက်တွင်မိနေသောကျားတစ်ကောင်ကို တွေ့သည်ဆိုပါစို့။ သင်မည်သို့ ဆုံးဖြတ်မည်နည်း။ အဘယ်ကြောင့်နည်း။ (က) ပစ်သတ်မည် (ခ) ရှောင်ကွင်း၍သွားမည် (ဂ) အခြားအဖြေရှိပါကဖေါ်ပြရန်----------
၈	သင်သည်စားဝတ်နေရေးအတွက်အမဲလိုက်ခြင်းဖြစ်လျှင် အခြားအလုပ်အကိုင်တစ်ခုပေါ်လာပါက အမဲလိုက်ခြင်းကိုစွန့်လွှတ်၍ ပြောင်းလဲလုပ်ကိုင်ရန်ဆန္ဒရှိပါသလား။ (က)ရှိပါသည် (ခ) မရှိပါ

သစ်တောဦးစီးဌာန
တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်း
(ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးပညာပေးလုပ်ငန်းလိုအပ်ချက်ဆန်းစစ်မှု)
အမည်ဖော်ပြရန်မလိုပါ။

ပတ်ဝန်းကျင်ဆိုင်ရာဗဟုသုတနှင့်ပတ်သက်သည့် လူကြီးမင်းတို့၏အဆင့်များအား မိမိတို့ကိုယ်တိုင် ရွေးချယ်၍ **စက်ဝိုင်းဝိုင်းပြီး** ဖော်ပြပေးပါရန်မေတ္တာရပ်ခံအပ်ပါသည်။ **(အနိမ့်ဆုံးအဆင့်သည် ၁ ဖြစ်၍ အမြင့် ဆုံးအဆင့်သည် ၁၀ ဖြစ်ပါသည်။)**

၁။ ပတ်ဝန်းကျင်ဆိုင်ရာ အထွေထွေဗဟုသုတပြည့်စုံမှု။

အနိမ့်ဆုံး ၁.....၂.....၃.....၄.....၅.....၆.....၇.....၈.....၉.....၁၀ အမြင့်ဆုံး

၂။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့်သက်ဆိုင်သော မူဝါဒနှင့် ဥပဒေများကို လေ့လာသိရှိထားမှု။

အနိမ့်ဆုံး ၁.....၂.....၃.....၄.....၅.....၆.....၇.....၈.....၉.....၁၀ အမြင့်ဆုံး

၃။ တနင်္သာရီသဘာဝကြိုးဝိုင်းအကြောင်းယခင်ကလေ့လာသိရှိထားမှု။

အနိမ့်ဆုံး ၁.....၂.....၃.....၄.....၅.....၆.....၇.....၈.....၉.....၁၀ အမြင့်ဆုံး

၄။ သဘာဝပတ်ဝန်းကျင်နှင့်ဆက်နွယ်နေသည့် လုပ်ငန်းများဆောင်ရွက်ရာတွင်လည်းကောင်း၊ ဆုံးဖြတ်ချက် ချမှတ်ရာတွင်လည်းကောင်း ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးကို ထည့်သွင်းစဉ်းစားလေ့ရှိမှု။

အနိမ့်ဆုံး ၁.....၂.....၃.....၄.....၅.....၆.....၇.....၈.....၉.....၁၀ အမြင့်ဆုံး

၅။ ပတ်ဝန်းကျင်ဆိုင်ရာဗဟုသုတများကို မည်သည့်မီဒီယာများမှ (ဥပမာ-ပုံနှိပ်စာနယ်ဇင်း၊ ရေဒီယို၊ တီဗွီ၊ ဆွေးနွေးပွဲ စသည်) အများဆုံး ရရှိပါနည်း။ အဆင့်အလိုက်ဖော်ပြပေးပါရန်။

(က)ပထမ----------

(ခ) ဒုတိယ----------

(ဂ) တတိယ----------

Ministry of Forestry
Forest Department
Taninthayi Nature Reserve Project

STRATEGIC ACTION PLAN FOR ENVIRONMENTAL EDUCATION

Prepared and submitted by:

Ngwe Thee

National Consultant (Environmental Education)

January, 2009

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Acknowledgements

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STRATEGIC ACTION PLAN FOR ENVIRONMENTAL EDUCATION

1. Introduction:

Environmental Education (EE) becomes a widely used management tool in Protected Areas management these days. EE is one of the management strategies adopted in the Conceptual Framework of Management Plan for Taninthayi Nature Reserve (TNR)(A. J. Lynam and M. Rao, 2008). Need assessment has been carried out in the Taninthayi Nature Reserve Project as a first and foremost requirement for EE from August-November, 2008. Based on the findings of need assessment, this Strategic Action Plan for EE is formulated for the time frame of 10 years. The goal of the strategic plan is to support conservation of tropical rainforests and its constituent biodiversity in TNR. The main objectives of the plan are:

- to foster environmental education activities within the local community to minimize their impact on TNR and to help people adopt the environmentally sound practices towards sustainability
- to support formal education in the production of environmentally literate generations in the vicinity of TNR
- to ensure the effectiveness of environmental education programme of TNR by improving coordination with stakeholders organizations involved in EE.

2. Definition of Environmental Education

Michael Matarasso and Nguyen Viet Dung (http://assets.panda.org) described the most widely used definition and concept of Environmental Education (EE) identified at the first Inter-Government Conference on EE in Tbilisi, Georgia in 1977 as follows:

"Environmental Education (EE) is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivation, commitment, and skills to work individually and collectively toward solutions of current problems and the prevention of new ones."

3. Goals, Objectives and Guiding Principles of Environmental Education

The goals, objectives, and guiding principles of EE were stated by Peyton *et.al* (UNESCO-UNEP/ IEEP, EPD-95/WS/2) with reference to Tbilisi Conference as follows:

<u>Goals of Environmental Education</u>

- to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;

- to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
- to create new patterns of behavior of individuals, groups and society as a whole towards the environment.

Objectives of Environmental Education

Awareness: to help social groups and individuals acquire an awareness and sensitivity to the total

environment and its allied problems.

Knowledge: to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.

Attitudes: to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.

Skills: to help social groups and individuals acquire the skills for identifying and solving environmental problems.

Participation: to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

Guiding Principles of Environmental Education

Environmental Education should:

- consider the environment in its totality - natural and built, technological and social (economic, political, cultural-historical, moral, aesthetics);
- be a continuous lifelong process, beginning at the pre-school level and continuing through all formal and non-formal stages;
- be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
- examine major environmental issues from local, national, regional and international points of view so that students receive insights into environmental conditions in other geographical areas;
- focus on current and potential environmental situations while taking into account the historical perspective;
- promote the value and necessity of local, national and international cooperation in the prevention and solution of environmental problems;

- explicitly consider environmental aspects in plans for development and growth;
- enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
- relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
- help learners discover the symptoms and fear causes of environmental problems;
- emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
- utilize diverse learning environments and a broad array of educational approaches to teaching / learning about and from the environment with due stress on practical activities and first-hand experience.

4. Environmental Education Approaches

According to Canadian Environmental Grantmakers' Network- CEGN (2006), three approaches of environmental education are described as follows:

1) Formal environmental education

Formal environmental education is linked with the formal education system and generally takes place in a school context.

2) Non-formal environmental education

Non-formal environmental education is organized educational activity outside the formal school system, and includes environmental education activities or programs provided by community organizations, youth groups, museums, zoos, and nature/interpretative centers, etc.

3) Informal environmental education.

Informal environment education is the provision of information without an organized educational /institutional structure and typically includes learning about the environment through the media, personal reading, every day experiences and interactions with other people.

5. Need Assessment for EE

In order to identify the needs for the long-term strategic planning for EE, the assessment as baseline study was carried out in the project area. The need assessment covered the following activities:

1) Review on existing awareness programme of TNRP
2) Identifying needs for the formal EE
3) Need assessment for the non-formal EE

A review on existing awareness programme was performed through the discussion with key educators involved in the programme and by using questionnaire surveys.

Need assessment for the formal EE consisted of:

- review on status of EE themes infused to existing curricula;
- assessment on student's knowledge and effectiveness of use of audio-visual aids in awareness talks;
- assessment on environmental literacy of teachers, teaching aids, methods and skills.

For the non-formal EE, assessment on Knowledge and Attitude (KA) of general audience was carried out among the villagers from 13 villages in the Project Area. In addition, need assessment on target audience was also undertaken in 3 villages viz., Michaunglaung, Zinba and Hnankye villages by dividing groups, based on the threats to TNR: shifting cultivators, taungya based orchard cultivators, timber cutters, and hunters. Basically, Knowledge, Attitude and Practice (KAP) of target audience were assessed by using interview-cum-questionnaires. Similarly, need assessment among local decision-makers has been conducted using questionnaire surveys. The following figure shows the need assessment for EE in TNRP area.

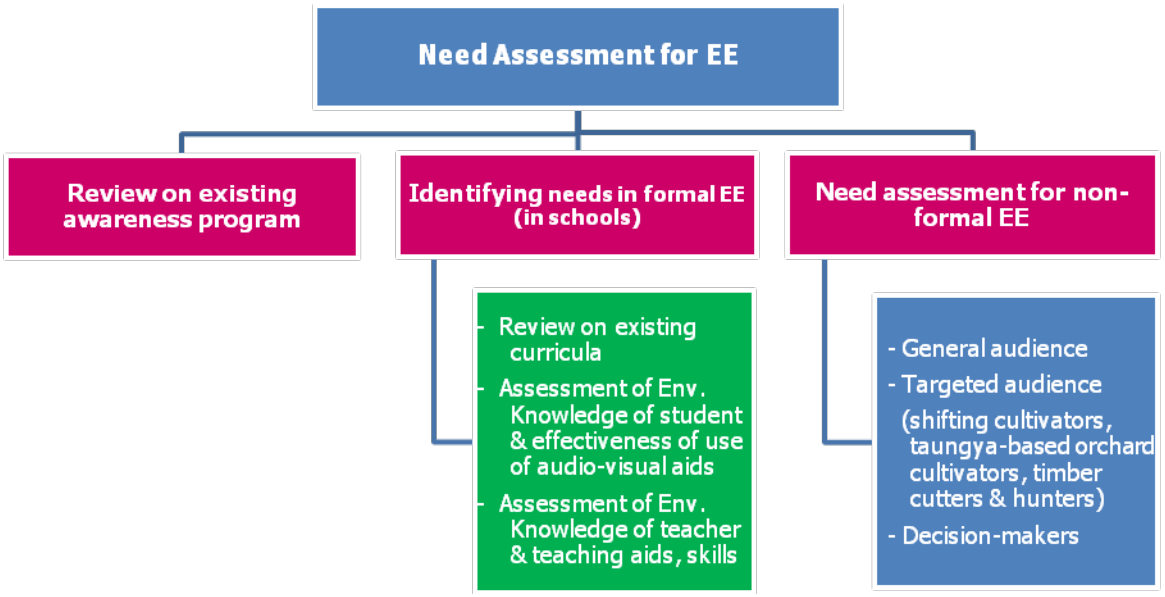

Fig.(1) Flow chart showing Need Assessment for EE

6. Findings of Need Assessment for EE

The findings of need assessment for EE are described as follows:

6.1 Existing Awareness Programme of TNRP

- Inadequate educational materials such as printed materials, audiovisual aids
- Talks and discussions mostly focused on promoting knowledge and awareness but rarely on skills in problem identification and solving.
- There is no dedicated Environmental Education team which was formed for this particular purpose only. The Educators are responsible for carrying out other tasks of the project and they could not concentrate entirely on the awareness program.
- Educators have received a very short training only on basic concept of EE.
- Specific education program with respect to different target audience still could not be developed.

6.2 Non-formal Environmental Education

6.2.1 General Audience

- Most of the people do not know the TNR boundary very well and are not aware of the prohibitions also
- Assessment on Environmental knowledge showed that Mon is lower than Dawei and Karen; female lower than male; ≥ 40 years lower than <40 years age group.
- Most of the villagers hold negative attitudes towards advantages of TNR i.e., they did not appreciate support by the project and project personnel and also for potential job opportunities;
- Those having access to formal education are more inclined to better environmental knowledge.
- Attitudes of most villagers (general audience) express that timber and bamboo cutting for personal use should be allowed inside TNR.
- Villagers who have attended TNRP awareness programme demonstrate better environmental knowledge than those who have not.
- Language barrier was encountered in Karen and Mon villages.
- Subcontractors of MGTC and TPC who are working in TNR have not received environmental awareness programme provided by TNRP.
- Overall ranking in terms of knowledge level and attitudes was found to be as follows:
    - Zinba, Yarphu, Yebon, Kawhlaing and Tharyarmon were in the lower level,
    - Kaleinaung, Michaunglaung(Old), Kayinshinhtami and Hnankye in the middle, and
    - Wunpo, Kyaukshat, Mayanchaung and Michaunglaung(New) in the upper level.

6.2.2. Targeted Audience based on the threats to TNR

6.2.2.1. Taungya cutters (shifting cultivation and taungya-based orchard cultivators)

- 50% of shifting cultivators are poor in environmental knowledge.
- Both shifting cultivators and *taungya*-based orchard cultivators are poor in fire use practice.
- Most of shifting cultivators in Michaunglaung believed that shifting cultivation is the traditional farming system of Karen people practiced since time immemorial.
- Majority of taungya cutters prefer to grow perennial crops, but accessibility, capital investment and land availability are major constraints to them.
- Generally practice of maintaining soil fertility was not carried out both by shifting cultivators as well as orchard cultivators.
- In rubber plantations some orchard cultivators are using chemical fertilizers and herbicides.

6.2.2.2. Timber and bamboo cutters

- Almost 50% of timber cutters in Zinba are poor in environmental knowledge.
- Illegal timber cutting by Zinba villagers links with social norms, immigration and weakness in legal enforcement.
- Some timber cutters in Zinba traditionally own land without cultivation and some have plots in integrated farm of Socio-Eco (MGTC).
- Low employment of Zinba villagers in MGTC, TPC and their subcontracted companies, compared to other villages.
- Timber cutters in Hnankye perceive negative attitude that TNRP causes problems to their families. Majority has no alternative livelihood options and many villagers are landless.

6.2.2.3. Hunters

- Hunters fall in the age group of under 40 years.
- The hunters are lack of knowledge in legal proceedings for protection of wildlife.
- Attitudes of most hunters show that there are still threats to large mammals (e.g. tigers)
- Surplus bush meat is used to sell in villages and the final destinations are Kaleinaung, Kanbauk village and Yebyu.
- Security forces along the service-track involve in hunting, and surplus bush meat is used to sell to companies' workers on site as well as in Nat-ain-taung village, at Myanmar-Thai border.

6.2.3 Local Decision-Makers

- General environmental knowledge, knowledge on TNRP and environmental related laws and policy are mostly below average level.
- First most media recommended by local decision-makers is “printed media” followed by TV.

6.3 Formal Environmental Education

- Generally, environmental themes infused in curricula are found to be sufficient.
- Teaching aids used in environmental lessons are inadequate.
- Learning environmental themes outside the classrooms is found to be lacking or very few.
- Environmental literacy of teachers is inadequate.
- Printed media is the first most one recommended by teachers from which they gain environmental knowledge.
- Use of audio-visual aids and quiz in awareness talks promotes the better understanding of audience.

7. Strategic Action Plan for EE Programme of TNRP

EE is broadly defined as raising awareness, acquiring new perspectives, values, knowledge and skills and formal and informal processes that are key indicators for behavior change in support of an ecologically sustainable environment (Government of Western Australia, 2004).

Hence, EE encompasses a spectrum of approaches such as:

- Environmental awareness-raising in the media, the Internet and other networks;
- Participatory community programs;
- Environmental content within the school curriculum;
- School based programs;
- Training for industry and small to medium business;
- Communication of traditional indigenous knowledge of the environment; and
- Formal education qualifications in areas such as environmental science, management, engineering and law.

According to Government of Western Australia (2004), Environmental Education Strategy and Action Plan can be developed in a variety of approaches that can be taken depending on the desired outcomes and the particular situation; however the goal of all environmental education programs must be sustainable behavioral change.

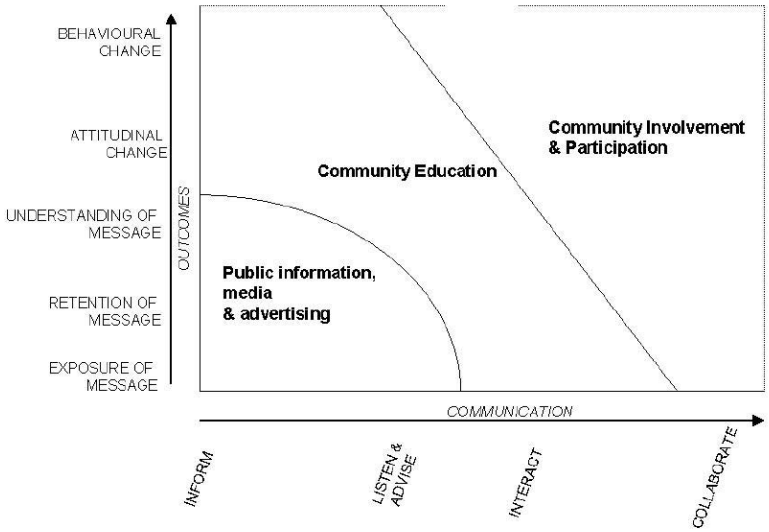

Fig. (2) Effective Communication towards desired outcomes

The relationship of levels of communication and the resultant outcomes at the initial phase (see fig.2) starts from information and exposure of message and the expected goal will be the collaborative effort of all concerned persons with the final achievement of behavioral change towards the goal of an ecologically sustainable environment. The very first requirement will involve public Information, media and advertising followed by Community Education and towards the final target of Community Involvement and Participation.

In line with the above mentioned behavioral change concept, the following 6 Strategies are recommended for the effective EE program development for TNR within a time frame of 10 years.

Strategy 1: Institutional Strengthening

To develop a well organized institutional structure for Environmental Education along with associated facilities and education materials necessary for this purpose and to build up the capacity of environmental educators.

Key outcomes:

- There will be an Environmental Education team organized for this particular purpose only.
- Environmental Education materials will be adequate.
- The capacity of environmental educators will be improved.
- An education centre and demonstration sites for educating general public and target audience will be developed.

Sr.	Strategic Actions	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
1	Form an EE team for intensifying the programme and assign a team leader with clearly specified responsibilities of the team and the team leader.	Project Director (TNRP)	x										Existing resources / additional staff to be supported by FD (if required)
2	Provide trainings / workshops related to Environmental Education and Communication to environmental educators by inviting guest lecturers or trainers.	Project implementation team	x	x	x	x	x	x	x	x	x	x	Forest Dept. (NWCD,Extension Div.), UoF, NCEA, WCS and NGOs
3	Develop printed media (Pamphlet on TNR, posters on protected mammals, birds in TNR, value of biodiversity, consequences of biodiversity loss etc.), and audiovisual aids.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	To be developed by TNRP using existing resources

Sr.	Strategic Actions	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
4	Establish Information, Education & Communication Centre fully equipped with educational materials and associated facilities.	Project Director (TNRP)		x									Allocation of budget by funding agencies / Project Coordinating Committee(TNRP)
5	Establish demonstration sites for soil conservation, agro-forestry techniques, community forestry, cultivation of medicinal plants etc.	EE team/ Project staff in LOUs	x	x									Assign from Existing project resources

Strategy 2: Developing Community Commitment to Nature Conservation and Sustainability

To foster Environmental Education activities within the local community to minimize their impact on TNR and to help people adopt the environmentally sound practices towards sustainability.

<u>Key outcome</u>:

- *Basic environmental knowledge of local community will be improved.*
- *Knowledge on TNR boundary, prohibitions and laws will be promoted.*
- *Awareness on environmental issue and sustainability will be increased.*
- *Environmentally friendly practices will be widely used.*
- *Attitude of local community on TNR will be more positive.*

Sr.	Strategic Action	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
1	Continue awareness discussion for raising awareness of the local community, promoting environ-mental knowledge, forming desirable attitude among both general audience and targeted audience with priority.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	Achievable with existing project resources
2	Assign Village Environmental Educators (VEEs) of Mon and Karen to overcome the language barrier and to facilitate	Project implementation team(PIT)	x										-do-

	the EE programme.												
Sr.	**Strategic Action**	**Responsibilities**	**Timeline (10-Years)**										**Resources**
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
3	Erect signboards at villages, mentioning TNR is located near the village, along with location maps, prohibitions and mottos as well.	Team Leader, EE team	x										-do-
4	Establish educational care programme as a project activities under community development.	Project implementation team	x										Budget allocation by funding agencies and Project Coordi-nating Committee
5	Provide training on prescribed burning to shifting cultivators and *taungya*-based orchard cultivators	EE team/ Project staff in LOUs	x	x	x	x	x	x	x	x	x	x	Existing project resources
6	Introduce community-based fire management system	EE team/ Project staff in LOUs		x	x								-do-
7	Provide training on agro-forestry, maintaining soil fertility (compost making and application) to shifting cultivators and *taungya*-based orchard cultivators.	EE team/ Project staff in LOUs	x	x	x	x	x	x	x	x	x	x	Existing project resources and MAS, Socio-eco (MGTC)
8	Provide training on improved fallow management to shifting cultivators having constraints to adopt agroforestry practice immediately.	EE team/ Project staff in LOUs	x	x	x								Met from Existing project resources
9	Provide the information / training on environmental impact of pesticide/ herbicide and handling methods to orchard cultivators.	EE team/ Project staff in LOUs	x	x	x	x	x	x	x	x	x	x	Existing project resources and MAS, Socio-eco (MGTC)
10	Demonstrate the environmentally friendly practices to the target audiences.	EE team/ Project staff in LOUs	x	x	x	x	x	x	x	x	x	x	To set up demonstration sites by using project resources

Sr.	Strategic Action	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
11	Organize excursion visits for targeted groups to successful sites in the field of environmental protection and income generation programme.	Project implementation team/ Team Leader, EE team				x	x	x	x	x	x	x	To be determined
12	Disseminate information on village use zone to individual village by using printed materials, maps.	EE team/ Project staff in LOUs	x										Developed by EE team leader/ dis-seminate through LOUs and VEE
13	Disseminate information on legally protected wildlife, value of wildlife, and wildlife law by using printed materials, posters, pamphlets and stickers among the poachers, middlemen, restaurant owners, consumers and transportation service providers.	EE team/ Project staff in LOUs	x	x	x	x	x	x	x	x	x	x	Developed by EE team leader by using existing project resource and share the EE materials from other linking sources.
14	Provide information on potential and successful income generation opportunities	EE team/ Project staff in LOUs	x	x	x	x	x	x	x	x	x	x	To be determined and studied.
15	Provide family planning education to women.	EE team	x	x	x	x	x	x	x	x	x	x	Invite resource persons from DoH, Socio-eco (MGTC)
16	Set up TNR signboard, signboards with prohibitions and mottos at the cross point of service track and TNR boundary to make company personnel and security forces aware of TNR boundary and prohibitions.	Team Leader, EE team	x										Met from existing project resources
17	Visit frequently to military camps, provide information on value of biodiversity, raise awareness of soldiers, and persuade them to participate in biodiversity survey and conservation activities.	EE team	x	x	x	x	x	x	x	x	x	x	-do-

Strategy 3: Advocating Local Decision-Makers

To promote the awareness of local decision in nature conservation activities and knowledge on environmental related policy and laws

Key outcomes::

- *Local decision-makers will be aware of nature conservation and TNR activities.*
- *Knowledge on environmental related policies and law will be improved.*
- *Participation and support will be promoted*

Sr.	Strategic Actions	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
1	Establish regular communication system with local decision-makers and discuss on real time environmental issues and activities of TNRP (e.g. monthly or quarterly or biannually)	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	Existing project resources
2	Develop and disseminate printed materials and project memorial gifts such as notebooks, calendars etc., having information on TNR and nature conservation.	Project implementation team/ Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	To be produced by EE team leader with support of PIT
3	Advocate local decision-makers on environmental related matters.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	Existing project resources
4	Disseminate copy of environmental related policy and laws to the local decision-makers.	Team Leader, EE team	x	x									Existing project resources
5	Produce and broadcast TV programme related to TNR for raising awareness of decision-makers at all levels.	Project implementation team/ Team Leader, EE team		x									To be produced, (MRTV/MWD)

Strategy 4: Making Formal Environmental Education More Effective

To ensure that all students in the vicinity of Taninthayi Nature Reserve understand the sustainability, environmental value and ecological foundation through promoting their knowledge and skills by making formal environmental education more effective.

Key outcomes:

- *Students in basic education level within the TNR project area will develop an understanding on sustainability, environmental value and ecological foundation.*
- *Awareness on sustainability and environmental issues will be developed.*
- *Use of appropriate teaching aids in environmental lessons will be increased.*
- *Environmental knowledge of teachers will be promoted.*

Sr.	Strategic Actions	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
1	Continue the awareness talks at the schools.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	Use existing project resources and DBE
2	Use more audio-visual aids, printed media, games and environmental stories to attract the audience's interest and to promote their awareness and knowledge.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	To be developed and modified
3	Organize quiz contest, essay writing competition, drawing competition etc. on the remarkable occasions or days.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	Existing project resources and DBE
4	Provide some appropriate teaching aids (e.g. posters, audio-visual packages etc.) suited to environmental lessons in existing curricula.	Project implementation team/ Team Leader, EE team		x	x								To be produced by EE team leader with support of PIT (in contact with DBE, DEPT)

Sr.	Strategic Actions	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
5	Organize excursion visits to parks, nature reserves, zoos and environmental education centers.	Project implementation team/ Team Leader, EE team			x	x	x	x	x	x	x	x	To be determined
6	Organize trainings, workshops, seminars related to environmental protection and education for teachers	Project implementation team/ Team Leader, EE team		x	x	x	x	x	x	x	x	x	DBE, DEPT, NCEA, FD, UoF, NGOs are available resources
7	Continue collective activities for the environmental protection, organizing waste cleaning day, tree planting day.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	Met from existing project resources and DBE
8	Provide current and fresh environmental information to school libraries to enhance the environmental literacy of teachers.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	FD, NCEA, NGOs, Internet, mass media, are available sources

Strategy 5: Coordination with NGOs, GOs and Stakeholder Organizations which involve in EE

To ensure the effectiveness of environmental education by improving coordination with NGOs, GOs and other stakeholder organizations

Key Outcome:

The availability of information, resources and services for environmental education will be improved and duplication of efforts and resources will be avoided.

Sr.	Strategic Actions	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
1	Establish a link with local NGOs, GOs and other stakeholder organizations which involve in EE.	Team Leader, EE team / Project implementation team	x										FD, UoF, NCEA, Socio-eco (MGTC), MAS, DBE, DEPT, DoH, NGOs
2	Share information and resources needed for EE among the stakeholder organizations.	Team Leader, EE team / Project implementation team	x	x	x	x	x	x	x	x	x	x	-do-
3	Exchange experiences and environmentally sound practices which are applicable for EE	Team Leader, EE team / Project implementation team	x	x	x	x	x	x	x	x	x	x	-do-

Strategy 6: Monitoring and Evaluating EE programme

To ensure the effectiveness of EE programme through monitoring, evaluation and improvement process.

Key outcomes:

- *EE materials are developed accurately for the target audience*
- *EE programme will be more effective.*

Sr.	Strategic Actions	Responsibilities	Timeline (10-Years)										Resources
			Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	Y-9	Y-10	
1	Perform post-evaluation on effectiveness of individual awareness talks / discussions.	Team Leader, EE team	x	x	x	x	x	x	x	x	x	x	Existing project resources
2	Carry out formative evaluations on the EE programmes of TNRP for further improvement	Team Leader, EE team / Project implementation team				x				x			-do-
3	Improve EE approaches and EE materials based on results of the formative evaluation	Team Leader, EE team / Project implementation team				x				x			-do-

8. Discussion and Conclusion:

In nature conservation, the major threats are usually related to the activities of human beings. The success or failure in meeting the primary goal of conservation relies totally on the social system of local community, comprising knowledge, skill, social norms, economics and laws, etc. Lack or inadequate awareness, knowledge and skill, poor socio-economic conditions and social norms, weakness in enforcing laws, are the main issues to be addressed in nature conservation. Although EE alone cannot address all issues related to the social system which direct or indirectly affect on the environment, it is a useful and essential tool for enhancing awareness of people for solving environmental problems within the context of EE.

In the TNRP area, according to findings from Need Assessment for EE, main human activities which adversely affect on the Nature Reserve and its biodiversity are wildlife poaching, shifting cultivation, illegal logging and burning for agricultural purposes. The findings of need assessment for EE have indicated that apart from knowledge, attitudes and skills, environmentally undesirable practices in TNRP area are more or less related to inadequate alternative livelihood, social norms of the villagers and weakness in legal enforcement. In order to mitigate these undesirable practices leading to environmental deterioration, it is very important to develop the commitments of local community and their participation towards sustainability of natural environment.

Basically, environmental awareness, knowledge and attitudes are basic requirements for developing commitments of local community. Therefore, this EE Strategic Action Plan was formulated to ensure promoting awareness, knowledge and forming desirable attitudes among the general audience (general villagers) in TNRP area and particularly target audiences linking with threats to TNR. In addition, the Strategic Action Plan emphasized on the improvement of skills of targeted audience, especially in burning practice and soil conservation practice through trainings and demonstrations. Moreover, EE programme should be performed in harmony with community development programme supporting the livelihood of villagers who depends on natural resource based economy and together with legal enforcement activities to have better impact.

In addition, the development activities such as agricultural expansion (e.g. expansion of rubber and oil palm plantation) and infrastructure development are carried out under the guidance of the local decision-makers. These development activities more or less might have adverse impact on TNR as land conversion for agricultural purpose in large scale and intrusion of non-resident investors may bring the villagers in the project area encroaching into TNR with decreasing land availability and resource access outside TNR. Similarly, it was frequently heard that some villagers who involved in logging gave reasons that they cut the trees for fulfilling timber requirement for construction of village library, bridge etc. Therefore, local decision-makers and their supports play a pivotal role in achieving activities of TNRP, and for this reason advocacy to decision makers was also included in this EE strategic plan.

In general, conservation educators often address school children, hoping to create environmentally responsible adults and this is always desirable goal, but may not be the first priority. Sometimes, however, school conservation education programme can pay immediate environmental dividends, in particular, when students in rural areas drop out of school early to work on family farms (David S. Wood and Diane Walton Wood, 1990). In TNRP area, school drop-out rate is generally found to be high, except the villages under socio-economic programme of MGTC (Min Thant Zin, 2008) and most of the children work on farms and helps their parents before completion of their basic education. For this reason, EE strategies in TNR need to support formal EE in schools for producing schoolchildren as environmentally knowledgeable ones.

In order to implement the above mentioned strategies successfully, institutional strengthening, coordination with stakeholders organizations, and monitoring and evaluation of education programme are very important as supportive cornerstones. Some weaknesses in these areas have been observed under the existing awareness programme of TNRP. Therefore, these supportive strategic actions are purposely integrated in this long-term EE strategic action plan to ensure the effectiveness of EE programme for TNR.

In conclusion, David S. Wood and Diane Walton Wood (1990) pointed out that education change people's behavior through logic and common sense. Also they clearly described that education is not the tool to use when people must be convinced to do something not in their best interest, and law enforcement, financial compensation, or social pressure might be better. Hence, although the above mentioned strategic actions could motivate awareness, knowledge, attitudes and skills of the villagers in TNRP area within its context, behavioral change towards nature conservation could achieve only when legal enforcement and improvement of their livelihoods, such as income generation schemes, micro-finance programme, creation of job opportunities etc., are implemented in parallel with EE programme.

Abbreviations:

DBE	- Department of Basic Education
DEPT	- Department of Educational Planning and Training
DoH	- Department of Health
EE	- Environmental Education
FD	- Forest Department
GOs	- Governmental Organizations
LOUs	- Local Operation Units
MAS	- Myanmar Agriculture Services
MGTC	- Mottama Gas Transportation Company Ltd.
MRTV	- Myanmar Radio and Television
MWD	- Myawady Television
NCEA	- National Commission for Environmental Affairs
NGOs	- Non-governmental Organizations
NWCD	- Nature and Wildlife Conservation Division
PIT	- Project Implementation Team
TNR	- Taninthayi Nature Reserve
TNRP	- Taninthayi Nature Reserve Project
TPC	- Taninthayi Pipeline Company Ltd.
UoF	- University of Forestry
VEE	- Village Environmental Educator
WCS	- Wildlife Conservation Society

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