



Title	Environmental Perception and Environmental Awareness of Residents in Layshi Township of Naga Land
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Environmental Perception and Environmental Awareness of Rural Residents in Layshi Townships of Naga Land

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Abstract

The purpose of this paper is to assess and manage the images and perception of rural people on their environment of study area. Environmental perception and environmental awareness of rural residents in Layshi township is studied by using the results of questionnaires. Three cluster or groups are selected as sample groups, from Layshi Township of Naga Land. Among these cluster 331 samples are selected and questionnaires are distributed. GIS method, Qualitative and quantitative methods are employed to measure the primary data collected by questionnaires. There are four distinctive perspectives of environmental perception and images such as physical, socio-economic, natural hazards and disasters. Perception and images are closely related to intimate environment of residents of Naga Land. Images and perception on conservation are related to necessities, conservation methods, reducing natural disasters, problems related to environmental deterioration, methods to protect these problems and method to conserve environmental problems of rural environment.

Key words - Environmental images, Environmental perception, Environmental awareness

Aims and Objectives

Main aims and objectives of these research are to assess the images and perception of rural residents on their environment, to correlate the environmental awareness of residents to rural environmental management of this township and to suggest from shifting cultivation to step farming of the rural development programs.

Materials and Methodology

To collect primary data for environmental images, questionnaires and interview methods are applied in this study. Random sampling is used to collect the primary data. There are three sample governmental staffs, farmers and others such as sellers, students, monks or religious services. Among these clusters 331 samples are allocated to distribute questionnaires. GIS, Qualitative and quantitative methods are employed to measure the primary data collected by questionnaires. There are 50 questions in questionnaire.

Study Area

Layshi Township is situated in Nagaland of the Sagaing Region, North-West of Myanmar. It lies between the latitudes of 25° 00' and 25° 45' North and between the longitude of 94° 00' and 94° 50' East. The total area of Layshi Township is about 1,057.209 square miles or 676,614 acres. It is bounded in the north by the township of Lahel, in the east by the

Kantee and Homalin Townships, in the south of Tamu Township and in the west by India. There are 2 sub-townships, 4 wards, 18 village tracts or 70 villages on the land area. There are several small villages under each village tract.

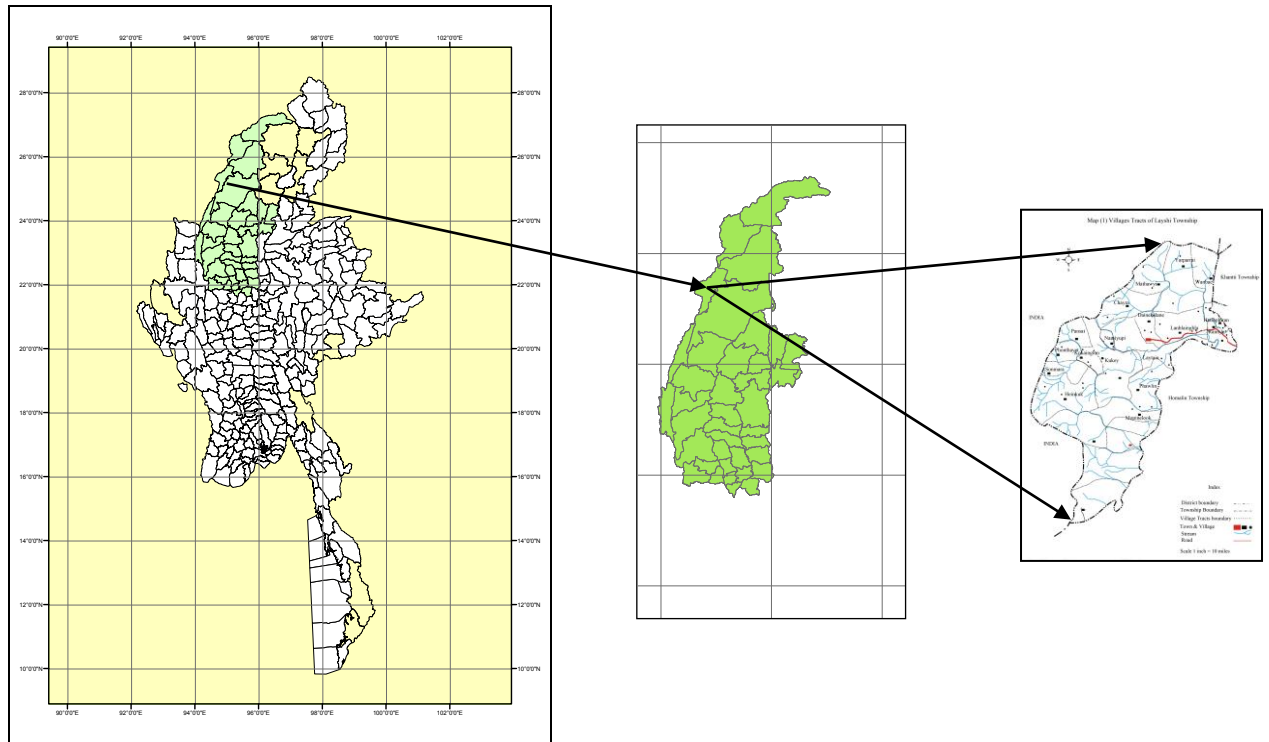


Figure (1) Location of Layshi Township

Results and Findings

1. Physical Environment in Layshi Township

Naga land is located in the north- west of Myanmar. It is bounded in the north by the township of Patcoi ranges, in the east by the Kachin State, in the south of Chin State and in the west by India. It includes Lahel, Layshi and Namyon Township. The main stream are following: Nankhar stream from east to west, Namphok stream from north to south, and Nansalain stream from west to south.

Layshi Township is an Naga upland. This region is part of the Naga Ranges which has a rolling topography with an elevation between 4,400' and 6,552' above sea level. Layshi Town lies 4443' sea level. The highest mountain range is "Saramayti" which rises in high an north and which gradually becomes lower towards the south. The highest peak of Saramayti is Layshi Township which is over 12,553 feet.

The drainage water is also obtained from streams and small springs. The main streams are Matuki, Ywa, Kazoo, Yatagon, Lanthan, Haki, Yadoung, Namkhat, and Nanway stream. The

availability of water for Layshi is related to climate such as temperature and rainfall. Although Layshi Township lies in the Sub-tropical Zone as it lies above 4,443 to 6,550 feet above sea level, it receives the Sub-tropical Mountain Climate (Cwb). November, December, January and February are the months with the lowest temperature ranging from 40 H F to the freezing point. April and May are the months with the highest average temperature of 70 HF. The annual rainy days are more than 100 days. There are also variations in the amount of rainfall. From May to October are the 6 months with the highest rainfall. 98 percent of the total annual rainfall is being received during these months. December is the month with the least rainfall and the coldest month.

The annual average rainfall for Layshi is about 100 inches. At present due to shifting cultivation, deforestation occurs due to the decrease in rainfall. Sometimes a hot dry climate is felt and it is found that the amount of underground water has decreased. Moreover as forests within the watershed area are becoming depleted and sediments in the springs and streams. However after purifying the muddy deposited water, domestic water can be used. It is also found that the purified drinking water is becoming scarce.

Soil is an important factor for agriculture. The major soil types found in the study area are mountainous red soil, red-brown forest soil. Mountainous red soils are found around the area between 3,000 to 5,000 feet of elevation. These soils are covered on the plateau limestone. The topsoil is mostly composed of humus. As shifting cultivation is carried on after clearing the hilly land by cutting forests soil erosion occurs. The slopes of the hills are steep and sheet erosion occurs and as there are many types of sediments deposited in the stream. Due to the hard bed rocks artesian and tube wells can not be dig. That is why the natural spring water (water from springs) which has no cover and roof is being used for washing clothes and for bathing by the local people.

The natural vegetations around the area have been cleared for shifting cultivation. The consequence of this practice, more erosion of the topsoil on the slope is intensified. As the region is over 4440 feet high, the natural vegetation is Pine Forest and ever green forest. But now due to shifting cultivation and cutting to trees for fire wood, Pine Forests are rarely found and ever green forest occupies a narrow area. Taung-Kathit, Laukya, Sakat, Yamanay, orchid, bamboo are found in ever green forest.

Human Factors

In 2008, the total population of Layshi Township was 14,649 persons and in 2012, there was 16,178 persons. The increase of population between 2008 and 2012 was 1,529 persons. The prime factor of the population increase in this Township is socio-economic conditions. The population density of Layshi township was 15 persons per square mile. The total rural people is (14,674) persons and the total urban people is (1,504) persons in this Township. There are 2820 households and 2930 families in this Township. Most of the images and perception were usually reflected by race and religious condition. The area is well distributed by various ethnic groups but some of them are the original groups such as the Naga and the Chins. According to 2012 report, the majority were Naga such as Tangon Naga, Paryar Naga, Makuyi Naga.

Other minorities ethnic groups included Kachin, Kayin, Bamar, Rakhine, and Shan. Therefore, the majority of religious population is Christian in Layshi Township of Naga Land, the second is Buddhist and Nat worshippers are less found in the study area. They formed 95 per cent of the total population. Religion is usually related to racial condition. That is why it is found that there are separate lands before independence period, which are used as Christian religious lands.

Type of Economic Activities in Layshi Township

The most important economic activity is various types of agriculture such as dry farm and shifting cultivation on the mountain areas. There is one main cash crop or paddy which are grown in small acreages in Layshi Township. Other economic activities include breeders of small-scale animal husbandry, hunter, door to door seller, manual labours, hunter and sewer for traditional dress. These all are associated with shifting cultivation.

There are four main types of agriculture in Layshi. These are step farming, shifting cultivation, dry farming or Ya cultivation and gardens on the village area. These crops are paddy, tea plants, potato, soy-bean, banana, orange, coffee, rubber, mango. Shifting cultivation is usually found on the mountain ranges which surround the study area. Villagers cultivate paddy in some limited land plots on the mountain slopes. Dry farming or Ya cultivation is found on the gentle slope of the mountain ranges. These dry farms are mostly practiced in the land plots located on the ranges. Main crops are sugarcane, corn, sunflower, sesame, and vegetables. Gardens on the study area are mainly used for tea plants, coffee plants, thitmawe and orange. Gardens in the surrounding area are mainly found near the settlement area.

In order to study the environmental aspects and impacts of agriculture, 32 sample villages were selected in the study area. In the field survey, type of farming, type of crops and some

factors related to inputs of agriculture were mainly studied. The result showed that environmental consequences would be related to type and scale of farming. In the case of shifting cultivation, the farmers produced very small amount of crops and they did not use chemicals and pesticides. Their farming system was responsible only for the consequential effect on erosion rather than environmental pollution. Therefore, only the combination of these different types of agriculture would impact on erosion, deposition and the storm. Shifting cultivation and population growth produce some pollutants such as air pollution, water pollution and burning forest.

Land Use Pattern

Land use pattern indirectly influenced on people's livelihood and their social environment that in turn related to image and perception of the people living in the study area. Total land use area of Layshi Township is 1,057.29 square mile or 676,614 acres in 2012. The land use of Layshi is divided as follows: residential and institutional land use(25,239-acres), agricultural land use(3985-acres)and unused land(430,257-acre). There is not clear divided industrial land use, transportation land use, commercial land use, recreational land use.

Land use of Layshi Township in 2012 showed that 33 per cent of total was forest land, 0.11 per cent of total was residential land and 1 per cent of total was cultivable land. About 63 per cent of total land use area was waste land. Among cultivable land (3985 acres), 52 per cent was shifting cultivation land, 23 per cent was Ya land, 19 per cent was Taungya land and 6 per cent was garden land. Agricultural land area is 3985 acres and there are 2830 families. Thus the ratio of the agricultural area to the amount of the family in Layshi Township is 1:1.4. That means on one acre of land, there is only one family.

Results and Findings

2. Perceptions and Awareness of Residents in Layshi Township

Environmental perception and environmental awareness of rural residents in Layshi Township was studied by using qualitative measurements. Images and perception are gathered from the answers of respondents of selected sample groups. These sample groups were government staffs group, farmers group and other group (monks, religious leaders, students). Questionnaires were distributed to 331 samples of these three samples groups in 32 sample villages.

Awareness on intimate environment of rural residents is analyzed by studying preferences, notice on physical features such as drainage, flowers, trees, lakes, creeks, and ponds near living and work places. Therefore, images and perception are mainly related to work places of respondents. In the preference pattern of living place, about 2 per cent to 3 per cent of residents preferred their living place. However, some amount of respondents from farmer group, government staff group did not prefer their living and work places. 50 per cent of other groups preferred their living place. The range of percentage lies between 5 per cent and 11 percent for all respondent groups. There is a variation in awareness on traditional condition or shifting cultivation. About 35 per cent of farmers responses that traditional cultivation is fair. However, 33 per cent of government staffs and 43 per cent of other group revealed that traditional cultivation is good because of have not other works. These results showed that the awareness on shifting cultivation is in moderate condition among all respondents.

Most of the respondents from all sample groups noticed that there are flowers and trees near their living places. It ranged between 78 per cent and 99 per cent. For respondents from company staffs, 99 per cent of them answered that there are flowers and trees near their living places. These respondents revealed that there are several good points for environment by growing flowers and trees. These good points are maintaining and climate giving shades, providing soil erosion and providing beautiful scenes and recreation. For farmers, high number of respondents, trees can provide maintenance for weather and climate of Layshi Township. Awareness on lakes and ponds near living place is very difficult to measure because Layshi Township is rural area and lakes and water bodies are difficult to see near their living places. Most of the respondents from all sample groups noticed that there are changes in spring, streams and ponds near their living places due to impact of deforestation in mountainous area and watershed area.

Awareness on physical environment

Aspects of awareness on physical environment include climate and other physical features because weather condition is very sensitive and people faces weather conditions everyday for the whole life. Weather events include temperature and rainfall. For rain, most of respondents from all group revealed that rainfall is more than previous years. Reason of more rainfall are normal condition of weather locating in the mountainous zone and less trees in the region. Most of respondents aware that Layshi Township is located in the freeze region. Therefore, rainfall is more. However, 14 per cent of respondents did not answer this question

because they usually live in their houses, and did not notice actual rainy condition outside their houses.

For the aspect of temperature, most of the respondents answered that temperature was higher in recent years than that of previous years. Here again, 70 per cent of government staffs and 65 per cent of farmers revealed that temperature condition change significantly. About 48 per cent of other group pointed out that temperature is higher in recent years. There are several reasons for increasing temperature. Some respondents said it was normal condition for region. Other reasons include increasing shifting cultivation, scattered trees, abnormal climate and deforestation. All respondent groups revealed that deforestation is one of the reasons for high temperature. Percentages for this answer are higher among the government staffs groups. Percentages also are high for reasons such as scattered trees, burning forest and using firewood.

Awareness on physical environment is also measured by images of residents on whether environment is changed or not. Answer for change of environment is higher for government staffs group and other groups. For farmer groups percentage on no change is higher than change in environment. The results of questionnaires showed various aspects of change in physical environment. These aspects are increased in number of buildings, cleaner environment, dense population and greening by growing trees. The results also showed several reasons of changes in physical environment. These reasons are modernization, dense population, economic development, reforestation programmes and increased number of immigrants and emigrants. Among them higher percentage are found for reasons on modernization and increased immigrants.

Awareness on socio-economic environment

Awareness on social environment is studied by asking questions related to change of social environment. In this case, most of the respondents from all sample groups revealed that there is no significant change in social environment of Layshi Township. However, up to 37 percent of respondents said there is a significant change in social condition of Layshi Township. High percentage on no change in social environment were significantly found for farmer groups whereas government staffs and other, 36 per cent and 37 per cent respectively, answered there is a remarkable change in social environment of Layshi Township.

There are various aspects of changes in social environment of Layshi Township. These aspects include immigration, increased population, unfamiliar dress, and social relations. Among

them change of social environment due to increased population is significant answers from respondents of all sample groups. Respondents from farmer group emphasized more on unfamiliar dress and social relations as change of social environment of Layshi Township.

There are two main reasons in the changes of social environment of Layshi Township. These are more female than male due to nearest India, immigration process. Most of the respondents from questionnaires survey revealed that there is significant change in cultural environment of Layshi Township. They accept to change Naga traditional dress for female and male.

76 percent expressed that there is a change in Naga cultural conditions. Among farmer, about 14 per cent respondents answered that there is no change in marginal area. There are several aspects for changes in cultural environment. Main aspects are higher living standards, modernization and wearing dresses in western styles (India). Most of the people emphasized on modernization with western living styles. The most significant aspect of cultural change is reflected in design and styles of dress and clothes. In this case, most of the respondents (from 85 per cent to 86 per cent) noticed the change of dress especially for young girls and boys. Nearly 89 per cent of respondents from government staffs noticed that there is a significant in designs and styles of dress and clothes. Actually, changes in clothes and dress styles is strongly related to modernization and near India. Facts can rapidly be spread through communication facilities and media.

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Among the cultural aspects, changes in house-style are wooden houses with zinc roof. For this purpose, images on previous house styles and images on recent house styles were comparatively studied. From this comparison, awareness on house style was analyzed. In the images on previous house style, most of the respondents emphasized on bamboo houses (up to 69 per cent) and wooden house (up to 39 per cent). 2 per cent to 21 per cent of percentages also found for huts such as (granting on year, three year). In recent house styles, brick house are rarely in native people. These situations are varied with townships of respondents.

Images of markets, as stated in the development objectives, income, employment, public goods, natural resources, environment, stability and independence of an area are gathered in the markets . It is therefore, necessary to understand about the markets and its potential to rural development and development planning for the future.

Power supply is another aspect for social environment. Images on use of electricity are related to supply sources. Although major supply is from government generators, the role of small and private engines is significant in rural. The frequencies of uses of these engines are also important for environment impact. The images of rural residents revealed this situation.

Awareness on environmental problems

Results of questionnaires showed the awareness of rural residents on several environmental problems. Natural hazards and disasters generally categorized as fire disasters, flood, earthquake, storm, animals and insects and diseases. For fire disaster, most of the respondents aware as serious problem. 27 per cent of the respondents, such as from farmer group, revealed that fire is very serious problem on burning forest near Taungya cultivation. But about 33 per cent of respondents from government staffs revealed that fire is serious environmental problems.

For flood, less than 5 per cent of all respondents from all sample groups revealed that it is not a serious problem. 3 per cent of respondents from farmer group responded for this question for flood because they are not familiar with flood frequently. In Panset village of Layshi Township, some farm were closed when there was a flood. Therefore, flood was a problem near stream for heavy rainy days. Respondents from all groups awarded that earthquake is a serious environmental problem for Layshi Township. However, most of farmer emphasized earthquake as a serious natural hazard. About 21 per cent of government staffs group also noticed earthquake as a serious problem. Earthquake, actually, is also related to knowledge about mountainous environment.

Main Problem of storm is earthquake in mountainous region. Respondents from all sample groups emphasized (37 per cent to 48 per cent) on storm as a serious environmental problem for Layship Township Area. There are higher percentages on very serious and serious category for problems related to insects and animals. In this case, insects mainly refer to mouse problem. Therefore, most of the respondents aware insect problems as Taungya cultivation.

However, about 100 per cent of farmer respondents revealed that insects and animals are serious problems for them and are not use pesticide.

This is mainly related to their living and working environment. Their answers reflected conditions of their intimate environment and experiences. For other respondents, careless waste disposal, Taungya extensive are main actions for deteriorating physical environment. Government staffs revealed that waste disposal, depletion of forest are main actions for deteriorating environment. Among the actions on deteriorating social environment, respondents from other group emphasized on careless, bad drainage and sewage system. Government staffs emphasized more on careless waste disposal. Old men mentioned careless, waste disposal, dress styles and drunkard are main actions which affect deteriorating social environment of Layshi Township.

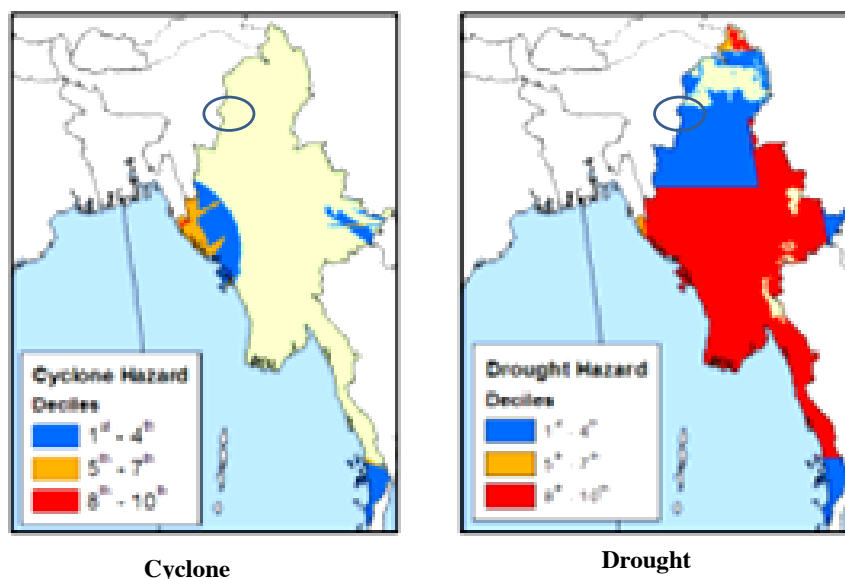
The land holding owned by one family is about (1.14) acres and agriculture or cultivation of crops is the only occupation in the study area. Other occupation sufficient for the family is not found. The acreages of paddy lands and "Taungya" lands amounted to 2827 –acres and the average yield of paddy production was only 53 baskets per acres. as chemical fertilizer are not applied to the croplands. Generally as a family can get only an average of 60 baskets of paddy per acreage at the almost. It is found that the stored up paddy consumption for me family is not sufficient. The total population of Layshi Township was 16,178 persons and the demand for paddy consumption was 194,136 baskets. It is also found that the stored up paddy in every year is not sufficient for 23 percent of the population of the township. As for other job opportunities, the villages there occasionally are occupied in hunting animals. They also search for wood, bamboos and orchids in the forests but they do not get extra income for collecting the products from the forest. The total acreage of Ya Lands in the study area is about (904) acres and the crops grown are sesame, maize for seeds, groundnut, sunflower, mustard for oil, Soya bean and other pulses. Garden lands occupy (254) acres and oranges are the main crops grown in the study area. Other crops which are grown are tea, coffee, avocado, pear, species and condiments.

In Layshi Township, the important systems lacking in order to conserve the environment rare the systems in the collection of waste and dirty materials, the system in distributing clear pure water, the system of drawing dirty water from the drains: the system of collecting and disposing of sewage. In Layshi Town, in order to get water and to distribute water, construction of water filtering water tanks or reservoirs should be carried on. Moreover the quality of fresh pure clean water should be maintained. Tax on water should be collected after getting systematic

report or data of water used by the families. Distribution of water by pump system mechanism, changing of water pipes when broken and new pipes should be constructed and installed in new pipes. The population increases, water should be distributed systematically according to the rotation system. A geographical point of view, environmental conservation, awareness of the native of the region has been studied by the researcher by questioning them through the questionnaires. 2 percent of the respondents from the questionnaires are received from people who moves from one village to another village. Only 0.5 percent of the local people shifted to Layshi in garden to make their children get education.

The study also focused on environmental images and perception on environmental problems and natural hazards. The results showed several aspects such as environment images showing on mental maps, images on natural hazards and disasters, perception on conservation, preferences of places and images on particular events. Rural residents, showed significant images on physical features such as mountains and rivers. However, man-made canals are important for rural residents for shifting cultivation. For natural hazards and disasters, respondents mentioned fire, wind, cyclone, flood, earthquake, landslide, diseases and environmental pollution. Among them, respondents emphasized on fire as the most important natural disaster for rural residents. Images on conservation also showed the importance of conservation on natural environment. Images and perception on conservation are related to necessities, conservation methods, reducing natural disasters, problems related to environmental deterioration, methods to protect these problems and methods to conserve environmental problems of rural environment.

Map() Natural Disaster Risk in Myanmar



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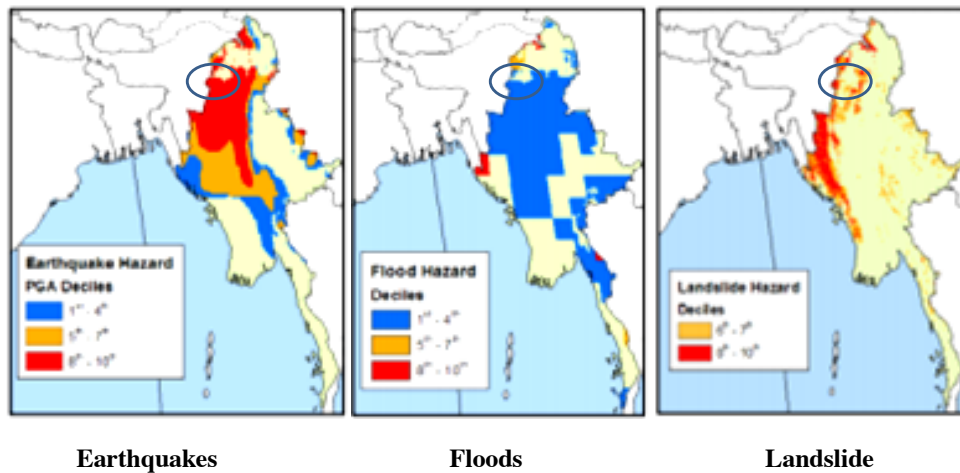
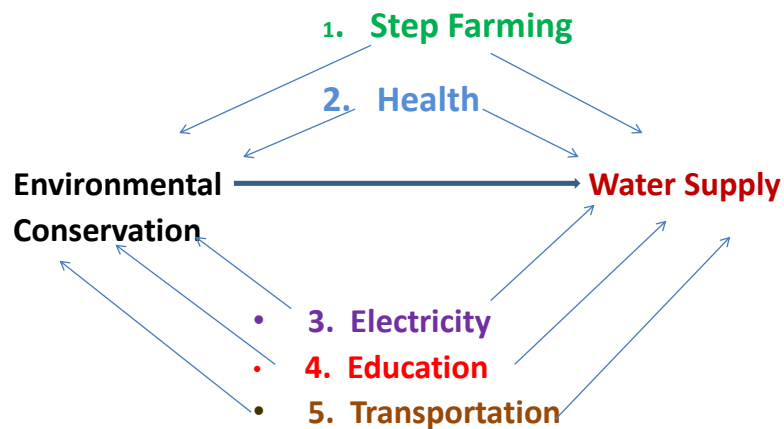


Figure ()Environmental Awareness and Environmental Conservation



• Source: Field Observation, 2012.

Discussion

Reasons of buying showed important image of socio-economic environment. These reasons are for family, for cooking, bad accessibility, necessity and for re-sale purpose. Most of the respondents knew the causes of the changes in building styles of markets in villages. In Layshi Township, the statement of the respondents of the questionnaires regarding their suggestions on various sectors are given in percentages as follows.

65 percent stated that although the hydro-electric power had been extracted but as the villagers do not know the techniques and technology of hydroelectricity. The experts of tapping hydro-electricity should be sent to train the settlers there. 64 percent are the constructor of good roads for transportation. 61

percent of respondents answered for teaches for schools, medicines for health, doctors, nurses and plans for constructing fly –proof latrines.

58 percent revealed that there are electricity to get electric light in the villages, pure fresh water, drinking water, and permission to irrigate water with pipes from the nearby springs. 46 percent stated that more books and journals are needed for the libraries. 45 percent revealed that Television Media of Myanmar are needed. 36 percent stated that as Nagas are the least development people, the school children should be trained to become the most outstanding students and government employees and service man should be sent in order to help in the development of the people of the region.

32 percent answered for loans in order to carry out terracing of crop land (step farming) for the cultivation of paddy. 30 percent of the respondents requested government for permission to grant Naga Literature and Language (Nagaonsaga or Nagamese) to be taught at all the school of Nagaland. 30 percent asked for permission to build pagodas. 10 percent answered for the controlling of prices of goods as carried on in India because the prices of goods are high in Naga Land. 10 percent stated that racial discrimination should be eliminated and upgrading of Naga culture and civilization should be carried out.

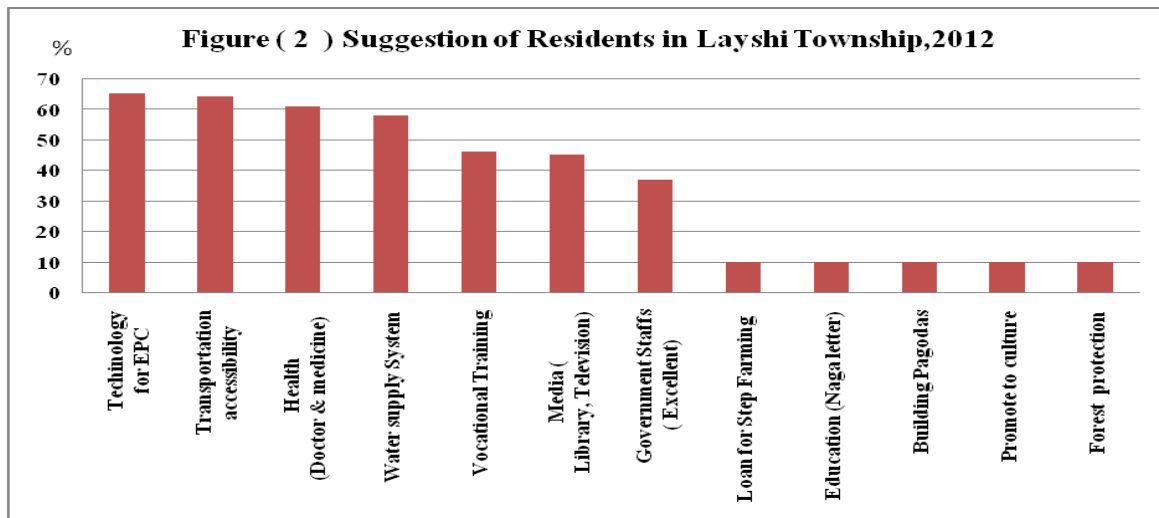
Table (1) Suggestion of Respondents in Layshi Township, 2012

No.	Particular	Education		Step farming		Hydro-electricity		Replantation		Water supply		Health /Doctor ,medicines	
		Fq	%	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
1	Government	37	61	23	38	36	59	13	21	31	51	34	56
2	Farmers	74	30	78	31	167	67	34	14	157	63	156	63
3	Other	7	33	5	24	12	57	5	24	5	24	13	24
	Total	118	36	106	32	215	65	52	16	193	58	203	61

Table (2) Suggestion of Respondents in Layshi Township, 2012

No.	Particular	Transport ation		Media		Library		Outside Education		different racial		NR		Total	
		Fq	%	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%	Fq	%
1	Government	49	80	28	46	30	49	31	51	0	0	6	10	61	100
2	Farmers	150	60	111	45	113	45	84	34	2	0.8	10	4	249	100
3	Other	14	66	10	48	10	47	8	38	0	0	5	34	21	100
	Total	213	64	149	45	153	46	123	37	2	1	6	48	331	100

Source: Field observation, 2012



Source: Table (1) &(2) ,Field observation,2012

During the field survey, the use of electric power or electricity plays an important role in Layshi Township for preventing the deterioration and deforestation of forests in Layshi Township. In the wards of Layshi Town 90 families and villagers of 26 villages with the help of private-owned generator the electricity is being distributed and in 20 villagers hydro-electricity with the strength of 3 KVA-10 KVA is being installed and used to get electric light. A system of solar power energy for electricity with a strength of 1800-Watts is being installed and used in the villages of Shwephiaye, Ngakyan, Chayar, Lanhlainghla, Wataw Village. Hydro- electricity power supply from the power plant station can be obtained only a few period after its installation but when the electric power station failed to give electric supply. There are no skilled experts or repair and maintain the generator or machinery. within the township, there are 188 families in the wards of Layshi town which do not get electricity. The villages which do not get electricity or electric light are Yawhaw, Modonphi, Kukey- Ywama, Gikyakhar, Sonmaya, Htawi, Miaungtha, Sainolin, Dainlane- away, Painnaekone, yadong, Heinkuk, Kyaekaw, Teekon, Htainnaeshan, Shar shane village and Mopinelok Sub-Township.

The researcher found only the primary schools and post primary schools. In the natural conservation of environment formal school education within the school and non-formal school education outside the school are needed. That is why, in order to upgrade the standard of education from the primary level to a level higher than that level schools in the villages of Kukey, Mathawyi,Modun Ywama, Wanbae-Ywahoung, Modunphi,Phwelin, YawyN, sinolin, and Sonmaya. These all schools should be upgraded to the middle school level and even to the high school level. For non-formal education outside the school, libraries should be opened and up- to -date journals, newspapers and books should be kept in the libraries. In order to encourage

children to go to school, full-time teachers (male as well as female) should be appointed so that they may persuade the children to attend school. This task for the teachers plays an important role in educating children regarding the environmental conservation of the Naga Land.



Photo(1) Education Facilities



Photo (2) Outside Education

As the transportation is difficult and accessibility is hindered, one cannot go easily from one village to another. There is less development in the area, knowledge regarding the upgrading of education, health, socio-economy and political ideas and knowledge should be imparted to the villagers by the authority in power. However it is still found that shifting cultivation is still being carried on, and natural exchange of goods on the barter system is still carried on. Furthermore knowledge regarding the environmental conservation has not yet been known by the people staying in the study area.



Photo (11) Gravel Roads accessibility



Photo (12) Earth road accessibility

On the eastern part of Layshi Township, lies Htamanthi village of Homalin Township which is 41 miles away from it. The tarred road, car road and earth road connecting the two townships can be used only in summer but during winter, cars cannot be used. Transportation in

rainy season can be carried on only by motor cycles. On the southern part of Layshi Township, between Hpapoke and Mopainglut Sub-township, a stone paved (gravel) road with a length of 5 miles was constructed. On the western part between Layshi and Swamsara a 45 miles long military strategic motor cycle road is being constructed. Local people used foot paths which roads on a self- supporting basis in order to travel by motor cycles. But it is not very successful because the mountains have steep slopes and ridges. There are many mountain torrents, pedestrians have to cross the mountain torrents by using non-cabled bridges. Thus good high—quality gravel or stone paved roads should be upgraded. Narrow roads should be widened so that the roads could become motor able by cars .

Images on transportation are also related to social environment. These images included types of transport, physical, social and cultural impact of transport, and good points of rural transportation. Not-only socio-economic conditions but also the knowledge and information of local people improved due to the road transport infrastructure. Social environment related to health was also measured by using past experiences such as diseases. Many types of diseases were mentioned by respondent groups. These diseases included Malaria, diarrhea, common cold, heart, eye, dysentery, stomach ache and head ache. Past experiences for these diseases were related to types of sample groups. Types of diseases these respondents mentioned were related to the levels of these respondents because heart disease, for example, is chronic and disease of effluents. Respondents mentioned types of diseases, place of treatment, frequency of treatments and images on frequently occurred diseases. Social environment was also studied by economic environment. There are several aspects related to work places. These aspects included ventilation system, and environmental impacts by work place.

In Layshi Township Christians can go to India to study. Religious Studies at the Technological Bible School easily in order to become pastors and teachers of the religious order. As for the Buddhist Monks who are appointed by the Government Religious Affairs Department , as they served in the mountainous region for two years only and returned to their monasteries. The development in the religious and social sectors are slow and weak in Naga Land. That is why, the villages in Layshi Township are still undeveloped. Major images on social environment included churches and monasteries. Since Layshi Township has been in rural area, there are several churches every village and some monasteries in this township. Therefore, these churches and monasteries become important images of rural residents in Layshi Township.

In Layshi Township, there are 67 villages and although out of them only 30 villages which carry on a self-help basis in using the water is not sufficient for the villagers. As pure water is not available for all the villages, water has to be boiled in order to get a safe drinking water. In 37 villages, during the rainy season, water is collected by using bamboo pipes which are connected with one another according to the ideas of the residents.

In summer and winter in order to get water people have to carry water from the stream which are one or three miles away from their villages. The wards and villages which meet with difficulties in getting water during summer and winter are all the wards of Layshi Town, and the villages are Mathawyi, Yarparmi, Painnaekone, Chaya, Dainekalane-Sanpya, Aungzaya, Yannwae, Kukey-ywama, Kokainglon, Phonthayat, Jagayan village. The villages which meet with difficulties in getting water during summer are Heinkuk, Yadoung, Jilar, wartaw, Soninyan, Mondonphi, Namiyupi, Dainkalaine- away, Satpyar, Htawyi, Sikeypon, Sharshane Village.



Photo (9) Water Supply System



Photo (10) Water Supply Pipeline System

The respondents who want to shift and stay in other towns or villages stated that if they go to the flat plain region they cannot speak Myanmar language and understand it. Moreover, very few Naga peoples are acquainted and friendly with the people of other races. Although Layshi Township is only 9 miles away from the developed country of India and although there are perceptions encouraging the mind but as there are a few knowledge of perception and general knowledge as well as understanding and outlook, regarding adequate Television and telephone connections , only when television media and telephone connections are installed adequately, the socio-economy can be upgraded and the present environment images and perceptions of Layshi Township can be changed. Shifting cultivation and irrigated water supply are the two major types of farming systems simultaneously existing in the mountain areas of the Naga Land. They have their own advantages, disadvantages and limitations. For instance, shifting cultivation should be

only used in areas with low population density and relatively high forest coverage. The development of land use systems in these areas must be determined by the natural, socio-economic and cultural environment

Shifting cultivation is carried on once every year by cutting trees annually. The "Taungya" lands owned by a family are being handed down to or bequeathed to their own descendents or the people of their own tribes only which is a limitation in their inheritance law. In changing "Taungya" shifting cultivation lands to "Terraced Paddy lands or step farming lands it takes a very long time and it is very hard for the farmer. The cost of manual labours is expensively Taungya land to Terraced paddy land such as Kyat 500,000/-per acre.

Layshi Township receives a sub-tropical mountain climate(Cwa). The use of hydro-electric power supply in order to get electric light in the study area is still few. It is found that the average annual consumption of fire wood for fuel for one family was about (7)tons. The use of firewood for fuel of the whole Layshi township was about (22540)tons. Within Layshi Township, out of the virgin forest lands, the annual acreages of forestlands which were cut and cleared for shifting Taungya cultivation were about (3) Sq-Km of virgin forest lands. The total of (5) Sq-Km of natural virgin forest lands had been cleared annually. As the rate of population growth had increased virgin lands would be used more than before and thus by the next 50 years, 30 percent of the virgin forest area will become developed and deteriorated.

Conservation of environment, reforestation and planting of trees after felling the trees should be thought to the native through educating talks and speeches. In carrying out the management of environment, the role of the governing body of the villages, heads and leaders of the villages are very important. The problems regarding the racial discrimination of the native people of the region should be lessened and should be eliminated. In order to maintain Law and order within the township programmers for religious studies and educators should be taught in the school as well as in other places outside of the school.

Local people in the study area are engaged in agriculture cultivation of crops and breeding of animals such as water buffalos, oxen, bison, goats, pigs, fish, chickens. The village of Pansat within Layshi Township which reared the largest number of basin(wild cattle).Fish breeding is carried on in the villages of Layoun, Phnethayet, Pamset, Sonmara, yadoung, Satpyar and Ngkuan . If fish breeding is carried on systematically and if fish breeding is taught systematically to the ignorant native, fish breeding can be successfully carried on. Chickens and

pigs are reared in the compounds of the houses. As disease are spread from animals to man, systematic rearing of animals should be carried out. If the occupation which produces more family income has increased, shifting cultivation (Taungya Cultivation) can be changed to other occupation which produce more income. If other good income producing occupations appeared, shifting "Taungya" cultivation will no longer be the main occupation. If shifting cultivation become less forest and forest trees can be conserved.

In studying the size of families of the study area, it is found that the requirement of income to support the size of families are inadequate as 66 percent of the families have to depend only on the shifting Taungya cultivation alone. 48 percent of education, 48 percent of health, 39 percent of residential buildings, 35 percent of purchasing of crop seeds, 32 percent of general social relations or dealings rare lacking.

In cooking food for the family and to warm oneself to protect cold or prevent cold, fire is needed to get heat to cook and to warm oneself from the cold weather. The average annual firewood for fuel needed every year for a family is about 7 tons of fire wood. In order to reduce the cutting of trees from the forest to use as fuel from firewood, it is necessary to use electricity to get electric light and heat to use for domestic use and household use.



Photo (7) Fuel Storage or Firewood



Photo (8) Fuel Storage or Firewood

The annual cleared forest land for shifting cultivation is 750 acres. Once the shifting cultivation is carried on farming. It was left fallow for about (10) to (15) years. The farmers returned to their first cultivated lands after cultivating the crops on another new plot of land. During the period when the land was used as grazing land or pasture land or vacant waste land or discarded land. The average of such fallow lands is about (7500)acres. 67 percent of the total land area are the lands which cannot the cultivated for crops. They include Reserved and un-reserved forest outside of the Reserved forest which are protected forest and which cannot be

cultivated. The remaining lands include 0.5 percent of agricultural lands amounting to (3,985) acres and 32 percent of virgin vacant lands amounting to (221,078) acres.



Photo (3) Shifting Cultivation or Taungya



Photo (4) Terrace or Step farming or lae

Because of changes in climate, scarcity of limited agricultural lands which were left as fallow lands from 10 to 15 years, Taungya cultivation or shifting cultivation should not be carried on. Instead of the former Taungya lands, the lands should be used as Garden lands where garden crops should be grown. Garden crops such as avocado, oranges citrus fruits (like grape fruit, lemon), pears and apples, condiments and species which are population in Indian markets: as well as plantation crops such as rubber, teak, Pyinkado, eaglewood, tea, and coffee should be grown. By cultivating these crops, climate changes can be prevented and environmental conservation can be carried on. Moreover the family income can be increased too.

Within Layshi Township as about 200 acres of paddy land can be reclaimed by using mechanized tractors for the cultivation of crops in Yan Naway plain region. By carrying out step farming on the highlands where hill paddy is grown instead of the former shifting cultivation and by carrying out the consumption of the irrigation canal system from the streams and distribution of the irrigation canals, the cultivation of crops can be carried on in Myoma ward, in the village tracts of Dainkalane, Wanbae, Htainpharyan, Heinkuk, Yaparmi, Chayar, Kukey, Phonthayat, Kokainglon Village Tracts and Mopinlok Sub- township. In carrying on step farming on the Highland .Paddy lands and growing paddy, crops with high yielding paddy strains should be selected and should be grown on the selected sample plots of paddy lands. The knowledge regarding how to systematically grow selected strains of paddy seeds with good yields should be irrigated and taught to the farmers. On the 10 acres of Taungya lands owned by one family and where forests were deteriorated and became vacant lands Taung Ka Thit (Erythrina), Laukya (

Schina), Sakat, Yamanay (*Gmelina arborea*). orchid and bamboo should be grown. Garden crops such as orange, tea, Tawkat, Avocado, fruit and coffee should also be grown.



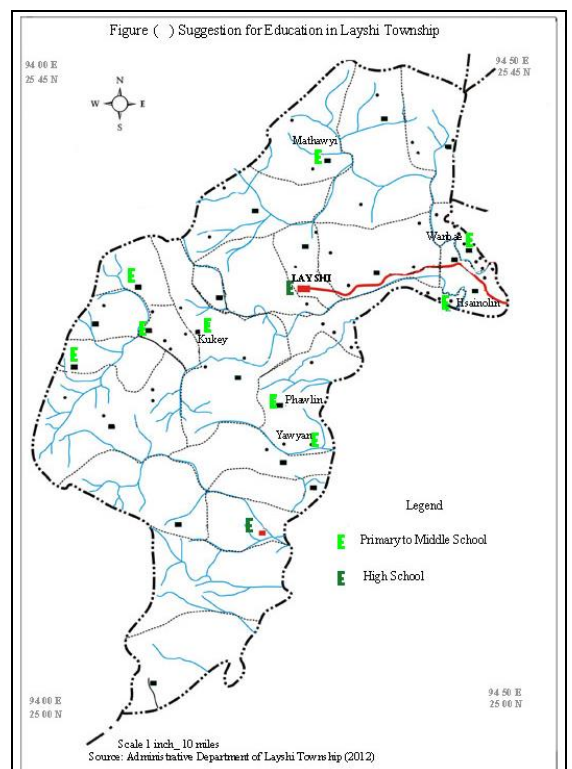
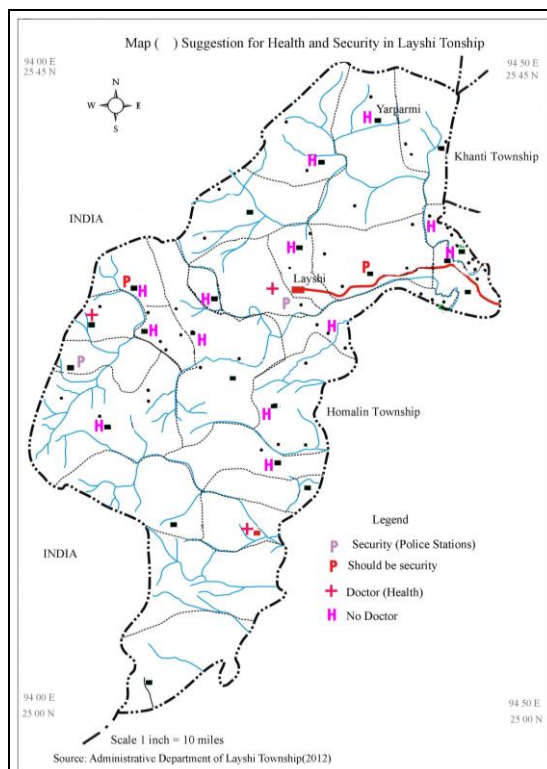
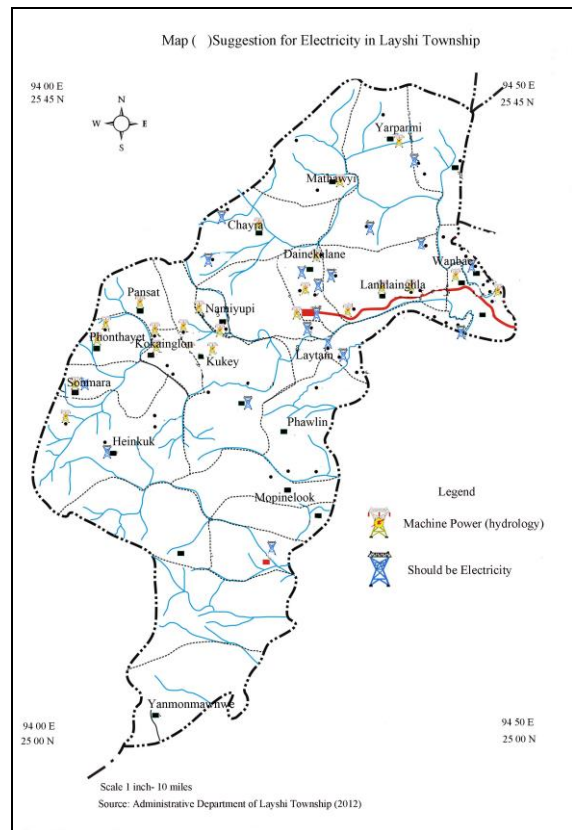
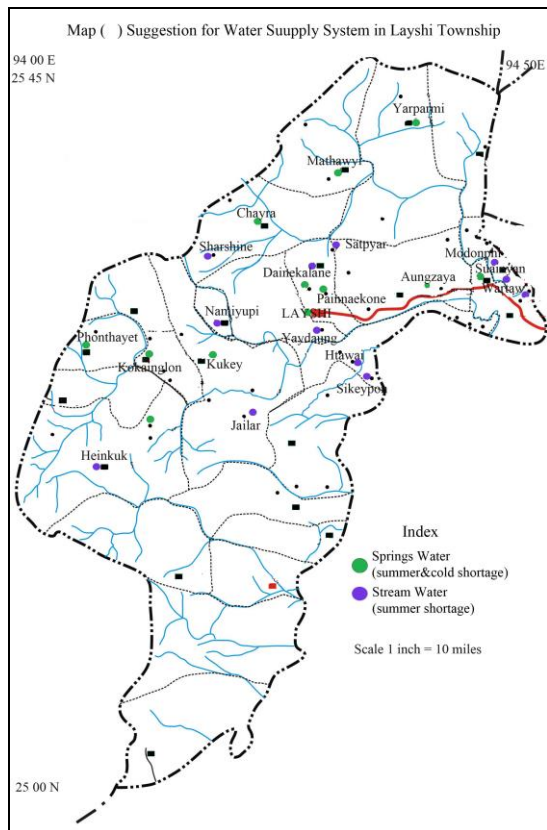
Photo (5) Garden crops (orange)



Photo (6) Re plantation

By expanding the agricultural activities and animals breeding industries in order to take the marketing crops to the markets quickly, marketing activities should be expanded. The transportation and communication of the area should be good. The burning of fire in the forests in order to drive the wild animals should be avoided in hunting the wild animals. Extermination of rare animals of the forest such as elephants, tigers, wild boar, wild pigs, Hill goats, deer, bison, monkey, antelopes, lion, fox, barking deer should be prevented. Birds such as Indian pied hornbill, Aunglaung birds, Peacock, Eamani birds, crane should be reared and looked after well. Moreover plants such as saloewood, Letpanphyu (white cotton wood), orchard, Taunglonkyaw, Yamane, Sakat, Kathit. *Erythrina arborescens* should be prevented. In order to conserve the trees, those species of trees should be replanted. By so doing environmental conservation can be carried on as well as many job opportunities can be opened for the workers of that area.

Shifting cultivation, which is still prevalent in the uplands of Naga Land, contributes significantly to forest loss and is the main cause of land degradation. This paper presents the causes and consequences of shifting cultivation and its potential land use alternatives. The results of the study show that traditional land practices, exacerbated by poverty and associated with a lack of technical knowledge is the main cause for the continuation of unsustainable shifting cultivation. Low population density, inadequate land for cultivation, low education levels, policy planning and implementation without local participation are all factors that influence farmers' decision to continue shifting cultivation. Intensive land management through agro forestry is a promising alternative that can sustainably manage the remaining forest resources. If adopted, such systems potentially provide good economic returns, and may significantly reduce rural poverty and protect the border lines.



Sources: Field Observations, 2012

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