

**The Republic of the Union of Myanmar**  
**Ministry of Natural Resources and Environmental Conservation**  
**Forest Department**



**Assessment of Local Communities' Perceptions and Attitudes in  
Relation to REDD+ Initiatives in Yedashe Township, Myanmar**



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မြန်မာနိုင်ငံ၊ ရေတာရှည်မြို့နယ်အတွင်းရှိ သစ်တောပြုန်းတီးခြင်းနှင့် သစ်တောအတန်းအစား ကျဆင်းခြင်းတို့မှ ကာဗွန်ထုတ်လွှတ်မှု လျှော့ချခြင်း (REDD+)၏ ကနဦးလုပ်ငန်းစဉ်များအပေါ် ဒေသခံပြည်သူလူထု၏ သဘောထားအမြင်များကို ဆန်းစစ်လေ့လာခြင်း

ခြူးသဉ္ဇာဉာဏ်၊ တောအုပ်ကြီး၊ သစ်တောဦးစီးဌာန  
ဒေါက်တာတင်မင်းမောင်၊ ပါမောက္ခ၊ သစ်တောနှင့်ပတ်ဝန်းကျင်ဆိုင်ရာတက္ကသိုလ်  
ဒေါက်တာမြသန္တာတိုး၊ ကထိက၊ သစ်တောနှင့်ပတ်ဝန်းကျင်ဆိုင်ရာတက္ကသိုလ်

### စာတမ်းအကျဉ်း

REDD+ ၏ ကနဦးလုပ်ငန်းစဉ်များအပေါ် ဒေသခံပြည်သူလူထု၏ သဘောထား အမြင်များကိုသိရှိ ခြင်းသည် REDD+ လုပ်ငန်းစဉ်များ ရေရှည်တည်တံ့အောင် မူဝါဒများ ရေးဆွဲရာတွင် အရေးပါသော အချက်တစ်ခုဖြစ်ပါသည်။ ဤစာတမ်းသည် REDD+ ၏ ကနဦးလုပ်ငန်းစဉ်များအပေါ် ဒေသခံ ပြည်သူလူထု၏ သဘောထား အမြင်များကို ဆန်းစစ် လေ့လာထားသည့်အပြင် ၎င်းတို့၏ သဘောထား အမြင်များအပေါ် အဓိက သက်ရောက် လျက်ရှိသော အချက်များကို ဖော်ထုတ်ထားပါသည်။ REDD+ လုပ်ငန်းစဉ်များကို ကနဦး ဆောင်ရွက်လျက်ရှိသော ရေတာရှည်မြို့နယ်အတွင်းရှိ ရွာ (၄)ရွာ တွင် အဓိကထား၍ သုတေသနပြုလုပ်ခဲ့ပြီး အိမ်ထောင်စုပေါင်း (၁၂၉) စု ကို စစ်တမ်းကောက်ယူခဲ့ပါသည်။ ဒေသခံ ပြည်သူလူထု၏ သဘောထားအမြင်များကို လေ့လာရာ၌ ၎င်းတို့၏ လူမှုစီးပွားရေး ဆိုင်ရာ အချက်အလက်များ၊ သစ်တောကိုအသုံးပြုမှုများ၊ REDD+ ဆိုင်ရာ ဗဟုသုတများနှင့် REDD+ စီမံကိန်းများမှရရှိသည့် အကျိုးအမြတ်များအပေါ် အခြေခံခဲ့ပါသည်။ သုတေသန ရလဒ်အနေဖြင့် ဒေသခံပြည်သူတို့၏ သဘောထားအမြင်များသည် REDD+ ဆိုင်ရာ သရုပ်ပြကွက်ရှိသည့်နေရာပေါ် မူတည်၍ ကွဲပြားလျက်ရှိပါသည်။ သုံးပုံနှစ်ပုံသော ဒေသခံ များသည် REDD+ လုပ်ငန်းစဉ်များအပေါ် ကောင်းမွန်သော သဘောထားအမြင်များရှိကြသည်။ အဓိကအကြောင်းရင်းမှာ၎င်းတို့၌ REDD+ဆိုင်ရာ ဗဟုသုတများရရှိခဲ့ခြင်းကြောင့်ဖြစ်ပါသည်။ တချို့သော ဒေသခံများအထူးသဖြင့် မိသားစုဦးရေများသော အိမ်ထောင်စုရှိ လယ်ပိုင်ဆိုင်မှုနည်းသော အမျိုးသား လယ်သမားများသည် REDD+ လုပ်ငန်းစဉ်များ အပေါ် အဆိုးမြင်သဘောထားများ ရှိနေခဲ့သည်။ အကြောင်းမှာ REDD+ လုပ်ငန်း စဉ်များ ဆောင်ရွက်မည်ဆိုလျှင် ၎င်းတို့၏ သစ်တောအသုံးပြုမှုများအပေါ် ကန့်သတ်ခံရနိုင်ကြောင်း၊ စိုက်ပျိုးမြေများဆုံးရှုံးလာနိုင်ကြောင်းနှင့် စားကျက်မြေများ လျှော့ပါးလာနိုင်ကြောင်း စသည့် စိုးရိမ် မှုများကြောင့်ဖြစ်ပါသည်။ အချုပ်အားဖြင့် သုတေသန ပြုလုပ်လေ့လာခဲ့သောဒေသရှိ ဒေသခံပြည်သူများသည် REDD+ လုပ်ငန်းစဉ်များအပေါ် အတိုင်းအတာတစ်ခုအထိ ကျေနပ်လက်ခံကြပြီး REDD+ ဆိုင်ရာ အသိပညာဗဟုသုတများ တိုးပွားအောင်ဆောင်ရွက်ပေးခြင်း၊ တခြားသော လူမှုစီးပွားရေး အပေါ် အထောက်အပံ့ ပြုနိုင်သော လုပ်ငန်းများ ပိုမိုဖန်တီးပေးခြင်းအားဖြင့် ၎င်းတို့၏ စိုးရိမ်မှုများကို လျော့ပါးစေကာ REDD+ လုပ်ငန်းစဉ်များ တွင်လည်း ပိုမိုပူးပေါင်းပါဝင်ဆောင်ရွက်လာမည် ဖြစ်ပါကြောင်း တွေ့ရှိခဲ့ရပါသည်။

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## **Abstract**

Information on local communities' perceptions and attitudes towards REDD+ initiative is essential in developing REDD+ policy to ensure its sustainability. The study was carried out to examine local communities' perceptions and attitudes towards REDD+ initiatives and to determine factors that influence on their perceptions and attitudes. Four villages were selected purposely and a total of 129 households were interviewed. Factors like socioeconomic, forest resource use, knowledge about REDD+ and benefits received from REDD+ projects were analyzed in order to know the main influencing factors on their perceptions and attitudes. The study showed that their perceptions and attitudes varied between demonstration and non-demonstration sites. About 70% of the local communities had positive perceptions and attitudes towards REDD+. Knowledge about REDD+ had significant causal relationship with their positive perceptions and attitudes. Some of the respondents particularly larger family members, male respondents and small land holdings farmers concerned over restriction on forest resource use, loss of cultivation lands and scarcity of grazing lands in implementation of REDD+ leading to negative perceptions and attitudes. Overall, they were somewhat satisfied on REDD+ initiatives and their willingness to support REDD+ activities would increase by providing more awareness raising and reducing their tensions by alternative livelihood activities in REDD+ implementation.

**Keywords:** attitudes, benefits, forest resource use, local communities, knowledge, perceptions, REDD+ initiatives, socioeconomic factors

# **Assessment of Local Communities' Perceptions and Attitudes in Relation to REDD+ Initiatives in Yedashe Township, Myanmar**

## **1. Introduction**

Deforestation and forest degradation remains as a global issue and accounts for nearly 20% of global GHGs emissions (Bran and Ghidiu-Bita, 2011). Solving the problem of deforestation is a prerequisite for any effective response to climate change. Meanwhile, REDD+ has the potential to simultaneously contribute to climate change mitigation and poverty alleviation, whilst also conserving biodiversity and sustaining vital ecosystem services. Additionally, REDD+ projects aim to reduce GHGs emission from deforestation and forest degradation, yet it would be impossible to achieve the aims of the projects unless local communities are fully involved in it. According to Mehta and Heinen (2001), people in the project areas must have positive perceptions and attitudes towards REDD+ activities in order to get full and effective participation from local communities. Moreover, local people's perceptions on REDD+ in their residential areas can be influencing the effectiveness of the implementation of REDD+ programmes. Epplé and Thorley (2012) also highlight that it is really necessary to plan and design the REDD+ activities to be compatible with local needs and perceptions.

While REDD+ brings benefits for biodiversity, ecosystem services and local communities, it also has negative impacts such as land use change, enforcement of local indigenous people to move in order to confiscate their land, loss of biodiversity and ecosystem services of forests, loss of livelihood activities for local people when the projects emphasize only on carbon benefits, elite benefit sharing, etc. Those negative impacts on the livelihoods of local people can change their perceptions and attitudes on REDD+, discouraging them to make an active involvement and participation in collaborating with the authorities in the implementation process of REDD+ initiatives.

In Myanmar, the population census in December 2014 showed that out of the total population of the country (about 51 million), 68 % of the population were classified by the World Bank as rural people and they have been depending heavily on the forests for their basic needs, especially for shelter, fodder, fuel wood, seasonal food and hunting for their livelihoods. As a forest-rich developing country, Myanmar has been implementing REDD+ activities in order to reduce its forest carbon emissions, and enhance and sustainably manage its forest carbon stocks. In addition, a very limited number of previous studies and researches have been carried out on examining the perceptions and attitudes of local communities. It therefore opens an area to do the research on local communities' perceptions and attitudes towards the initiatives so that appropriate local communities' perceptions and attitudes are taken into account in the REDD+ policy development.

## 2. Research Objectives

The study mainly aims to examine local communities' perceptions and attitudes towards REDD+ initiatives in order to support in the implementation of REDD+ programme. Under the main objective, the specific objectives are as follows:

- 1) To explore how influencing factors affect local communities' perceptions and attitudes; and
- 2) To analyze satisfaction level of local communities on REDD+ project activities and that on the right to people's participation in decision making process and forest conservation at demonstration sites and non-demonstration site

## 3. Methodology

The study was carried out in Yedashe Township which is located in Taungoo District of Bago Yoma region (Figure 1). In Yedashe Township, REDD+ pilot projects have been initiated since 2011. They mainly carried out REDD+ demonstration activities, extension programs, educational public talks and organizing livelihood development trainings.

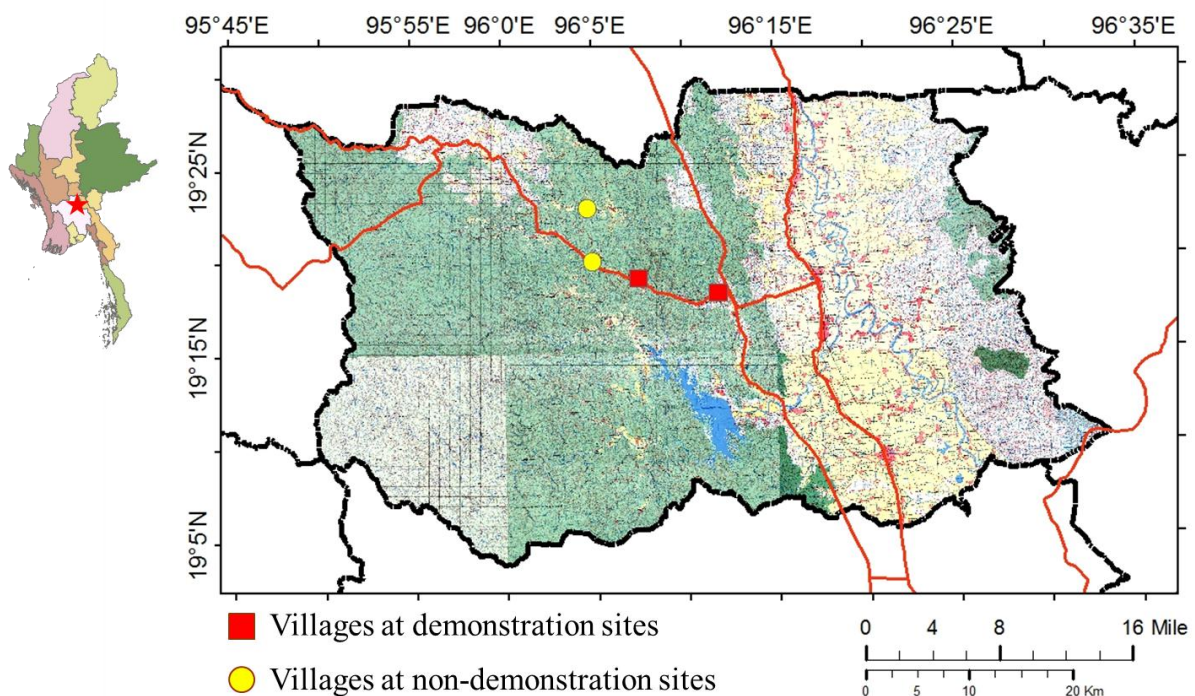


Figure 1 Location map of study area

Quantitative social survey research design was mainly used in this study. Using purposive sampling technique, four villages were selected based on the fact that whether REDD+ demonstration plots for restoration of degraded forest and forest conservation were

established or not in the study villages. The villages having REDD+ demonstration plots were regarded as Group 1 (Demonstration sites) and the other villages with no demonstration plots were regarded as Group 2 (Non-demonstration sites). Households were selected by using simple random sampling assuming that the respondents in those villages could have the knowledge and experiences related with REDD+ in order to assess their perceptions and attitudes regarding REDD+ for this survey. A total of 129 households were interviewed covering 30% of the total households in each village.

Data analysis was conducted in Statistical Packages for Social Sciences (SPSS) version 22 and Microsoft Excel 2013. The decision to predict the respondents' perceptions and attitudes regarding to REDD+ initiatives made the choice of a logistic regression a more appropriate tool for this analysis. Two logistic models were tested using hierarchical regression in which only socioeconomic variables were entered in the first step (hereafter referred to as model 1) and three more variables namely forest resource use, knowledge about REDD+ and benefits received from REDD+ projects were added in the next step (hereafter referred to as model 2). Odd ratios of significant variables were used to facilitate model interpretation. According to Tabachnick and Fidell (2006), odd ratios greater than one will increase the likelihood of the occurrence of the event, and odd ratios less than one will decrease the likelihood of the occurrence of the event.

Satisfaction level on the projects and local people's participation were calculated by using Weighted Average Index (WAI) for each group. The weights were regarded into five scales: very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied and very dissatisfied and the range were defined as 1, 0.8, 0.6, 0.4 and 0.2 respectively (Naing, 2014). Its value can be calculated by multiplying the statement to its corresponding weight and dividing it by the total number of responses (Miah, 1993).

$$I = \sum FiWi / N$$

Where:

I = WAI;

Fi= frequency of response to a particular statement;

Wi= weightage of statement; and

N= total number of responses

## **4. Results**

### **4.1. Perceptions of Local Communities on REDD+ Initiatives**

#### **4.1.1 .Perceptions on Opportunities**

Over 66% of the respondents considered that REDD+ activities can bring opportunities to their daily lives in table (1). Getting more income from employment

opportunities was the main expected opportunity they considered, followed by better climate in their region from protecting the forests and improvement in children education.

Table 1 Perceptions and attitudes of local communities between groups in percentage of total respondents

| Variables          | Responses | Group 1<br>(n=54) | Group 2<br>(n=75) | Overall<br>(n=129) |
|--------------------|-----------|-------------------|-------------------|--------------------|
| <b>Perceptions</b> |           |                   |                   |                    |
| a) Opportunities   | Yes       | 81.5              | 56.0              | 66.7               |
|                    | No        | 18.5              | 44.0              | 33.3               |
| b) Burdens         | Yes       | 14.8              | 24.0              | 20.2               |
|                    | No        | 85.2              | 76.0              | 79.8               |
| <b>Attitudes</b>   | Positive  | 74.1              | 56.0              | 63.6               |
|                    | Negative  | 25.9              | 44.0              | 36.4               |

While socioeconomic variables were added in Model 1 (Table 2), annual income was positively correlated with their perceptions on opportunities. Respondents with higher annual income were more likely to perceive opportunities from REDD+ initiatives than those with lower income. However, family size was negatively correlated with perceptions on opportunities. Respondents with larger family members perceived no opportunities can bring from REDD+ activities.

Table 2 Predicting the odds ratios of local communities' perceptions on opportunities from REDD+ initiatives

| Variables            | All villages<br>(n=129) |         | Group 1<br>(n=54) | Group 2<br>(n=75) |
|----------------------|-------------------------|---------|-------------------|-------------------|
|                      | Model 1                 | Model 2 | Model 2           | Model 2           |
| <b>Socioeconomic</b> |                         |         |                   |                   |
| Village (Group 1)    | 2.19                    | 0.52    |                   |                   |
| Gender (male)        | 0.41                    | 0.26**  | 0.46              | 0.27              |



|                              |                 |                |               |                |
|------------------------------|-----------------|----------------|---------------|----------------|
| Occupation (farmer)          | 0.80            | 0.59           | 0.07          | 1.72           |
| Family size                  | 0.81 *          | 0.74**         | 0.25 **       | 0.84           |
| Age                          | 0.99            | 1.00           | 0.97          | 1.01           |
| Education (Middle and above) | 1.71            | 2.50           | 0.75          | 4.27           |
| Farm size                    | 1.03            | 1.04           | 1.13          | 0.98           |
| Annual Income                | 1.09 **         | 1.05           | 1.17          | 1.04           |
| <b>Forest resource use</b>   |                 | 1.32           | 1.02          | 1.59           |
| <b>Knowledge</b>             |                 |                |               |                |
| Objectives                   |                 | 0.82           | 0.72          | 0.84           |
| Project activities           |                 | 1.71*          | 3.58 *        | 1.27           |
| Prohibited activities        |                 | 1.46*          | 1.04          | 2.09**         |
| <b>Benefits received</b>     |                 | 1.39*          | 1.51          | 1.64*          |
| <b>Overall accuracy (%)</b>  | <b>70.5</b>     | <b>76.7</b>    | <b>85.2</b>   | <b>78.7</b>    |
| <b><math>\chi^2</math></b>   | <b>21.8 ***</b> | <b>44.0***</b> | <b>20.3 *</b> | <b>29.0***</b> |

\*p<0.10, \*\*p<0.05; \*\*\* p<0.01

In Model 2, when three more variables namely respondents' knowledge about REDD+, forest resource use and benefits received from the projects were entered along with socioeconomic variables, family size was remained significantly negatively correlated with their perceptions on opportunities. This factor was significantly correlated with their perceptions on opportunities in Group 1. Moreover, male respondents were less likely to perceive opportunities from REDD+ initiatives than female. Model 2 also showed people who had more knowledge about REDD+ project activities and prohibited activities within the REDD+ demonstration plots were more likely to perceive opportunities from REDD+. People who received more benefits from the REDD+ projects were also the same. But the effect of these factors was different between the groups, in which people with more knowledge about project activities in Group 1 perceived having opportunities whereas the respondents in Group 2 who perceived having opportunities from REDD+ were the ones who knew more prohibited activities and who received more benefits from REDD+ projects.

It can be seen clearly that in Model 2, four variables made a unique statistically significant contribution to the model, in which the strongest predictor of perceiving REDD+ as opportunities was the knowledge variables with odd ratios of 1.71 and 1.46. After adding three more variables in Model 2, chi square values and overall accuracy were increased.

#### 4.1.2 Perceptions on Burdens

In their perceptions on burdens, only 20% considered that REDD+ activities can cause burdens in their daily lives as described in table (1) and the most frequently burdens they perceived in their lives were limitations on firewood collection and pasturing.

Table 3 Predicting the odds ratios of local communities' perceptions on burdens from REDD+ initiatives

| Variables                    | All villages<br>(n=129) |                 | Group 1<br>(n=54) | Group 2<br>(n=75) |
|------------------------------|-------------------------|-----------------|-------------------|-------------------|
|                              | Model 1                 | Model 2         | Model 2           | Model 2           |
| <b>Socioeconomic</b>         |                         |                 |                   |                   |
| Village (Group 1)            | 0.53                    | 0.03 ***        |                   |                   |
| Gender (male)                | 0.73                    | 0.90            | 11.78             | 0.81              |
| Occupation (farmer)          | 2.51                    | 2.13            | 1.96              | 0.98              |
| Family size                  | 0.84                    | 0.75            | 0.57              | 0.82              |
| Age                          | 0.99                    | 0.95 **         | 0.81              | 0.94 **           |
| Education (Middle and above) | 0.63                    | 0.72            | 1.00              | 0.48              |
| Farm size                    | 0.95                    | 0.98            | 1.99              | 0.99              |
| Annual Income                | 1.04                    | 1.00            | 0.98              | 1.00              |
| <b>Forest resource use</b>   |                         | 0.58 *          | 0.11              | 0.59              |
| <b>Knowledge</b>             |                         |                 |                   |                   |
| Objectives                   |                         | 0.36 ***        | 0.01 *            | 0.43 **           |
| Project activities           |                         | 1.99 *          | 2.16              | 2.83 *            |
| Prohibited activities        |                         | 1.41            | 2.83              | 1.12              |
| <b>Benefits received</b>     |                         | 2.55 ***        | 213.73            | 2.21 **           |
| <b>Overall accuracy (%)</b>  | <b>80.6</b>             | <b>83.7</b>     | <b>96.3</b>       | <b>80</b>         |
| <b><math>\chi^2</math></b>   | <b>7.8 ns</b>           | <b>41.8 ***</b> | <b>27.9 ***</b>   | <b>21.4 **</b>    |

\*p<0.10, \*\*p<0.05; \*\*\* p<0.01

Regarding respondents' perceptions on burdens, Model 1 was not statistically significant. In the next step (Model 2), village conditions was significantly influencing factor on their perception of having burdens. Respondents from Group 1 were less likely to answer that REDD+ can cause burdens than those from Group 2. Age, forest resource use, knowledge on REDD+ objectives were negatively correlated with perceptions of having burdens from REDD+ activities while knowledge on REDD+ project activities and benefits factors were positively correlated. The effect of having more knowledge on REDD+ objectives were the same in both groups causing the perceptions of having no burdens.

In Model 2, the strongest predictor of perceiving REDD+ as burdens was the benefit variable with odd ratio of 2.55. In Group 2, older people were less likely to perceive having burdens, however, respondents with more knowledge on project activities and more benefits received from REDD+ projects perceived having burdens. Although their overall accuracy remained nearly the same in Model 1 and 2, it became significant at  $p < 0.01$  in Model 2 and their chi square values were increased, shown in Table 3.

## 4.2 Attitudes of Local Communities towards REDD+ Initiatives

About 64% of the respondents in the study villages had positive attitudes towards REDD+ initiatives while only 36% held negative attitudes (Table 1). In Model 1 using only socioeconomic variables, occupation and age were significantly correlated with their attitudes towards REDD+ initiatives (Table 4). Farmer had more negative attitudes towards REDD+ than non-farmer but older respondents were more likely to support REDD+ initiatives. These factors also retained in Model 2 and people who knew more about objectives had positive attitudes towards REDD+. In Model 2, the strongest predictor of having positive attitudes towards REDD+ was the knowledge variable with odd ratio of 1.71.

Table 4 Predicting the odds ratios of local communities' attitudes towards REDD+ initiatives

| Variables            | All villages<br>(n=129) |         | Group 1<br>(n=54) | Group 2<br>(n=75) |
|----------------------|-------------------------|---------|-------------------|-------------------|
|                      | Model 1                 | Model 2 | Model 2           | Model 2           |
| <b>Socioeconomic</b> |                         |         |                   |                   |
| Village (Group 1)    | 1.3                     | 1.4     |                   |                   |
| Gender (male)        | 0.7                     | 0.5     | 0.1*              | 0.8               |
| Occupation (farmer)  | 0.2***                  | 0.2***  | 0.0***            | 0.4               |

|                              |                |                |                |                |
|------------------------------|----------------|----------------|----------------|----------------|
| Family size                  | 1.2            | 1.2            | 0.5            | 1.3            |
| Age                          | 1.0*           | 1.0**          | 1.1            | 1.1 **         |
| Education (Middle and above) | 2.3            | 2.3            | 2.1            | 2.3            |
| Farm size                    | 1.1            | 1.0            | 1.6*           | 1.0            |
| Annual Income                | 1.0            | 1.0            | 1.1            | 1.0            |
| <b>Forest resource use</b>   |                | 1.0            | 0.6            | 1.2            |
| <b>Knowledge</b>             |                |                |                |                |
| Objectives                   |                | 1.7**          | 3.3**          | 1.6            |
| Project activities           |                | 0.8            | 0.9            | 0.7            |
| Prohibited activities        |                | 1.0            | 0.9            | 1.1            |
| <b>Benefits received</b>     |                | 0.8            | 0.8            | 0.8            |
| <b>Overall accuracy (%)</b>  | <b>66.7</b>    | <b>72.9</b>    | <b>79.6</b>    | <b>66.7</b>    |
| <b><math>\chi^2</math></b>   | <b>21.5***</b> | <b>29.8***</b> | <b>26.4***</b> | <b>12.7 ns</b> |

\*p<0.10, \*\*p<0.05; \*\*\* p<0.01

Regarding the separate models for each group, male and small land holding farmer were less support to these initiatives than female and non-farmers in Group 1. Respondents with larger farm sizes had favorable attitudes towards REDD+ and people who had more knowledge on objectives had positive attitudes towards REDD+ initiatives. Only older people in Group 2 were more favorable attitudes towards REDD+ and the model was not statistically significant. In Model 2 by adding three more variables, the results showed that overall accuracy percentage and chi square values had been improved.

#### 4.3 Satisfaction Level of Local Communities

Their satisfaction level were analyzed based on the factors including initiation of REDD+, rural development activities, capacity building provided by the projects, and local people's right to involve in decision making process and forest conservation activities. According to WAI, respondents in the study area were 'somewhat satisfied' on REDD+ projects and local people's participation, in this case people living in demonstration sites were 'very satisfied' and those from non-demonstration sites were 'somewhat satisfied' (Table 5).

Table 5 Overall degree of satisfaction on REDD+ and their participation between groups

| Villages               | Weighted Average Index (WAI) |                               |
|------------------------|------------------------------|-------------------------------|
|                        | Satisfaction on REDD+        | Satisfaction on participation |
| Group 1 (n=54)         | 0.81                         | 0.83                          |
| Group 2 (n=75)         | 0.67                         | 0.63                          |
| <b>Overall (n=129)</b> | <b>0.73</b>                  | <b>0.68</b>                   |

Note: very dissatisfied = 0.00 – 0.20, somewhat dissatisfied = 0.20 – 0.40, neutral = 0.40 – 0.60, somewhat satisfied = 0.60 – 0.80, very satisfied = 0.80 – 1.00 (Naing, 2014)

## 5. Discussion

### 5.1 .Factors Influencing on Perceptions and Attitudes

#### 5.1.1 . Socioeconomic Factors

According to the survey results, negative perceptions and attitudes were mainly related with their socioeconomic conditions. In compared with the number of respondents with positive perceptions and attitudes, the number of those who had negative perceptions and attitudes were relatively small and these arrived from the respondents of larger families, male and small land holdings farmers.

Larger families did not perceive REDD+ activities as any opportunities, holding the belief that their daily activities like firewood collection and grazing would be prohibited. Compared to small families, they were much more dependent on forests to meet the necessity of the whole family. For the small families, they had fewer worries on their family, not significantly affecting their perceptions that REDD+ projects would bring opportunities in their village development and annual aids to the villages.

Gender variation brought in different results of the study. Compared to female, male perceived REDD+ activities providing them no opportunities, considering that they are the main responsible person to support the whole family so that they can have more prohibitions with their resource use due to REDD+, so male were less support to these initiatives than female. Female considered mainly the project benefits like income generating activities, job creation and better conditions in children education. This finding is consistent with the study of Ratsimbazafy et al. (2012) that women have less dependency on the forest than men and therefore men are more affected by the restriction of the forest than women and less supportive of the conservation project. The study of Poudel et al., (2015) also indicate that male household's family from a medium wellbeing category hardly uses firewood and fodder while women have experienced REDD+ differently from their male counterparts as REDD+ efforts to increase their skills and income. Badola et al. (2012) also discuss about the different perception between males and female respondents towards conservation issues, in which more males believed that their rights had been violated compared with females.

People earning their living as farmers were more likely to have negative attitudes towards REDD+ than non-farmers. Out of farmers, mainly small land holding farmers were less support to these initiatives and farmers who owned more farmland had positive attitudes. The reason behind was that farmers experienced land acquisition due to plantations so they got worry about REDD+ initiations in their villages, in which farmers with lesser farm sizes were more worried as they were more vulnerability to those actions. This result is also in line with the findings of a REDD+ project in Tanzania which indicated that past conservation initiatives showed to have created negative perceptions on REDD+ implementation as a result of the experience they had where most people lost their land to conservation initiatives (CCIAM Programme, 2010).

Therefore, male with larger families having small farmlands seem to have vulnerable state more than others as they highly depend on forests for their livelihood with less diversified sources of income so that they were more likely to have negative perceptions and attitudes.

On the other hand, older people were less likely to perceive REDD+ activities having burdens and had more favorable attitudes towards REDD+. It seems that they consider for future generations in receiving REDD+ benefits and they have more traditional knowledge about conserving the forests. Tesfaye (2017) explain that older people perceived the forest as a protective use while younger perceived as an important source of supplementary income. They might more aware about the ecosystem function of the forests and concern about the consequences of deforestation and forest degradation.

Income was another influencing factor on their perceptions on REDD+. People with higher annual income perceived REDD+ having opportunities than those with lower income. It is likely that their dependency on forest resources are not significant while poor households will be more affected by the restrictive measures and REDD+ might increase their vulnerability as they are more reliant on forests to meet their subsistent needs.

Many studies have found positive association between education and conservation attitudes (Lise, 2000; Shrestha and Alavalapati, 2006). In this study, education was found no significant in determining their perceptions and attitudes. However, it seems that experienced older people and educated young people might have positive perceptions and attitudes while youngsters with low education might have negative ones.

### **5.1.2. Forest Resources Use**

Nearly all of the respondents depend on forest resources for subsistence and commercial use. The study showed that people who extracted different varieties of forest resources perceived REDD+ activities having no burdens. This can be explained by the fact that REDD+ demonstration plots were a little coverage in their villages and it might not have significant impact on their current resource extraction. Moreover, some respondents perceived they can use forest resources from other forests areas, so leakage is likely to happen in the study area. The finding is consistent with the study of Angelsen (2008) based

on the fact that this would increase the leakage effect in causing deforestation in others places which are not under the project. It seems that doing larger areas of REDD+ implementation would have negative impact in their forest resource use and could generate the opposite point of view.

### **5.1.3 . Knowledge**

Regarding their knowledge about REDD+, people living demonstration sites showed distinctive perceptions on opportunities and positive attitudes based on their higher knowledge level. However, understanding on REDD+ of the people from non-demonstration sites is still in question as they did not know about the REDD+ properly. Than et al. (2016) describe that the REDD+ programs could contribute well to the awareness of the rural people in the study area. The study of Jeremiah et al. (2014) reveals that lack of proper information about the key objectives of the REDD+ project and its benefits generate negative attitude towards REDD+ although they have high level of awareness on the deforestation problem, its impact and the contribution of forests to the climate change. Therefore, clear understanding about the concepts of REDD+ is essential for those of the respondents.

As the models demonstrated that knowledge factor increased positive perceptions and attitudes towards REDD+, awareness raising activities of REDD+ initiative programs are critically important to the local communities. This finding conforms to the findings by Jeremiah et al. (2014) that awareness about REDD+ have a greater influence on a person's attitude towards REDD+ and most of the respondents who were aware of the REDD+ objectives had positive attitude towards REDD+ while the respondents who were not aware of the objectives had negative attitude towards the project. Mialla et al. (2004) also say that among other reasons, this awareness contributed to change local community attitudes.

### **5.1.4 . Benefits**

Ratsimbazafy et al. (2012) report that perception of direct benefits from the project was found to be the main factor, can influence their perceptions and attitudes towards the projects and, revealed that most of the respondents who were directly benefitted from the forest conservation supported the forest conservation project. In this study, although people received benefits from the projects, those kinds of benefits could not generate positive attitudes of local communities as most of the benefits from the projects are only indirect benefits at the village level rather than individual level and these cannot fulfill their livelihood effectively. However, the study of Kusaga (2011) reveal that expected income they will receive from carbon trading motivated their willingness to participate in REDD+ initiative.

## 5.2 Satisfaction Level of Local Communities

Their satisfaction on REDD+ initiations and its activities also attributed to positive perceptions and attitudes of the respondents towards REDD+ initiatives due to the fact that most of the respondents in the study area were aware of deforestation and forest degradation problems in their areas and they thought that conservation activities are needed to address these problems.

From the results of satisfaction on local people's participation, people living in demonstration sites assume that they can involve by means of consultation in decision making process regarding forest management. However, under the interpretation of the concept of full and effective participation, 'consultation' is not necessarily sufficient to ensure the full and effective participation of relevant stakeholders on its own. It is therefore necessary to go beyond the 'consultation' and provide real opportunities for indigenous peoples to influence decisions in relation to legislative or administrative measures that may significantly affect them (Rey et al., 2013). Moreover, local communities were not fully aware of their rights regarding FPIC which is a legal basis for ensuring 'full and effective participation' of indigenous peoples.

Most of the people from non-demonstration sites could not get a chance to involve in that kind of decision making as most of the forest management in their areas is mainly concerned with plantations programs. This implies that their right to participate in project planning, monitoring and evaluating activities in the future REDD+ implementation need to be enhanced in the study area.

Overall, they are somewhat satisfied on the initiatives and local people's participation, this implies that their satisfaction on REDD+ initiatives can be a good sign of their willingness to continue participate in the implementation of REDD+. Other studies also highlights the impact of satisfaction as a determinant factor on community attitudes and their consequent support (Nunkoo and Ramkissoon, 2009; Vargas-Sanchez et al., 2009).

Variation between the groups is believed to have affected their perceptions and attitudes. The results indicated that demonstration sites created more positive effects on local communities' perceptions and attitudes as people living in those areas had much more knowledge, received more benefits related to REDD+ and had more satisfaction on REDD+ than those from non-demonstration areas. However, people living non-demonstration sites were willing to support REDD+ activities rather than private plantations as they did not prefer to clear cutting the existing vegetation in the establishment of plantations and they thought that these plantations worsen their forest conditions leading to deforestation and forest degradation. Therefore, REDD+ projects' activities are likely to be successful in the study area.



## **6. Conclusion**

The study examined local communities' perceptions and attitudes towards REDD+ initiatives focusing on the factors of socioeconomic, forest resource use, knowledge about REDD+ and benefits received from REDD+ projects. Respondents living in demonstration sites had more positive perceptions and attitudes than those from non-demonstration sites. According to the models, knowledge factor had greater effects on their perceptions on opportunities and positive attitudes rather than other factors. This implied that respondents who had more proper knowledge about REDD+ indicated more positive perceptions and attitudes towards REDD+ initiatives. Perceptions of having burdens and negative attitudes were correlated with their socioeconomic conditions such as gender, occupation, family size and farm size. Especially their vulnerable situations, worries about restriction on forest resource use and concerns over loss of cultivation lands and scarcity of grazing lands were the main causes of their negative point of view. With regard to satisfaction level, satisfaction degree of the respondents from demonstration sites was higher than those from non-demonstration sites on REDD+ projects and local people's participation. It is therefore recommended to carry out awareness raising activities with clear information on REDD+ leading to have more positive perceptions and attitudes. Moreover, for reducing forest dependency as well as for socioeconomic development of the local communities, creating other income generating activities need to be promoted in the study area along with the REDD+ initiation programs. This would help to decrease negative perceptions and attitudes of local communities.

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