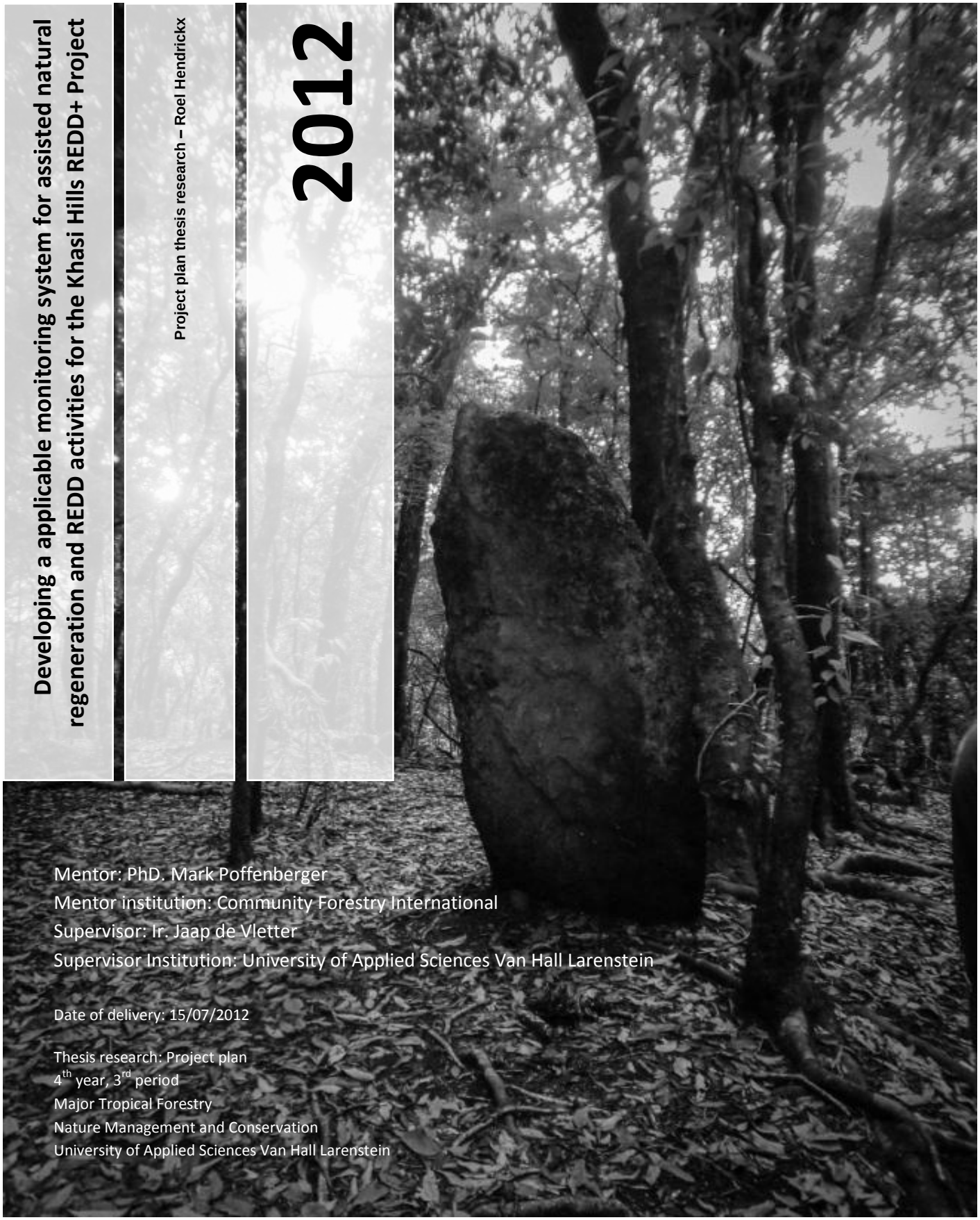
Developing a applicable monitoring system for assisted natural regeneration and REDD activities for the Khasi Hills REDD+ Project

Project plan thesis research – Roel Hendrickx

2012



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Date of delivery: 15/07/2012

Thesis research: Project plan
4th year, 3rd period
Major Tropical Forestry
Nature Management and Conservation
University of Applied Sciences Van Hall Larenstein

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Summary

The project plan for this thesis research was conducted in order to gain perspective in activities that will be undertaken by the student, Roel Hendrickx, within the time span from July 2012 until November 2012. First a brief introduction is given about the project its setting, hereby giving an overview of the Khasi Hills REDD+ project and its current status, the project area and its inhabitants.

The afterwards given problem analysis is logically followed by the activities that will be performed in the next months to address the previous identified problems. In the following chapter the methodology and practical realization of the activities are explained and finally a risk analysis together with their possible solutions is given.

The front page picture displays the inner sanctum of the Mawhplang Sacred Grove, Photo taken by R. Hendrickx.

Content

1. Motivation for the thesis subject

The thesis is one of the final parts of the study *Forest and nature management* and the implementation proves that the student is able to function successfully in his future professional domain for which he has been educated. In this frame Community Forestry International (CFI) and the student came together to the thesis subject: Developing a applicable monitoring system for assisted natural regeneration and REDD activities for the Khasi Hills REDD+ Project.

The motives for this thesis subject are:

- It is in line with the study Tropical Forestry, it relates to various subjects from the themes *Costa Rica reforestation*, *Capita Selecta*, *Project development and communication* and *Forest Management Plan* given throughout the education;
- CFI was very interested in support and collaboration from a tropical forestry student, the opportunity for additional input is present;
- The Khasi Hills REDD+ project focuses on reducing deforestation and degradation in a participatory way using a PES approach; thereby creating an alternative source of income for local communities, raising their self empowerment and preserving a unique ecosystem;
- It relates to my personal interest which is a more participative community forestry;
- It will provide a unique learning experience for the student in an experienced team that (already) has a good reputation concerning community forestry.

2. Frame for the thesis project

Community Forestry International was approached by the Khasi community leaders in 2005 where a request was made for institutional, technical and financial assistance in order to gain capacity to conserve and restore their community forests. This request was done in response to growing concerns over forest degradation and the increasing pressure on sacred groves and other natural resources in their Umian Watershed (Poffenberger 2012). The current deforestation rate in the East Kashi hills is 6,8% per year for open forest and 3,6% per year for dense forest (FSI, 2006). The main drivers of deforestation and forest degradation are forest fires, unsustainable firewood collection, charcoal making, stone quarrying, uncontrolled grazing and agricultural expansion (Poffenberger 2012).

In march 2012 arrangements were made between Mr. Poffenberger and the student for a practical thesis research within the Khasi Hills REDD+ project.

The following chapter gives a broad overview of the Khasi Hills REDD+ project, its current status and stakeholders. Furthermore a first introduction to the project area and its inhabitants, the Khasi people, is given. This brief introduction is needed to gain the necessary background into the thesis project its subject, organization and planning.

2.1 The Khasi Hills REDD+ project

The Khasi Hills REDD+ project (KHRP) is situated in the East Khasi Hills District of Meghalaya, India, see Annex 1 and 2. The project area's size is 27.139 ha and covers eighteen traditional Khasi territories called *Hima's*[1], within these kingdoms are 62 participating villages located. It is one of the first REDD+ projects in Asia managed and implemented by indigenous communities with the support of Community Forestry International, the Bethany Society, the Khasi Hills Autonomous District Council, Planet Action and the Waterloo Foundation. The project duration will be 30 years.

This REDD+ project is designed to slow, halt and reverse the loss of community forest cover in the project area by providing institutional, natural resource management and financial incentives. Furthermore it represents a durable strategy to address the extreme poverty facing rural families true alternative sources of income and capacity building. It seeks to demonstrate how the Khasi people, coordinated by their own institutions, can implement REDD+ activities that control drivers of deforestation and thereby restore forest cover, improve watershed hydrology and make a transition to more sustainable agricultural systems which are climate resilient.

The project is certificated under The Plan Vivo Foundation standards, a Scotland based carbon registry, that addresses both environmental and socio-economic indicators.

2.2 Stakeholders

There are 62 participating communities coordinated by 18 Local Working Committees (LWC). Each LWC supports natural resource management activities of 2 to 5 villages. The communities and LWC's are assisted by a trained village staff, who act as extension workers and community facilitators, and by the community forestry Federation, who will oversee and coordinate the REDD+ project.

[1] *Hima*: Kingdom, on average a *Hima* consists out of 3 to 4 villages.

The Federation will be assisted in the project development by Community Forestry International (CFI), an American based NGO. CFI will be assisted by the Bethany Society, an Indian NGO locally based in Shillong, who will deliver support for technical capacity building and third party monitoring.

The Federation meets 8 to 10 times each year with representatives from all ten *hima* to hold project management discussions. The Local Working Committees meet quarterly to supervise the NRM plan implementation in the 62 villages. Additional meetings are held at the village level as required to implement project activities.

Bethany Society will be the base office for a newly- formed REDD Technical Support Unit (RTSU) with experienced local CFI staff consisting of a forester, project manager and computer specialist, and an experienced bookkeeper and office manager. The RTSU will liaison with staff at Bethany Society, the Federation, and CFI. The student will be boarded at the Bethany Society.

The RTSU team exists out of:

- Mr. Lamphar S. Majaw: bookkeeper and finance trainer;
- Project manager, recruiting in progress;
- Mr. Roel Hendrickx; Community Forestry International volunteer.

The RTSU team works on a regular basis with following (independent) people:

- Mr. K.S. Marbaniang, Forest Ranger: Natural Resources Management Specialist (independent);
- Mr. Sywell Lyngdoh: Socio-economic specialist (The Bethany Society);
- Mr. Tambor Lyngdoh: Chief Community Facilitator.

Planet Action, a non-profit wing of the SPOT company will be responsible for the remote sensing of the project area. This will be done every five years.

The U.K. based Waterloo Foundation provided funds for the project design, the National Rural Employment Guarantee Act (NREGA) provides up to 100 days employment per year to low income persons which will be used for community development projects, natural resource management and restoration activities.

An overview of the different stakeholders is given in Annex 3.

2.3 Status of the Khasi Hills REDD+ project

All participating villages are in the process of designing a management plan for their lands. This is done in a participatory way, using social mapping and household surveys. The natural resource management plan includes a socio-economic part and a forest management part and will be valid for five years. In this stage most of the management plans have been created but the socio-economic and forestry part still have to be combined for the creation of a well balanced natural resource management plan.

Since 2005 CFI has been actively engaged in supporting the first pilot projects in the project area and The Bethany Society has spent the first year of the project (2011-2012) training communities in bookkeeping, project management, climate change awareness and forest management.

In 2011 a first forest monitoring was done: 40 plots were monitored of which 20 in dense forest and 20 in open forest. The result lead to the first carbon stock calculations, this action was performed by Planet Action.

At the beginning of July 2012 the RTSU team has been formed and the headquarters have been installed, however the team still lacks a project manager. The student is part of the RTSU team.

At this moment negotiations between CFI and two private carbon brokers are held concerning the first carbon sales.

2.4 The project area

The project area is situated in the Sub-Watershed of Umiam River, East Khasi Hills District of Meghalaya, India, see Annex 1 and 2. The project area's size is 27.139 ha and covers eighteen traditional Khasi territories called *Hima's*, within these kingdoms are 62 participating villages located. The project area largely covers the Umian River sub-watershed, one of the major rivers of the state and an important water source for the state capital Shillong.

The climate of the Meghalaya state is monsoonal with an average rainfall of 2200mm. Almost 85% of the annual rainfall occurs in between mid-May and September. While October and November represent the autumn, a transitional period, the winter season is from December to February (Tiwari 1999). The mean annual maximum and minimum temperatures between 1980 and 1999 are 22°C and 16°C, respectively (Barik 1992). The soils within the project area are derived from underlying gneisses, schist's and granites and are grouped under latosol (oxisol) type (Pascoe 1950). The broad soil types are: laterite soils, red soils, hill soils. The soils within the sacred forests however are usually light grey and rich in organic material and nitrogen (Tiwari 1999).

The project area falls under the Central Plateau Upland region with altitudes that vary from 150 m up to 1.961m above the main sea level. A terrain characterized by steep regular slopes, rolling uplands intersected by rivers and dotted with rounded hills of soft rock.

The land use of within the project area, see Annex 2, has been changing throughout the decennia due to deforestation. A lot of the mixed evergreen cloud forest has been replaced by Sub-Tropical Pine forests or grasslands and savannas. Most of the present forests are community lands but some private forests are also present.

According to Champion and Seth (1968) the following vegetation types have been identified in the project area:

a. *Sal forests*: Sal forests in the state can be grouped into two types:
   Alluvial Sal: This type conforms to the type of North Indian Tropical Moist Deciduous Alluvial Sal forests;
   Foot hill and plateau sal: This type confirms to the type of North Indian Tropical Moist Eastern Hill Sal forests;
b. *Mixed deciduous forests*: North Indian Tropical Moist Deciduous;
c. *Evergreen forests*: These forests confirm to the type of Northern Tropical Semi Evergreen Forests and Assam Plain Semi Evergreen forests;
d. *Bamboo forests*: This type confirms to the type of Northern Tropical Semi Evergreen Forests and secondary Moist Bamboo Brakes;

e. *Grasslands*: Northern Tropical Moist Deciduous Forests and Low Alluvial Savannah Woodland;
f. *Very Moist Sal Bearing Forests*;
g. *Eastern Himalayan Moist Deciduous Forests*;
h. *Assam Sub-Tropical Pine Forests*.

However, the bamboo forests and grasslands and savannah woodlands are not of a climax type but are only a result of the removal of the original forest cover. Also the Sub-Tropical Pine Forests are not in a climax type but are of secondary nature and in a stage of succession termination (R.M. Shamgpliang, 2010).

2.5 The Khasi people

The Khasi are an indigenous tribe that inhabit the mountainous region in the North-East of India. The meaning of the word Khasi has numerous interpretations, however Hamlet Bareh's one is the most accepted ~~one~~, he believes Khasi means: *born of the mother*. This already brings forth the matrilineal character of the Khasi, since they trace their descent from the mother. The most supported view concerning the origin of the Khasi people, both linguistically and racially, is that the tribe is a remnant of the first Mongolian overflow to India (R.M. Shamgpliang, 2010).

The Khasi people have their own language and writing, traditional clothes and are mostly Christians but their traditional religion is still practiced and well preserved. The traditional religion of the Khasi may be described as: *"… animism or spirit worship, or rather, the propitiation of spirits both good and evil on certain occasions, principally in times of trouble*." (Gourdon, The Khasis, 1907, p. 105). This traditional believe that is so closely connected to nature let to the preservation of large patches of primary forest, so called sacred groves or (*Li) Law Kyntang*. The Khasis are mostly involved in agriculture, stockbreeding or herding. However additional sources of income are generated true charcoal burning, quarrying of stone and fishery. The Khasi people use following forest products on a regular basis: bamboo, broom grass, bay leaf, Dalchini, packing leaf, wood lichen, charcoal, fuel wood, medicinal plants and timber (B.K Tiwari, 2008).

3. Problem description /problem analysis

First a global problem description of the project area is given for both environmental and socio-economic indicators. This will be followed by a problem analysis specific for the thesis assignment.

3.1 Problem analysis of the project area

3.1.1 Environmental problem analysis

The current deforestation rate in the East Kashi hills is 6,8% per year for open forest and 3,6% per year for dense forest (FSI, 2006). The main drivers of deforestation and forest degradation are forest fires, unsustainable firewood collection, charcoal making, stone quarrying, uncontrolled grazing and agricultural expansion (Poffenberger 2012).

The Umian watershed has the highest recorded rainfall in the world ~~but~~. Despite this fact the region is experiencing increasing dry season droughts due to accelerated deforestation. This combined with an increased temperature undermines the hydrological function of this critical watershed, disrupting agricultural practices and creating intensified cyclonic storms contributing to erosion and downstream flooding in the Bangladesh (Gangetic) and Assam (Brahmaputra) river basins.

Climate change is the main underlying force that is worsening the key drivers of forest degradation and deforestation since it intensifies and extends dry seasons ground fires, reduces soil moisture and rainfall and contributes to a historic pattern of aridization and biomass loss. The resulting loss of dense forest habitat has placed pressure on the region's water resources, farming systems, and biodiversity (Poffenberger 2012).

3.1.2 Socio-economic problem analysis

The main income generating activities of the Khasi people within the project area is agriculture and rear livestock. The average land holding per household is only 0,25 ha and the average annual income per household (5 to 8 members) is just Rs. 30,000[2] or less than USD$ 2 per day. Concrete this means that 80 to 90% of the participating households were below the poverty line, their main problems in the village have been identified as poverty and lack of employment. Development priorities include more jobs, better road access, improved water supplies and improved access to schools and health facilities.

The lands and forests carrying capacity is being exceeded due to population expansion. Meghalaya's population increased with 30,65% between 2001 and 2011. Many rural families are having up to 6 or 8 children, which makes investments in education and healthcare difficult. Village profiles indicated that 56% of the 62 villages had a high forest dependency with 1 to 3 community forest blocks within 1 to 2 km of the village. Accessibility is still a major problem: only 11% of the villages had road availability. A factor closely related to higher poverty rates (Poffenberger 2012).

3.2 Problem analysis of the thesis project

The KHRP is currently developing natural resource management and livelihood plans for the participating 62 villages: these need to be aggregated at the cluster level (micro-watershed, 18 plans). The cluster plans need to reflect the larger plan at the Umian sub-watershed level (10 plans). And finally a creating a global project management plan.

[2] One euro is approximately 65 Indian Rupees, so +/- 460 euro

Team discussions showed the need of an information system that manages village, cluster and sub-watershed natural resource management and livelihood plans. Therefore the need for a basic GIS system to store and retrieve spatial data is needed and guidance in the aggregation of data from village up to the overall sub-watershed NRM plan.

The RTSU team is currently lacking a project manager and therefore searching for a team member who has knowledge of forestry, Arc GIS and forest inventory. An application for this job has been posted on the 14th of July 2012 in the Shillong Times Newspaper.

The RTSU is in need of a person who can provide training in forest monitoring activities, tree mensuration. The RTSU is in need of a person who can facilitate the tree mensuration of 40 plots in the months September and October.

The RTSU is in need of a person capable of creating maps who can be used to plan future management activities.

The student noticed that the current forest monitoring system, for 40 plots, is not user-friendly at all and could be updated to a simpler form in Access that could ~~be~~ consist out of ready to be filled in forms that auto calculate various results (volume, basal area, …).

4. Activities in time and products envisaged

Since this is not a theoretical thesis subject but rather a practical project, the research questions are formulated in activities – their desired output and time frame, see table 1.

Table 1: CFI volunteer activities

No	Activity	Implementer	Output	Time frame (2012)
1	Preparation of the 62 Village Management plans both for the forestry and socio-economic.	CFI volunteer, Sywell Lyngdoh	Village Management Plans ready	July
2	Preparation of management plans at the cluster level	Project manager, CFI volunteer	Cluster management plans ready	August
3	Formulate recommendations for a general management plan	CFI volunteer	Recommendations ready	September - beginning November
4	Identification of 1000 ha[3] of ANR[4] area to be protected for restoration	Natural resource management expert and CFI Volunteer	1000 ha ANR area identified	July – September
5	Creation of a monitoring and reporting system on Access and Arc GIS to monitor the existing 20 forest monitoring plots in dense forest, as well as 20 forest monitoring plots in open forests of the Project Area.	CFI volunteer	Information system complete	July – August
6	To train and sensitize the New Project Manager on the Forestry Monitoring and Reporting System.	CFI volunteer	Capable project manager	August - September, if project manager is recruited
7	Validation of Project	All stakeholders (including M. Poffenberger and Mr. Palit	Project is on track, meets Plan Vivo standards	Mid-August
8	Field Training of volunteers, community facilitators, and village community members on use of GPS, Clinometers, DBH Tape, etc for field mapping and forest inventory works.	Project manager, CFI volunteer, volunteers , community facilitators	Capable staff	August – September

[3] 1000 ha is based upon the provided planting material from the forestry departments nursery
[4] Assisted Natural Regeneration

9	Conducting re-inventory of existing 20 forest monitoring plots in dense forests, as well as 20 forest monitoring plots in open forests in the Project Area.	Project manager, CFI volunteer, volunteers , community facilitators	40 plots been monitored	September – October
10	Train RTSU staff in using information system	CFI volunteer, RTSU staff	Completed forest monitoring report (Access and Arc GIS)	October
11	Formulate conclusions from the forest monitoring report	CFI volunteer	Conclusions ready	October - beginning November
12	Evaluate global information system	CFI volunteer	Evaluation ready	October- beginning November
13	Formulate a sustainable silvicultural system for different forest types	CFI volunteer	Silvicultural system ready	Beginning November
14	Communicate recommendations and conclusions	CFI Volunteer RTSU staff, CFI International	Results communicated and explained, defended	Beginning November

A more detailed time frame is provided in annex 4.

4.1 Products envisaged

The main outcome of this thesis project will be three Office Word documents, in font Garamond 11: one as the main document, the second one containing all annexes and the third one will be a log showing all the undertaken activities by the student in time. The main document will be around 75 pages.

The content of the main document will roughly be:

Abstract
List of abbreviations
Content
Introduction
The Khasi Hill REDD+ project
The project area
- Socio economic
- Environmental
- Vegetation/habitat/fauna&flora

Global management plan
- Land use
- Zonification
- Silvocultural system

Assisted natural regeneration
Afforestation
Maintenance

Sustainability
Risk analysis
Expected impacts
Recommendations
Conclusion

The document will be accompanied by an Access 2010 database, showing the monitoring results of 2011 and 2012. This database will be connected to Arc GIS of which any output, maps or files, will be provided on a CD-ROM.

The access 2010 database should be able to calculate volume, basal area, species distribution, number of trees per hectare and sequestrated carbon. The maps in Arc GIS will display this data per plot and if possible for bigger areas. Also future management activities such as ANR or afforestation will be displayed. Other maps will be generated based upon the needs and desires of the involved stakeholders.

4.2 Additional products

As mentioned above the student will be boarded at The Bethany Society, in exchange here for boarding the student will help in an ongoing project of The Bethany Society. The project concerns the management of natural resources in a village, especially mapping of the forests area. However this collaboration still has to be initiated, so information is scarce. The results of this project will probably not be mentioned in the main document (see above), but in the log.

5. Methodology / project approach

In this chapter the methodology for realizing the different activities will be described. Some factors are of course still vague and can only be clarified over time.

The preparation of the (62) village management plans is based upon a standard form (see Annex 5) which has to be combined with results from the socio-economic research preformed earlier. The final result will be a management plan for a period of 5 year describing the future management of the village it's natural resources. The work will be done by Sywell lyngdoh, a socio-economic expert and the CFI volunteer. Additional help can be provided by the other RTSU members and the NRM expert.

The preparation of management plans at the cluster level seeks to combine and integrate a well balanced vision for an area of 3 to 4 villages between socio-economic factors and natural resource management. These management plans will include a planning of the future management activities and future land use (zonification).This activity will be done by the RTSU staff.

The formulation of recommendations towards a general management plan will be based upon two main future management activities: forestry and zonification. The recommendations concerning forestry will provide a silvicultural system for the sustainable felling of trees in different forest types and NTFP collection. Also recommendations towards future management activities such as assisted natural regeneration, afforestation, prevention of fires and prevention of uncontrolled grazing will be addressed. The zonification will visualize a balanced land-use system together with a description of possible future activities and management.

The identification of the 1000ha for ANR management will be performed by the NRM expert and the CFI volunteer. The areas will be chosen by indicators such as the status of the area, accessibility, socio-economic needs etc. The results will be visualized and defended. Field visits within the project area and bottom-up communication during these visits will be necessary as well in order to identify ANR areas.

The creation of a monitoring and reporting system on Access and Arc GIS to monitor the existing 20 forest monitoring plots in dense forest, as well as 20 forest monitoring plots in open forests of the Project Area will be done by the CFI volunteer. The desired outcome is a reusable database that auto calculates volume, basal area, number of trees/ha, most common species, carbon sequestration and diameter classes. The database should be usable in Arc GIS for the creation of maps, a second product of this activity. Since the plots have fixed locations, a monitoring was conducted in 2011. The data of this past activity will be used to create the first database. The entered data can afterwards be deleted, leaving a ready to fill in database with the necessary queries. This is possible since the plots location is fixed and in the field monitoring is planned to take place every 5 years.

Additional monitoring will be conducted by remote sensing and the taking of photographs at set locations. The photographs taken will be linked to Arc GIS. Research has to be conducted if the remote sensing could be made more user friendly and reporting simplified. The Access and GIS database will be accompanied by a manual on how to operate it. Additional help and feedback on drafts of the information system will be given by Mr. M. Poffenberger (CFI), Mrs. W. Aubrey (Bioclimate), Mr. T. Lyngdoh (Chief Community Facilitator) and Mr. S. Ambagis (Planet Action) true through group mail correspondence.

In mid august a validation of the project will take place, this will be done by Mr. Palit, a Nepalese REDD+ expert and Mr. M. Poffenberger. The validation will include a workshop in Kolkata (see Annex 6), a visit to the project area and revision of all realized documents and plans. The CFI volunteer will participate throughout the entire validation process.

The training and sensitizing of the new project manager/coordinator on the information system will be done before and during the tree mensuration since the information system will then be put into use.

Field Training of volunteers, community facilitators, and village community members on use of GPS, Clinometers, DBH Tape, etc. for field mapping and forest inventory works will be done in small groups before or during the actual tree mensuration. This will be done by the project manager and the CFI volunteer. It is quite possible that the RTSU staff and their independent collaborators will also attend this workshop to build future capacity. For details on the methodology of plotting see below. The volunteers will normally be 2 girls and 2 boys who already worked with members of the RTSU team. All involved people's contact information can be gained from Mr. T. Lyngdoh. Practical arrangements, date, materials and place will be organized by the project manager and CFI volunteer.

Conducting a re-inventory of existing 20 forest monitoring plots in dense forests, as well as 20 forest monitoring plots in open forests in the Project Area (see annex 6 for an overview of the plots) will be done by the project manager, volunteers, Community facilitators and the CFI volunteer. Dense forest plots are 10 square meters (0.01 ha), and open forest plots are 20 square meters (0.04 ha). In each plot, the tree species and diameter at breast height (DBH) were recorded as well as top heights of three trees at the lower, middle, and upper canopy. In a sub-plot of 1 square meter the regeneration of saplings is calculated. Since the project area consists out of many slopes a simple table in Excel is used to take slopes their effect on the length of the plot into account. The plot is set out by using robe, compass and GPS. Practical arrangements, date, materials and place will be organized by the project manager and CFI volunteer.

Training the RTSU staff in using information system will be a matter of using the newly created information system by entering the collected field data, this will be done by the RTSU staff. Afterwards the information system will be evaluated with an informal inquiry among the users. Adjustments and improvements can then be made by the CFI volunteer.

The formulation of a sustainable silvicultural system for the different present forest types will be done by the CFI volunteer, literature study will need to be conducted (maybe in Belgium) and Mr. J. De Vletter can be contacted for feedback. The result will be an overview of forest products (timber and NTFP's) and the quantities in which they can be harvested in a sustainable way.

The communication of results and recommendations will be done in person towards the RTSU unit and the Bethany Society at the end of the stay of the CFI volunteer. All 3 reports, all Arc GIS and Access data will be transferred towards CFI, The Bethany Society, RTSU and Van Hall Larenstein. The Bethany Society will receive an additional report on their project, in person if possible.

6. Risk analysis and possible solutions

In table 2 an overview of feasible risks that could be encountered during the project and their possible solutions is given.

Table 2: Risk analysis

No	Risk	Possibility of occurrence	Solution
1	Communication failure; the volunteer doesn't speak Khasi	High	Communicate through a third person who masters both languages (English – Khasi); self-study of Khasi language and increased daily usage
2	Power failure interrupting work	High	Charge laptop battery up front or take a break so future work activity is increased
3	Insufficient knowledge of Arc GIS, Access 2010	Medium	Consult manuals, internet, teachers, class notes, …
4	Insufficient knowledge of GPS	Low	Manual available online
5	Insufficient botanical knowledge	Low	Daily contact with main timber species
6	Cultural differences that interfere with work	Low	The volunteer is open minded and operates in a empathic way
7	Diseases interfere with work	Medium	Take medication, rest
8	Slow internet connection interferes with work	High	Be patient, do literature study in Belgium
9	Traffic jams causing delays or even the missing of appointments	High	Leave early or expect other participants to be late as well (very likely)

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8. List of abbreviations

ANR: Assisted natural regeneration
CFI: Community Forestry International
DBH: diameter at breast height
FSI: Forest survey India
GIS: Global information system
GPS: Global positioning system
ha: hectares
KHRP: The Khasi Hills REDD+ project
LWC : Local Working Committees
mm: millimeter
NGO: non-governmental organization
NREGA: National Rural Employment Guarantee Act
NTFP: non-timber forest products
U.K.: United Kingdom
USD: United States Dollar
REDD: Reducing emissions from forest degradation and deforestation
Rs: Rupees
RTSU: REDD Technical Support Unit

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