

**PDD EXECUTIVE SUMMARY**

*Project Activity by Lao Thai Hua Rubber Company Limited  
Mitigation of GHG: Rubber based agro-forestry system for sustainable  
development and poverty reduction in Pakkading, Bolikhamsay  
Province, Lao PDR.*

## **1. Project Developers**

Lao Thai Hua Rubber Company Limited, Vientiane, Lao PDR

## **2. Host Country**

The Lao People's Democratic Republic (Lao PDR)

## **3. Project Description**

### **3.1. Project Title**

Mitigation of GHG: Rubber based agro-forestry system for sustainable development and poverty reduction in Pakkading, Bolikhamsay Province, Lao PDR.

### **3.2. Targeted Greenhouse Gas**

Carbon Dioxide (CO<sub>2</sub>)

### **3.3. Project activities**

#### **3.3.1. Objective**

Mitigating Greenhouse Gases (GHG ) and reducing poverty in relation to an environment that enables active participation of rural communities in an array of climate change mitigation activities, primarily by compensating for GHG emission through implementing a rubber based agro-forestry system with food crops and other related programmes, to support sustainable organic agriculture that would lead to substantial reduction in poverty among marginalized communities in Pakkading District, Bolikhamsay Province.

Pakkading is a least developed area and one of the identified 47 poor districts in Laos and has been identified as a suitable zone for para-rubber tree plantation by GOL (Government of Laos).

An organic rubber based agro-forestry system will be established in an extent of 1000 hectares to be completed by the end of the year 2010. Initially, 547 hectares will be planted by the end of 2008 as the first stage planting,

#### **The project will allow:**

- Poverty alleviation and wealth creation in rural areas,
- Community empowerment through active participation in all stages of the project, and
- The improvement of basic infrastructure for rural communities.

### **3.3.2. Outline of the project**

The land identified for the first phase of the project is an abandoned area leased from poor farmers. The natural forests have been destroyed by slash and burn since 1970. This took place and was mostly abandoned since year 2000 until the project came into place in 2008. The land is owned by 402 farmers/households of three villages (Huay Hai, Huay Phet and Nam Sang) with a total population of about 3,500. Around 73% of them are living below the poverty line and majority of the people practice small area upland rice production and seasonal cropping using species such as corn, cassava, and banana.

The project area will be fenced off by banana trees lining the 1000 ha plantation. There are large areas of underutilized land available in Pakkading and these lands can be used in a more productive manner for the benefit of mitigating GHG emissions and to generate sustainable livelihoods and opportunities for disadvantaged communities. Combining GHG absorption and poverty reduction in one sustainable project is the main purpose of the project developer.

The practices of slash and burn cultivation has depleted the soil but will be rehabilitated by planting rubber and other tree species with deep root systems. This illustrates the potentials in agro-forestry development in the region. The project will therefore have an immediate impact on social and economic development in the region, by creating sustainable livelihoods and other development benefits.

### **3.3.3. Natural and Socio-economic Environments around the Project Site**

#### **Natural**

##### **a. Climate and hydrology**

The area is in the Southeast Asia monsoon climate regime. During November-February, when the sun is to the south of the equator the climate is under the influence of the cold continental high pressure region over China.

##### **Temperature**

According to 14 year (1990-2004) records of temperature, the mean minimum, mean average and mean maximum temperatures were 21.78<sup>0</sup>C, 26.30<sup>0</sup>C and 30.86<sup>0</sup>C respectively. The hottest year recorded was 1996.

##### **Humidity**

Relative humidity in the area is in general over 75% during the night and early morning, even reaching 85-90%. The relative humidity decreases during the day with a minimum in the afternoon at levels around 60 and sometimes even 40%. Very low humidity may occur in December, January or February. High relative humidity plays a role on trees internal pressure and is favorable to latex production and tree growth.

## **b. Topography**

The country as a whole is classified as mountainous; however, the project area is classified as lowland. The project area is between 18°06'50" to 18°09'20" N Latitude and 104°16'20" to 104°20'30" E Longitude. Elevation is from 141 m to 410 m MSL.

There is a variation of soil types in the proposed project area. As soil quality begins to degrade under shifting cultivation of cleared land, hill tribe agriculture abandons formerly cultivated land. Soil depth profile range from 20 cm in Nam Sang village to 120 cm in Huay Phet village. The disadvantages of these soil types are a low humus content and low cation exchange capacity, which makes temporary retaining nutrients in the topsoil quite difficult.

Most of the fertility was historically stored in the forest cover and, once the forest-cover is removed, these soils rapidly become very poor and therefore sensitive to surface-erosion. The soil of Huay Phet village is vulnerable and eroded near the Huay Phet stream. It was reported that the banks of the stream were lost year by year from 0.2 m to 1 m width because of no protection of trees cover.

## **c. Vegetation, ecosystems, rare/endangered species and their habitats**

The vegetation type in this area is representative of tropical forest whereas the ecosystem of *Dipterocarpaceae*, have been subjected to heavy destruction due to construction of the roads and slash and burn by local villagers affecting the characteristic of secondary habitats that have been cleared of forest cover. There are no threatened or endangered species within the project boundary. Since the large trees have been cut down and lands are degrading, these lands are not habitats for fauna.

## **Socio economic issues**

The lands identified for the project are abandoned /underutilized areas in Pakkading District. Lands belong to 402 farmers/households who did not or have not properly maintained the land. The benefits that would follow are:

- 1) Ample employment opportunities for youth and population at large in the area with attractive remuneration. 73% live below the official poverty line.
- 2) Additional knowledge will be given to local communities in training on clearing of lands, making of compost production of microorganisms for fertilizers (bio-fertilizers), and on techniques to establish and maintain agro-forestry plantations with highest levels of returns.
- 3) Income from the sale will be shared with local communities as part of lease agreement, incentives to workers etc. The project will pay for land taxes and contribute to the village fund at a rate of 10,000 Lao Kip per ha per year.

The social responsibility policy of the company will initially secure access to basic

health services for the community as well as basic education. However, in the long run, selected scholarships for higher education will be considered.

Improvements to the infrastructure in the area is being carried out such as road network, water supply, electricity, construction of village meeting hall, fish pond, wells etc.. Apart from that, the project is committed to consider any claims or feedbacks from the community so that it could respond to the real needs of the people. The project creates direct employment opportunities in the establishment, maintenance, harvesting, and processing of the products throughout the project cycle in the project area.

### **3.3.4. Government Policies and Measures**

Lao Government's policy, objectives and strategy for the forestry sector are nested within and consistent with the overall National Socio-Economic Development Plan, the National Growth and Poverty eradication Strategy (NGPES, 2004), the Rural Development Program, the Strategic Vision for Agriculture Development and the National Biodiversity Strategy and Action Plan. Accordingly, Department of Forestry with local Government office who response for Land and Forest Allocation Program (LFAP) of Lao Government have defined suitable areas for rubber plantation for the period 2006-2010 in Lao PDR. The increasing threat from climate change on the environment has been recognized by the Government of Laos. The most recent initiative, establishing the Climate Change Secretariat (DNA) is delegated as a major role in this strategy.

Lao PDR has developed an impressive array of environmental laws, rules and regulations focusing on sustainable development such as Environmental Protection Law, Decree on Environmental Impact Assessment (EIA), Environmental and Social Standard for Hydropower Development, Guideline for Sustainable Development of Hydropower Sector, National Action Plan for Adaptation (NAPA), Clean Development Mechanism Decree and likewise.

### **3.3.5. Environment issues**

The project is totally complying with the country's environmental strategy by selecting environmentally friendly technologies and following the proper guidelines and regulations. An Environmental Impact Assessment (EIA) has been done by the project developer.

The proposed venture's objective to facilitate mitigation and adaptation to repercussions of such phenomena falls in line with the Government strategies. The venture have recognized that restoring degraded and underutilized land through reforestation have the added advantage of sequestering CO<sub>2</sub> and therefore trading this CO<sub>2</sub> to developed nations who emit CO<sub>2</sub> in quantities more than the accepted level can be made possible. Moreover, this is a venture promoting effective global and domestic partnership towards minimizing damage from climate change, while providing revenue and reducing poverty in Lao PDR.

There are many significant environmental credits of natural rubber resource such as

ability to lock carbon both in biomass and rubber, rubber plantations functioning as self-sustaining eco-system (annual leaf fall, branches, fruits, twigs, root hairs), cultivation being less demanding on fertilizers and pesticides, promoting soil conservation (in view of 25 to 30 year replanting cycles), up keep of soil, ground water, water infiltration, scope for biodiversity (integration of other species in the inter-rows) being largely a smallholder crop for purposes of livelihood, is less profit driven exploitation of environment area. Rubber wood going into wood based furniture which is held in inert form for a considerable period of time and the woody portion remaining in the soil decomposes in-situ etc., all in favor of natural resources.

Rubber plantation is one of the efforts for the “Green Development” program expanding land for agricultural production and reflecting a transition from subsistence production based on shifting cultivation to commercial production improving land fertility, speeding up fertilizer production, especially for ensuring initiatives in balancing the availability of fertilizers for agricultural production.

### **3.3.6. Comments of Stakeholders:**

Stakeholder consultations were conducted during the preparation of the project and continued throughout the implementation. The stakeholder consultations were in the form of formal and informal meetings and awareness programmes. Consultations were helpful in obtaining stakeholder comments.

District officials from Pakkading District and village chiefs/villagers were extensively consulted during the preparation phase November 2007-May 2008. The Vice Governor Mr. Langsy of the District has been following the preparation phase closely. The officers under him gave full support as the project area had been identified for rubber tree planting and would directly benefit the communities in the 3 village areas in terms of poverty reduction and infrastructure improvement.

During these meetings with local communities and employees brief description of the project was given by the management and the stake holders’ views about the project have been taken into account. A notice prior to the meeting was prepared and displaced in the area. In addition to this, villagers were informed verbally by project developers. Stakeholders included labourers, surrounding communities including women and children, field manager, officers of Department of Environment, University lecturers and students, CDM consultants and other management staff of the site.

### **3.3.7. Consideration to Technology and Costs of Rubber Tree Plantation**

#### **- Planting**

At the time of planting, the site is to be adjusted beforehand: bush and weeding as land preparations, and tilling under some circumstances, are to be performed. These works have been undertaken for approximately 547 ha of land in 2008.

#### **- Incubation**

Immediately after plantation, surface of soil is to be impoverished by exposure to the sun, and flow-out of surface soil to take place. At the same time, as weeds sprout and absorb nourishment, weeding shall be paid special attention.

Fertilization is an important silvicultural practice. Proper fertilization to foster the initial growth makes possible resin collection in the early stage, which will lead to improve project profits. Although it depends on weather and clone, 5 to 6 years is required for the incubation period.

#### **- Estimate of Rubber Tree Growth Rate**

The volume of a tree has relationship with tree height and girth. Appropriate growth models have been used to estimate tree volume using tree height and girth as parameters. These data will be obtained by permanently established sample plots in the project area.

Furthermore, provided that growth is considered CO<sub>2</sub> sink, it is necessary that growth of underground as well as that of branches/leaves should be considered. Parameters such as Biomass expansion factor (BEF), Root-shoot ratio (R), Carbon fraction (CF) will be used in these calculations. All these estimations are done according to approved methodology AR-ACM0002 (Version 01, Sectoral Scope 14, EB 46).

### **4. Effect of AR-CDM project**

#### **4.1 Project Period, Credit Acquisition and Additionality**

The expected operational lifetime of the project is 30 years. The net anthropogenic GHG removal by sinks for the period of 30 years is 1,175,313.69 tonnes of CO<sub>2</sub> in maximum without renewal. The credit is Temporary CER (t-CER).

#### **4.2 Baseline of Rubber Plantation**

Under the applicability conditions of approved methodology AR-ACM0002 (Version 01, Sectoral Scope 14, EB 46), the changes in carbon stock of above-ground and below-ground biomass of non-tree vegetation may be conservatively assumed zero in the baseline scenario. The land was stratified according to major vegetation types using satellite maps, detailed ground surveys and interview with local communities. Baseline carbon stock calculation was done for strata with few growing tree using the equations provided in AR-ACM0002 (Version 01, Sectoral Scope 14, EB 46)

#### **4.3 Estimation of net GHG Balance**

The estimated CO<sub>2</sub> reduction is 500,112.35 tonnes CO<sub>2</sub> for 14 years and

1,175,313.69 tonnes CO<sub>2</sub> for 30 years.

## **5. Monitoring plan**

There are 3 strata for *ex ante* estimation of carbon stocks. Strata 1 – trees planted in 2008 (547 ha), strata 2 – trees planted in 2009 (55.7 ha) and strata 3 – trees planted in 2010 (397.3 ha) all belonging to 3 villages namely Nam Sang, Huay Hai and Huay Phet. Total number of sample plots needed for project monitoring was calculated using methodological tools and software approved by EB.

The following activities shall be conducted:

- Monitoring of the project boundary
- Monitor and report on the conformity of land preparation with the practices documented in AR-CDM PDD;
- Monitor and report on the conformity of rubber tree plantations with the practices documented in AR-CDM PDD;
- Any significant improvement to the guidelines to farmers on rubber tree plantation will be explained.
- Monitoring of forest management

Project area database will be annually updated in two stages:

- Early every year with newly approved parcels, their physical and tenure details,
- At the first comprehensive tree census after planting, the number of trees will be the base for plantation area assessment.

For the management needs of the pilot activities, the project developer will take comprehensive survival census and sample trees measurements on every sample parcel of the project twice a year before the first tapping and every other year thereafter. The main purpose is to monitor girth growth so that farmers can start tapping when the girth reaches 50 cm, which usually happens around age 7. This intense monitoring continues after tapping starts to ensure that tapping is neither too hard nor too tight: a slow and steady girth increment ensures a maximum latex projection over time.

Assessment of both above-ground and below-ground biomass will be carried out annually.

## **6. Sustainability of Project**

The project does not involve the short-rotation harvesting of fast-growing trees but the long-term growth of trees which is favorable to carbon sink, as well, the income is expected in the collection of rubber resin during project period.

Furthermore, as rubber timber after the 30 year rotation is possible to be effectively utilized for various purposes, the project has a potential to encourage many side business.



## **7. Project Timetable**

Start : June 2008

PIN : Letter of non-objection 30<sup>th</sup> September 2008

PDD : Submission 18<sup>th</sup> September 2009

Crediting period : 30 years

Life cycle of project : 30 years

## **8. Contribution to Sustainable Development of the Host Country**

This AR-CDM project will positively contribute towards the sustainable development of Lao PDR as described above and mentioned in the Sustainable Development Check List.