Report on

Development of A/R CDM Projects Optimized to Serve Corporate Social Responsibility (CSR) Needs

March 2008

Sumitomo Forestry Co., Ltd.

1. Project overview and Indonesian response

1.1 Project overview

Two projects, one small-scale AR-CDM and an additional AR-CDM project, will be implemented in the Republic of Indonesia in line with policy on corporate social responsibility (CSR). The Indonesian Ministry of Forestry is also demonstrating a keen interest in the implementation of AR-CDM projects and has pledged full cooperation on the following two projects.

(1) Small-scale AR-CDM project (Yogyakarta coast)

Sandy soil and strong seasonal winds that blow in from the south in the dry season make it difficult to grow trees along the coast at the southern end of the Special Region of Yogyakarta on the Indian Ocean. The strong winds are also responsible for particularly poor agricultural productivity. The Indian Ocean to the south of the island of Java is also prone to frequent earthquakes and tsunamis, and coastal planting is urgently needed to alleviate tsunami damage. Sumitomo Forestry will therefore implement a small-scale AR-CDM project that will involve planting approximately 100ha (10 km x 0.1km) of trees along the coast aimed at improving agricultural productivity by preventing wind and sand damage and moderating tsunami damage.

(2) AR-CDM project (Bromo Tengger Semeru National Park)

Repeated forest fires on the western slopes of the craters of caldera-shaped active volcanoes in Bromo Tengger Semeru National Park in Eastern Java have transformed them into grassy plains. An AR-CDM project will be implemented on around 1,200ha of deforested land aimed at improving CO2 absorption, preventing soil runoff, recharging water resources, protecting biodiversity and improving the area's value as an ecotourism destination. Figure 1 shows the location of both AR-CDM projects.

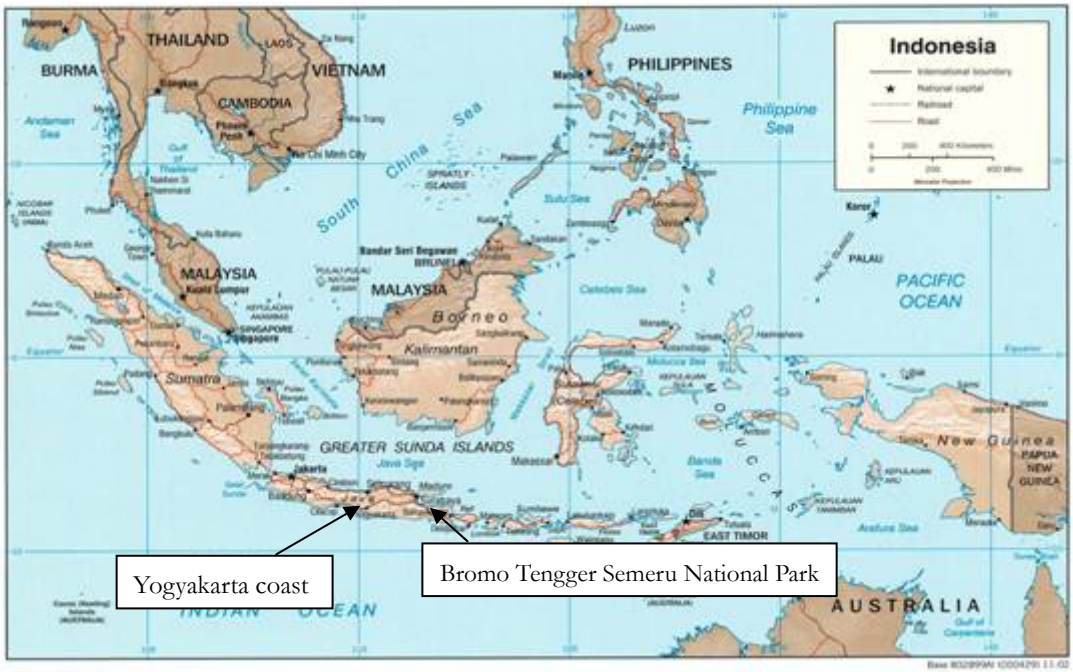

Fig. 1 Map of Indonesia showing project locations

2. Host country acceptance of AR-CDM projects

2.1 Ratification of the Kyoto Protocol and establishment of a Designated National Authority (DNA)

Indonesia signed the United Nations Framework Convention on Climate Change on June 5, 1992 and ratified it on August 23, 1994. The country signed the Kyoto Protocol on July 13, 1998, ratifying it on December 3, 2004. Indonesia established the National Committee on CDM (NCCDM) in July 2005 as the Designated National Authority (DNA).

The NCCDM sets approval guidelines and criteria for evaluating proposed projects based on environmental, economic, sociological and technological sustainability. Project implementation has environmental, economic and sociological implications for local areas, and so impacts are monitored at the regional level, while the sustainability of the technology is evaluated at the national level.

2.2 AR-CDM project activity

Indonesian forests are defined under a 2004 forestry ministerial ordinance as 'mature trees of 5m or more in height and 30% or more forest cover over a minimum land area of 0.25 hectares'.

A report on land eligible for AR-CDM projects by the Asian Development Bank, the Center for International Forestry Research (CIFOR) and the International Center for Research in Agroforestry suggests that Indonesia has 46 million hectares that would be considered eligible for AR-CDM projects.

International aid has been used for past AR-CDM initiatives, but no PDDs have yet been submitted to the DNA. Reasons for this include a complicated and arduous system, the high risk of forest fires

and illegal logging, time limits on credits, the obligation to pay compensation and the difficulty of securing finance.

3. Investment in AR-CDM projects as CSR

If verified CO2 absorption and the globally beneficial functions of forests such as recharging of water resources, prevention of earth and sand runoff, maintenance and protection of biodiversity, mitigation of wind, sand and tsunami damage that are generated by AR-CDM projects are evaluated appropriately, an inflow of funds in the form of funding for corporate CSR activities and individual carbon offsets can be anticipated.

4. Details of small-scale AR-CDM project (Yogyakarta coast)

4.1 General overview of project area and surrounds

The planned project area is a protected region in which production activities are prohibited. Local residents do conduct agricultural activities on the inland side of the proposed project area, but they are not formally permitted to do so and do not have either ownership or usage rights for the land. They grow chilies, melons, watermelons and other crops, but productivity is extremely poor.

4.2 Overview of proposed project activities

The proposal involves planting trees over an area 100m wide and 10kms long (100ha) along the coastline of Bantul and Kulon Progo Regencies in the Special Region of Yogyakarta with the aim of mitigating wind and sand damage and improving agricultural production in sheltered areas. This will be a small-scale AR-CDM project as it involves the removal of no more than 16 kilotons of CO2 per year. The project will run for 20 years from 2008 to 2027, with planting taking place over three years from 2008 to 2010.

4.3 Project participants

Table 1 shows the project participants and the roles they will play.

Table 1. Project participants and roles (during planting period 2008–2010)

No.	Participant	Role
1	Farmers' groups	・Planting operations ・Protect of planted area
2	Watershed Management Office, Directorate General of Land	・Explanation of project to local residents ・Provide various resources for planting including seedlings

	Rehabilitation and Social Forestry, Ministry of Forestry	with assistance of the Ministry of Forestry ・Draft and implement resident participation programs
3	Special Region of Yogyakarta Forestry Agency, Bantul and Kulon Progo Regency Forestry Agencies	・Manage project land ・Monitor for illegal activities
4	Private company (PT. Kutai Timber Indonesia)	・Explain project to local residents ・Implement and oversee planting work ・Manage of project land
5	Sumitomo Forestry Co., Ltd.	・CDM-related administration ・Fund costs of planting
6	Indonesian Ministry of Forestry	・Administration related to local laws ・Fund planting costs

4.4 Project location and boundaries

Figure 2 shows the location of the project land. The first 200m from the coastline is designated a protected area under local government regulation. The protected coastal area is 2,983ha, spans four regencies and is home to ten villages. Most of the area consists of sandy beaches or grasslands (see Photo 1). Part of the area is farmed by local farmers, but much of the farmed area lies outside the protected zone.

Photo 1. Vegetation on planned project land

4.5 Environmental conditions

The soil is basically sand and so contains virtually no accumulated organic matter (carbon). There is ample groundwater at a depth of 4-5m at around 200-300m in from the coast. There have been no

particular reports of endangered species around the project area.

4.6 Tree species

After taking into account soil and climatic conditions, it was decided to plant sheoaks (*Casuarina equisetifolia*) in areas directly exposed to sea breezes, and fruit-bearing cashew nuts (*Anacardium occidentale*) and acacias (*Acacia auriculiformis*) on the landward side not exposed to the salt air (Photos 2 and 3).

Photo 2. Three year-old sheoaks

Photo 3. Cashew nut trees

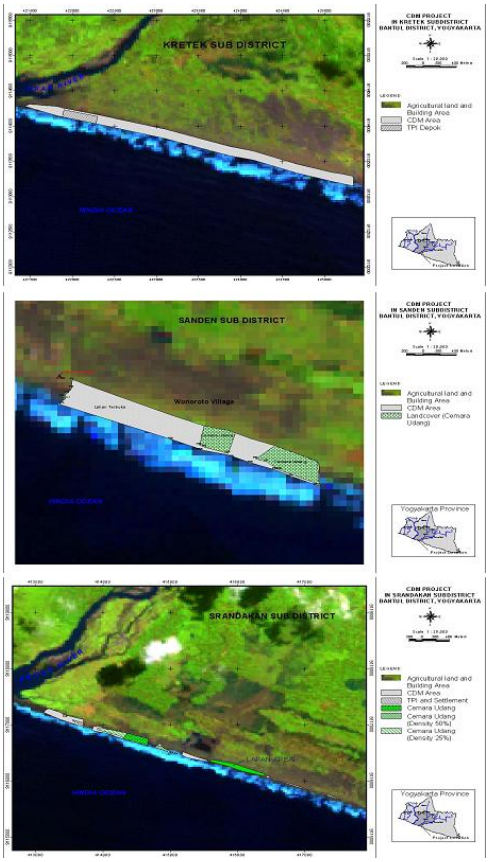

Fig. 2 Land for small-scale AR-CDM project (Bantul Regency, Special Region of Yogyakarta)

4.7 GHG and carbon pool selection

The proposed project targets CO2 emissions only. Because it is a small-scale AR-CDM project, only the above-ground and below-ground biomass has been taken into account when considering the carbon pool inventory.

4.8 Eligible land

Following clarification of the process involved in determining the eligibility of the project land, Landsat images were used to show that the land was not forest at the end of 1989 and when the project started. A site analysis determined the project should involve an area of 100 hectares.

4.9 Technology to be used in small-scale AR-CDM project

(1) Allocation of land to farmers

Discussions are being held with the Ministry of Forestry, landowners and local government on how local residents will be involved with the project, including formally allocating land use rights for 0.05 to 2 hectares of land to each farming household for a fixed period.

(2) Dealing with aridity and strong winds

Drought-resistant tree species will be selected. Water storage facilities, which can also be used for agriculture, will be set up for irrigation to maximize survival of the planted trees. Wind-resistant tree species will be planted on the windward side (coast side) of the project.

(3) Selection of tree species

Sheoaks are both drought- and wind-resistant. Cashew nuts are fairly drought-resistant, and farmers have a strong desire to plant them as they also have high commercial value.

(4) Fertilizers

Actinomycete bacteria (Frankia), which occur on the roots of sheoaks, fixate atmospheric nitrogen, precluding the need for fertilizers.

4.10 Estimated net anthropogenic carbon removal

As this is a small-scale AR-CDM project, leakage will be ignored. Trees will not be felled, so there will be no CO2 emissions associated with this activity, and no N2O emissions as no fertilizer will be used. The baseline will be zero as the area to be planted is grassland. Emissions, leakage, and baseline changes will all be zero, meaning that net anthropogenic CO2 removal will equal the total net volume of CO2 removed. The estimated net anthropogenic CO2 removal over a 20-year period is shown in Table 2.

Table 2. Estimated net anthropogenic CO2 removal over 20 years from project start

Year	1	2	3	4	5	6	7	8	9	10
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Planting Area (ha)	30	30	40	0	0	0	0	0	0	0
Tree Volume (m3)	0	2	18	82	233	485	823	1,247	1,697	2,165
CO2 Removals (ton)	0	4	43	197	561	1,176	2,008	3,063	4,187	5,362
Annual CO2 Removals (ton/yr)	0	4	39	153	365	614	832	1,055	1,124	1,175

Year	11	12	13	14	15	16	17	18	19	20
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Planting Area (ha)	0	0	0	0	0	0	0	0	0	0
Tree Volume (m3)	2,586	3,001	3,389	3,741	4,033	4,297	4,527	4,697	4,813	4,899
CO2 Removals (ton)	6,431	7,509	8,519	9,437	10,205	10,910	11,528	11,975	12,275	12,479
Annual CO2 Removals (ton/yr)	1,068	1,078	1,011	918	768	705	618	447	300	204

4.11 Baseline and application of monitoring methodology

(1) Methodology

Simplified baseline and monitoring methodologies (AR-AMS0001) authorized by the CDM Executive Board will be adopted for determining additionality of project activities. Application of these methodologies is limited to grasslands and cultivated land, which presents no problem for this project as the land involved is grassland. Furthermore, the project area is designated as protected land and future use will not be permitted. Because the grassland cannot be used for any activity whatsoever, there will be no impact on local residents.

(2) Evaluation of additionality

i) Specification of barriers

The proposed project land is protected, which means that economic or production activity of any kind is not permitted under any circumstances. Indonesia has set up the National Movement for Forest and Land Rehabilitation (GERHAN), a government program for restoring forests in specific areas, but only an extremely small amount of funding is allocated at the Regency level for afforestation of areas that need it. The available funding covers the cost of planting only, and there are no funds for managing planted areas. In many cases, the plants are left to their own devices, subsequently die, and the project ends in failure. It may also be difficult for local residents to access tree varieties or species appropriate for a project, there may be no local community body for the project, and there may not even be enough properly trained workers with the right skills.

ii) Baseline

Both the biomass and soil carbon quantities in the project area are virtually zero as the land is beach with sparse growth of grass. There is little spatial variation and the entire project area is more or less uniform. Land use by investors and local communities that would promote carbon fixing is hindered by the barriers mentioned above. This means that without project activities, carbon accumulation in the

project area would remain unchanged; in other words, it would presumably remain at close to zero. The baseline approach used will be, '22(a) Existing or historical, as applicable, changes in carbon stocks in the carbon pools within the project boundary'.

4.12 Environmental and socioeconomic impacts of project activities

As stated above, the project land is designated under local government regulation as a protected area, and no production activities whatsoever are permitted on that land. Implementation of the project must therefore have no environmental impact and cause no shift in production activities.

5. Bromo Tengger Semeru National Park

5.1 General overview of project area and surrounds

Bromo Tengger Semeru National Park covers 57,000ha and was designated as a national park in 1982. While it is a known tourist spot, the area around the crater of Mt. Bromo is a sacred place in indigenous religion and religious ceremonies are conducted there. Repeated forest fires and landslides in the national park have dramatically reduced and devastated the forests. A reforestation program has been underway since 2001, and 2,492ha were planted up to 2006. However, 2,819 hectares were lost to forest fires between 2001 and 2006, which was greater than the planted area. Forest fires can be caused by fires intentionally lit on agricultural land that spread or run out of control, discarded cigarette butts, campfires lit by mountain climbers and fires lit to make charcoal that are not properly extinguished. This AR-CDM project will be implemented on land that has been burnt over by forest fires.

5.2 Project participants

Table 3 shows the project participants and the main roles they will play. The fire brigade is organized such that in principle only public servants are allowed to work as firefighters inside the national park, so we want to encourage the Directorate General of Forest Protection and Nature Conservation in the Ministry of Forestry to establish Forest Fire Control Brigades (known as Manggala Agni).

Table 3. Project participants and roles

No.	Participant	Role
1	National Park Office, Directorate General of Forest Protection and Nature Conservation, Ministry of Forestry	Explain project to local residents, introduce measures to protect and monitor of planted area and combat forest fires
2	PT. Kutai Timber Indonesia	Manage planting operations

3	Sumitomo Forestry Co., Ltd.	CDM-related administration, fund planting and operation
4	Company A	Contribute to planting costs

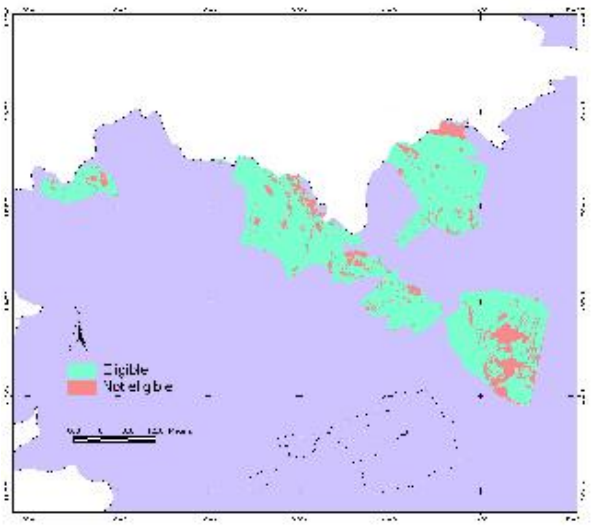

Fig. 3. Land within Bromo Tengger Semeru National Park eligible for AR-CDM project (shown in green)

5.3 GHG and carbon pool selection

The proposed project targets CO2 emissions only. No fertilizer will be used at the time of planting, and so N2O is excluded from consideration. The carbon pool takes into account the above-ground and below-ground biomass and soil carbon.

5.4 Technology used in this AR-CDM project

(1) Planting area and tree species

Approximately 1,200ha will be planted in the ten years from 2008. Mainly native species such as cemarah (*Casuarina junghuhniana*), black wattle (*Acacia decurrens*) and beech varieties will be planted to replace current vegetation. PT. Kutai Timber Indonesia and national park authorities will cooperate to produce the seedlings.

(2) Planting technique

To prepare for planting, an area 1m in radius from where the plant is to be planted will be cleared of weeds and the roots removed. The area around the tree will be cleared of weeds annually until the new trees reach 1m in height. A 30-50m wide strip will be completely cleared of grasses prior to the dry season to create a firebreak.

5.5 Estimated net anthropogenic carbon removal

(1) Emissions and leakage

This includes emissions produced within the project area from the consumption of fuel by motorcycles and cars used in administering the project, trucks used to transport seeds and other materials and fuel for firefighting vehicles. The return trip from the project area to the office in the nearest village is around 20km. Table 4 shows the calculated emissions and leakage.

Table 4. CO2 emissions associated with implementation of project

	VehicleType	Quantity	Fuel Consumption (km/l)	Travel Distance (km/day)	Operating Day (day/yr)	Total Usage	Oil Type	CO2 Emissions (ton)
Emission	Motorcycle	5	30	50	250	2,083	gasoline	4.838
	Car	2	10	80	250	4,000	LGO	10.496
	Work truck	3	5	20	75	900	LGO	2.362
	Transportation	4	5	20	250	4,000	LGO	10.496
	Fire engine	3	5	20	120	1,440	LGO	3.779
	Total	17			945	12,423		**31.970**
Leakage	Motorcycle	5	30	20	250	833	gasoline	0.000
	Car	2	10	20	250	1,000	LGO	2.624
	Work truck	3	5	20	75	900	LGO	2.362
	Transportation	4	5	20	250	4,000	LGO	10.496
	Fire Engine	3	5	20	120	1,440	LGO	3.779
	Total	17			945	8,173		**19.260**
Total		34			1,890	20,597		**51.230**

As indicated in the above table, annual emissions are predicted to total 32 tons of CO2 with 20 tons of CO2 leakage, a total of 52 tons of CO2.

(2) Baseline

The baseline will be set at 15 tons of CO2/ha (with no increase), as the area to be planted is grassland.

(3) Estimated net CO2 removal

Based on the above premise, the amount of CO2 that will be removed is shown in Table 5.

Table 5. Net anthropogenic CO2 removal

Year	1	2	3	4	5	6	7	8	9	10
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Planting Area (ha)	100	220	220	220	220	220	0	0	0	0
Tree Volume (m3)	0	73	582	2,813	8,776	19,247	34,208	53,782	77,496	105,431
CO2 Removals (ton)	0	103	837	4,051	12,629	27,743	49,453	78,061	112,897	154,028
Annual CO2 Removals (ton/yr)	0	103	734	3,214	8,577	15,114	21,710	28,608	34,836	41,131
Emissions (tonCO2)	22	22	22	22	22	22	22	22	22	22
Leakage (tonCO2)	9	9	9	9	9	9	9	9	9	9
Baseline Removals (tonCO2)	0	0	0	0	0	0	0	0	0	0
Actual Net Removals (tonCO2/yr)	**-31**	**72**	**703**	**3,183**	**8,546**	**15,083**	**21,679**	**28,577**	**34,805**	**41,100**
Total (tonCO2)	**-31**	**41**	**744**	**3,927**	**12,474**	**27,557**	**49,236**	**77,813**	**112,618**	**153,718**

Year	11	12	13	14	15	16	17	18	19	20
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Planting Area (ha)	0	0	0	0	0	0	0	0	0	0
Tree Volume (m3)	137,144	171,235	206,512	240,467	270,368	296,056	316,636	333,314	346,129	354,799
CO2 Removals (ton)	200,889	251,514	304,105	355,020	400,331	439,620	471,564	497,625	517,977	532,234
Annual CO2 Removals (ton/yr)	46,861	50,625	52,591	50,914	45,311	39,289	31,944	26,061	20,352	14,257
Emissions (tonCO2)	22	22	22	22	22	22	22	22	22	22
Leakage (tonCO2)	9	9	9	9	9	9	9	9	9	9
Baseline Removals (tonCO2)	0	0	0	0	0	0	0	0	0	0
Actual Net Removals (tonCO2/yr)	**46,830**	**50,594**	**52,560**	**50,883**	**45,280**	**39,258**	**31,913**	**26,030**	**20,321**	**14,226**
Total (tonCO2)	**200,548**	**251,142**	**303,702**	**354,586**	**399,866**	**439,124**	**471,037**	**497,067**	**517,388**	**531,614**

5.6 Baseline and application of monitoring methodology

Afforestation and reforestation project activities implemented on unmanaged grassland in reserve/protected areas (AR-AM0010) will be applied for the proposed AR-CDM project.

5.7 Evaluation and verification of additionality

As a baseline scenario, it is assumed that without project activities the devastation of the national park will continue. Because it is a national park, it can be presumed that it is unattractive to investors. The following barriers were assumed.

・With the current approach, forest fires can be expected to consume a larger area than can be planted.

・The existing planting program only allows for the cost of planting and so the trees cannot be properly cultivated.

・There is no technology for collecting seeds or raising seedlings to rejuvenate the original forest vegetation.

・There is a lack of specialist organizations, technology, facilities and funding to deal with forest fires.

Keeping records of the proposed project activities will ensure there are no negative environmental or socioeconomic impacts.

6. Issues with implementation of the project

6.1 Risk of forest fires

The most effective method of preventing forest fires is preventative action and prompt extinguishing of any fire. Preventative action will include issuing fire alarms, education and training of local residents and park patrols. A forest fire brigade will be formed for early detection and extinguishing of fires, firefighters will be trained and equipment organized and maintained.

6.2 Risk of illegal logging

Illegal logging within the park boundaries is done by people who harvest wood to burn to produce charcoal and denude black wattles (for craftwork). Therefore, increased monitoring and education of local residents about the environment are important measures.

7. Commercial value of projects

7.1 Tree planting funding and selling of credits

(1) Yogyakarta coast

Sumitomo Forestry will provide funding for CDM-related administration, planting operations and overseeing planting. The Directorate General of Land Rehabilitation and Social Forestry of the Ministry of Forestry will bear responsibility for materials to be used in the planting project such as seedlings and associated costs. The plan is that the two bodies will each receive 50% of the credits.

(2) Bromo Tengger Semeru National Park

With regard to planting costs for this project, Company A will be responsible for social contribution activities, and Sumitomo Forestry will bear all CDM-related costs. Allocation of credits is a matter for future negotiation and will be agreed upon prior to completion of the PDD.

7.2 Economic efficiency of CDM planting projects

The two projects are both planned for protected land and so will not be subject to future logging. Ecotourism cannot be reasonably expected in the short term, and so income will consist only of credits earned from the planted land. It would be difficult to position the project as a profitable activity as the value of the credits will be low, processing the credits will difficult, the CO2 sink will be small and thus not produce an immediate effect, and there will be risks associated with the long-term management of the planted area . For the time being, the company will contribute to planting costs as part of its CSR activities. It should be possible to contribute AR-CDM credits to the carbon offset market, but this is not yet clear.

7.3 Proposed method of processing profits from sale of credits

Any profits earned from selling credits from either project could be used to offset the enormous costs of planting, to reform agriculture (through introduction of new crop varieties, agricultural product marketing advice or assistance with developing the local agricultural industry), to aid with education (fixing schools, supplying study materials, establishing a scholarship system for mountain areas, investing in environmental education for local residents and at elementary and junior high schools), or maintenance and repair of local public facilities (roads, mosques, setting up ecotourism bases etc.)

7.4 Issues with implementation of the project

Sumitomo Forestry and PT. Kutai Timber Indonesia (KTI) will cooperate with local residents during the planting stage. Local residents will be paid wages for their work. Full efforts will be made to prevent theft of sheoaks for potting and preventing forest fires, which pose the greatest risks. In Yogyakarta, little work will be required two to three years after planting making management easy.

The greatest risk for the Bromo Tengger Semeru National Park project is forest fires. We plan to urge the Ministry of Forestry to set up a local office of the Manggala Agni, an organization dedicated to forest fire prevention.