

# *Peduli lahan merapi*

**Landcare Indonesia: an integrated community approach to sustainable livelihoods and adaptation to climate change impacts in corridor area villages of Mt. Merapi, Central Java**



By

**Raymond Obunga, Uyung Pramudiyanto, Victoria Mack, Sue Marriott and Luluk Khoirul**

**May 2009**

**For further information contact:**

Secretariat for International Landcare (SILC) Inc  
45 Sproules Road, Wallington, 3221 Vic., Australia.  
**tel:** +61 3 5250 5252  
**mobile:** + 61 418 529 106  
**email:** [smarriott@silc.com.au](mailto:smarriott@silc.com.au), or  
[vmack@silc.com.au](mailto:vmack@silc.com.au)

Institute for Forest and Environment (INFRONT)  
Jl. Magelang km 7, Perum Jombor Baru Blok V/17,  
Mlati - Sleman, Yogyakarta 55285, Indonesia.  
**tel:** +62 274 710 4833  
**email:** [infront\\_office@yahoo.co.id](mailto:infront_office@yahoo.co.id)

Last updated 16 August 2009

**Project Title:**

Landcare Indonesia: an integrated approach to sustainable livelihoods and adaptation to climate change impacts in the corridor area villages of Merapi Mountains, Central Java

**Problem Statement:**

This proposal aims to establish a foundation Landcare project in Indonesia. It will build on the work already completed by the Institute for Forest and Environment (INFRONT) and implement a sustainable agro-silvo-pastoral (ASP) model within the framework of landcare to address the problems of land degradation, poverty and climate change. It is one of the first field-based climate change preparation projects in Central Java with strong links to local and regional planning and policy, hence, it will build local and regional capacity, provide lessons and serve as a local and regional pilot demonstration site.

The corridor area villages between Mt Merapi and Mt Merbabu National Parks represent one of the worst forms of land degradation on Java Island. Almost 90% of the primary vegetation cover has been lost due to agricultural conversion and clearance for firewood which supplies over 80% of energy needs of the area's 27 000 inhabitants. Fuel wood demand has depleted local supply and collection involves high opportunity cost of a day's trekking and encroachment into the forests' reserve areas. The area's population density (494/sq km) is already beyond the land's carrying capacity, and growth continues to put pressure on the ecosystems resources, threatening the survival of key biodiversity and the stability of the vital watersheds – the source of 27 rivers supplying water to millions of people in Central Java.

Agriculture is the area's economic mainstay, and farming is done on steep slopes without any soil and water conservation methods. This has exposed the soils to erosion agents, thereby reducing the productivity of the farms. Agriculture in the corridor area is strongly influenced by annual variations in rainfall caused by the Austral-Asia monsoon and El Niño-Southern Oscillation (ENSO). The Intergovernmental Panel on Climate Change (IPCC) climate models focusing on Bali and Java islands indicate that harmful delays in monsoon rains could more than double in future, from 9-8% today to 30-40% (PNAS, 2007). The predicted higher temperatures, longer dry seasons with lower levels of rainfall patterns are already discernible to the local farming communities as 'abnormal' weather patterns, and whose wide variations in the onsets of both the wet and dry seasons confound the indigenous knowledge systems of *pranata mangsa* (Javanese cultivation seasons). With climate change, the deteriorating erosion levels will likely intensify, and affect water supply through reduced infiltration, and further negatively impact local livelihoods that are based on vegetable crops; these do not only require higher precipitation, but the predicted climate change-induced pests and disease patterns are likely to cause huge crop losses, and severely affect the poor who are less able to substitute crop losses through food purchases. As one of poorest communities, they are already vulnerable living in one of Indonesia's climate change 'hotspots'.

The communities lack the capacity to cope with climate change and its related environmental stresses that threaten their livelihoods through continued resource degradation. Without appropriate adaptation and mitigation interventions, reduced rainfall and higher temperatures will accelerate soil carbon loss, reduce soil fertility and diminish water tables, and thus destroy local farming system and livelihoods. In turn, this will result in higher production costs as farmers are forced to spend more cash on farm inputs and thereby aggravate the poverty cycle these communities are already in.

**Project Goal and Objectives:**

The goal of the Project is to enhance the adaptation capacity of the farming communities and to negative impacts of climate change and conservation of the landscape of the corridor of the Merapi – Merbabu Mountains. The specific objectives of the Project are:

1. To demonstrate an innovative and sustainable agro-silvo-pastoral land use model to enhance ecosystem functions, diversify agricultural production potential and improve household incomes in two pilot villages;
2. To build local capacity to mitigate landscape degradation through awareness campaigns, skill training and policy reforms;
3. To increase adaptation capacity by raising awareness about climate change and its impacts to the local farming communities and stakeholders and enhance skills on mitigation and adaptation measures.
4. To disseminate project results, experiences and “lessons learned” at the local, national and international levels.

**Approach and activities:**

INFRONT has been working with the farming communities in Lencoh and Samiran - two of the corridor area’s ten villages - since 2005, and the proposed community-driven agro-silvo-pastoral land use model is a direct result of the project’s research. This model integrates the cultivation of agricultural crops and multipurpose trees species (MPTS), and is aimed to meet the priority needs of the local people while simultaneously maintaining the biological and environmental functions of the landscape. INFRONT will implement the sustainable land use model, using demonstration plots as well as the Javanese traditional ‘ home gardens’ as adaptation paths in the two pilot villages. In both cases the project will intensify the cultivation of sengon (*Paraserianthes falcataria*), and intercrop with various other hedgerow species, including grasses e.g. Napier grass (*Pennisetum purpureum*) and leguminous shrubs, e.g. *Leucaena leucocephala*, among others. The sale of the timber products and the surplus firewood from this system would greatly improve the household incomes of the farmers and provide additional environmental benefits, notably carbon storage. The project aims to build the capacity of the farmers’ groups on various aspects of simple silvicultural methods to ensure self-sufficiency in seedling production. The project will also promote a range of soil and water conservation technologies, such as physical barriers (e.g. contour bunds, bench terracing), vegetative barriers (e.g. contour hedgerows), various supplementary physical structures (e.g. drainage canals, check dams, soil traps, etc) and agronomic / fertility management measures (e.g. crop rotation, multiple cropping, manuring, composting).

Thus, as a ‘win-win’ strategy, the model addresses both the **mitigation** and **adaptation** elements by contributing to green house gas emissions (GHG) reductions, and also assists in adaptation to climate change impacts; furthermore, it combines important technology transfer and capacity building elements – the major barriers to climate adaptation and carbon projects. It will serve as a farmer field school, promote farmer-to-farmer learning from small scale, tested methodologies for integrating and scaling up the use of traditional knowledge, help raise awareness, enhance skills and institutions for the benefit of sustainable land use.

While estimates for increased carbon storage due to increased intensification in Indonesia have been conducted in Sumatra and West Java under different management systems, none exists for the agro-ecological systems of the corridor area. The pilot project will measure the flows of CO<sub>2</sub> sequestered per year from reforestation activities to determine carbon stocks sequestered; it will consider the other elements of eligibility (e.g. maximum area of land, average land holding, and the maximum number of households likely to participate in a single project) to help it qualify as a small-scale CDM project: under the clean development mechanism (CDM), a reforestation project does not qualify as small-scale if it sequesters more than 8000 tonnes of CO<sub>2</sub> per year. Further, capacity building to farmers on how to measure carbon stocks and the issues of relative high costs of transaction should help them overcome constraints to taking advantage of emerging carbon markets.

**Beneficiaries / Target group:**

About 7000 small-scale farmers in the two villages of Lencoh and Samiran (1616 households), will benefit during the pilot phase. The group is characterised by high poverty levels above the national average, has one of the highest proportions of those living below the poverty line in Java; other

factors are: high unemployment; high rate of drop outs; low literacy levels; lack of skills; lack of alternative sources of 'off farm' jobs. Culturally, the population features large extended families and high dependency ratio, requiring greater resources for sustenance.

**Expected outcomes:**

*Socio-economic benefits:* increased total production of fuel wood and fodder to meet local deficits; employment provision and diversification of local economy through value-addition processes of the various agroforestry products (timber, fibre, etc); training of over 200 community facilitators to catalyse positive behaviour towards sustainable land use; incomes from agro-tourism due to reforestation-enhanced landscape aesthetic values.

*Environmental benefits:* reduced encroachment on forest reserve resources through development of firewood and fodder resources; increased soil carbon stocks due to improved land management; erosion control and hydrological benefits in the watersheds with increased rainwater infiltration; improved soil fertility; conservation of agro-biodiversity at farm level and associated improved biodiversity across the landscape; provision of physical services in the form of wind/storm protection, increased carbon organic matter and above-ground biomass by use of soil conservation measures; future preparation of payment-of-environmental services (PES) schemes and CDM pilot projects for carbon trade.

**Budget:**

An indicative total budget over three (3) years is suggested, with the main expenditure being on: staff; facilitators and consultants; office expenses and travel; field demonstration plots; farmer to farmer training; exchange and dissemination of project experience; and the establishment of a Landcare Association or Alliance in Indonesia.

**Special considerations:**

The project fits into the government's objective to reduce poverty in its current medium-term plan. It is also in line the government's commitment in medium-term plan to achieve the Millennium Development Goals (MDGs) by 2015. The ASP model offers a platform for estimating carbon stocks, the results to serve as useful tools for developing a pilot small scale Clean Development Mechanism (CDM) scheme to benefit the local communities.

The pilot project has the following supportive national and international agencies to share knowledge, skills and experiences with: Gadjah Mada University's Forestry Faculty, the Secretariat for International Landcare (SILC) Inc., Landcare International (LI), Australian Landcare International (ALI) Inc., and the Landcare Foundation of the Philippines (LFP) Inc.

**Important assumptions:**

It is assumed that land degradation, poverty and climate change impacts are critical priority issues in the corridor area and all stakeholders are willing to contribute towards ecosystem restoration and livelihoods improvement through mitigation and adaptation measures. Furthermore, experience gained from the pilot project activities in the two villages is not unique to the area but replicable in the entire corridor area and elsewhere in the region and beyond.

**Why Landcare?**

Andrew Campbell<sup>1</sup> in an email to the Chairman of Landcare International in October 2008 eloquently summed up the potential global role of Landcare:

The looming global food crisis, converging with (and being exacerbated by) rising energy and nutrient prices, water scarcity in many regions and underlying climate change, further accentuated by subsidies for first-generation biofuels, especially in the US and EU, will place more pressure on local farming systems and resource management skills than ever before. The

---

<sup>1</sup> Andrew Campbell is Managing Director of Triple Helix Consulting Pty Ltd. He was Australia's first National Landcare Facilitator (1989-92) and CEO of [Land & Water Australia](http://www.triplehelix.com.au/about.html) (2000-2006), <http://www.triplehelix.com.au/about.html>

need to prevent further land degradation and to rehabilitate once fertile lands that have been degraded has never been more acute. This will require smart, resilient farming systems adopted on a widespread scale. We have to close the wide gap between the best farmers and the average, and we need to make huge improvements in preventing the worst practices and the long term costs they impose on the resource base of future generations.

All countries face major challenges and very difficult policy choices. There is a disturbing trend to start to see food production and environmental protection as competing objectives — a very short-term and self-defeating approach. There is a grave risk that local communities feel helpless and impotent in the face of big external forces over which they have little influence, and about which they feel confused and hear conflicting signals. It will be difficult for governments to make the decisions that will be needed over coming decades while bringing their people with them, and giving local communities practical options and support.

A framework through which governments and communities can work in partnership — with industries and NGOs as appropriate — is a potent tool. It is essential if we are to tackle the challenges of climate change, and sustainable food production and resource management, at the most crucial grassroots level. If such a framework already exists, is trusted at a community level and already has a good track record (like Landcare), then in my view that is an invaluable asset that should not be squandered, but in fact should be built upon.

One of the beauties of Landcare is that it combines a focus on farming systems and land use practices with an explicit acknowledgement of the social and broader ecological (or catchment) context in which they are situated. In my view we underplay the social learning elements of Landcare and the effect it can have on social norms within a given community. Landcare can provide a useful mechanism through which we work through the big challenges we face, down at a meaningful local level. It can be an efficient way for governments to engage with a cross-section of landholders, through which to deliver new forms of assistance for sustainable land management.

□