

Cooperation Fund for the Water Sector

Pilot Demonstration Activity

Activity Title: Technology Transfer in the Application of Vetiver Systems (VS) for Slope Stabilisation, Erosion Control and Initiating Sustainable Upland Farming Systems to Citarum Riparian Community Groups	
Proposer (Name, Div/Dept): David Booth MBE, Indonesian Vetiver Network (IDVN) Coordinator & Director of Ekoturin Foundation (East Bali Poverty Project [EBPP])	
Request Date: 13 December 2007	
Country (DMC): Indonesia	Region: Southeast Asia Regional Department
Activity Proposed Start Date: March 2008	Activity Proposed Duration: 9 months
Cost Estimate: USD 65,000	
Implementing Organization Contact: David Booth MBE, Indonesian Vetiver Network (IDVN) Coordinator & Director of Ekoturin Foundation (East Bali Poverty Project [EBPP]), Tel: 62-361-410071; Fax: 62-361-430785; Email: info@eastbalipovertyproject.org	
Consultant Identified? NA	If so, Consultant(s) Contact:
ADB Activity Officer - name, position, division, telephone and e-mail:	Christopher I. Morris, Senior Water Resources Specialist, Agriculture, Environment and Natural Resources Division, South East Asia Department, ADB, +63-2-636343, cmorris@adb.org

Short Description:

1. Background and Rationale:

Vetiver systems are now in use in over 100 countries providing effective, efficient, economical and sustainable solutions to the problems faced in the Citarum River Basin.

What is Vetiver?

Vetiver is a clump grass with sterile seeds and cannot become a weed;
It is perennial and permanent and only grows where we plant it;
It forms a dense, permanent hedge preventing soil loss from runoff;
It has dense root system penetrating to at least 3 meters and leaves that can grow 2-3 cm per day;
It grows in most soil types irrespective of nutrient status, pH, acid sulphate, salinity, etc;
It should not compete with plants it is protecting;
Vetiver improves soil fertility and water quality;
It can grow again after being burnt;
It can survive long periods of drought and submersion in water for over 50 days;

The type of Vetiver which is used for soil and water conservation in India, China, Southeast Asia, Africa, Australia, America and around the world is *Vetiver Zizanioides*, specifically the South Indian genotype. Another genotype from North India is ineffective for soil and water conservation and can become a weed. See The Vetiver Network (International) website at www.vetiver.org

2. Objectives:

The Objectives of the Citarum River Basin Vetiver Project is to coordinate and empower stakeholders and NGO's through transfer of appropriate vetiver technology within an initial period of six months and the goals of wider replication over a longer period to: control water and soil erosion, protect natural resources and introduce sustainable upland farming systems to improve livelihoods and increase income by:

- Introducing and raising awareness of the effectiveness of vetiver (*Vetiveria zizanioides*) systems (VS) in water, soil and natural resources conservation, soil and water erosion control, river basin management, sustainable agriculture, slope stabilization, disaster mitigation and other numerous beneficial uses;
- Hands-on training for key stakeholders on vetiver characteristics, vetiver planting, propagation, maintenance and management on a "see by example" basis and interaction with farmers groups in other regions of Indonesia who have successfully converted arid mountain slopes into flourishing vegetable gardens;

The views expressed in this paper are the views of the authors and do not necessarily reflect the views or policies of the Asian Development Bank (ADB), or its Board of Directors, or the governments they represent. ADB does not guarantee the accuracy of the data included in this paper and accepts no responsibility for any consequences of their use. Terminology used may not necessarily be consistent with ADB official terms.

- Establish pilot projects with key stakeholders in some of the steeper basin regions and empower local NGO's and key stakeholders to successfully replicate/extend VS training and the above technologies to other farmers groups in the Citarum River Basin;
- Initiate sustainable upland organic farming systems for food security and eventual economic development
- Develop a core group from the stakeholders and NGO's as "Vetiver Leaders" to establish a vetiver Network to disseminate vetiver systems technology throughout the whole Citarum River Basin;
- Introduce a core group of successful vetiver systems trainees from the stakeholder groups and NGO's to the wider scope of vetiver grass technology by involving them in the first Indonesian Regional Vetiver Conference in 2008

3. Scope of Work / Description of Activities:

Prior to initiating any vetiver training courses, the most at risk areas of the steeper sections of the Citarum River Basin must be identified from documentation, photos, population statistics and ADB overview of the key problems being faced to then evaluate the key areas where VS can become an invaluable element of the sustainable solution.

The key activities are envisioned as follows:

1. Visit by IDVN team to the Citarum to (a) see the nature of the basin, (b) meet the key stakeholder groups and NGO's active in the basin to identify/determine the potential group of trainees and (c) review of "stakeholder champions" to participate in the PDA
2. PRA community surveys to determine demographic data, present livelihoods and aspirations etc
3. Coordinate Stakeholders in Citarum and review of suitable pilot project areas
4. Field visit to EBPP's successful vetiver-based poverty alleviation programme on the eastern/north-eastern slopes of Mounts Agung and Abang by local Citarum NGO's and selected stakeholder trainees for introduction to vetiver systems, and hands-on training and interaction with communities in east Bali who have transformed their lives from basic subsistence cassava & corn farmers to economically developing communities with vetiver slope stabilisation as the core AND introduction to community sustainable development projects in a permaculture-type system.
5. Extended "train the trainer" training course for Citarum NGO's with field trips to wide ranging vetiver projects throughout Bali to empower them to eventually train farmers groups throughout the Citarum River Basin
6. Design of pilot projects in selective steep basins where slope stabilization is critical and in need of sustainable upland farming systems
7. Land preparation that includes bush clearance and possible terrace establishment
8. Establishing vetiver nurseries in all of the key areas to ensure sufficient high quality planting stock is available and to allow for replicating in other areas due to fast growth of vetiver
9. Pilot projects implementation
10. Develop long term plan for extension use of vetiver in appropriate key areas in Citarum in conjunction with stakeholder groups, local NGO's and ADB representatives and follow up with budget.
11. Monitoring of pilot projects after 1 month, 3 months and 6 months. The first month is the most critical for good vetiver growth, dependent on correct watering and maintenance. Within 3 months, vetiver can be harvested from nurseries for transplanting on the projects.
12. Pilot results determination would be expected within 6 months of the start on site of actual vetiver planting.
13. Introduce the concept of community-based sustainable organic farming with pilot projects to include, but not be limited to, land improvement, local manure and fertiliser projects, and all the stages from seedling planting to seed saving for sustainability
14. Participation in Indonesian Vetiver Conference with the theme "Vetiver Systems for Environmental Protection and Disaster Mitigation". This is a great opportunity for representatives from local NGO's and "stakeholder champions" to learn about all of the key benefits of Vetiver Systems, interact with Indonesian practitioners from the environment, agriculture, engineering, water/sanitation, mining and other sectors.
15. Follow up monitoring and coordinating development of potential new vetiver project sites to eventually protect the whole of the Citarum River Basin.

4. Implementation Schedule, Institutional Management Arrangements, and Proponent Qualifications:

The implementation schedule is shown below. A total of ten (10) months will be required to implement the first pilot project.

Management supervision and control will initially be by IDVN/EBPP team, working with the PDA and selected trainees, until the successful establishment of the pilot projects and vetiver nurseries in all of the agreed locations with the goal of empowering the selected "stakeholder champions" and NGO's to take responsibility for day to day management of the vetiver planted areas and the organic farming groups. Capacity building training will be ongoing and systems initiated for the replication of pilot projects by the initial trainees.

The documentation and systems developed in the model projects of this first stage will be designed so that they can be completely replicated but consultation on design of regions that are different in nature and scope will require expert design input from IDVN/EBPP.

NO	ACTIVITIES	MONTH												
		1	2	3	4	5	6	7	8	9	10			
1	Visit by IDVN team to the Citarum													
2	PRA community surveys to determine demographic data, present livelihoods and aspirations etc													
3	Coordinate Stakeholders in Citarum and review of suitable pilot project areas													
4	Field visit to EBPP's successful vetiver-based poverty alleviation programme on the eastern/north-eastern slopes of Mounts Agung and Abang by local Citarum NGO's and selected stakeholder trainees to include community sustainable development projects in a permaculture-type system													
5	Extended "train the trainer" training course for Citarum NGO's													
6	Design of pilot projects in selective steep basins where slope stabilization is critical and in need of sustainable upland farming systems													
7	Land preparation that includes bush clearance and possible terrace establishment													
8	Establishing vetiver nurseries in all of the key areas to ensure sufficient high quality planting stock is available and to allow for replicating in other areas due to fast growth of vetiver													
9	Pilot projects implementation													
10	Develop long term plan for extension use of vetiver in appropriate key areas in Citarum in conjunction with stakeholder groups, local NGO's and ADB representatives and follow up with budget													
11	Monitoring of pilot projects after 1 month, 3 months and 6 months													
12	Pilot results determination would be expected within 6 months of the start on site of actual vetiver planting.													
13	Introduce the concept of community-based sustainable organic farming with pilot projects to include, but not be limited to, land improvement, local manure and fertiliser development, and all the stages from seedling planting to seed saving for sustainability													
14	Participation in Indonesian Vetiver Conference with the theme "Vetiver Systems for Environmental Protection and Disaster Mitigation"													
15	Follow up monitoring and coordinating development of potential new vetiver project sites to eventually protect the whole of the Citarum River Basin													

5. Expected Results (outputs/outcomes/effects/impacts):

By preventing erosion and conserving soil and water, the established vetiver hedges will contribute to a rapidly improving environment from the upper slopes of the basin down to the bottom, and once implemented on a large scale, should eventually prevent pollution entering the Citarum River.

Hence, whilst benefiting the natural environment, fragile ecosystems and reducing pollution to the Citarum River, the stakeholder communities should gain multiple benefits from more stable land, healthier environment, reduced air pollution due to absorption by the vetiver leaves, carbon sequestration and many economic benefits from crop outputs, animal fodder from vetiver leaves, dried vetiver grass to be used for roof thatching and the potential of developing vetiver handicraft businesses from both the roots and the leaves.

6. Measurable Performance Indicators:

Performance indicators are directly related to the activities shown in the implementation schedule above. Benchmarks are (a) Completion of training of the stakeholder & NGO trainees to a standard where all participants completely understand what they are doing, why they are doing it, what they are meant to achieve and how to ensure they can continue on their own with minimum outside input afterwards. Follow up monitoring and evaluation will be a continuing process until all participants demonstrate they are confident, capable and able to continue on their own in the knowledge that the ultimate goals are overall environmental improvement, nutritious food security and eventual sustainable economic development; (b) Successful establishment of the pilot vetiver planting projects and nurseries (c) Growth of dense vetiver hedges and visual evidence of vetiver properties in reducing water runoff, trapping sediment and enabling crop planting to be successfully achieved in the terraces between the vetiver hedges; and (d) Well established community vetiver teams who are competent in implementing vetiver systems without further supervision in their own land and of training other community stakeholder groups in all the processes they have learnt.

7. Stakeholders Participation:

As stated in the Scope of Works and Implementation Schedule, the stakeholders are involved in the project from its inception. The stakeholders are all of the community groups, local NGO's, PDA and the River Basin Authority. Their participation and complete involvement from the outset is essential, especially how they perceive the ultimate benefits, which is expected to foster a complete sense of ownership through empowerment.

8. Scope for Replication/Use in Other River Basins

Vetiver Systems Technology and solutions can definitely be replicated in other river basins subject to expert design to accord with the problems to be solved and the outcomes expected for the populations living in the river basin region. The vetiver plant has the great benefits that (a) it only grows where you plant it; (b) it cannot become a weed,.

9. Costs Estimate

NO	EXPENDITURES CATEGORIES	TOTAL (US\$)
1	Vetiver slips for planting in agreed pilot location and community nurseries	5,000
2	Specialists:	
	a. Visit by IDVN/EBPP team to the Citarum (socializations, dissemination of information and selection of stakeholder champions)	12,505
	b. Visit & consultation fee for TVNI expert, Dr Paul Truong	5,500
	c. Coordinate Stakeholders in Citarum and review of suitable pilot project areas	275
3	PRA community surveys to determine demographic data, present livelihoods and aspirations etc: inputting data and analysis	3,846
4	Training, workshops, seminars and awareness programmes	
	a. Field visit to EBPP's successful vetiver-based poverty alleviation programme on the eastern/north-eastern slopes of Mounts Agung and Abang by local Citarum NGO's and selected stakeholder trainees to include community sustainable development projects in a permaculture-type system	11,769
	b. Contribution towards IDVN Indonesian Vetiver Conference with the theme "Vetiver Systems for Environmental Protection and Disaster Mitigation"	7,500
5	Equipment, supplies and documentation: Computer work, equipment rental, stationeries, etc	2,747
6	Project management monitoring and evaluations	7,875
	Sub-total	<hr/> 57,017
	10% for contingencies	5,702
	TOTAL	<hr/> 62,719