

Editorial
From China with Love

During 6-12 November 2001, Dr. Sumet Tantivejkul, Secretary-General of the Chaipattana Foundation in his capacity of the Chairman of the Continuing Committee (CC) of the International Conference on Vetiver (ICV), together with the Editor, in his capacity of the Secretary of CC/ICV, at the invitation of Prof. Liyu Xu, the Coordinator of the China Vetiver Network, traveled to Guangdong and Fujian Provinces, People's Republic of China, to make suggestion and decision on the venue of the Third International Conference on Vetive (ICV-3). They have made a visit to observe R&D on vetiver at various places in both provinces, and to discuss with the Chinese authorities, particularly the cities of Guangzhou in Gaungdong, and Fuzhou in Fujian, with respect to their infrastructures and their support for the organization of ICV-3.

The Editor wishes to put in record the warm hospitality he and Dr. Sumet received from Chinese vetiver scientists. They have learned a lot on the extensive investigations of the appellation of the vetiver system in both provinces. There is no doubt in their minds that China has progressed tremendously in the area of vetiver system. They were impressed with the briefing on vetiver R&D organized by Guangdong Provincial Grass Industry and Environment Association. Equally impressed in Guangdong Province were the demonstrations on the use of vetiver for stabilizing gargage landfill at Tatie Mountain, embankment at Conghua Highway, and Huonglongtai Reservoir, and a thrill in seeing a hugh mountain slope stabilization at Huizhou University, and Vetiver Eco-engineering Project at Xingfengjang Reservoir.

In Fujian Province, they were impressed with the briefing at the Soil and Water Conservation Office on various R&D on the vetiver system, and the use of vetiver in stabilizing slope of Yongchun and Fuquan Highways, and embankment stabilization at Fujian Provincial Agricultural School.

It gives the mission members a hard time to decide on which city to hold ICV-3 since both cities are equally competent in most respects. However, a decision was finally made by the Mission, which has now been passed on to the members of the CC/ICV for their final agreement. Official announcement as to the venue of ICV-3 will be made in Vetiverim 20.

The Growing Vetiver Movement in Vietnam*

This is a story of earlier plans not being followed in detail, of specific goals not being met but still, it is a story of purposes being accomplished.

In my wrap-up upon returning from Vietnam in early 1999 (17 February 1999, at <www.vetiver.org/VetiverNetworkVietNam/News/PostTirpWrapUp.htm>), I wrote, 'individual initiative is the exception, not the norm. In Vietnam it would be difficult – it is difficult – for a "champion" of vetiver to rise up as has occurred in a number of these countries. Well...the exception has seemingly occurred, a champion of vetiver has arisen!

You will also see back then that I wrote 'There is a risk the work [of the seminars, etc.] might be wasted, its energy squandered, if that energy is not soon harnessed to visible, satisfying action.' Well... with a champion, and others, vetiver as a movement is now 'happening' in Vietnam, in 2001! Following are some highlights:

1999: Vetiver was 'happening' in Hghe An Province. As related in that earlier report, the Gardeners Association (Hoi Lam Vuon) of Hghe An (with its Chairman, Nguyen Hong Son), was enthusiastic about getting going with vetiver. In April, at Vinh (a provincial city), they were planting vetiver from the National Institute of Soils and Fertilizers in Hanoi. In June, a team went to Thailand for about 10 days, bringing back on their return a truckload of a dozen varieties of vetiver for multiplication, to create a new 0.4 ha nursery.

2000: The year 2000 was mostly spent in discussions and some planning – I was performing my 'coordinator' function – but there was little work with vetiver *per se*. Most important was that Paul Troung was preparing for his second trip back to Vietnam.

2001: This year is turning out to be a banner year! First of course there was Paul Truong's trip in January. Read Paul's full report of his trip to both Vietnam and southern China in Vetiverim 17:8-10. Stemming from that (Paul was invited for the purpose) are significant new efforts from two centers:

- That 'champion of vetiver' I mentioned above: Mr. Pham Hong DucPhuoc of the University of Agriculture and Forestry at Thu Duc, Ho Chi Minh City, and his colleagues and students, have initiated projects in Thu Duc, and also in Gia Lai and Dak Lak provinces in the southern highlands.
- Mr. Le Viet Dung and Mr. Luu Thai Danh of the University of Can Tho are setting up project sites in the Mekong River Delta area, including An Giang, Dong Thap, and Can Tho provinces.

Vetiver system is now an officially recognized measure for the control of soil erosion, slippage, and waterway bank collapse, in a 'Decision' signed by the Minister of Agriculture and Rural Development (see below – Ed.) This obviously opens the way for broader application of VS in Vietnam.

And finally, Paul Truong is preparing for yet another trip back – his third – in January, and more good things are bound to come out of that.

Yes, this is turning out to be a banner year!

Vetiver Counters Soil Erosion in Vietnam*

Recently, the Minister of Agriculture and Rural Development of Vietnam announced a 'Decision' with regard to the acceptance of broad-scale application of vetiver grass to protect sloping land against soil erosion. The following article, translated from Vietnamese, has been published in the principal newspapers *Sai Gon Giai Phong (Liberated Saigon)* and *Nhan Dan (The People)*, and is also shown at <www.vetiver.org/VetiverNetworkVietNam/1999-2001.htm> on the website of Vetiver Network Viet Nam.

"Vetiver is a kind of perennial grass with roots 2-3 m in length, stems 1.5-2.0 m high, thin erect leaves 40-90 cm long, and 0.4-1.0 cm wide, with more than ten varieties. The roots of the grass by penetrating deeply enhance its function of countering erosion and collapse, and filtering polluted water in the soil.

The stems form a belt that block flying sand. The roots are fragrant, with distillation yielding 2-3% of a valuable essential oil. The young leaves are fodder for livestock. The roots along with the stems and leaves can be used to make various artistic handicrafts, pulp for paper, and pressed panels.

For ten years now, the National Institute for Soils and Fertilizers has been carrying on experiments using vetiver grass to create hedgerows to protect the soil in cultivation on sloping land in a number of midland provinces of the North. The Institute of Agricultural Sciences of the South has also researched the adaptability of vetiver and its ability to counter soil erosion in the eastern part of the South. These two research efforts have been evaluated highly by the Science and Technology Council of the Ministry of Agriculture and Rural Development

The 'Decision' granting authorization to apply vetiver grass on a large scale opens up many prospects in fighting the collapsing of riverbanks, and of roads in sloping areas. We have learned that almost four months ago, the agricultural chemical and commercial company Thien Sinh and the University of Agriculture and Forestry of Ho Chi Minh City have cooperated in the field tests of

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multiplying vetiver so that later on it can be applied on a broad scale. The intention is that by July 2002 there will be 150 ha of planting material to supply to various places.

Presently, the technology of applying vetiver grass is being experimented with in a number of works in Can Gio District, on National Highway 14. The provinces of Dong Thap and An Giang have established projects to plant vetiver grass against the collapse of the banks of waterways.”

First China Railway Technology Identification and Evaluation Conference^{*}

The First China Railway Vetiver Technology Identification and Evaluation Conference was held in Nanjing from 18 to 20 October 2001. Around 40 participants attended the Confer of the National Railway Ministry, Second Survey and Design Academy of National Railway Ministry, and the Fourth Survey and Design Academy of National Railways Ministry, the Shanghai Railway Bureau, the Railway Office of Jiangshu Province, Director of the Xingchang Railway Headquarters, Manger of the Xingchang Railway Co. Ltd., and Director of the Xingchang Vetiver Slope Stabiliztion Co. Ltd.

On 18 October, Prof. Liyu Xu, Coordinator of the China Vetiver Network introduced the characteristics of vetiver and vetiver research and development in China and in the world. Then all participants went to Huangqiao to observe the demonstration site. The railway of Huangquiao section was constructed at the end of 2000 and planted with vetiver grass in April 2001. About three months after planting the grass grew up and exerted a good protection function. Four months after planting the grass reached 2 m high. The well-established vetiver hedges gave all participants deep impression and even a surprise. During the planting stage some railway engineers did not believe that the grass would protect this kind of slopes formed by pure silts derived from deep farm land on the alluvial plain, while the farmers said that rocks could hardly protect the slope, not to mention the grass. The railway had to pay the farmers for crop loss caused by sediments from the newly constructed railway embankments. The railway engineers had to use huge plastic sheets to cover the whole embankments.

On 20 October, the Manager of the Xingchang Vetiver slope Stabilization Co., Ltd. introduced the background and the process of the establishment of the demonstrations, and a hot discussion was followed. Then a leading identifying group was formed and the group prepared identification and evaluation comments that fully approved the success of the demonstration and suggested the technology to be tested in more locations and different railway slopes in order that vetiver technology could be extended faster and smoothly to the whole railways in southern China.

^{*} *By Liyu Xu, Coordinator, China Vetiver Hetwork, Nanjing, China <vetiver@jlonline.com>*

During the Conference the Chinese edition of Diti Hengchaovanich's PRVN Technical Bulletin No. 1998/2, Vetiver Grass for Slope Stabilization and Erosion Control, was distributed.

It is planned that such a conference will be organized in two more cities, Huangqiao, and Yixin. At each place, local engineers will be invited to attend the conference so that more people could be familiar with vetiver. Meanwhile, the report on the first test of vetiver technology for railway protection in China will be prepared and released soon.

Vetiver System for Xinchang Railway Embankment Stabilization**

There has been a great progress in the application of the vetiver system (VS) for highway construction since the conference on "Vetiver Bio-engineering Technology for Erosion and Sediment Control and Civil Construction Stabilization" held in Nanchang and organized by China Vetiver Network (CNVN) in 1999. Large demonstrations were established in several provinces in southern China, many vetiver companies were established by soil conservation institutions, highway bureaus, and private sectors. In some provinces, the application of VS has become official regular activities adopted for highway embankment protection. For example, the Fujian Provincial Highway Bureau released an official document requesting all highway institutions to use VS, while the Zhejiang Provincial Highway Association established an official vetiver company to extend VS. The National Highway Research institute incorporated VS into national highway greening regulation to be finally approved by the Communication Ministry.

There was a difference of using VS on highways and railways in China. Each section of the highway institutions, regardless of the level (national, provincial, county, or township), is entitled to use VS so long as the authority accepts the VS. However, no railway institution can start vetiver planting until they got permission from the top railway organization via Railway Survey and Design Academies. It means that if somebody wants to use VS, he or she has to pass through various doors for permission. With efforts from Xinchang Railway Company located at Nanjing the capital of Jiangsu Province, the first railway vetiver company was launched in 2001 and started to use VS at the same time.

1. Background of Xinchang Railway

The Xinchang Railway Company has been responsible for construction the Xinchang Railway, with a total distance of 638 km, since 1998, to be completed in 2001 with total budget of 6,230 million Yuan. The railway is located in East China, from Xinyi of Jiangsu Province to Changxing of Zhejiang

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Province. Most of the land the railway passed is plain or low land. The embankment was constructed with pure silt of alluvial material.

To introduce VS to the whole Xinchang Railway and to other railways, the first large demonstration was arranged in Huangqiao section (around 32°20N, 120°30E) where the road materials came the deep soil derived from Yangtze River with north sub-tropical climate (Table 1). The absolute maximum temperature was 38.8°C and the lowest temperature was -12.5°C. The annual rainfall was 1021.9 mm, of which 55.8% was distributed from June to September. The earth material mainly contains fine sand that is very easy to be eroded by either water or wind (Table 2). When the embankment was constructed the railway institution had to use plastic sheets to cover the whole slope against erosion. To protect the railway company had to use rocks to make wall and skeleton and then to spray grass seeds on the place between the skeleton. The seed spray usually costs 9 Yuan/m² and needs to be maintained for one year, and to spray water every three days in the first month since seeding, if there is not

Table 1. Air and soil temperature

Depth (cm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
0	2.9	4.9	10.1	17.2	23.3	28.1	31.9	32.0	25.8	19.3	11.7	5.1	17.7
5	3.2	4.7	9.0	15.5	21.1	25.7	29.8	29.9	24.6	18.5	11.6	5.5	16.6
10	3.6	5.0	9.0	15.0	20.4	25.0	29.1	29.4	24.5	18.6	12.0	6.0	16.5
15	4.0	5.1	8.9	14.8	20.1	24.6	28.6	19.1	24.6	18.8	12.5	6.4	16.5
Air	1.9	3.8	8.0	14.9	19.2	23.9	27.7	27.5	22.5	16.8	10.6	4.4	15.0

enough rainfall, while the rocks cost around 60 Yuan/m³. To save money and promote a quick vegetation cover a section for over 5,000 m² was designed to use vetiver.

Table 2. Soil mechanical analysis of the field

Depth (cm)	Particle size (mm, %)			
	>0.05	0.01-0.05	<0.01	<0.001
0-12	29	43	28	15
12-49	31	45	24	13
49-71	31	47	22	13
71-100	26	45	29	17

2. Vetiver Planting and Management

On 20 April 2001 vetiver Planting materials comprising 120,000 tillers were transported from Dabie Mountain where farmers produced them and contracted vetiver projects since 1998 in order to alleviate poverty and to protect environment.

When transported to the railway construction site the stems of planting materials were about 50 cm long and the roots were about 15 cm long. There were 15-100 tillers per clump. The tillers were adhered

together with loamy soil. To increase survival rate and reduce water loss the tillers were cut at 20 cm and then separated into small clumps that contain 3-6 tillers. Unfortunately some tillers were still around 40 cm long because the local farmers wished to save energy and cut the seedlings as little as possible.

As the soil contains large proportion of silt particles and very little clay, it lacks water storage capacity. To moisten the roots and keep moisture for a longer time the roots were dipped with loamy-clay paste very thoroughly just before planting. At the same time ditches with 20 cm depth were prepared along straight contour lines. To avoid disturbing the slope too much the width of the ditches was limited to around 10 cm with a special designed digger. Vetiver was planted with a spacing around 10 cm x 140 cm (Fig.1). Because the soil lacks plant nutrients (Table 2), a little of compound chemical fertilizer (N 15%, P₂O₅ 15% K₂O 15%) was applied with an amount of 25 g/110 m ditch. After the application of fertilizer it was covered with 3 cm of soil to avoid direct contact between roots and fertilizer.

Since there was little rainfall before planting the soil contained some moisture; irrigation was provided just when the planting was finished on 22 April. The whole planting process lasted two days. There followed with rainfall the next day and then two cloudy days.

Investigation on 25 May 2001, one month later, found only 40% of the planting materials survived. On 30 May, about 30,000 tillers were transported from Suzhou to the demonstration site and planted for the second time. The re-planting was carried out on 31 May 2001. The weather was cloudy. Watering was done on the same day just after the planting.

For the second planting the tillers with clay soil were obtained from the nursery. As it was quite difficult to separate tillers even if the clumps were soaked under water. The tillers together

Table 3. Soil nutrient analysis of nearby farm field

Depth (cm)	O.M. (g/kg)	T-N (g/kg)	T-P ₂ O ₅ (g/kg)	S-N (mg/kg)	S-P ₂ O ₅ (mg/kg)	S-K ₂ O (mg/kg)	CaCO ₃ (g/kg)	CEC (Me/100g soil)	PH (water)
0-12	10.0	0.87	1.66	100	7	97	6.9	9.4	8.1
12-49	8.3	0.67	1.51	79	1	51	9.2	9.3	7.7
49-71	4.5	0.38	1.57	70	1	73	16.3	10.3	7.8
71-100	2.0	0.25	1.25	57	2	61	58.8	6.1	8.1

O.M. = organic matter, *T-* = total, *S-* = Soluble

With clay were separated with knives. The tillers were cut to the length of 20 cm long. Watering was also provided once the planting was finished. Later, the third planting was done on 26-27 June 2001 to insure that vetiver hedges could be formed smoothly. The planting materials were also obtained from Dabie Mountain.

In addition to three times of irrigation after planting and re-planting, additional irrigation was provided twice. Besides, diluted pig manure was applied on 28-29 July. A total of 15 kg of carbamide

was applied on 17 August. It is worth to indicate that once vetiver grew up weeds also grew when investigated on 21 June, two months after planting, since vetiver improved micro-ecological condition. To avoid effect of weeds, weeding was done on 26 July. But the roots of weeds remained in soil to control erosion.

3. Function on Erosion Control

Generally, the grass that was firstly planted on 20 April reached around 80 cm high two months after planting and formed a preliminary hedge and started to exert the protection function. Investigation at the end of July, three months after planting, the whole embankment was fully protected with vetiver grass that reached over 2 m high. The roots reached 80-110 cm. The embankments were well protected and past a raining season safely, because vetiver has dense and massive root system underground and offers better shear strength per unit fiber concentration. According to farmers' experience, the slope must be protected by stones had to use huge plastic sheets to cover the whole embankments against erosion. The present demonstration showed that vetiver hedges acted as concrete wall or rock skeleton to protect the highway.

However, according to the investigation on 27 June a small slide with about 4 m³ was found and then the repair work and replanting were provided. Soil sampling and analysis showed that although the particle size distribution looked no great change, the No. 4 sample had a texture of sand and loamy sand because it had less clay particles, which explained why this section of the slope had a small slide (Table 4). However, the slide happened two months later since the vetiver hedges were not fully formed because of the continued rainfall during plum-raining season. Once the season passed and the vetiver grew up, the embankment no longer clasped.

4. Conclusion

The first application of vetiver for railway embankment protection was quite successful, which indicated that vetiver could be used to protect slope formed by sand particles that was quite different from other numerous applications on highways in the mountainous area in China that usually contained rock fragments, some clay particles and mixed with forest soil containing some organic materials. Although the best planting season in this area was March in the dormancy period, vetiver could grow up in three months planted at the end of April while vetiver started to grow.

To ensure planting to be successful, following practices should be seriously considered:

Table 5. Mechanical analysis of surface soil from different section of road embankment

No	Description	Particle size (mm, %)				Texture
		2-0.2	0.2-0.02	0.02-0.002	<0.002	
1	Vetiver grew very well, south slope	0.8	74.8	16.0	8.4	Sandy loam
2	Vetiver died after first planting, south slope	0.5	84.0	9.8	5.7	Sandy loam
3	Vetiver grew well, north slope	0.5	69.5	20.5	9.5	Sandy loam
4	Slide place, north slope	0.5	84.8	9.5	5.2	Sand & loam sand

Before planting people may consider it to be an absolutely technical issue. However, once seeing the planting procedure, he or she may look down upon the technology and therefore led to the planting failure. As a result, planting and management regulation should be prepared and be followed during the whole process.

- Planting materials should not come from the nursery with very clayey soil to avoid difficulty for separating.
- Organic manure is recommended to be used as basic manure. If chemical fertilizer is used calcium-magnesium-phosphate might be used to avoid possible root damage.
- Planting materials should be very carefully prepared (not longer than 20 cm).
- Suitable planting season should be selected so that the planting could be most successful with less effort and to prevent possible collapse during raining season, especially for the embankment formed by sand or loamy sand texture. Besides, soil analysis should be conducted before planting in order to design different measures for different soils.

5. Survival rate and growth behavior

5.1 Survival rate

The survival rate of the first planting was not high when investigated on 25 May 2001. It was possibly caused by:

- i. It was required that the chemical fertilizer should be buried under 3 cm of soil before planting to avoid direct contact of roots with the fertilizer. However during practice the roots might touch the fertilizer, as the railway manger deemed it not important.
- ii. The tillers had long stems and leaves that increased evaporation. Although the stems of tillers was required to be 20 cm long at most, some of them were 30 or even 40 cm because farmers wanted to reduce their pruning work and wished to cut as little as possible.

- iii. The tillers were too long and some of them were planted too deep. For some tillers about 20 cm stems were buried. It may also influence their survival.
- iii. It is shown that the survival rate was higher when planting 6 tillers/clump than 3 tillers/clump. Therefore it is recommended that more tillers should be used for engineering protection.

Regarding to the planting materials planted on 31 May, the survival rate was around 40% when checked on 21 June, about 20 days since planting. However it increased to 70% and to 85% when checked on 26 June (just 5 days later) and 2 July respectively. It was because the soil and air moisture turned high during the plum-raining season at that moment. Furthermore, there was large area of rice field along the railway. At that time the field was irrigated for planting rice seedling and the air moisture became high. The new leaves appeared very late because most of the roots were cut out and destroyed during separating clumps and only few roots were left and adhered tightly by clay. It would take longer time for the very few adhered roots to recover to new environment and to grow.

(to be continued in the next issue)

East Bali Project and Vetiver^{*}

Ekoturin Foundation, which in 1999, became known as East Bali Poverty Project, was established in July 1998 in response to a plea for help by an isolated mountain village of over two thousand families, with no water supply, toilets, roads or electricity, and where most children were malnourished and illiterate. Interviews with over 1,000 families revealed a myriad of problems, yet when asked their most urgent need, the villagers asked for "education for our children so that they can lead us to a better life and a self-sufficient future". Thus an inspiring and productive collaboration began.

Our Mission: To empower illiterate and malnourished children, reduce poverty and promote culturally and ecologically sensitive sustainable development in impoverished rural communities.

Our Promise: "No money, rice or any short-term solution: any project must empower you, be sustainable and in accordance with your aspirations and needs."

New Projects

- 80 illiterate children start school, sponsored by Hard Rock hotel Bali
- Iodine supplements for 3,000+women and children, sponsored by UNICEF
- Dental health and hygiene project for over 2,000 children

^{*} From "Sustenance" (the official newsletter of East Bali Poverty Project) Vol. 1, Edition 1, May 2001

- Children grow their high nutrition lunch
- Vetiver grass gives a new lease of life to a barren mountain
- Appropriate technology using bamboo: (1) a new school; (2) clean water
- Vetiver grass Handicrafts: children learn new skills for future growth
- Charity Café: fundraising and awareness center in Ubud

Vetiver Grass Gives a New Lease of Life to Barren Mountain Slopes

Our first trial with vetiver grass was the purchase of 83,000 slips from Flores in March 2000, specifically to save 8 km of rapidly eroding mountain tracks that were our only way of getting to the communities. Not only did we deep our tracks open, but also within months we were able to take vetiver seedlings to create terraces in our first organic kitchen garden trials in Bunga hamlet. The 400,000 vetiver tillers bought from West Java in December 2000 are the realization of our vision to bring life to the presently infertile mountain slopes primarily with the long-term goal to: improve farmland → improve agriculture → improve nutrition → improve health.

Flatter and more arable land is needed to enable more nutritious crops to be planted, and thus reduce dependency on cassava. Vetiver should help us achieve this by conserving soil and water and allowing natural terraces to form on the steep farmland during the monsoon season. We will then add compost, iodized fertilizer, introduce worm casting and then plant a balance of fruits and vegetables on the improved farmland. In addition, by planting trees as an integral part of the permaculture system, we hope eventually vetiver will be the key to reforestation, and be the start of a 'food forest', thus revitalizing the ecosystem in this presently harsh environment.

Vetiver Grass Handicrafts: Children Learn New Skills for Future Growth

The rapid reproduction of vetiver grass – every one shoot planted will reproduce up to 15 in 3-4 months – has opened up a new opportunity for skills training and fundraising.

Handicrafts: The grass stems and the roots are some of the strongest and most durable weaving materials known that do not require pre-processing. East Bali Poverty Project staff who originate from the village have been working for the last three weeks experimenting with different handicrafts that have already been introduced to the children in all our education projects.

Newfound skills for the children and latent talent in the youth of the village will enable us to develop a thriving school and home industry. All we need is the market, which I am sure will be no problem. Our local research shows that many shops are already selling a wide range of vetiver handicrafts, all of which are imported from Java. The roots are the most popular, used for centuries by Indians who believe the scent has a therapeutic effect in healing stroke, headache and delaying senility.

Indian poets referred to the vetiver scent as ‘the smell of the first monsoon shower on parched soil’, and ‘the perfume of a rejuvenated earth’.

Proposed Alliance of TVN and ACDI/VOCA

Statement of Purpose

The Vetiver Network (TVN) and ACDI/VOCA intend to form a close alliance to stimulate greater investment in land and water conservation projects that use ‘vetiver system’ (VS) and to widen the promotion of VS for other environmental mitigation purposes, including its use for infrastructure stabilization, water quality improvement and protection of contaminated sites. To do this, TVN’s current information activities, including networking, promotion, and dissemination, will be delegated to ACDI/VOCA, where it will be operated as an autonomous global program, the “Vetiver Information” (VIN), within the Latin America and Global Programs Division. The TVN Board will continue to raise funds to support the VIN and will be joined in that effort by ACDI/VOCA.

Basic Principles

The following basic principles will govern the transfer of the “Vetiver Information Network” function from TVN to ACDI/VOCA:

1. ACDI/VOCA makes a commitment to operate the VIN, as detailed in agreement, for a minimum of three years, subject to the receipt of necessary funding.
2. Both TVN’s and the names shall be used only for ends specifically approved by TVN’s Board.
3. ACDI/VOCA will maintain as separate the financing and operation of the VIN and revenues derived from any technical assistance to projects and programs undertaken by ACDI/VOCA. Volunteers currently associated with TVN and its regional and national networks will be informed of opportunities to volunteer in ACDI/VOCA projects. Such projects shall not be considered a VIN activity.
4. This agreement authorizes ACDI/VOCA to raise funds for the purpose of recovering the incremental costs to ACDI/VOCA of operating the VIN, using both TVN’s same and status as a nonprofit, tax-exempt private foundation, as defined in sections 501 (c)(3) and 509 (a) and of the IRS Code. Funds solicited to support the VIN will not be used to support any other ACDI/VOCA activity.
5. The ACDI/VOCA VIN Program will take over the outreach role of TVN, which consists of the basic and special functions detailed below.
6. The Board of Directors of TVN will continue to set editorial policy and establish network priorities. The ACDI/VOCA VIN Program will be responsible for following these policies and priorities, and the VIN will respond to the TVN Board as it currently does. ACDI/VOCA will be given a place on the TVN Board.

The ACDI/VOCA VIN Program will maintain and respect the same relationship with all of the country and regional networks as currently exists. Among others, this will include raising of the funds required to provide the relatively minimal financial support necessary to keep the regional and national networks functioning. It also implies keeping these networks informed of any activities generated by or related to information about VS in Their area, working through and with them if possible, always involving them to the extent possible.

Decision-Making

1. The TVN Board of Directors is the ultimate authority for all decisions related to the mission, policies and priorities of the ACDI/VOCA VIN Program. ACDI/VOCA's management is the ultimate authority for all decisions relating to the day-to-day management of the VIN Program.
2. The Board of the TVN and the management of ACDI/VOCA will keep each other completely informed of any decisions or pending decisions that would affect the relationship between the two organization or the established mission, policies and priorities of the VIN.
3. For purposes of the transition period, the TVN's technical sup-committee will take the decisions that otherwise would require TVN Board approval.

The VIN coordinator will be responsible for all day-to-day decision-making and for carrying out the VIN mission and policies established by TVN's Boar. The VIN Coordinator will be selected and hired by ACDI/VOCA with the advice and consent of the technical sub-committee established by the TVN Board.

The TVN Board will retain its prerogative to raise funds also for "special activities", but will coordinate its fund-raising activities with ACDI/VOCA to ensure that the same donors are not approached independently by each organization. Special activity funds may or may not be channeled through the ACDI/VOCA VIN Program, at the discretion of the TVN Board.

A Report from Madagascar^{*}

How many times have we thought of you and relished memories of your visit. We have made tremendous progress on many fronts since you were here and I wanted at long last to catch you up on everything that has happened and to express our deepest gratitude for the absolutely critical role you both played in helping us get things off the ground. We really do speak of you both very very often and it

^{*} From a letter to Mr. Diti Heengchaovanich and Dr. Uthai Charanasri by Mrs. Karen S. Freudenberger, Regional Director, FCE Rehabilitation Project, Madagascar, <KSF@chemonics.mg>

is almost as if you are present as members of our project since your ideas continue to influence us in so many ways.

You may have heard that in early 2001, we got a grant of \$2.7 million from USAID to do more systematic rehabilitation work. At the point, the FCE-Rehabilitation Project was born, and those of us who had been working on these issues with LDI, moved over to create a new project. Gilles (whom I'm sure you will remember) and I were the core members of a team that has now grown to a dozen or so people. Among your friends on the project are Mme. Solo, who is in charge of the Control and Supervision team for engineering and railway works.

The first activity of the project was to do a systematic assessment of all the urgent needs to make the FCE train line sustainable. That study was finished in July and showed a need for about \$12 million to fully rehabilitate the line to the point where it can be financially viable. With that figure, we then went looking for additional funds. To jump ahead in my story, we have now lined up donors for just about the full amount, including the African Development Bank and the World Bank. In the meantime, as we wait for the other donors to get their funding in place, we are going ahead and working on the parts of the rehabilitation that are most urgent, including rehabilitation the locomotives, carrying out the most urgent, including rehabilitating the locomotives, carrying out the most urgent infrastructure work, stabilizing the line, and working on embankments. I can assure you that you will hardly recognize it as the same line you traveled a year and a half ago! I will send a few pictures to give you an idea.

Need I say that vetiver has been a critical part of the whole thing? I think that we have planted something like two million vetiver tillers by now. We have used them to stabilize all the drainage infrastructures and unstable slopes. The community activities have been a HUGE success. We have 250 farmers who have agreed to switch from annual (manioc or rice) crop production to sustainable systems where the slopes are stabilized by vetiver and then interpolated with fruit trees, pineapple, or spices. (These are all steep slopes that go right down to the train line so we are trying to control erosion.) We used the system that Uthai helped us develop where we loan the farmer the tillers the first year and then he/she pays them back in the second season. It has been a great success and there are even farmers who are now expanding the vetiver stabilization to their own slopes that are back away from the train line. It is our great hope that this intervention, along with significant improvements to drainage systems the whole length of the line, will have a major impact in reducing the line's vulnerability to future cyclone damage. There is a waiting list for farmers who want to join the activity and now the northern railway line has asked us to come to help them design a similar intervention up there. One of the pictures I am sending you is of the top of the tunnel PK 121. I am sure you remember that we went up there: It was a

terribly mess, with a lake on top of the tunnel and terrible constant leaking inside. On Diti's advice, after regarding the top of the tunnel, MacDonald and Jeans put in the drainage systems and vetiver plantings that you will see in the picture.

It truly a work of art and, better yet, there are only a few drops of water inside the tunnel now. There are so many other things that are happening, but I won't bore you with the details. This should at least give you an idea of how far things have come since your visit. Please do pass along this report to His Majesty the King, if you think he would be interested, with our deepest gratitude to him for all he did to support us by sending the two of you to Madagascar at a truly critical time. It gives me tremendous pleasure to say that our combined efforts have given the FCE railway a new life and provided a better future for the 100,000 people who depend on the line for their livelihood.

Thank you again and we really hope that we will be able to show you in person one of these days how much your efforts have meant to us.

Mark joins me in sending fond wishes to you both.

A Visit to China by the Representatives of CC/ICV**

The People's Republic of China was nominated by the participants of the Second International Conference on Vetiver (ICV-2) held in Cha-am, Phetchaburi, Thailand, 18-22 January 2000, to be the host of ECV-3. During the past one-and-a-half years, Prof. Liyu Xu, the Coordinator of the China Vetiver Network, who has been charged with the responsibility of organizing ICV-3, has approached Guangzhou City together with Guangdong Province, and Fuzhou City together with Fujian Province, to be the possible venue and host of ICV-3.

Prof. Xu has requested the Chaipattana Foundation to help in seeking fund to organize ICV-3. HRH Princess Maha Chakri Sirindhorn, Chairperson of the Chaipattana Foundation, has graciously approved the funding of US\$ 15,000, as the first seed money to the Organizer. In order to make final decision on the venue and the host of ICV-3, Prof Xu requested Dr. Sumet Tantivejkul, Secretary-General of Chaipattana Foundation and Chairman of the Continuing Committee (CC) the International Conference on Vetiver (ICV), and Dr. Narong Chomchalow, Coordinator of the Pacific Rim Vetiver Network, and Secretary of the CC/ICV, to visit the two potential provinces of China, with funding support on travel from the Chaipattana Foundation. Arrangement has been made with the Royal Thai Consulate-General Office

* *By Narong Chomchalow, Secretary, Continuing Committee, International Conference on Vetiver.*

in Guangzhou to liaise with the Chinese authorities on the program of their visit was made during 6-12 November 2001.

A report has been prepared by Dr. Sumet Tantivejku and Dr. Narong Chaomchalow for submission to the members of the Continuing Committee of ICV. It includes the background of ICV, the summary of the visit, and the recommendations as to the venue and other organizational structure of the ICV-3. Decision made by the Continuing Committee as to the venue and organizer of ICV-3 will be made available in Vetiverim 20.

A Book on "Response to Land Degradation"

Edited by E.M. Bridges, I.D. Hannam, L.R. Oldeman, F.W.T. Penning de Vries, S.J.Scherr, and Samran Sombatpanit. This is a new book produced jointly by the Soil and Water Conservation Society of Thailand, the Land Development Department, Bangkok, IBSRAM (now IWMI), ISRIC, University of Maryland, USA, NSW Department of Land and Water Conservation, Australia, and the World Association of Soil and Water Conservation. It is published in August 2001, with a size of 18 x 24 cm, 510 pp. and 12 color plates. Price: Softbound, US\$45 (GB£30), hardbound US\$79.50 (GB£53) (with free surface mail delivery). Send your order to Science Publishers, Inc., P.O. Box 699, Enfield NH 03748, USA. Fax: +1-603-6325611, E-mail: <sales@scipub.net>. Contact the Soil and Water Conservation Society of Thailand (Phone: 02-562-0731) for Thai orders.

The book *Response to Land Degradation* has been designed for the advanced reader interested in methods of sustainable land management and the prevention and the control of land degradation. It provides a coherent view of the current situation concerning land degradation and the human response to the problem. The readership of *Response to Land Degradation* will be all people concerned with land management, whether from the point of view of the farmer, landowner, economist, banker, politician, sociologist, soil scientist, environmental scientist or geographer. The problem of land degradation and how it is being tackled is presented by leading world experts in their respective fields of study.

Altogether there are 39 papers and 50 boxes, contributed by 140 authors from 30 countries. They are grouped into 11 chapters: *Introduction; Setting the scene; Driving forces and pressures; State of the world's land resources; Impacts upon society and the environment; Tools for monitoring and assessment; Conservation and rehabilitation; Institutional innovations; Law and policy; International initiatives; Future responses.*

Vetiver Glossary 5: Vetiver Propagation

This is the fifth part of the series on Vetiver Glossary. The first part, on “Vetiver and Its Related Terms”, was published in Vetiverim 15. The second part, on “The Vetiver System”, was published in Vetiverim 16. The third part, on “Species and Related Taxa”, was published in Vetiverim 17. The fourth part, on “Use and Utilization of Vetiver” was published in Vetiverim 18. The format used includes the definitions from: (i) Webster’s New World Dictionary, Third College Edition, (ii) <www.dictionary.com>; and (iii) the Editor’s known as Vetiverim’s. Their explanations are also provided.

Multiplication:

Webster’s: *n.* a multiplying or being multiplied. (Multiply is defined as to cause to increase in number, amount, extent, or degree.)

www.dictionary.com’s: *n.* 1 The act or process of multiplying or of increasing in number, or the condition of being multiplied, 2 propagation of plants and animals, procreation.

Vetiverim’s: *n.* any means of reproduction solely to increase the number of individuals

Explanation: For vetiver, ‘multiplication’ is used solely to increase the number of individuals of

Vetiver plants, without having the objective of planting them in the field.

Propagation:

Webster’s: *n.* a propagating or being propagated; specif. reproduction or multiplication, as of a plant or animal. (‘propagate’ is defined as 1 to cause (a plant or animal) to reproduce itself, 2 to reproduce (itself); said of a plant or animal, 3 to reproduce or multiply, as plants or animals

www.dictionaro.com’s: *n.* 1 multiplication or increase, as by natural reproduction. 2 the process of spreading to a larger or greater number; dissemination, 3 the act of propagating; continuance or multiplication of the kind by generation or successive production; as, the propagation of animals or plants

Vetiverim’s: *n.* any means of reproduction, either for increasing the number of individuals or for subsequent planting out in the field

Explanation: Propagation is used as a general term of reproduction of vetiver; it also includes multiplication through various means to increase the number of individuals. The ultimate goal of propagation is to grow individual vetiver planting materials in the field, either through the process of multiplication first, or directly growing the propagated plants in the field.

Micropropagation:

Webster’s: (none)

www.dictionary.com's: *n.* 1 a tissue culture technique for plant propagation in which offsprings are cloned from tissue taken from a single plant, 2 the use of biotechnological methods to grow large numbers of plants from very small pieces of plants, often from single cells using tissue culture methods.

Vetiverim's: The clonal production of meristematic tissues of young bud (apical or lateral) or young inflorescence.

Explanation: Vetiver can be multiplied to a large number through the use of tissue culture technique. (See further explanation of Tissue Culture, below.)

In Vitro Culture:

Webster's: (none). '*In vitro*' means in glass'; isolated from the living organism and artificially maintained, as in a test tube

www.dictionary.com's: (none). '*In vitro*' means: 1 in an artificial environment outside the living organism, 2 within a glass, observation in a test tube, in an artificial environment

Vetiverim's: A technique for culturing cells, tissues, or organs of plants in a sterile medium

Explanation: (see explanation in Tissue Culture, below.)

Tissue Culture:

Webster's: *n.* the process or technique of growing tissue artificially in a special, sterile culture medium; the tissue thus grown

www.dictionary.com's : *n.* the technique or process of keeping tissue alive and growing in a culture medium

Vetiverim's: 1 a technique for culturing tissue excised from a plant (know also as explant) in a sterile medium, 2 a culture of tissue grown by this technique or process

Explanation: Differentiated tiny plants (also known as plantlets) developed from the explants can be used to propagate upon attaining a good size, and after a period of nursing in the nursery.

Letters to the Editor

Vetiver in Flood Control

I very much liked your Editorial (in Vetiverim 18) on the use of vetiver in flood control; it is applicable to us all, and gets to the heart of what we are doing individually: confronted with this enormous problem of excess water rushing down slopes causing damage, loss of life and disappearance of fertile soil. There is a corollary to the problem, which is implied in the solution: "who is going to do the work" to plan and plant the thousands of rows of vetiver needed to protect the fragile lands? I don't feel this comes out enough in the Editorial.

I have been trying to find the happy medium between: 'they (governments and public institutions), and 'the rest' (those directly impacted, yet those who do not always have the leadership, confidence, or organizational structure to handle the task). While it is evident the 'they' have a critical role, might we not also work on practices that get 'the rest' better empowered, equipped, informed, and juiced-up to do the work themselves? *Can we suggest in an editorial the important role of the private sector, or at least non-government branches: professional nurseries, service providers (consulting groups) and very energetic village groups/ NGOs?*

Focussing on them here in Senegal and in Madagascar has produced quite startling results. Nurseries are provided with plants, and to obtain their original stock, they sign a "Dynamic Commitment" in which they agree to 'reimburse' the project triple the number of plants within 4 months. In addition, they are coached and advised that they are the ones who have to develop the market for their production; they should not count on people coming to them to buy vetiver 'off-the-shelf'. In effect, the vetiver producers become the vectors of technology dissemination. The same approach is reserved for consulting firms and service providers. NGOs are a bit more difficult, yet they become part buyers and disseminators who obtain supplies from nurseries and who call on the service providers to assure good planting techniques.

I am not sure the approach is replicable in other parts of the world, but one paragraph on enticing the private and NGO sectors to take charge in implementing vetiver planting might be a provocative addition!

Ah, it is so easy to be an armchair advisor! You should know that we use your newsletter here as a model of "network information sharing" and as a document to supplement existing literature. It is excellent.

Criss Juliard, DynEnterprises, Dakar, Chemonics International

<cjuliard@DYNAENTERPRISES.com>

Thanks for your valuable advice. I agree that "There is a corollary to the problem, which is implied in the solution: 'who is going to do the work' to plan and plant the thousands of rows of vetiver needed to protect the fragile lands?" I admit that this did not come out enough in my Editorial.

No doubt that many of our readers are people who are increasingly convinced in the value of the technology, yet it is difficult to reinforce our resolve on getting 'doers', at least here in Thailand. This has happened time and again in our recent history. Many advised have been made in the past with respect to flood control measures, but very little has been done. Otherwise, we probably won't have such disasters.-Ed.

Economic Value of Vetiver Grass

First let me compliment you and Dr. Sumet on an excellent report and acknowledge the effort you both went to in visiting China to promote the vetiver system and the next conference, ICV-3. I never cease to be impressed by the support His Majesty the King of Thailand and his staff are prepared to extend in helping the world to understand the vetiver system. In my eyes this puts Thailand above all other countries in its ability to think outside the square.

There is one point in the report that keeps cropping up in every country I have ever worked in and I quote below from your report on China.

“Soil and Water Conservation Office of Fujian Province (8 Nov.)

A meeting was organized for the visitors to be acquainted with Fujian governmental organizations and their role in vetiver promotion. Several heads of government offices were present. Dr. Yang Xuezheng, Director of Soil and Water Conservation Office of Fujian Province, welcomed the visitors and stressed the importance of vetiver in soil and water conservation. It is noted that in Nanping City, vetiver has been used in terrace and highway stabilization, for erosion control in tea plantation, all of which are satisfactory. However, *as vetiver has no economic value, its promotion is difficult.*”

Modern agriculture is expected to produce an abundance of cheap food, but at the same time take account of environment concerns. In Hurricane Mitch, ‘conventional’ farms using the industrial model of chemically-intensive monoculture had 60-80% more soil erosion, crop damage and water loss than those poorer farmers that practiced ‘traditional’ methods such as crop mixing and some form of soil conservation, including vetiver hedges. There are few more powerful reminders of the fragility of human endeavor than the October 1998 storm that swept away half a country. Hurricane Mitch ripped through Honduras, Nicaragua and Guatemala, taking 10,000 lives, leaving over 2 million people homeless, and wiping out \$5.5 billion-worth of the region’s economy. Our colleague Jim Smyle, who was there, documented this disaster for us in a paper presented to the Second International Conference on Vetiver (held in Thailand, January 2000) entitled “Disaster Mitigation and Vulnerability Reduction”. He explained the part that vetiver hedges played in stabilizing farms on the slopes, meaning that not all farmers suffered in equal measure. Those with established vetiver hedges were generally protected from slips and mudslides. Many of those farmers would have asked the same question, “What economic value is there in vetiver?” The answer is that their ‘insignificant’ vetiver hedges saved their farms and their livelihood. This is the very basis of sustainability. After such a massive event as Hurricane Mitch, these farmers were able to carry on farming. Economic development that fails to address the importance of soil and slope stabilization along with moisture conservation, especially in rained areas, is totally misguided

and worthless. The development of modern genetics owes much to plant breeders of the past, but now modern farming is being flooded with biological information and molecular tools courtesy of modern medicine and its genomic revolution leading to transgenic crops. This means that production in the West enabled 40% of the world's food to be produced on 50% of the agricultural land that is irrigated.

However, none of this technology has reached the subsistence farmers that make up over 50% of the work force in developing countries. They are rainfed farmers, farmers who, with their present traditional methods of farming, could not get the full genetic expression out of the new crops being produced even if they could get the seed. Many of these farmers have given up and moved in to the towns looking for unavailable work and contributing to the FAO figure of 830 million people in the world that are under-fed.

Vetiver grass technology (now known as the vetiver system – Ed.) is the only technology being offered to these rainfed farmers in subsistence areas. A technology that will lead the way to sustained production at little cost, and enable the farmer to stay on his land. After 40 years in the business, I can't think of any other technology that offers so much for so little.

Vetiver hedge technology can be used in conjunction with irrigation farming, stabilizing banks, canals, the drainage system, spreading out any unexpected flooding, preventing damage and soil loss. In subsistence farming vetiver hedges are one of the best means of conserving soil moisture essential to germination crops in rainfed areas, at the same time, preventing erosion and loss of fertility.

But most important, the vetiver system is there when nature goes berserk and delivers another Hurricane Mitch. It is silently protecting the farmer's livelihood – his farm. It is saving his soil for his children and their children; without it, he has no protection and no future. It is his insurance! This is the 'economic value' of vetiver grass.

John Greenfield, Former World Bank staff

Email: <greenfield@xtra.co.nz>

Thanks for your argument for using vetiver hedges technology as a means of disaster prevention. I fully agree with you – Ed.

Training of Vetiver Handicraft Making

I recall reading in a prior issue of Vetiverim that in Thailand your crafts people are creating beautiful items from vetiver, and that you are willing to train people from other parts of the world. I am a volunteer at The Future Centre in Barbados, West Indies, where we are creating a center for education about sustainability. We want to include an exhibit of vetiver (which, incidentally, was used in Barbados centuries ago in connection with growing of sugar cane), and would like to create a space where crafts

people could make and well items made from vetive. I have talked with a local basket maker who is using vetiver, but in very simple items; she expressed interest in learning how to create more sophisticated products such as are being made in Thailand. Pleased, if it is still available, let me know the details of your offer of training.

Marilyn Gilmore, The Future Centre
Edgehill, St. Thomas, Barbados, West Indies
<marilyngilmore@sunbeach.net>

Thanks for your interest in our program. We are now planning to organize the training course on vetiver handicraft making in Thailand, but we are still looking for a donor support, and will let you kinw if this is successful, otherwise the trainees will have to pay the expenses as stated in Vetiverim 17 – Ed.