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Editorial

Vetiver Glossary

According to the Webster's New World Dictionary, 'glossary' is "a list of difficult, technical, or foreign terms with definitions or translations, as for some particular author, field of knowledge, etc., often included in alphabetical listing at the end of a textbook".

Although 'vetiver' is a well-known term that is now understood by many people, there are also some newly coined terms and other old terms that are used in association with it. Many of these terms are not clearly understood by the 'vetiverites', a term coined by the Editor for those who work on vetiver. Worse is the fact that some authors use certain terms with no scientific basis while others use one term instead of the other that is more appropriate. Examples can be seen in the use of the terms like 'reclamation' and 'rehabilitation' almost interchangeably. This is also true for such pairs of terms like 'use' and 'utilize' or 'utilization', 'tiller' and 'slip', 'propagation' and 'multiplication', 'variety' and 'ecotype', etc. Some terms are not even understood by people outside our field, e.g. polybag, bioengineering, phytoremediation, vertical interval, backslope, slideslope, plantlet, explant, vetiver system.

To help our readers who are not familiar with technical terms used in the literature on vetiver, the Editor attempts to compile the glossary on vetiver and other terms used association with it, and present them in each issue of the 'Vetiverim' to be considered by the readers. They are 'on trial' basis, and, thus, not to be taken as the 'final' version. The Editor welcomes any comments or suggestions from the readers, with the hope that, towards the end of the series, a booklet on "Vetiver Glossary" will be published to help develop a standard terminology for using in vetiver literature.

Due to the space limitation in each issue of the Vetiverim, instead of presenting the terms alphabetically from *a* to *z*, a set of related terms will be presented first. Definition of terms from Webster's Dictionary will be given first, followed by our definition, and their explanation. The website www.dictionary.com will also be consulted.

The present issue will feature the glossary on the term 'vetiver' itself, together with other related composite terms with the root word of vetiver. Other sets of terms which would follow in

subsequent issues include 'vetiver system', 'species and its related taxa', 'vetiver propagation', 'uses and utilization of vetiver', etc. Suggestions from the readers are most welcome for the sets of terms to be described in the future issues.

Vetiver Glossary: Vetiver and Its Related Terms

The glossary on vetiver and its related terms includes definition(s) from: (1) Webster's New World Dictionary (Third College Edition, 1993), if any, and (2) the Editor (known as Vetiverim's definition). An explanation of the term will also be given.

Vetiver:

Webster's: n. Fr. *Vetiver* < Tamil *vettiveru*, lit., root that is dug up (*ver*, root). **1** an East Indian grass (*Vetiveria zizanioides*) whose roots yield a fragrant oil used in perfumes, cosmetics, etc. **2** its fibrous roots, also used for making screens, mats, etc.

Vetiverim's: n. a common name of the grass of the genus *Vetiveria* having profuse and deep root system and strong culm used in soil and water conservation in many countries in the tropics and subtropics. *Vetiveria zizanioides* has fragrant roots used in making perfumes, cosmetics, and in traditional medicine.

Explanation: **1** vetiver is originally a French word, derived from a Tamil word, *vettiveru* (*vetti* = to dig up, *ver* = root), also *vattiveru*, *vetivern*. **2** vetiver originally means the fragrant roots of *Vetiveria zizanioides*, a species used in perfumes, cosmetics, etc., and no mention has been made on other species and other uses, especially for soil and water conservation. **3** vetiver also means 'hatch up' – an exact description of how the spongy roots so valued for their aroma, are collected. **4** the two species of vetiver currently used in soil and water conservation, i.e. *Vetiveria zizanioides* and *V. nemoralis* have wide distribution throughout Asia, and not localized in East India as was originally believed to be. **5** the term is usually followed by the collective work, 'grass', a common practice in naming a plant under a group to which it belongs, like napier grass, ruzi grass, Bermuda grass, etc. As the term is becoming more popular, it is suggested to drop the word 'grass' to save time and space, and, to change the tune of misconception in some countries where the word 'grass' has a notorious meaning of being useless.

Vetiver Bline:

Vetiverim's: n. natural material made from the root mass of the vetiver plant used as a blind to cool down the heat of the summer, a common practice in northern India.

Explanation: The blind is woven from the wiry, fibrous root of vetiver. The vetiver blind is continually doused with water throughout the day, turning the very wind that can dehydrate a person walking in the sun, into a scented cooling breeze, which passes through the soaked vetiver blind, releasing a bittersweet aroma. It is believed that this scent has a therapeutic effect in healing heat stroke, headaches, and delaying senile decay. An Indian poet, Bihari (1595-1664), in *The Satasai*, described the vetiver blinds as "Lend to burning summer noon the scented chill of winter nights". This evidence indicated that vetiver is an ancient crop but its use in those days has been limited only to its fragrance.

Vetiver Grass:

Same meaning as vetiver. There is consensus of opinion that the word 'grass' be dropped from the term to save space and time, and to change the tune of misconception in some countries where the word 'grass' has a notorious meaning of being useless.

Vetiver Grass Technology (VGT): See Vetiver System (VS)

Vetiver Grass Hedgerow (VGH): See Vetiver Hedgerow (VHR)

Vetiver Handicraft:

Vetiverim's: n. traditional product made by manual skills from cut leaves and culms of the vetiver plants grown generally for soil and water conservation purpose. [Webster's definition of handicraft: n. work done or articles made by manual skills.]

Explanation: The utilization of vetiver leaves plays an important role in growing vetiver for soil and water conservation purposes since the leaves and culms are normally cut off at regular intervals to stimulate growth. Such cut leaves and culms can be utilized in handicraft making to earn extra income. They can be utilized directly to make wicker works, or interlaced into 'basic units' of different shapes and forms of braids and interlace patterns before setting up to form any particular wicker works, or using looms to weave into mats or other products.

Vetiver Hedgerow:

Vetiverim's: n. a single row of vetiver plants grown close together as a hedge along the contour of the slope for soil and water conservation.

Explanation: It is also called 'vetiver hedge (VH)'. Once firmly established, vetiver hedgerows (VHR) will act as living barrier, to collect sediment and plant debris, slow down runoff, and allow clear water to pass through, thereby enriching the soil with organic matter and moisture collected in front of the hedgerows. For the system to provide an optimum degree of protection against erosion, the hedgerows should be spaced apart at the proper vertical interval, i.e. the vertical distance from one hedgerow to the next one up or down the slope.

Vetiver Oil:

Vetiverim's: n. an essential oil obtained by steam distillation of the root mass of vetiver.

Explanation: Spongy root mass of *Vetiveria zizanioides* contains trace amount of essential or volatile oil which can be extracted by steam distillation. Its major components include vetivones, khusimone and khusitone. Occasionally its scent dominates a perfume, but more often it is used as a fixative in fine fragrances and in soaps, lotions, deodorants, and other cosmetics. In aromatherapy, it relieves stress, anxiety, nervous tension and insomnia. It also provides relief from arthritis, rheumatism, aging skin, fatigue; it is grounding and regenerating. In traditional medicine, it is a stimulant, diaphoretic and coolant. In food, it is used to flavor sherbet.

Vetiver oil has been produced and used in perfumery for quite a long time. Vetiver oil is a low volatile oil; it is normally used as a base to fix other high-value volatile oils like rose oil, lavender oil, jasmine oil, etc. It used to be produced in Indonesia, China, Sri Lanka, Mauritius, Haiti, and a few other countries. Planting the vetiver grass and followed with a rigorous harvest could substantially affect soil erosion. Therefore, vetiver planting has been banned in many countries such as Indonesia, Sri Lanka, etc. This has reduced the supply of vetiver oil such that its price has increased many folds during the past decade.

Vetiver Scent:

Vetiverim's: n. a pleasant aroma released from the vetiver root dug from the soil and hanged in the shade, believed to have a therapeutic effect in healing stroke, headaches, and delaying senile decay.

Explanation: 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”.

Vetiver System (VS):

Vetiverim's: a low-cost, simple technology employing live vetiver plant for soil and water conservation and environmental protection

Explanation: Originally known as the vetiver grass technology (VGT), VS is a practical, inexpensive, low maintenance and effective means of soil erosion and sediment control, water conservation, and land stabilization and rehabilitation. It is also environmentally friendly. The main components of the VS are the uses of live vetiver plant in agricultural and non-agricultural applications, and utilization of dry vetiver plant parts which are by-products of vetiver grown for soil and water conservation in handicrafts, root thatch, mushroom growing, animal fodder and feed stuff, industrial products, herbals, etc.

Vetiveria:

Vetiverim's: n. 1 the genus to which vetiver belongs; it is a latinized word derived from Tamil *vettiveru*. 2 the name of a vetiver newsletter

Explanation: 1 genus name: coarse, glabrous perennial grasses with profuse deep root mass. Two species, *V. zizanioides* (lowland vetiver) and *V. nemoralis* (upland vetiver) are used in soil and water conservation purpose; the first one with fragrant roots containing essential oil is also used in perfumery and cosmetics. 2 the name of a newsletter: An occasional newsletter published by the Vetiver Network Philippines (VETINETPHIL), first number being issued in March 1997.

Vetiverim:

Vetiverim's: n. the name of the quarterly newsletter published by the Pacific Rim Vetiver Network (PRVN), first number issued in July 1997.

Explanation: ‘Vetiverim’ is derived from ‘vetiver’ (the common name of the grass in which the network as well as the newsletter is focused on), and ‘Pacific Rim’ (the region the network is serving). It is published by the Office of the Royal Development Projects Board (of Thailand) which acts as the Secretariat of the PRVN, and is distributed free of charge to institutional and scientist members, which, at present, stand at about 1000.

Vetiverite:

Vetiverim's: n. one who works on, or makes use of, vetiver.

Explanation: It is a new term coined by the Editor since it is thought that such a term would link people who work on any aspects of the vetiver, including those who use and utilize it for various purposes, close together.

Vetivert:

Vetiverim's: n. a famous French brand name (Guerlain) of fragrant products (perfume, deodorant, after shave lotion, etc.) using essential oil extracted from the root of the vetiver grass.

Explanation: Due to the high price of the vetiver oil, which is being and the fact that it is used as a fixative, there is no perfumery products made principally from the vetiver oil. However, many inexpensive vetiver-scented perfumes can be produced synthetically.

Other terms with the word "vetiver" as a component to be described in succeeding issues are Vetiver System, Vetiver Uses and Utilization, Vetiver Species and Ecotypes, Vetiver Propagation, Vetiver Networks and Acronyms, Vetiver Vernacular Names, International Conferences on Vetiver.

(To be continued in the next and succeeding issues)

Vetiver Development in China in 2000

This is part 2 of the report of a field trip made by Liyu Xu, Coordinator, China Vetiver Network, in Fujian Province, from Pingtan Island in the south to Wuyi in the north. The first part published in Vetiverim-14 covers the report on: (1) Vetiver and a County Town, and (2) Vetiver for Highway Protection in Northern Fujian Province.

3. Vetiver in Pingtan Island

Some people may have seen and remember that a lot of vetiver was planted in Pingtan Island under the supervision of Madam Zhang. There is now a major change in that farmers themselves have strong intention to plant vetiver, not only to protect their ponds, but also to prevent sediments from flowing into the ponds, because the sediments may cause great problem to fish fingerlings.

Another key application is that farmers start to plant vetiver along the ridges of their plots to protect vegetables and crops from strong-wind damage. On this island, strong wind proves to be the main factor influencing crop production. Many years ago, a wind break, using *Casuarina equisetifolia*, was built with an average spacing of 120 m between rows. However, it is still not enough to calm down the strong wind. Recently, farmers preferred planting vetiver which could grow to three meters high in one year and yet occupied very limited space.

Besides, some farmers joined together voluntarily and organized private groups to contract projects with engineering institutions. They also contacted, encouraged, and provided planting materials to, other farmers to plant vetiver.

To disseminate vetiver grass technology and to help farmers to grasp it, the Pingtan Charity Association decided to invite China Vetiver Network to co-organize training courses. The first course was held in September 2000.

4. Difference Between Cuts and Fills

Vetiver could be planted on both the cuts (backslopes) and the fills (sideslopes) of the embankments. However, if the results were compared, we would find that there is a great difference. Generally speaking, vetiver grow very well on fills. The only problem is that we should replant vetiver when it is washed away during heavy rains and should repair the newly eroded gullies during the first few months after planting. But for the cuts – huge cuts in particular – result was quite different. The soil, slope gradient and aspects vary dramatically. In some sections, the soil was thick and the slope was gentle, and vetiver grew well. In other places, the soil was shallow with steep slope and large amount of rock fragments. The soil contained extremely low amount of moisture. Therefore, vetiver growth was limited. Thus for a huge cut, different management practices should be applied for specific sections, e.g. more water and fertilizer should be applied in some places, especially during the first few months, so that vetiver can grow healthily and evenly. In some places, small terraces should be established to retain more moisture, and container seedlings should be used. It also indicated that there are still some issues to be studied when vetiver grass technology is applied in large scale.

Besides, the situations were different with different climates. The climate in Fujian and other provinces in southern China is sub-tropical. The temperature and rainfall are much lower than in tropical countries. Hence, the soil horizon is relatively thin. In the Philippines, for example,

the parent rock was deeply weathered with very deep soil stratum or weathered parent materials. Vetiver grows well even on large cuts.

5. Great Demand for Planting Materials

In addition to the institutions mentioned above, there were many large development projects in the highway sector throughout the country in the year 2000. The spring season was a very busy time for vetiver workers. The highway authorities in Fujian, Zhejiang, Jiangxi, Yunnan, and many other provinces were very busy with planting vetiver. For example, in Jiangxi Province, vetiver was planted for the highway embankment protection around the Poyang Lake totally more than a hectare (10,000 m²) in Duchang County, and with similar demonstrations in Xingguo and Xingyu Counties. In Lishui Prefecture of Zhejiang Province vetiver was planted in 1999 and 2000 for highway stabilization in the mountains.

In addition to the highways, vetiver was also used for dam stabilization and quarry re-vegetation in Guangdong Province, for rehabilitating copper mine tailings in Jiangxi Province, and gold mines in Fujian Province. As a result, there was an unprecedented shortage in planting materials in the spring of 2000. All planting materials in Fujian and Jiangxi, the two provinces with largest production, were sold out. The price per tiller increased from 5 cents to more than 15 cents RMB. To meet the needs for planting materials, many new private sectors in Fujian started to establish nurseries in a large scale in the autumn of 1999 and in the spring of 2000. Experiments showed that planting tillers during the autumn can help the multiplication of planting material faster than that planting in the next spring time. For example, when the tillers were planted on 22 September, they were 40 cm high and with 5-6 new tillers for per clump when checked in October. Previously, people used to vetiver plant tillers in the nursery in spring, but now they start to plant in autumn as well, which is good for fast multiplication.

A Jokeful of Crops^{*}

Petaia Balawa thought his good friend, Osea Bolawaqatabu, was joking when he proposed to set up a farm on a hillside in Matuku Village, in the interior of Ra Province, Fiji

^{*} *Extracted from Fiji Post (a national daily newspaper of Fiji), 23 October 2000*

Islands. After all it was a common knowledge that the piece of land in question had been infertile for ages.

Yet, his friend persisted and for the sake of their friendship, Mr. Balawa gave in. “I thought that if I let anything be planted on that land I will be the laughing stock of the village, but if I refuse Osea, this may hurt him and strain our years-long friendship”, said Mr. Balawa. “Then I thought that I should let him have his way and when he failed he would just leave me in peace.”

Osea had his way. He is the Senior Agricultural Research Officer in the Land Use and Planning Section (LUPS) of the Ministry of Agriculture, Fisheries and Forests (MAFF). With the use of vetiver grass as contour hedgerows on the sloping land, Osea had plans of controlling the soil erosion and thereby retaining the fertility of the land on which he had proposed to set up the model farm. The land in that farm resembled many other pieces of available land in this part of Ra. “The Matuku Village lies in the Bureivanua District of Ra and the main source of sustenance for the villagers is gathering food from the surrounding forests and the Wailoa Creek that runs beside the village”, said Osea. He pointed out that the land surrounding Matuku was very steep with slopes that averaged 15-20°.

“Flat land is virtually non-existent and farmers are now encroaching on marginal lands in search of food” Osea continued. He said the purpose of setting up a model farm on Mr. Balawa’s land was to educate the nearby farmers about the importance of soil conservation and the means to do so. Traditional farming practices were well-entrenched in Mr. Balawa’s mind and even when the agriculture team started the work on the hill, Mr. Balawa was convinced that the plan of using the land would fail. “I was certain that the piece of land could not be cultivated. How could it be as it had been made infertile due to its continued use? In addition to this, the land was infested with *Navua* sedge and I thought that there was no way that the land could be cultivated” he added.

But the LUPS Lautoka staff, led by Osea, achieved results that were most surprised to Mr. Balawa. “When Osea and his team came and cleared the land, then planted Dalo, interspersing it with vetiver grass, the useless land suddenly bloomed.”

“The plantation was flourishing and I had to acknowledge that vetiver can work miracles. The vetiver grass, native to India, was introduced in Fiji in the early 1800s, mainly to provide thatching material for houses. Although it was commonly used to stabilize embankments, terraces and to delineate farm boundaries, its application as a soil conservation measure was

not realized until the early 1950s. The use of vetiver as a soil conservation measure became prominent in the cane belt areas, but elsewhere it was not done due to the lack of awareness and emphasis placed on the importance and effectiveness of controlling soil erosion.”

“The vetiver grass has a widespread root system that penetrates deep into the soil for up to 5 m”, explains Osea. “The roots act as a net, ensuring the soil remains in place and keep it from eroding. The top soil does not get washed away and the soil retains its moisture.”

He pointed out that the vetiver grass planted on the Matuku Village hill served the same purpose, and rendered the soil fertile. After the vetiver grass has proved its worth to Balawa, he has become a ‘convert’ of the vetiver grass technology (VGT). “My farm on the hill that has been improved by the VGT is just a five-minute walk from my house. When the hill was useless, I was farming at a site five miles from my home. For a 58-year-old man to walk to daily at such a distance was an exhausting exercise in itself.”

Osea has been taken advantage of the now fertile hillside and Balawa has interplanted the *Dalo* with *Yaqona*, Chinese cabbage and tomatoes. He does not need to walk five miles every day to reach a suitable farming area anymore. Similarly, many farmers in Ra have decided to follow suit. A field day (see following article – Ed.) recently organized at Balawa’s farm by MAFF has attracted many more ‘vetiver’ potential converts.

Vetiver Grass for Soil Conservation: A Farmer’s Field Day in Fiji*

Vetiver grass has been introduced to Fiji from India during the early 1800s mainly to provide thatching material for houses. Although it was commonly used to stabilize embankments, terraces and to delineate farm boundaries, its application as a soil conservation measure was not realized until the early 1950s. The Colonial Sugar Refinery (CSR), the predecessor of the Fiji Sugar Corporation (FSC), initially began to realize the problems associated with severe soil erosion of sloping lands cultivated to sugarcane which became more and more prevalent. This was very evident in Rakiraki area where the land is very steep and very high rainfall intensity.

The Land Use Planning Section (LUPS) of the Ministry of Agriculture, Fisheries and Forests (MAFF), Fiji has conducted a farmer’s field day under the theme “Vetiver Grass for Soil

* Extracted from “Farmer’s Field Day” and “Farmer’s Field Day Report” published by the Land Use Planning Section of the Ministry of Agriculture, Fisheries and Forests, Fiji

Conservation” on 12 October 2000 at Mataku Village which lies in the Bureivanua District of Ra Province in the Western Division. The main source of sustenance for the villager is through gathering food from surrounding forests and from the nearby Wailoa Creek that runs alongside the village. The land surrounding Matuka is very steep with slope averaging 15-20°. Flat land is virtually non-existent and farmers are now encroaching on marginal lands in search for fertile soil. Initially, farmers planted in areas surrounding the village and by the roadside which is easily accessible and closer to the village. Many farmers have abandoned their farmlands and are moving higher towards upland areas. Presently, the trend now seen farmers moving into sloping lands where the risk of potential soil erosion is very great. It has also seen the clearing of forestland to plant and grow crops. Matuka Village is one of the many villages where VGT is in use. Since 1997, more than 50 farmers adopted this technology. These farms are in the provinces of Nadroga, Ba, and Navosa.

The overall objectives of the farmer’s field day were to: (i) raise general awareness of land users in rural communities on the benefits of sustainable land use practices, and (ii) inform and disseminate information of the causes, effects and prevention of soil erosion on sloping lands using vetiver grass technology (VGT). The participants have been drawn from 11 nearby villages, totaling over 80 (far exceeded the expected numbers); a large number of extension and research staff were also present, while three resource personnel were from the LUPS.

Result: The farmers are now more knowledgeable about the use of VGT to control soil erosion as indicated by the type of questions asked during the discussion session. Questions flowed freely and farmers were very confident in forwarding these questions. Judging by the nature of the questions, there is a strong indication the farmers have grasped the knowledge of the use of VGT as a soil conservation measure. Furthermore, there is efficient implication of raised general awareness of the causes, effects and prevention of soil erosion amongst farmers and staff. Printed material prepared by the LUPS was given to farmers and its staff. This serves as further information about VGT and its use and general information and reminds the field day attendants of lessons learnt. The display was photographic representation of previous demonstration farms that the LUPS has worked in other localities together with brief explanations.

Summary Report of the International Training Course on the Vetiver System

As announced in Vetiverim-14, the Heineken Breweries Co. Ltd. has donated US\$50,000 to the Office of the Royal Development Projects Board (ORDPB) to promote the use and utilization of vetiver. Heineken has its green label image and is dependent upon sources of clean water for its products, so the company is interested in environmentally beneficial technologies, especially those that involve the conservation of clean water. The ORDPB has decided to use this fund for two main activities, (i) training, and (ii) dissemination of technology. The topic of the training is "The Vetiver System", and is offered to both the international trainees from various countries as well as to the Thai people, both of which were conducted by the ORDPB on behalf of the Chaipattana Foundation which received the donation from the Heineken Breweries. A number of ORDPB's member agencies provided technical supports, such as giving lectures, preparing the sites and facilities for the study tour and on-the-job training.

The main objective of this International Training Course is that after the training, the trainees will become familiar with the vetiver system and the various technologies employed, appreciate what is being done in research, experimentation and application, and have concepts on how to promote the technology in their own environment.

The Course took place from 19 to 30 November 2000. This 12-day duration was divided into five activities, namely: (i) 2 days for international travelling to and from Bangkok (all trainees, except one from Nigeria, arrived in Bangkok on Sunday 19 November and departed from Bangkok on Thursday, 30 November 2000); (ii) 2 days for course work at the Asia Hotel in Bangkok; (iii) 3 days for demonstrations, on-the-job training and study tours (at the Asian Institute of Technology in Pathum Thani, the Queen Sirikit Botanic Garden in Chiang Mai, the Land Development Station in Chiang Rai, the Doi Tung Development Project in Chiang Rai); (iv) 3 days for the study tour to successful project sites, e.g. at Huai Sai, Nong Phlap, Khao Changum; and (v) 2 days for travelling within Thailand.

There were 35 trainees from 15 countries in all five continents. The introductory part of the lecture covered the importance of the vetiver while the main feature included propagation techniques and nursery management, the use of vetiver grass in various systems of both agricultural and non-agricultural activities, and the utilization of the leaves and other parts.

Problems and prospects of VS technology transfer by various agencies in Thailand have also been discussed. The practical, hands-on training provided a good opportunity for the trainees to learn all the techniques of propagation and planting out in the fields for different purposes. The study tour to various sites where vetiver has been successfully established has added to the trainees' experience through the concept of 'seeing is believing'.

For the assessment of the International Training Course, participants were asked to complete the evaluation forms on a daily basis from the opening day on 20 November 2000, up to the last day on 29 November 2000. The information from the evaluation forms can be concluded as follows:

The majority of participants lie in an age range between 31 and 50 years (73.68%) and are predominantly male (89.47%). Regarding education, more than half of the participants graduated with a master's degree (52.63%), followed by a doctoral degree (31.58%), a bachelor's degree (10.53%) and less than a Bachelor's Degree (5.26%). Their present positions are practitioners (31.58%), government executive officials and directors (21.05%), technical officials (21.05%), professors (15.79%), and chief executive officers from the business sector (10.53%), respectively. Their responsibilities range from project planning, project supervision, project coordination, to project implementation.

From the assessment, the opinions of the respondents towards the Course can be summarized as follows:

(Text continues on p.17)

Pictorial Report of the International Training Course on the Vetiver System is shown on pages 9-16

1. *Lecture topics, lecturers' knowledge, training approach, and time for the in-class session at Asia Hotel:* The majority deemed that they were appropriate and they also gained more knowledge on the vetiver system after attending the Course.

2. *Lecturers' knowledge, lecture and demonstration methods, and time for the study tour sessions:* The majority viewed that they were appropriate and they also gained more knowledge on the vetiver systems after the study tours. Moreover, they were highly satisfied with the study tours and with every chosen site.

3. *The knowledge gained (before and after attending the study tours):*

3.1 *Before attending the study tours:* The knowledge of the majority of the participants on the 14 sites was little (68.42%-94.74%) and moderate (5.26%-31.58%).

3.2 *After attending the study tours:* The knowledge of the majority of the participants on the 14 sites was much (57.89%-78.95%), moderate (21.05%-36.84%) and little (0%-10.53%) respectively.

4. *The satisfaction level after having taken the study tours to 14 sites:* The majority of participants were satisfied with all the 14 sites.

5. *The question "If Thailand has a chance to organize the International Training Course on Vetiver System again, what should the topic be?":* Some participants suggested that the course should emphasize the theme of 'the Cost-Benefit of Vetiver' which consists of the following topics:

- ✧ The Effects of Vetiver Utilization upon Farmers' Income
- ✧ Cost-Effectiveness of the Use of Vetiver
- ✧ Classification of the Benefits from Vetiver System by Experts on Various Aspects, namely Biology and Ecology, Economics, Agriculture, Non-Agriculture, Engineering, Up-to-date Research, International Cooperation, Farmers' Opinion, Socio-Economic Results from the Adoption of Vetiver System by Thai farmers.
- ✧ Marketing Aspects of Vetiver Handicraft Products and the Cost and Return Analysis

Other suggestions for different themes and topics are:

- ✧ The Extension of Vetiver Grass Technology to Farmers
- ✧ Vetiver System and the Global Warming
- ✧ Vetiver and the Environment

Altogether there are 22 proposed topics for the future training courses; two participants confirmed that the topic of the present course was appropriate. Apart from the topics, the participants also gave opinions on the course activities such as more round table discussions and visit to observe the mining activity and rehabilitation.

6. *Additional suggestions and opinions:* The participants mentioned six points of success of the International Training Course, followed by three problems concerning communication and two problems regarding duration. They said that they would apply the

knowledge gained to generate benefits for their organizations and their countries. They also expressed words of thanks.

The Vetiver Network Awards Program – Series Three – 2001 – 2004

The Vetiver Network (TVN) is pleased to announce the third series of Vetiver Awards, made possible thanks to a generous grant from the William H. Donner Foundation. TVN will award a total of US\$45,000 in prize money, distributed as described below. In anticipation of the Third International Conference on Vetiver, to be held in China in 2004, whose theme will be 'Vetiver and Water', one category of the awards will be Vetiver System applications in relation to water. As in the past, the TVN hopes to receive many nominations for each category. The competition for the Vetiver Awards, in years past, has brought out information that significantly increased our knowledge of vetiver's uses, applications and benefits. The deadline for nominations will be 1 October 2003. Award winners will be announced in early 2004.

Eligibility

All vetiver users, be they individuals or groups, who have shown initiative in research, or utilization or promotion of the Vetiver System. These may include farmers, technicians, NGOs, students, scientists, researchers, private companies, innovators, etc. who have produced and documented concrete, repeatable results.

Award Categories

Awards will be given in six categories:

1. Water Applications
 - a. Watershed Protection/Improvement
 - b. Engineering – Natural and Constructed
 - c. Quality – Pollution Control and Treatment
2. Engineering/Infrastructure Protection
3. Land Reclamation
4. Dissemination
5. Country Vetiver Award
6. Farmer/User Awards - Regional
 - a. Asia
 - b. Africa
 - c. Latin America

d. Others

7. Vetiver 'Champion'

Award Value

Awards will range between US\$3,000 and US\$500 for the first through the third places. All awardees will receive a special commemorative certificate

Documentation

There is no award application form. Nominations may either be from individuals regarding their own work or be made by another person. Documentation may consist of several types of information (personal accounts, reports, articles, photographs, scientific papers, testimonials, etc.), however, we strongly encourage the inclusion (where relevant) of photographs and 'before' and 'after' photographs whenever possible. Please be as brief and clear as possible.

The following should be mailed to The Vetiver Network:

1. Name and address (phone, fax, and email as available) of nominee
2. Name and address (phone, fax, and email) of nominator (if applicable)
3. Project information:
 - a. Location of Project
 - b. Description of Project
 - c. Accomplishments of Project
 - d. Importance of Project
4. Supporting documentation (optional, but useful in determining awards)
5. Name and address of a reference who is familiar with the project

Award Selection

Projects will be judged on the following:

Merit: Quality of thought and methods used to accomplish the project's goals.

Relevance: Project's potential to protect/improve the environment or lower costs or improve quality of life or other noteworthy impacts.

Innovation: originality, including using old ideas in new ways.

Application: Demonstrated usefulness of the results.

Extra credit will be given (where relevant) to those who include practical details of benefits and costs, or a benefit-cost analysis, or efficiency analysis (i.e., benefits-costs of the Vetiver System compared to traditional or other systems).

Award Categories

Within these categories there are no pre-defined topics. The creativity and innovation of the user is the only constraint. The ideas listed below in each category are only illustrative to give a clearer idea of what might be interesting.

1. *Water Applications:* The theme of the International Conference on Vetiver in 2004 in China is 'Vetiver and Water'. Most Vetiver System applications can be thought of in terms of its relationship to and effect on water through:

a. Watershed Protection/Improvement – Such as the use of the Vetiver System for protecting and improving the quality of water through treatment of watersheds, streambanks and streamside buffers, for soil moisture and/or groundwater improvement, reduction of sedimentation, etc.

b. Engineering – The use of VS to protect and stabilize the banks and channels of natural and constructed waterways, and dams.

c. Quality – Use of VS to control and treat polluted surface water, groundwater and wastewater.

2. *Bioengineering Applications:* Use of VS for stabilization and protection of buildings, roadsides, railroads, bridges, industrial sites, landfills, cut-and-fill slopes, and other infrastructure or engineering applications, for slope stabilization in vulnerability/hazard reduction, etc.

3. *Land Reclamation:* The use of VS for reclamation of abandoned and polluted, toxic lands, degraded sites, gully stabilization, mine spoils and slimes stabilization and revegetation, improvement of soils with extreme conditions, etc.

4. *Dissemination:* Original publication, brochure, pamphlet, multi-media, etc.

5. *Country Vetiver Award:* Award given to acknowledge the best overall achievements and results of a VS program in a country.

6. *Farmer/User Awards:* Awards to acknowledge the utilization of vetiver by individuals to improve the quality of their lives through economic and environmental improvements via increased production on agricultural lands, economic/environmental improvement and/or other

uses of VS such as providing mulch, fuel, artisanal uses, livestock fodder, etc. There will be awards made in each of the following regions of the world:

- a. Asia
- b. Africa
- c. Latin America
- d. Others

7. *Vetiver Champion*: Open to nominations for people who have been instrumental, either in their country (region, globally) or technical area (for example, research, soil and moisture conservation, etc.) in effective and dedicated promotion, investigation, improvement, etc. of the use of the vetiver system.

Please send nominations to:

The Vetiver Network
3601 N. 14th Street
Arlington, Virginia 22201
USA

Please include a self-addressed card which we can then return to you to acknowledge receipt of nomination.

You will find the same on the front page of our homepage at <http://www.vetiver.org>.

Vetiver Funds

Vetiver System is a low-cost technology to solve big problems of soil and water conservation. However, before such a system can be transferred, there is a need for funds to support research and development as well as for transfer the derived technology. The Vetiver Network (TVN) has been established as a non-profit organization to support the use and utilization of vetiver for soil and water conservation. During the first few years of its existence, it received full support from the World Bank. However, such support has been terminated and it now depends on grants from various governmental and non-governmental agencies.

During the past few months, TVN received the following grants:

<i>Donor</i>	<i>Amount (US\$)</i>	<i>Objective</i>
Amberstone Trust	55,000	
The Wallace Global Foundation,	75,000	
Denmark Government	114,000	Knowledge transfer (newsletters, reprinting green books, homepage, CD ROMS, etc.).
William Donner Foundation	100,000	Support VS research grants program.

(Of this amount, \$45,000 will be provided for research on water-related aspects of vetiver)

The US Internal Revenue Service has recently confirmed the status of the Vetiver Network as a tax-exempt foundation.

In addition, the Office of the Royal Development Projects Board (ORDPB) of Thailand received \$50,000 from the Heineken Breweries Co. Ltd. to be spent for the promotion of the uses and utilization of vetiver. This fund will be used in: (i) organizing an international training course on Vetiver System, and (ii) VS technology transfer through publications and CD ROMs.

These funds support the overall objectives of 'Vetiver 2000 Project'. Altogether, this amounts to nearly \$400,000. These fundings are to be used to leverage additional funding from other donors such as UK, Holland, Germany, Sweden, Norway as well as from the private sector.

Use of VS on Degraded Soils Won a Rolex Award

Maria Eliza Manteca Onate of Fundacion Golondrinas in Ecuador is one of 'Year 2000 Winners' of five \$100,000 Rolex Awards for her work in establishing a nature reserve, successful education program based at a model farm promoting sustainable agriculture which has utilized the Vetiver System for Agriculture in order to cultivate the degraded soils on the farm. Fundacion Golondrinas was one of the NGOs that received grant (\$10,000 each) from TVN in 1996.

Information on Maria Eliza's and her project is available at:

<http://www.rolexawards.com/laureates/laureate2.jsp?id=0037>

If any readers have obtained good result in the project on the transfer of technology on vetiver system, you may submit your project for the \$1,000 award to Joan Miller, Coordinator, The Vetiver Network, 3601 N. 14th St., Arlington, VA 22201, USA. Tel: 703-525-7092 / Fax: 703-243-6203; Email: vetiver@vetiver.org; Homepage: <http://www.vetiver.org>

CD ROMs on Vetiver System

Dr. Paul Truong of the Queensland Department of Natural Resources in Brisbane, Australia has recently released two CD ROMs on the Vetiver System. The first is entitled 'Vetiver System Techniques'. It is a collection of several of Dr. Truong's previous technical CD ROMs as well as new topics that relate to the various uses of the Vetiver System. The content of the disk is as follows:

- ✧ Vetiver Grass System: Research, Development and Applications in Queensland, Australia (1988-1997)

- ✧ Vetiver Grass System for Flood Erosion Control – A Pictorial Record (1993-1996)

- ✧ Vetiver Grass Technology for Infrastructure Protection: A Pictorial Record (Revised Edition 1999)

- ✧ Vetiver Grass Technology for Environmental Protection: A Pictorial Essay (January 2000)

- ✧ Vetiver System for River Bank Stabilization: A Pictorial Essay (March 2000)

Included in the above are photographs, text and data supporting VS for each use.

The second CD ROM, 'Vetiver System Resources' includes the following and more:

- ✧ Report on the Second International Conference on Vetiver: Vetiver and the Environment (Paul Truong)

- ✧ A Look See at Vetiver Grass in Malaysia (P.K. Yoon)

- ✧ Vetiver Grass: The Plant (Paul Truong)

- ✧ The World Bank Slide Set (Dick Grimshaw and John Greenfield)

- ✧ Vetiver Barriers: A New Upland Buffer Tool, USDA-ARS (Seth Dabney)

- ✧ Bio-Engineering Conference, Manila 1999 (Paul Truong)

The Office of the Royal Development Projects Board has been requested to produce both CD ROMs in Bangkok for The Vetiver Network (TVN). They were given as a compliment to all trainees of the International and National Training Courses on the Vetiver System recently held in Thailand. The rest has been sent to TVN for further distribution. They are highly recommended as "Vetiver Library Essentials". For those who are interested in having both CD ROMs, which are available free of charge, except for handling and postage, please send an

international money order, in US Dollar for the amount of \$10, made out to 'The Vetiver Network' to TVN, 3601 N. 14th Street, Arlington, Virginia 22201, USA.

Letters to the Editor

Farmers' Field Day in Fiji

The Land Use Planning Section (LUPS), Ministry of Agriculture, Fisheries and Forests (MAFF) Fiji, has conducted researches on Sustainable Land Management Technologies, one of which being the planting of vetiver grass on the contours to control soil erosion on sloping land, i.e. Vetiver Grass Technology (VGT). LUPS organized a farmers' field day on 12 October 2000 at Matuku Village, Ra Province, Fiji which is one of the several villages where VGT has been in use. Since 1997, more than 50 farmers have adopted this technology which is steadily realized as an effective measure for soil erosion prevention. The attached report summarizes the response from farmers and MAFF Fiji staff who attended the field day. In addition, the article "A Jokeful of Crops" appeared in a national daily newspaper (Fiji Post, 23 October 2000), reporting on the Field Day, is also attached.

Osea Bolawaqatabu
Land Use Planning Section
Ministry of Agriculture, Fisheries and Forests
Fiji

Thanks for sending us the report and the newspaper clipping, both of which have been extracted and published in this issue of Vetiverim. Congratulations on the work well done. This is another example of a successful program that should be attempted in other countries. – Ed.

A Request from Pakistan

Pakistan is an agricultural country with a population of 140 million. The natural resource base of the country is suffering serious degradation, in the face of fast growing population. Among other soil degradation processes, water erosion in rain-fed areas of the country is a key cause of declining food security by engulfing cultivated lands and/or reducing their productivity through loss of fertile topsoil and/or precious rainwater. Thus, both the basic resources for

agriculture – land and water – require immediate ameliorative attention in rain-fed agriculture for rehabilitation of the resource base as well as sustaining productivity.

Vetiver System (VS) has shown its promise for conservation of soil and water under wide variety of conditions. It has proved its worth for increasing the productivity of soil and/or water many folds on sustainable basis. It is cost effective and requires very little operation and maintenance cost. It therefore offers a good chance for poverty alleviation through enhancing agricultural productivity on sustained bases.

Water Resources Research Institute (WRRRI), National Agricultural Research Centre (NARC), Islamabad, Pakistan is endeavoring to develop low-cost technologies for soil and water conservation through community participation. Considerable research/development work done elsewhere on VGT will be of great value. The Vetiver Network is providing commendable service to its member countries. It is requested that we may be included in the network and please provide us vetiver grass material and financial support for testing/evaluation under our local conditions. This arrangement will provide us an opportunity of benefiting from the relevant experience and guidance for a more meaningful research-cum-development endeavor in Pakistan.

Muhammad Shafiq, Principal Scientific Officer
Head, Soil and Water Conservation Program, WRRRI, NARC
Islamabad, Pakistan
Email: wrrri@wr-narc.isb.sdnpk.org

Thanks for your interest in the vetiver and PRVN. I am sorry that our network covers only the countries in the Pacific Rim, thus we cannot have Pakistan in our Network. However, we are most happy to send you all our publications that should be helpful to understand the great value of this miracle plant for soil and water conservation purposes.

Your letter prompted me to think that we should also have a regional network for South Asia as there are only a few national networks at present. As NARC is well known throughout the region, why don't you approach The Vetiver Network (Address: Joan Miller, Coordinator, The Vetiver Network, 3601 N. 14th St., Arlington, VA – 22201, USA. Tel: 703-525-7092 / Fax: 703-243-6203; Email: vetiver@vetiver.org; Homepage: <<http://www.vetiver.org>>) to consider providing support to set up a regional network for South Asia.

From NC to NC of NC (Can anyone guess what it means by NC's?)

I am working for a local governmental service in the agronomic domain and particularly in coffee growing. As I am trying to give this coffee industry a sound and clean impact on the environment and put it in the long term, I came into contact first with vetiver grass technology which has been used here in the past four years, and then with The Vetiver Network. My task is to incorporate the vetiver in the coffee industry: (i) to prevent soil compaction from farm equipment use, (ii) to improve underground tank capacities, (iii) to manage the effects of river floods, (iv) to produce mulching and construction materials, and (v) to recycle water and wastes at the wet mill. This is to be done in an ISO 14001 Environmental Management System in order to label the products. Secondly, I own a 25-acre farm located on 10-20% slopes where I started to reuse the vetiver grass. Thirdly I spend some time for local coffee history searching on practices that have been used such as VGT. I am a 50-year old senior agronomist with 20 years' experience in New Caledonia (NC) where VGT should be promoted for protection against tropical climate conditions and for nickel-mine site rehabilitation. NC is a French island located in the southwest of the Pacific Rim, close to Australia (Queensland) and New Zealand. I saw on your web site that you are looking for coordinators for certain territories and I therefore would like to know more about it, to see if I could become a member and national coordinator for NC.

Georges Donskoff

Nily, VU15, La Foa, 98880

New Caledonia

Donskoff@netscape.net

Thanks for your kind offer. On behalf of the Regional Coordinator of PRVN, I am appointing you to be the National Coordinator for New Caledonia. I have arranged to send you all our publications and CD ROMs on vetiver. If there is anything further you want to obtain from PRVN, please don't hesitate to contact us. – Ed. [The answer to the meaning of NC's in the heading is "From Narong Chomchalow to the National Coordinator of New Caledonia"]

Potential of Vetiver in Trans Thailand-Malaysia Pipeline

Are you able to provide me with the publication mentioned by Joan Miller (Techniques of Vetiver Propagation –Ed.)? I am most interested in your work in Thailand. Now that the Trans Thailand-Malaysia Pipeline project (from Songkhla in Thailand to Butterworth in Malaysia) has

passed the public enquiry, I think there will be a lot of potential for vetiver to be used as a mitigation measure to control erosion and silt run-off into local watercourses.

Your work in the Office of the Royal Development Projects Board is well known and highly respected. We would very much appreciate your cooperation and perhaps some sort of link-up if the project finally proceeds in the next year.

Robert French

Atlas Consult & Associates Sdn. Bhd.

Petaling Jaya, Selangor, Malaysia

E-mail: atreal@po.jaring.my or rof@tm.net.my

Thanks for your interest in our activities. I have arranged to send you a copy of my paper, "Techniques of Vetiver Propagation – with Special Reference to Thailand" as requested. In addition, the Petroleum Authority of Thailand's paper on "The Use of Vetiver Grass System for Erosion Control and Slope Stabilization Along the Yadana Gas Pipeline Right-of-Way" has also been sent to you since the situation of the Trans Thailand-Malaysia Pipeline is similar to the Yadana Pipeline from Myanmar to Thailand. I am sure both papers will be useful to your project. – Ed.

A Grant from William Donner Foundation

The Vetiver Network is pleased to announce the receipt of a grant of US\$100,000 from the William Donner Foundation. Approximately half of these funds has been allocated by TVN to support a research grant program whose details are as follows:

The Vetiver Network is pleased to announce a continuation of its Vetiver System (VS) research grants program. In anticipation of the Third International Conference on Vetiver in China in 2004, TVN wishes to encourage research on the theme 'Vetiver and Water' which is the conference theme. Through the generosity of the William Donner Foundation, TVN will award grants totalling \$45,000 for research on water-related aspects of vetiver. TVN will fund up to 50% of the proposed research, the remaining 50% to be provided by additional sources. Applications for funding under \$2,000 are strongly encouraged, and small enabling grants (\$100 - \$1,000) are especially favored, as is collaborative and interdisciplinary research. The maximum funding for an individual grant is \$9,000, which with matching funds would require a total budget of at least \$18,000.

Preproposal process provides TVN with a Statement of Research (up to 250 words) that describes the scope of work, including testable hypothesis and anticipated results. Clearly state total budget and amount requested from TVN. Any topic will be considered for funding; priority will be given to research on VS interrelationships with water quantity, and/or distribution. (For those who are interested, the following articles by Dick Grimshaw discuss this topic, Vetiver Newsletter 22 ('Vetiver and Water, an Enhanced Perspective') and <http://www.vetiver.org / TVN_editors_re.htm>. For preproposals considered of potential interest, TVN will request a complete research proposal; the level of detail required will depend on the size of the request and the nature of the research. Matching funds commitments (which can include self-funding but not in-kind contributions) must be documented prior to award. TVN may also assist, without further obligation, in providing review recommendations and contacts for potential collaboration.

Submissions

Please send all preproposals (mail, email, or fax) to The Vetiver Network, ATTN: Donner Research Grants, 3601 North 14th Street, Arlington, Virginia 22201, USA; vetiver@vetiver.org; fax: 7032436203. There is no deadline for submission. Further details will be posted on The Vetiver Network homepage (www.vetiver.org)

Joan Miller – Coordinator

The Vetiver Network, 3601 N. 14th St., Arlington, VA – 22201, USA

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