

VETIVERIM

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Editorial

What did we achieve at ICV-5?

The Fifth International Conference on Vetiver (ICV-5) was held from 28-30 October 2011 in Lucknow, India, the country of origin of vetiver, which is now used for soil and water conservation in almost 100 countries all over the world. No other place is more appropriate than the Central Institute of Medicinal and Aromatic Plants (CIMAP), where a lot of research works on vetiver has been conducted for a long time, including the release of new varieties of vetiver, and most recently, of a new tetraploid clone of vetiver.

The theme of ICV-5, "Vetiver and Climate Change" is most appropriate and timely, since we are now facing a number of incidences caused by climate change such as devastating tsunamis, super storms, very heavy rain falls, severe floods and droughts, and other catastrophes the world has never experienced before.

The ecological, economic and social applications of the Vetiver System (VS) have opened a world of opportunities for basic and applied research. VS could help mitigate the adverse effects of climate change, such as flood and landslide disasters, soil degradation, lowering water quality and quantity, plus pollution control.

As the host of ICV-5, India has shown the rest of the world her achievements in vetiver R&D and also offered an opportunity for the participants to see vetiver in action in its native home in Lucknow, a place where vetiver is in its native habitat.

At ICV-5, a number of vetiver experts presented their findings relating to vetiver and climate change. In addition, ICV-5 featured a wide range of other VS applications. This has provided an excellent opportunity for scientists, growers, entrepreneurs, industrialists and environmentalists to interact and share their experience on the prospects, potential, and opportunities of VS applications. It is heartening to learn that many of the young participants have gone ahead in finding new uses and applications of the VS, as well as finding new places for which the old applications are the right solution.

In addition to the work highlighted above, the host institute provided most generous hospitality for international as well as domestic participants on a par with all previous ICVs. We all returned with fond memories of India, the original home of vetiver.

Report of the Fifth International Conference on Vetiver*

Vetiver plant, botanically known as *Vetiveria zizanioides*, belongs to the grass family. A native grass of India, vetiver is now grown in over 100 countries all across the globe from tropical to Mediterranean climates. It can tolerate wide range of temperature and soil conditions. The grass known by its common name “Khus” in Hindi and “Ushira” in Sanskrit has traditionally been used in India for over 800 years for extraction of its root essential oil known as “Rooh Khus” variously used in perfumery and beverages.

Lately, this grass has attracted worldwide attention as a natural inexpensive and practical means for its environmental applications, including conservation; detoxification of degraded soil and water, flood and landslide disaster mitigation. In addition to its tremendous potential in environmental conservation, this grass also shows promise for possible mitigation of global warming while providing a livelihood for rural communities through secondary use of its biomass in social forestry, mushroom cultivation and handicraft making.

Four international conferences on this “miracle grass” have been organized since 1996 outside India, two in Thailand (in 1996 and 2000), one in China (in 2003) and another one in Venezuela (in 2006). This is the first time that an International Conference on Vetiver – the fifth in the series with the conference theme “Vetiver and Climate Change” was organized in India at the CSIR - Central Institute of Medicinal Plants, Lucknow from 28-30 October 2011.

As a pre-conference activity the Patron of The Vetiver Network International (TVNI) Her Royal Highness Princess Maha Chakri Sirindhorn of Thailand planted two Thai endemic plants named after her, namely ‘Champi Sirindhorn’ - *Magnolia sirindhorniae* Noot. & Chalermglin and ‘Sirindhorn Walli’ - *Bauhinia sirindhorniae* K. & S.S. Larsen, at the CSIR - Central Institute of Medicinal and Aromatic Plants, Lucknow and also at the CSIR - National Botanical Research Institute, Lucknow on 27 October 2011.

The opening ceremony of the conference was held on 28 October at CSIR-CIMAP, Lucknow with Her Royal Highness Princess Maha Chakri Sirindhorn as the Chief Guest who declared the Conference open and also released a Conference Souvenir. Director of CIMAP, Professor Ram Rajashekharan in his welcome address expressed his pleasure for organizing this historical event at the green campus of CIMAP and in the city of Lucknow where vetiver is a native, and the Organizing Secretary Dr. Umesh C. Lavania introduced the distinguished Chief Guest - Her Royal Highness Princess Maha Chakri Sirindhorn of Thailand. H.E. Dr. Ampol Senanarong, Privy Councillor to the HM the King of Thailand, in his remarks highlighted the significant role played by the HM the King of Thailand in promoting the Vetiver System. Her Royal Highness Princess Maha Chakri Sirindhorn in her inaugural address pinpointed the newer roles, including application of vetiver grass model in mitigating the problem of atmospheric carbon in addition to the significant impact the Vetiver System has made in solving various environmental problems and possibly mitigating the adverse effect of climate change. She expressed that during the conference, apart from discussing and viewing the latest applications of the Vetiver System, we should advance further, to the next step that would lead to greater benefit for all mankind.

On this occasion the Director of CIMAP released a seed infertile autopolyploid clone of vetiver named, “Khus-40”, developed at CIMAP, Lucknow. This clone has value in ecological plantations for soil conservation and carbon sequestration. The Secretary-General of the Chaipattana Foundation of Thailand, Dr. Sumet Tantivejkul announced the fifth series of “The King of Thailand Vetiver Awards and the King of Thailand Vetiver Award Certificates of Excellence” and the President of The Vetiver Network International (TVNI), Dr. James Smyle announced the TVNI Awards. Both these awards were given to the awardees by Her Royal Highness Princess Maha Chakri Sirindhorn of Thailand during the opening ceremony.

* By U.C. Lavania, CSIR - Central Institute of Medicinal and Aromatic Plants, Lucknow, India, <lavaniauc@yahoo.co.in>.

The Conference was attended by over 70 Indian participants plus 90 foreign delegates representing 20 countries. The delegates included leading practitioners, experts, and policy makers associated with the Vetiver System applications from all over the world. This provided an excellent opportunity for scientists, growers, entrepreneurs, industrialists and environmentalists to interact and share their experience on the prospects, potential, and opportunities of VS applications.

There were 70 oral and 30 poster presentations, including plenary lectures by the international experts and award winners, covering the theme areas: (i) climate change and the potential contribution of the Vetiver System, (ii) infrastructure protection and pollution control, (iii) recent global innovations in R & D and its applications, and (iv) other contributions to VS, relating to vetiver oil and processing, economic and social uses of vetiver by-products, general aspects and basic studies.

The book of abstracts, unedited proceedings, and powerpoint presentations made at the ICV-5 are available on www.vetiver.org. The book of abstracts (souvenir) contains messages from lead vetiverites who have pioneered and championed the cause of Vetiver System applications in a global perspective. A duly edited version of the full ICV-5 proceedings will be made available shortly.

In addition to interactive deliberations, one of the unique attractions of the Conference was: “Vetiver Handicraft Training Class” mentored by PTT Company Ltd., Bangkok, wherein hands-on training was provided for making handicrafts from vetiver leaves. In addition to delegates, other visitors, self-help groups, and staff of CIMAP actively participated in this activity.

The host institute CIMAP instituted ICV-5 poster awards were given to the five best posters presented during the conference. The selection of the posters was made by the international experts.

The conference concluded with specific recommendations emphasizing the need to:

- (i) Develop the right kind of plant material for specific applications,
- (ii) Participation of public-private partnership and involvement of youth force for implementation,
- (iii) Establishment of bioengineering standards,
- (iv) Documentation of C-sequestration and water recharge, bioenergy and phytoremediation potential of vetiver system technology,
- (v) Synthesis of available information in a simple way and using local languages for dissemination,
- (vi) Strong follow-up of the deliberations of the conference, take advantage of Mr. Richard Grimshaw’s blog,
- (vii) Development of an economic model for the benefit sharing with local communities.

It was announced that next ICV-6 shall be held in Da Nang, Vietnam in 2014 on the theme “Vetiver and Energy”

Script from the World’s Largest English Language Newspaper*

Conference on Vetiver Concludes at CIMAP

The conference on vetiver concluded on Sunday at CIMAP with major recommendations being emphasis should be made towards sharing the information on vetiver (‘khus’ in local language). The future of the vetiver depends on the young generation. It was stressed to disseminate the information from school levels. The panelists also recommended that research work especially in the area of bio-engineering and phytoremediation should continue in this miracle grass and both government and private organizations/enterprises should be involved to help the society. The plan should also be made to produce large number of the plant material for spreading the crop area. Whole farming system of vetiver should be considered for development, traditional medicinal uses of vetiver should also be explored. The next conference of vetiver will be held in Vietnam.

* From “Times of India”, October 31, 2011, courtesy Mark Dafforn, US National Academy of Science, Washington, DC, USA, <VetiverNet@aol.com>.

Thailand's Support of and Participation in the Fifth International Conference on Vetiver*

Between 28 October – 2 November 2011, the Central Institute of Medicinal and Aromatic Plants (CIMAP), with support of the Chaipattana Foundation, Thailand; the Office of the Royal Development Projects Board (ORDPB), Thailand; the Vetiver Network International (TVNI); India Vetiver Network; the National Science Agencies in India, organized the Fifth International Conference on Vetiver (ICV-5) at CIMAP, Lucknow, India, under the theme of “Vetiver and Climate Change.” The objectives are to review the development on the prospects and potential of vetiver in addressing issues related to climate change and mitigation of global warming. In addition, the conference aims to provide the latest development on vetiver system applications to underscore its promises and potential in the service of global community while presenting an overview of vetiver ecosystem services as well as continuing the expansion of the networks of the vetiver system users around the world.

Prior to the Conference, arrangement has been made for Her Royal Highness Princess Maha Chakri Sirindhorn, the Chairperson of the Opening Ceremony of ICV-5, to plant two plants the bear her name, ‘Chapi Sirindhorn’ (*Magnolia sirindhorniae*) and Sirindhorn Walli (*Bauhinia sirindhorniae*) at the head office of CIMAP, and another set at the National Botanical Research Institute as a memory of her visit to Lucknow.

To fulfill the royal initiatives of His Majesty the King of Thailand on the development and promotion on the utilization of vetiver, Her Royal Highness Princess Maha Chakri Sirindhorn granted US\$ 15,000 as a contribution to the organization of the conference and presided over the conference as the Patron of TVNI. ORDPB as the agency responsible for coordinating vetiver activities in Thailand actively participated in the event by bringing 65 academics to attend the conference and present papers. In addition, various patterns of award-winning handicrafts made from vetiver from Thailand were displayed to make the public know the economic value of vetiver that helps to earn more income in addition to the conservation of soil and water. At the event, a group of Thai experts in handicraft making arranged a training course on handicraft making from vetiver leaves for the interested which was found to attract a lot of participants.

Another contribution from Thailand to ICV-5 was through granting of the King of Thailand Vetiver Awards. HRH Princess Maha Chakri Sirindhorn has graciously granted US\$ 10,000 from the Chaipattana Foundation for the King of Thailand Vetiver Awards for the most outstanding achievements on vetiver. The awards were split into two prizes, carrying US\$ 5,000 each, for the most outstanding research and dissemination of the Vetiver System. Each award was further split into two categories, each with US\$ 2,500 prize money. These include Agricultural and Non-Agricultural Applications for Research Category, and Government and Non-Government Agencies for Dissemination Category..

At the Opening Ceremony, Her Royal Highness the Princess graciously presented the awards to 12 recipients of the King of Thailand Vetiver Awards for the best papers on research and dissemination as well as 9 recipients of TVNI awards. Other activities included the plenary session, the concurrent session and the poster sessions. The conference was successfully organized and attended by approximately 160 participants of international (90) as well as Indian (70) academics and experts in Vetiver System application.

This conference enabled the participants to learn more about the development and promotion of vetiver grass in Thailand, which have been implemented according to the royal initiatives of His Majesty the King who has continuously granted initiatives on vetiver for almost 20 years.

So far, it can be said that the implementations in Thailand have been recognized at the international level. Moreover, the Thai academics who attended the conference had a great opportunity to exchange their experiences with the international users of vetiver and learned the successful implementations in Thailand that can be applied elsewhere.

* By Foreign Affairs Group, Office of the Royal Development Projects Board, Bangkok, Thailand.

Minutes of ICV-5 Business Meeting*

The Business Meeting of ICV- 5 was held on 28 October 2011, between 4.30 – 5.00 p.m. at a conference room of CIMAP, Lucknow, India. Altogether 17 persons consisting of country and regional network representatives and interested persons joined the meeting (for the name list see Annex 1). The conclusion of the meeting is as follow:

1. Chairman’s Announcement

Dr. Narong Chomchalow of Thailand, Chairman of the Continuing Committee for the Fifth International Conference on Vetiver (CC/ICV-5), acting as the Chairman of the Business Meeting, stated that the main objectives of this Business Meeting were to decide on the host of ICV-6 and to find the replacement of the previous members of CC/ICV-5 to be the members of CC/ICV-6.

2. Amendment of ICV Constitution

The ICV Constitution had been sent by the Chairman to each CC/ICV-5 members and other VIPs in the vetiver circle. There was no response to the amendment. However, during the meeting, it was proposed to split original Region 6 – The Americas into 3 regions, namely, Region 6 – North America, Region 7 – Mexico, Central America and the Caribbean, and Region 8 – South America.

3. Nomination and Selection of the Host Country of ICV-6

Mr. Tran Van Man, the President of SBTV Construction and Advance Technology Ltd., and the Coordinator of Vietnam Vetiver Network (VNVN) has proposed to organize ICV-6 in Vietnam.

4. Proposal on the Place and Date of ICV-6

Mr. Tran Van Man proposed that ICV-6 will be held in Danang, Central Vietnam. He presented how and why he thought Vietnam should be the host of ICV-6. His company has been using vetiver in construction and waste management for many years. Danang is a city with lots of potentials and facilities to accommodate big conferences.

The ICV-6 organizing committee will consist of Dr. Tran Tan Van, the former VNVN Coordinator, as the Chairman, Mr. Tran Van Man as the Vice Chairman, and Dr. Paul Truong as the Advisor. The venue could be either Furama Resort or University of Danang.. Both are well equipped and suitable for the conference. The date of ICV-6 is set to be in March 2014 or 2015, when the weather is in the finest period of the year.

5. Proposal on Theme and Sub-theme of ICV-6

The proposed theme is ‘Vetiver and Energy’..

The proposed sub-theme is ‘How to prove that vetiver as a new concept to contribute sustainable energy?’

However, in the meantime, suggestions and comments on the theme and sub-theme from everyone are welcome.

6. Nomination of Members of CC/ICV-6

The following members have been elected:

Ex-Officio Member (President of the immediate past ICV):

Dr. Ram Rajasekharan (India)

Regional Representatives:

Region 1: Southeast Asia

Dr. Narong Chomchalow (Thailand)

Dr. Tran Van Man (Vietnam)

Region 2: East Asia, Oceania and the Pacific

Prof. Liyu Xu (China)

Dr. Paul Truong (Australia)

Region 3: South Asia

* By Suwanna Pasiri, Office of the Royal Development Projects Board, Bangkok, Thailand, (spasiri2011@gmail.com).

- Dr. Umesh Lavania (India)
- Mr. P. Haridas (India)
- Region 4: Middle East, North Africa, and Europe
 - Mr. Criss Juliard (Mediterranean)
 - Mr. Marco Forti (Italy)
- Region 5: Sub-Sahara Africa
 - Prof. Jonnie van den Berg (South Africa)
 - Mr. Roley Noffke (South Africa)
- Region 6: North America
 - Dr. Dale Rachmeler (USA)
 - Dr. Doug Richardson (USA)
- Region 7: Mexico, Central America and the Caribbean
 - Mr. Alberto Rodrigues (Puerto Rico)
 - Mr. Leonel Castro (Guatemala)
- Region 8: South America
 - Mr. Rafael Luque (Venezuela)
 - Ms. Paula Pereira (Brazil)

7. Election of Chairman of CC/ICV-6

The meeting agreed that Dr. Narong Chomchalow of Thailand continues to be the Chairman of CC/ ICV-6.

Annex 1. List of ICV-5 Business Meeting Participants

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|-----|---|-----------|
| 1. | Dr. Narong Chomchalow (Thailand) | Chairman |
| 2. | Dr. Jim Smyle (President, TVNI) | |
| 3. | Dr. Dale Rachmeler (Ex-President, TVNI) | |
| 4. | Mr. Criss Juliard (Lebanon) | |
| 5. | Dr. Paul Truong (Australia) | |
| 6. | Mr. Roley Noffke (South Africa) | |
| 7. | Dr. Umesh Lavania (India) | |
| 8. | Mr. P. Haridas (India) | |
| 9. | Mr. P. Lakshmanaperumalsamy (India) | |
| 10. | Mr. P. Vincent (India) | |
| 11. | Dr. Tran Tan Van (Vietnam) | |
| 12. | Mr. Tran Van Man (Vietnam) | |
| 13. | Miss Trang Phan (Vietnam) | |
| 14. | Mr. Leonel Castro (Guatemala) | |
| 15. | Mrs. Elise Pinnors (Kenya) | |
| 16. | Mr. Yoan Coppin (Madagascar) | |
| 17. | Mrs. Suwanna Pasiri (Thailand) | Secretary |

Impression of the Participants on ICV-5
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The Fifth International Conference on Vetiver (ICV-5) held in Lucknow at CIMAP is another milestone in the life of the International Vetiver Network and the movement across the globe to create sustainable solutions to many vexing problems facing people as they deal with environmental degradation and ever increasing demand on existing natural resources. Our hosts for ICV-5 led by Dr. Umesh Lavania and the staff of CIMAP extended to all of us gracious hospitality and provided to us the means to meet, discuss, and interact with each other as we do every four to six years. As a member of the TVNI Board of Directors and former TVNI President, I would like to personally say thank you for their efforts as we all know that it is not easy putting this kind of event together. It was especially gratifying to see the Thai delegation arrived led by HRH Princess Maha Chakri Sirindhorn of Thailand at a time when their capital city of Bangkok was being devastated by

some of the worst flooding it has sustained over the last 100 years. Their dedication to our cause goes beyond normal expectations. Each time I go to such an event and this is my third one, I am constantly amazed at what I see and hear. Vetiver Systems are being expanded into new territory and reinforced in areas we know so well. Work by young professionals is especially gratifying as they will ensure our future. As this was my first trip to India, it was a wonderful experience looking at Indian culture and visiting sites in which I was able to see places that used vetiver mats many hundreds of years ago to provide aromatic air cooling and seeing is believing. The tradition of holding these events was assured with the selection of Vietnam as the next host for ICV-6. Again I wish to extend my heartfelt gratitude to our Indian hosts and to all participants who traveled from afar to share their vetiver stories in a never ending saga. Finally, I wish to acknowledge the ever-present feeling that what John Greenfield and Dick Grimshaw did to create this network several decades ago was and remains an inspiration to one and all and especially to me.

Dale Rachmeler, Director, TNVI
<drachmeler@busac.org>

The ICV-5 was good for many things, for all sorts of reasons. But for one specific issue I have this to say: it is rightfully a worldwide network, capable of collaboration for world class advocacy! The issue is this: Chinese increasingly fund infrastructure works in Africa: highways, hydropower dams, etc. And they are much involved in the implementation as well. However, to the regret of us from TVNI (in Congo, Kenya, Ghana, etc.), we were yet to see Chinese contractors using vetiver. There is an easy explanation for that: most contractors hail from near Beijing, where climate is too cold for use of vetiver. So they don't know Vetiver System.

But on the other hand, in Southern China there exist companies like Guangzhou City Vetiver Scientific & Technical Co. Ltd. (www.gz-xgcy.com) that have built up great expertise on use of Vetiver System for infrastructure works. Its representative, Mr. Feng Ziyuan was present in Lucknow and he understood where to go: to Congo (B). In collaboration with Alain Ndonga (doing highway construction supervisory work for Egis-BCEOM in Congo Brazzaville) contacts were well established, and now we have good hopes that in March, Guangzhou City Vetiver Scientific & Technical co. Ltd. will start its technical guidance and field support to enable (fellow Chinese) contractors apply Vetiver System in their highway works. So that we will not hear the question again: "yes, but if the Chinese don't use it, so why should we consider it?"

Elise Pinnars, Green Cycle Consulting Ltd., Kenya
<elise.pinnars@gmail.com>

Ideas for ICV-6

As for ICV-6 in Vietnam, I think that we should postpone it for at least a year from what was presented to us as time is needed to accumulate sufficient new work to present as opposed to rehashing existing works. I also do not believe that there is enough information or work on the subject of Vetiver and Energy. It is my personal opinion that we should perhaps modify this to a broader based subject and I am willing to interact with others to come to a consensus on what that might be. We have begun this discussion among us but have yet to make any concrete proposals. I think that it is important at such events to visit sites that show Vetiver System in action like what was done in China and in Venezuela. I believe that this can be done in Vietnam given the large number of works done and those that are to be done. Therefore I would like to simply put a hold on my approval of the title of ICV-6 and believe that it should be held at the earliest in late 2015 and better yet in 2016. This is only my personal opinion and I will await what others have to say. One suggestion could be "Vetiver and Sustainable Solutions for Land and Water Use Management" as a subject. The broader the better.

Dale Rachmeler, Director, TNVI
<drachmeler@busac.org>

Abstracts of TVNI's Award Winning Papers

In line with the previous International Conference on Vetiver, The Vetiver Network International (TVNI) has offered awards to the papers submitted for presentation at the Fifth International Conference on Vetiver (ICV-5) held in Lucknow, India, 28-31 October 2011, on various categories. Below are the list and abstracts of winning papers in all categories.

❖ **Global Vetiver Champion:** Dr. Narong Chomchalow, Chairman, Continuing Committee of the International Conference on Vetiver; Coordinator, Pacific Rim Vetiver Network, Office of the Royal Development Projects Board, Bangkok, Thailand, <narongchc@au.edu>. The awarding was granted by unanimous decision of the 2011 TVNI Awards Panel. As there was no paper submitted, the awardee has been requested to prepare a paper for presentation at ICV-5.

“Twenty Years of Contributions by the TVNI Global Vetiver Champion Award Winner”

Since 1991, the author has been involved in vetiver research and development, as well as in the organization of the International Conferences of Vetiver (ICVs) since the first one up to the present. He continuously coordinates the activities of the Pacific Rim Vetiver Network (PRVN). The present paper briefly describes his 20 years of contributions in all ICVs, namely, as the initiator of the ICVs and as the Chairman of the Continuing Committee of ICV, and in the organization of ICV-1 to 5. His role in the coordination of the Pacific Rim Vetiver Network (PRVN), such as the birth of PRVN and the activities of PRVN, will also be discussed.

❖ **Vetiver Champion:** Mr. Yoann Coppin, CEO La Plantation Bemasoandro, SUARL, Ambatomaro, Antananarivo, Madagascar, <plantation.bemasoandro@yahoo.fr>.

“The Vetiver System, A Biological Solution for Development and Conservation in Madagascar”

Madagascar has an exceptional biodiversity, with an average 75% of endemic mixed fauna and flora population (the highest in the world), and with a very large range of ecosystems, from rainforests with 3,500 mm/year rainfall in the North-East to the arid areas under less than 250 mm/year on the South, and an altitude between 0 and 2 876 m.

In spite of this background the agro-environmental degradation is catastrophic. According to a World Bank's study, almost 300,000 ha of forest disappear each year, and there is only 10% of the rainforest left. Also according to the World Bank, Madagascar is one of the most eroded country in the world. The traditional agricultural practices (slash and burn cropping practice during the rainy season) is not adapted to the topography, soil types, climate, and especially regarding to the demographic growth - 50% of the 20 million inhabitants are less than 18 years old. This practice is, by far, the first reason for the land degradation. The extreme poverty (80% of the population living with less than 1€ a day) prevents the major part of the farmers to have access to alternative practices. After slash and burn, the land is bare and farmers sow upland rice just before the big rain falls. Nothing is done to take care of soil erosion, and a large part of the nutrients are washed away. The farmers will have to clear another parcel of land for the next year crop. In the third year no crop is able to grow on this severely deteriorated land. According to a World Food Program study, 400T/ha/year of soil is taken away by the erosion. The sediments end up on the wetlands, rice fields (which disappearing under sediments), rivers and finally on the sea and its coral reefs. The result is a huge degradation of environment, a very poor and acid soil, developing massive landslip, locally known as Lavaka.

The Vetiver System (VS) can offer several perfect solutions and is well adapted to the economical and agro-environmental contexts, namely: (i) easy to promote the technique, (ii) simple and cheap to apply by the farmers themselves, (iii) adaptable to all conditions in Madagascar, (iv) fast, sustainable and efficient technique for water and soil conservation, and (v) promote sustainable farming - farmers can cultivate the same part of land year after year with improved yield, they do not have to move their farms every year, conserve their soil and protect the forests, as well as rice

fields, rivers, etc. These erosion problems are not only concerning the agricultural field, but also have a large impact on infrastructures, and consequently have a very negative impact on economy. In this context, La Plantation Bemasoandro is a small private company that wants to bring the VS at its high potentiality and as an amazing tool to bring answers facing these problems. Since its creation, this company has collected, produced, planted or used 1,5 million of vetiver plants in three years period, and has planted 83 km of vetiver hedgerows for (i) land rehabilitation and environmental restoration, (ii) slope stabilization and infrastructures protection, (iii) floods and sedimentation damages alleviation, (iv) water treatment and urban landscaping with almost 100% of success. However, the main key to success of vetiver lies in its correct way usage. The company has created more than 15,000 man-day employment for poor people, and has trained thousands of farmers, also technical staff, engineers, project chiefs. In this way, the company in charge of VS application participate not only to protect infrastructure, but also to improve environmental, social and poverty alleviation impacts.

❖ **Country Vetiver Award:** Mr. Shantanoo Bhattacharyya, Coordinator and Honorary Executive Director, Eastern Vetiver Network, Bamunimaidam, Guwahati, India, <shantanoo.bhattacharyya@gmail.com>.

“Vetiver System – The Green Tool against Erosion”

Vetiver Grass Technology is a well established system for protection of soil slopes from erosion. It is used for this purpose in over 100 countries throughout Asia, Africa and the Americas, where it is a low cost, environmentally sustainable and community friendly solution. The Vetiver system was introduced to Assam in the beginning of the year, 2009 with the formation of Eastern Vetiver Network, India. This paper is a description of three demonstration bioengineering projects- one to stabilize hill slopes, one to stabilize a major bridge approach and the other to protect against the severe erosion of the Brahmaputra river in the North-East Indian state of Assam.

All the three projects were designed, supervised and monitored by the author. A vulnerable slope on the eastern face of the Chunsali hill along the Noonmati- Kharghuli road at Guwahati was chosen for the hill slope project. This location was a perennial problem during the monsoon. For the bridge approach project, the approaches to the Doria bridge in Majuli- the largest river island was chosen because the soil was silty sand, typical of the flood plains of Assam. Majuli is notorious for erosion and it is very difficult to control erosion without costly measures. Another problem in Majuli is the unavailability of rocks locally for the conventional protection works with gabions. For the river bank protection, a stretch of Brahmaputra riverbank was chosen. This was chosen because the river bank retreated by about 1 km from 1998 and the Govt. of Assam decided to apply the Geosynthetic mattress on that stretch. This offered a good opportunity for comparison also. The full process of stabilization including propagation of the plants in a nursery, dressing slopes, planting onto the slopes and maintenance is described. The condition of the slopes before planting, during growing period, and after the monsoon season in 2010 is described. In all the projects only local manpower was used. The labourers engaged gained enough skill to work elsewhere. The demonstration project confirms that the Vetiver system can be used in Assam to control erosion on hill slopes / bridge approaches/ high embankments and river bank. The Vetiver System can be used alone or in combination with traditional engineering approaches currently used in the region. This system will bring in a paradigm shift in the erosion control regime of a poor state like Assam through its economy, environment friendliness and community involvement. The success of these projects established the Vetiver system as self evident and spurred interest in the system throughout India and in Nepal.

❖ **Country Vetiver Award:** Dr. Oswaldo de Jesus Luque Mirabal Inversiones Luque M, C.A. Edificio Tinapuey, Apto 7C, San Jacinto, Maracay, Venezuela, <oluque1@gmail.com>.

“Contribution of Development of the Vetiver System in Venezuela since 2000 to 2011”

The author has participated in the development of vetiver in several projects in Venezuela, in the present decade. This involved more than 20,000 people, who have learnt the vetiver

technology directly from poor communities or through promotion in radio, TV and newspaper interviews. He has promoted the Vetiver System (VS) to the Mountain Oasis Organization, a group formed for small organic farmers who were involved in the environment issue, especially in soil and water conservation, in the high mountains of Miranda State in early 2,000. He also introduced the VS to the Yaracuy Consortium, an organization of poor farmers in Yaracuy State in the same year.

He was the principal director of the Vetiver Polar Foundation Project, which involved more than 11,000 people. First, he introduced vetiver handicrafts and when people became interested and generated money, they were encouraged to grow the plant for soil and water conservation; Ultimately the Project was consolidated in 21 sites around the country, generating more than 3,500 employees in 7 years, giving him the responsibility of convincing the Venezuelan Polar Enterprise to hold the Fourth International Conference on Vetiver (ICV-4) which took place in 2006, of which he was a member of the Organizing Committee. He played a principal role in the formation of Vetiver Antierosion Company initiated in 2001, and became the technical staff member, who actively participated in the application of vetiver for soil conservation, a reclamation of a Bauxite Mine and the use of vetiver handicrafts for more than 14 indigenous communities who lived in the neighborhood of the mine. He has been instrumental in the use of vetiver combined with trees to protect 40 ha at Minalba Mineral Water Springs, to prevent erosion and improve water conservation. Minalba Mineral Water, the company has belonged to Pepsi Cola Venezuela, since 2003. He participated as the PVFP vetiver staff, for the International Training Course on Vetiver Handicraft in Bangkok, Thailand in 2005, passing this experience to artisans in Venezuela. He introduced the vetiver ecotypes collection from Khao Hin Son Royal Development Study Center in Thailand to Venezuela, and made all the necessary contacts with the Faculty of Agronomy, and the Central University of Venezuela, to make the adaptability studies around the country possible.

Since 2007 he has joined the Caribe's Enterprise and their group of Companies (Pavimentadora Life in Barinas, Truchicultura Moconoque in Merida, and Ceramicas Caribe in Chivacoa) which are working with the vetiver project in three localities in Venezuela; all these projects have been directed by the author. Initially he focused on handicrafts, and then the technology to protect the land and water with vetiver barriers. He conducted an experiment to evaluate the adaptation of vetiver in the Venezuelan Andes, high Mountains to 2500 m asl. He participated in the creation of Progress Organization (PROGRESAR) supported by Caribe's Ceramic Co., dedicated to teaching vetiver handicrafts, VS, painting, hand-made candles, and other items related to the personal development of poor people from Yaracuy and Lara States. He participated as the organizer of three seminars together with the Latin American Vetiver Network, Vetiver Antierosion Co, Andes University, Venezuelan Central University and "Ceramicas Caribe Co". He shared his experience on vetiver in Venezuela with a Training Course for Indigenous People in Central Panama Republic, combined with participation of Vetiver Antierosion Co. and an Organizing Committee: Ministry of Agriculture and Ministry of Environment of Panama in 2008.

He participated in many technical meetings with the staff of the Ministry of Environment of Venezuela, Miranda State, to help in the establishment of a political forum in the area named Miranda High Plain, since then all the development projects have planted vetiver as a mitigation for protection of land and water resources. Recently in the Los Salias Municipality in the same state, he promoted the use of vetiver by teaching the communities on how to use vetiver bioengineering for protection and stabilization with vetiver barriers in large areas affected by very heavy rain in 2010.

He participated in the conception of the documentary film "Vetiver, the Holy Plant", made by Polar Foundation and in the publication on vetiver published by Polar Foundation. He was an advisor of a thesis to investigate the vetiver treatment of contaminated water, and conducted research on the same subject with Polar San Joaquin Brewery in Carabobo State.

In summary, through his devotion and commitment in using VS for poverty alleviation and environmental protection in the past decade, VS has been firmly established in Venezuela as a proven solution to the above issues

❖ **Country Vetiver Award:** Mr. Robinson Vanoh, Kimbi, Papua New Guinea

“Vetiver Systems Technology – New Britain Islands, Papua New Guinea”

Vetiver System (VS) is at its juvenile stage in Papua New Guinea due to lack of funding from the government. Another contributing factor would be lack of technical information on VS readily available which can be used to embark on carrying out extension work in Papua New Guinea. The government’s input, more awareness, extension programs and feasibility studies are to be carried out in a lot of the at-risk rural areas on the effective use of the VS.. The implementation phase will be smoothly carried out with support and funding from the government. The author has promoted awareness in some affected areas and the response received is overwhelming. Stakeholders are enthusiastic to implement the VS if given opportunity. The pros and cons of the various methods to be applied will be discussed in length. He started planting vetiver since 2007 and since then it is gaining popularity in Kimbe. With further technical assistance and background expertise from Dr. Paul Truong from The Vetiver Network International, he has no doubt about the outcome of this program that it will be successful in Papua New Guinea.

❖ **Innovation Award:** Ms. Maria Calderon, Guatemala <imariacalderon@gmail.com>.

“Potential Applications of the Vetiver Systems in the Lake Amantitlan Watershed, Guatemala”

This research focuses on the possible hydrological, infrastructural and social applications of the Vetiver System (VS) - an affordable bioengineering technology – in the watershed of a highly polluted lake near Guatemala City, and how the construction of a wetland park displaying the different uses of the VS could teach people how to participate in a technology to clean the lake. Interviews, research and data collection were conducted in Guatemala, as well as in Chile, Australia and Indonesia.

❖ **Innovation Award:** Mr. Alain N’Dona, Egis-International, Kinshasa, Republic of Congo.

“Integration of the Vetiver System within Conventional Erosion Control Technologies in Brazzaville, Republic of the Congo”

Brazzaville, the capital of the Republic of Congo, has experienced worsening damage caused by soil erosion in the last decade. The conventional engineering efforts to halt the progression of this erosion have remained unsuccessful as the works constructed for this purpose are quickly destroyed after one or two rainy seasons. In this context, the idea of integrating the Vetiver System (VS) with conventional engineering techniques, has proven to be an effective new approach not only to halt the progression of erosion, but also to ensure the protection and structural durability of conventionally constructed erosion control structures. To demonstrate this, three sites in the northern part of Brazzaville (Casis, Pylône and Boukeni) were chosen to test this new anti-erosion integrated approach. Thus, the combination of bioengineering techniques (planting of vetiver) and conventional techniques of erosion control (construction of drains, terramesh retaining walls, gabions, slope benching and reshaping, the use of sandbags, etc.) provided a more effective anti-erosion control system as well as a means to protect the conventional engineering works. At the Casis site, the conventional engineering work included the construction of a drain, terramesh retaining walls, gabion protected embankments and a degraded slope. The integration of the bio-engineering and VS was used primarily to protect these structures and stabilize the slopes by planting vetiver hedgerows. At the other two sites (Pylône and Boukeni), the conventional engineering work done consisted of stacked sandbags in the lower part of the ravine and where the water flows into the ravine to halt the progressive slippage of the ravine walls due to erosion. The vetiver-based bio-engineering system in this case involved the planting of vetiver hedges directly into these sandbags to not only provide vegetative protective cover of the sandbags, but more importantly, to anchor them in place using the deeply rooted vetiver plants.

Observations on these three sites in April 2011 show that the vegetative cover using vetiver and its subsequent development of deep root system has stabilized all the slopes, provided sustainable protection of the drain built in September 2008 as well as anchoring all the sandbags.

This combined system has thus for the first time stopped the progression of erosion despite the high intensity rainfall (100 mm or more per day) frequently recorded there. This high rainfall would have created much more destruction of the conventional measures (thus much more erosion) if it had not been for the use of this vetiver-based integrated approach for erosion control.

❖ **Climate Change Award:** Mr. João Henrique Eboli, Petropolis, RJ, Brazil, <jheboli@gmail.com>; and Paulo R. Rogério, Pomerode, SC, Brazil, <prroge@terra.com>.

“Slope Stabilization in Itaipava-Petropolis, R.J., Brazil, Using Vetiver Solution – A Total Success”

The use of the VS for stabilization of slopes no steeper than 1:1 (H:V) if made with appropriate care, using adult slips and distributed fairly well in both directions, horizontal and vertical (10cm between slips, 1m / 1.5m between lines (H) and about 2 slips/m² as ‘living nails’) can assure stability of the slope, even after the slope suffered from a slip. The basic design is to reduce the kinetic energy of runoff create an effect of natural soil nailing, in such a grid that the deep vertical roots of vetiver act as a true set of ‘nails’ holding the soil mass, preventing incremental erosion and reducing the chances of pockets of water on the slope that may result in high hydraulic pressures leading to slippage. The roots of *Vetiveria zizanioides* can penetrate from 3 to 4 m deep into the soil mass, and have the strength of about 1/6 that of mild steel (75 MPa). In the slope of this work, on 12/2010, we excavated at three points, 2m/2.5m deep into the soil mass, and observed a fantastic network between the roots. What else do we need? This is a cheap and safe solution. So, it is hoped that this work demonstrates the real potential of the VS to mitigate the effects of the climate change that currently provokes the natural disasters on the environment.

❖ **New Frontiers in Vetiver:** Dr. Suaib Luqman, Molecular Bioprospection Department, Biotechnology Division, CIMAP, India, <s.luqman@cimap.res.in>.

“Investigations on Biological Activity of *Vetiveria zizanioides* (L.) Nash, a Palingenesis of Some Important Findings in the Miracle Grass”

Vetiveria zizanioides, synonymously known as *Chrysopogon zizanioides*, widely cultivated in the tropical regions of the world, is a miraculous grass native to India first developed for soil and water conservation by the World Bank during mid 1980s. Popularly known as ‘khus’, it is the major source of the well-known oil of vetiver, which is used in medicine, cosmetics and in perfumery making agarbattis, soaps, soft drinks, pan masala. Being a major constituent of ‘Rasayana’ in Ayurveda, different parts of the vetiver plant have traditionally been used by the Indian tribes for treating various ailments, diseases and disorders including boils, burns, epilepsy, fever, scorpion sting, snakebite, sores in the mouth, headache, toothache, weakness, lumbago, sprain, rheumatism, urinary tract infection, malarial fever, acidity relief and as an anti-helminthic. It has also been used in traditional medicine of Asia and Africa, particularly ancient Tamil literature mentions the use of vetiver for medical purposes. The essential oil of vetiver has extensive applications in toiletries and cosmetics, possesses sedative property and has traditionally been used in aromatherapy for relieving stress, anxiety, nervous tension and insomnia. Root is also important in traditional medicine as a carminative, stimulant and diaphoretic. Besides these medicinal properties of the plant, the dried culms of the plant are used as brooms and to thatch roofs. Pulp of the plant is used to prepare straw boards and paper. In India, the roots have been used for making screens, mats, hand fans, and baskets. Formulations containing oil and/or extracts of vetiver have been reported to treat inflammatory bowel disease, urinary tract infection, and in making insect repellents. Research on various aspects of vetiver make it an excellent plant describing many characteristics including phytoremediation, water purification, leachate and effluent disposal, utilizing wastewater, removing nitrogen and phosphorus, etc. It is one of the most promising aromatic plants known to possess antimicrobial, antioxidant and germicidal properties. However, the plant has not been studied exclusively for other pharmacological activities and there is a lack of scientific evidence to prove these effects. Over the last few years we have been studying bioactivity of the vetiver root as a part

of our effort to discover plant-based biologically active molecules using molecular and cell target based assays. In our published reports, we showed potent antibacterial, drug-resistant modifying, hydroxyl radical scavenging, anticancer, antihepatotoxic and antioxidant activity in intact and spent root of vetiver. In view of our findings, the present paper recapitulates some important findings on the bioactivity of *Vetiveria zizanioides* and a palingogenesis has been made for this miracle grass.

Bioengineering with Vetiver

Mohammad Golabi, a soil science professor at the University of Guam, has put his years of research on vetiver grass to practical use in shielding the reefs in Pago Bay from the harmful effects of construction-induced run-off.

One of the major health hazards facing Guam's reefs is soil erosion resulting in sedimentation and suffocation of the complex organisms that make up a reef system. "Vetiver's ability to tolerate high stress situations, adapt to a variety of conditions, develop a dense vertical root system, and powerful soil binding characteristics make it an ideal candidate for controlling soil erosion," says Golabi.

Vetiver grass has a spongy root system that binds the soil beneath the plant to a depth of up to 3 meters forming a dense underground curtain that prevents gulying and tunneling. Once the hedge has been established, it can live up to 50 years and does not require further maintenance other than periodic trimming. With the right conditions thick hedges can be formed within one year of planting, but it generally takes two to three growing seasons to establish a hedge dense enough to withstand torrential rains and protect the shoreline from sedimentation.

In this pilot project, Golabi in cooperation with the developers planted vetiver grass along a Pago Bay beach area adjacent to a tract of land that had been cleared for a new housing project. Fully developed vetiver seedlings were planted in contour rows along the beach without disturbing the aesthetics of the area. The plants established in a few months, forming a thick hedge that prevents sediment from water-borne erosion from flowing into the ocean.

"It is also expected that these vetiver hedges may even be able to protect the beach area against tidal surge once their root systems are well established. These hedgerows clearly demonstrate that the vetiver grass system is a unique, economical and effective bioengineering technology for protecting coral reefs from further degradation in the Pago Bay area and may be applied to other sites around the island," says Golabi.

For more information regarding vetiver grass or soil science contact Prof. Mohammad Golabi at <mgolabi@guam.uog.edu>.

Vetiver and Native Plants in California

Doug Richardson (a landscaper who uses vetiver and native plants in landscape design) planted the slope at the Santa Barbara City College (California) some years ago. Before vetiver was planted there was mud and rock in the street after every major storm. There have been no problems since.

Native plants have voluntarily established themselves. The slope protected with vetiver, along with the volunteer trees and shrubs that include: the tree – 'toyon' (*Heteromeles arbutifolia*). Also you can also make out a number of smaller shrubs native to this area including coastal sage (*Artemisia californica*), and chaparral broom (*Baccharis pilularis*) both of which are growing well with the vetiver. The native blackberry is also growing with the vetiver but is harder to see in these photos.

Doug (who was Chairman of the Environmental Horticulture Department at Santa Barbara City College) says that experience in California is that after a season of irrigation to establish vetiver no further irrigation is required to assure its survival. Fires are a serious problem in California.. He has found that vetiver outperforms the native grass - *Leymus condensatus* in maintaining green less flammable foliage in drought conditions. This does not mean that vetiver does not burn once ignited, but it produces flames that are about 6 to 8 ft high, compared to native

chaparral species (*Ceanothus*, *Manzanita*, *Adenostoma*, etc.) like most of the sages which can be quick to ignite, burn at higher temperatures, throw flames 50 -100 feet in height and throw embers which are large and persistent. Vetiver, as a grass with high moisture content, has less actual biomass and density than the woodier species. Vetiver sprouts quickly from its roots if burned, and this is a huge plus for subsequent erosion control not to mention the preservation of the original costs and investment that went to getting it established. If the vetiver was used for decontaminating soils, such as a landfill, containing leachates and effluent it would be lush and green and unlikely to be flammable. Interestingly in Fiji, where vetiver (for erosion control) was grown in association with sugar cane, appeared to be only sined when the cane was burned prior to harvesting.

Letters to the Editors

Stabilizing Rice Bunds with Vetiver Hedges

I was reading my latest "Economist" and noticed that Thailand is the World's leading exporter of Rice. This must have been a difficult year what with the massive floods you have experienced – I hope you get a chance to reinforce the rice paddy banks, or bunds, with vetiver hedges as I showed on page 39 in my latest book, "The Vetiver System for Soil and Water Conservation".

By stabilizing the bunds with vetiver hedges, the flood damage is reduced, the water doesn't get a chance to "flow" across the crop lodging it and ruining it. The bunds don't get broken down by the erosive movement of the flood water needing expensive labour consuming repair. Vetiver leaves make ideal 'string' for tying rice bundles, and feeding the buffalo apart from their insecticidal, fungicidal effects as a mulch in the paddy field.

You could make quite a name for yourself, after the floods have subsided, by talking the rice growers in to planting a single line of vetiver along the top of their rice bunds. When I did this in India, the rice growers were at first concerned about mice living in the vetiver, they also had problems with crabs making holes in their bunds. Contacting them later they said, "No mice and now no crabs." The vetiver repelled them both, they were very happy.

John Greenfield, TVNI Board of Director, New Zealand
<27@xtra.co.nz>

Thanks for your kind thought and I agree with all your suggestions. I only hope that I have the gut to do all what you have suggested. I am passing John's suggestions to other Thai officials to take action along the line of your proposal. - Ed.

Vetiver Activities in the Caribbean Islands

We already have 80 members in our Vetiver Caribbean discussion group, but not enough interaction or news of vetiver applications in the Caribbean islands. Our geographic location gives us both the need to defend our soils from severe weather events and the ability to grow vetiver quickly all year. I fear that we are really not taking full advantage of the plant resources that we have.

I am asking for everyone's assistance in creating a better profile of what has been done in each Caribbean island and what resources are available internally or to share. To the best of your abilities (and time available) I would like your feedback or research to gather the following information for each location.

- Is vetiver in use in your island?
- Is it the desirable *Chrysopogon zizanioides* that is non-fertile and will not spread naturally from its planting site?
- How has the plant been used there in soil conservation? Try to provide photos and size estimates. Try to investigate the history of these plantings - when it was done, where the plants came from, who did the work.
- Are there any commercial or educational sources that can supply plants for new projects?

- To what other locations can this sources ship plants while following proper import/export regulations?
- What is your personal involvement with vetiver and what would you want to achieve? Are you finding the necessary resources?

Members of the International and Latinamerican discussion groups are invited to provide any information that you may have regarding the Caribbean Islands.

Thank you everyone for your assistance in collecting this information.

Alberto Rodriguez <alrod312@gmail.com>
Associate Director, Caribbean Coordinator
The Vetiver Network International

Hope by now you have received favorable responses from vetiverites in the Caribbean Islands. May I suggest you to set up the Caribbean Islands Vetiver Network (CIVN) and join the group as the ninth country vetiver network in Latin America. - Ed.

Is Valeriana the Same as Vetiver?

I am in contact with a colleague who has informed me about the use of Valeriana in a project in Guatemala - which he informs me is another name for vetiver. Have you ever heard of vetiver referred to as Valeriana? Using google I have found vetiver referred to as *Valeriana officinalis*. Would this be the same desirable species, *Chrysopogon zizanioides*, that is covered in most existing literature? My colleague informs me that the Valeriana he is using has an excellent root system and matches the description of vetiver, except that he says it is not as fast growing as desired.

Jonathan Barcant
<jcbarcant@gmail.com>

Valeriana is definitely not vetiver, a group of plant in the genus Vetiveria, nor its new generic name, Chrysopogon. It is a member of the family Valerianaceae, not Gramineae - the grass family. Thus, vetiver is definitely not Valeriana officinalis, as referred to by Google. One cannot depend on Google as it was written by laymen having no scientific background.

The Spanish word, 'Zacate Valeriana', as used in many Latin American countries, is the vernacular name in Spanish of vetiver, but it is definitely not a member of Valeriana species of the botanical family Valerianaceae - a distinct family from Gramineae or Poaceae, or the grass family. Even to the layman, Valeriana officinalis is not a grass, and it cannot perform the function of a grass like vetiver. -Ed.

Introducing Bolivia Vetiver Network

I like to inform you about the new website <www.vetiverbolivia.org> for an extension of the Vetiver System in Bolivia.

Despite a number of very positive developments with the vetiver technologies in a number of South American countries, like Chile, Brazil, Venezuela, etc., Bolivia is still a country with only a very few activities with vetiver technologies. We hope that this will change in the future!

The objectives of this new website for Bolivia are:

- Support in the formation of a Bolivian Vetiver Network.
- Supporting the extension of technologies of the Vetiver System in a diverse country like Bolivia, as practical solutions to economic problems in rural development and the environment, such as water pollution, soil erosion, rural roads interrupted in times of rain, landslides, etc.
- Disseminate information and recommendations of the Fifth International Conference on Vetiver (ICV-5) in Lucknow, India 28-30 October 2011, with the theme "Vetiver and Climate Change".
- Interchange with other experience of the technology of the vetiver in other countries of Latin America, such as Brazil, Columbia, Venezuela, etc.

Joe Boehnert, Associated Director, Latin American Network
<<http://vetiverlatina.blogspot.com>>

As the Registra of the World's Vetiver Networks, I welcome the establishment of the Bolivia Vetiver Network. Based on the four-letter code of the Vetiver Network, may I suggest you to use "BOVN" as the acronym of the Bolivia Vetiver Network.

For your information, there have been eight country vetiver networks in Latin America, namely:

Network Name	Acronym	Contact Person	Email Addresses
<i>Brazil Vetiver Network</i>	<u><i>RBVN</i></u>	<i>R.deSouza Lima</i>	<i><brasilvetiver@hotmail.com></i>
<i>Colombia Vetiver Network</i>	<i>RCVN</i>	<i>Torres Jimenez</i>	<i><ambygro@latinmal.com></i>
<i>Costa Rica Vetiver Network</i>	<i>CRVN</i>	<i>Linda Moyher</i>	<i><organic@racsa.co.cr></i>
<i>Ecuador Vetiver Network</i>	<u><i>ECAUTIVER</i></u>	<i>Piet Sabbe</i>	<i><info@ecuativer.com></i>
<i>Mexico Vetiver Network</i>	<u><i>MEXVN</i></u>	<i>Nick Dolphin</i>	<i><lasosac@yahoo.com></i>
<i>Panama Vetiver Network</i>	<i>PAVN</i>	<i>Jose Luis Garcia B.</i>	<i><cuty_99_1950@yahoo.com></i>
<i>Peru Vetiver Network</i>	<i>PEVN</i>	<i>Julio Alegre</i>	<i><j.alegre@cgiar.org></i>
<i>Venezuela Vetiver Network</i>	<i>VEVN</i>	<i>German Trujillo</i>	<i><germantr@telcel.net.ve></i>

Thus, Bolivia Vetiver Network, BOVN, Joe Boehnert <<http://vetiverlatina.blogspot.com>> will be added to the above list. According to the rule in using acronym of the Vetiver Network, RBVN should be changed to BRVN, ECAUTIVER to ECVN, and MEXVN to MXVN. However, these acronyms have been used since the beginning before the rule was enforced, they are allowed to be used as such. –Ed.

Botanical Name – Vetiveria zizanioides (Linn) Nash. Synonyms: Andropogon muricatus Retz. Andropogon squarrosus Hook. Vetiveria zizanioides chemical constituents Allokhusiol, Benzoic acid, Cyclocapacamphene, Epikhusinol, epizizanal, 2- epizizanonone, B- eduesmol, Eugenol, Iskhusimol, Isokhusinoloxide, Isovalencenol, Isovalencic, Khusimyl acetate, Khusinodiol, Khusinol, Khusitoneol, Laevojujenol, Levojunenol, Vanillin, Vertiselinenol, B- & J vetivene, Vetivenic acid, vetiverol, Zizaene, Zizanol etc. Vetiver. Vetiveria Zizanoid; Other names: vetivert, khus. Group: WOODS AND MOSSES. Odor profile: Vetivers from different parts of the world differ a lot. Fueguia 1833 Muskara Vetiveria. unisex 2016. Nouveau Paris Perfume Dumann Azure. Vetiveria zizanioides is belonging to Poaceae family. It is well known plant from south India and widely distributed in India, Burma, Ceylon, and spread from Southwest Asia to tropical Africa. Vetiveria zizanioides is commonly known as khas - khas, khus, vetiver, Vala in different languages. Root of Vetiveria zizanioides have been suggested in the Indian system of medicine for a number of diseases.