

# **Vetiver in Africa: A Continent-Wide Solution**

## **An Examination of Vetiver Use in African Countries and a Presentation of Lessons Learned As a Guide for Future Expansion**

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### **EXTENDED ABSTRACT**

#### **Background and overview of use on the continent**

Just about all the applications mentioned have been tried in some fashion on this continent, not all, but most. However, its lack of rapid adoption is a fact and something that perplexes all of us. As you can see from the map, many countries have tried it, only a few are actually expanding its use. We are here to talk about how we can contribute to this effort of growing the network movement in Africa. Major applications in evidence include erosion control, infrastructure stabilization, handicraft production and forage production. Less practiced applications include coastal protection, pollution control, thatching, medicinal use, essential oil production, agroforestry, pest management, sand dune stabilization, mine tailing phytoremediation and watershed protection.

#### **Spotlight on six specific countries**

British colonial use in East Africa – Uganda, DRC, Malawi, Kenya 1930-50s included land demarcation and contour hedges on slopes but died out with independence. Essential oil production mainly led by the French continued but on a relatively small scale in La Reunion. Today there is a renaissance in Kenya and Ethiopia with new programs in Ghana, Madagascar and Senegal.

#### **Malawi**

Begun in 1990 at the NGO level, vetiver technology became interesting to donors, and big programs were designed and funded using *C. nigriflora* at first and switching to *C. zizanioides* later on, with an emphasis on nurseries over demonstrations. There was a lack of ownership by beneficiaries as large projects took over the promotion of vetiver technology that did include lots of demonstrations. A major constraint existed due to a single short rainy season, and inappropriate extension techniques. Most problems were overcome but project funding and extension mostly stopped and a movement of the 90s subsided to little growth in last decade.

#### **Cameroon**

This is an example of a vetiver champion's ability to slowly spread the knowledge, distribute plants and implement demonstrations with very little support. Simon Ngwainmbi is single handedly maintaining a vetiver presence in several provinces and carrying materials by hand to villages throughout parts of Cameroon for example. He developed a simplified planting system (three-man system), developed several by-products from fiber and roots including medicinal products and continues to promote vetiver person-to-person. In the 90s, he was able to get more than 30 NGOs signed up to the movement. But like many other countries, the lack of funding left a country-wide movement to languish. Cameroon's experience is the antithesis of what happened in Malawi

## **Senegal**

*C. nigriflora* has been well known in Senegalese culture for centuries especially for water disinfection, medicinal uses of roots and oil. Introduction of *C. zizanioides* by Criss Juliard via a USAID-funded project, Dynaenterprises occurred in 1999. Based upon his experiences promoting vetiver for erosion control and infrastructure stabilization in Madagascar, he trained staff, set up nurseries, created demonstrations, translated research and extension documentation, used community facilitators and put in place a new technology system for semi arid zones. He successfully demonstrated coastal protection and left behind a dedicated cadre of trained technicians and projects. Today, ten years later, Tony Cisse can be seen as one of the vetiver leaders in that country.

## **Madagascar**

Vetiver essential oil extraction has been going on in La Reunion for more than 100 years, however, in Madagascar, a minor amount is produced. It was not used for erosion control until the USAID-funded CAP project brought Dick Grimshaw to Madagascar to introduce its use for erosion control especially on rural road infrastructure. Criss and I learned about vetiver first hand from Dick and a movement was born. Village nurseries emerged along farm to market roads. Road users associations were able to take over rural road maintenance as vetiver use reduced the need for major maintenance. The technology evolved and was used on stabilizing the FCE railroad in the second phase of CAP 1999-2003 and will be the subject of a case study presentation during this conference. Today vetiver has been extended to dune stabilization on mining concessions and Mr. Roley Noffke who was responsible is one of the resource persons here. Mr. Yonan Coppin is also here to showcase his community work including a nickel slurry pipeline stabilization project for which he has worked at the community level to provide planting material to the nickel mine management team led by Mr. Joe Bayah.

## **Democratic Republic of the Congo**

Vetiver was introduced in colonial times then forgotten about in the post-colonial period. Vetiver can be found in isolated locations but was not being used for conservation or land management. In late 1980s, a private Belgian company introduced vetiver for essential oil extraction, then, abandoned the effort. In 2004, Innovative Resources Management, a US-based NGO implemented a small program in two provinces – nursery production, community training, rural road embankment demonstrations and urban erosion demonstrations. Work was done to promote vetiver to road contractors and donors. In 2006-8, vetiver was used on several other roads projects. A vetiver champion, Alain N'Dona leads the movement there and is expanding to Congo Brazzaville. He will speak later on about his experiences.

## **Republic of South Africa**

Vetiver use in S. Africa also originated in colonial times. In modern times, the early 1990s saw several promoters developing various programs. Tony Tantum of Specialised Soil Stabilisation in Howick worked with vetiver for many years in the mining industry and demonstrated the techniques for establishing vetiver on tailing of various minerals: diamonds, platinum, gold as well as on construction sites. His philosophy was simply “apply the technology correctly and the results will always be satisfactory”. Other uses included forage production, handicrafts and the creation of vetiver briquettes for fuel. Sue Hart of EcoLink, an NGO, successfully demonstrated vetiver technologies at the community level in Mpumalanga near Krueger National Park. Johan Swart of Soil Erosion Control was involved in propagation and commercial bank stabilization.

Following the success of the First International Vetiver Conference in Thailand in 1996, Tony Tantum invited Paul Truong and Dick Grimshaw to South Africa in 1997 to promote the use of Vetiver in that country. They gave a series of presentations at the Chamber of Mines, Johannesburg, Dickon Hall Co, Nelspruits, Cedara College and the Institute of Natural Resources, University of Natal, Pietermaritzburg, Moore Spence and Jones P/L, Howick.

Following that visit, the Southern Africa Vetiver Network was established in 1997 by Duncan Hay from the Institute of Natural Resources, University of Natal, who distributed newsletters, planting material, implemented research and provided training. Indeed material from the Southern Africa Network has been used in many other African countries including Morocco, Ghana, Zimbabwe, Tanzania and Malawi.

More recently, Roley Noffke, of Hydromulch, SA has taken a lead in demonstrating vetiver use in combination with hydroseeding and you will hear about his projects later on in the program. Dr. Johnny Van der Berg's research in integrated pest management clearly shows the positive impact intercropping cereals with vetiver hedges have on reducing selected insect damage without resorting to pesticide applications. The latter is a highly value tool for better crop management that is sustainable and affordable.

Countries who are relatively new comers looking at vetiver include Ghana, Somaliland, Mozambique, Rep. of Congo Brazzaville, Egypt, Tunisia, Burkina Faso, Sierra Leone, Liberia, and, Algeria

### **Current vetiver applications in Africa**

- Agricultural lands erosion control
- Agroforestry applications such as mulching, fire and wind barriers, fruit tree production and soil moisture stabilization
- Embankment stabilization: streams, roads, and gullies
- Watershed protection: large-scale use to prevent high run-off, chemical pollution of waterways, reduce sedimentation
- Handicrafts and other fiber based technology
- Pipeline protection
- Property demarcation
- Urban erosion mitigation
- Coastal protection from storm damage
- Water quality improvement: algae removal, aquaculture lake protection
- Integrated pest management in cereals and grain storage
- Forage production for livestock
- Nursery production and landscaping

- Soil fertility improvement through organic material incorporation
- Mine tailings phytoremediation
- Village latrine protection
- Medicinal use
- Residential foundation stabilization
- Ornamental horticulture and vegetable production

### **Lessons learned**

- Projects versus community driven activities are usually not sustainable.
- Diversity of funding sources creates competition not adoption and it needs coordination and oversight that a network might provide.
- Demonstrations and their visibility are vital as reference points to generate the demand for future interventions.
- Meeting a need felt by local populations versus project perceived problems must be harmonized to insure sustainability.
- Need for funding and a need for champions, both are essential for a program to proceed and be sustained.
- Research is needed, but the knowledge base is already very large and there is little need to repeat research work already done.
- Networking is critical but is difficult given the huge African diversity with respect to climate, languages, cultural differences, and the hesitance to try something new within countries and across countries.

### **The way forward**

- Country networks need to be motivated, funded and technically supported.
- Information sharing needs to be increased – for example: blogs and discussion groups, vetiver clubs.
- Search for and support to vetiver champions when they emerge.
- Resolve the lack of funding and define the means to mitigate this, for example reminders to major donors of previous work using vetiver and the need to continue promoting solutions instead of beginning afresh.
- Interact more with successful movements in SE Asia especially China who is increasing its engagement in many African countries.

## **Links to vetiver use in Africa found on our website**

[http://www.vetiver.org/g/archives\\_agric\\_crop\\_prod.htm](http://www.vetiver.org/g/archives_agric_crop_prod.htm)

Eco-Technical Applications of Vetiver Grass in Tanzania (KB86 -10/26/03)

Senegal - Vetiver and bananas - video (MB 18MB 10/23/02)

Senegal Vetiver Hedgerows improve banana growth (11/13/02 - 120KB)

Study on Digestibility of Nutrient Content of Vetiver Grass (KB 130 -10/26/03)

Vetiver for termite control and house construction in Senegal (448 kb 8/23/01)

Vetiver Victorious: The Systematic Use of Vetiver to Save Madagascar's FCE Railway. Paper (KB 276 10/21/03)

[http://www.vetiver.org/g/archives\\_medicinal.htm](http://www.vetiver.org/g/archives_medicinal.htm)

Cameroon: Utilization of Vetiver Grass Roots for Medicinal and Other Purposes

[http://www.vetiver.org/g/archives\\_soilconservation.htm](http://www.vetiver.org/g/archives_soilconservation.htm)

Erosion Control in Agricultural Areas: An Ethiopian Perspective (3/26/01)

Experiences with Vetiver Grass in a Soil and Water Conservation Programme for Communal Farmers in Zaka District, Zimbabwe

Integrated Food Security Project -- Amhara Regional State – Ethiopia

Kenya: Mseto Environmental Self Help Group Vetiver Grass Project.

Madagascar - The Potential Use of the Vetiver Grass Technology for Soil and Water Conservation and Land Stabilization in Madagascar.

More Advanced Conservation Farming for Steeper Slopes. Contour Vegetative Strips Vetiver Grass in Zambia and Malawi (5 kb 3/11/01)

Performance of Narrow Strips of Vetiver Grass and Napier Grass as Barriers against Runoff and Soil Loss on a Clay Loam Soil in Kenya. (10/26/04 KB902)

Report on the Introduction of Vetiver Grass in Ngie, NW Cameroon, for Contour Farming and Roadside Stabilisation (12/01/2000 Kb37)

Role of vetiver grass in stone lines stabilisation in the central Plateau of Burkina Faso. (18 kb 3/11/01)

Soil Conservation/VS research - Nigeria (4/30/07)

Status report on the use of Vetiver Grass for soil and water conservation by GTZ IFSP South Gonder, Ethiopia (KB 76)

Tanzania DANIDA Conservation Trial

Use of Vetiver Grass for Soil and Water Conservation in Nigeria (KB211 -10/26/03)

Vetiver Demonstration Report. Swaziland Progress Report to August 2001. (11/16/01 21KB)

Vetiver in the rehabilitation of the degraded Zegzeg watershed in Ethiopia. Tessema Chekun Awoke (CP1-4) (KB43)

Vetiver grass hedgerows for soil and water conservation in the farmlands of Uganda. Godfrey Kasozi (CP1-8) (KB19)

Vetiver System Utilization For Agriculture And In The Fight Against Urban Erosion In Democratic Republic Of The Congo (DRC). (06/18/08 KB460)

Zimbabwe: Hippo Valley Estates -- Magudu Vetiver Outreach Project.

[http://www.vetiver.org/g/archives\\_plant\\_agronomy.htm](http://www.vetiver.org/g/archives_plant_agronomy.htm)

Differences between *V. zizanioides* and *V. nigratana* from Senegal (5/14/02)

Fire Tolerance of Vetiver Grass (02/22/06 MB2.5) pdf KB 130)

Rooting characteristics comparison of *Vetiveria nigratana* and *Vetiveria zizanioides* (KB 384 8/23/01)

Senegal - *Vetiveria Zizanioides* - The plant (50KB 10/7/01)

[http://www.vetiver.org/g/archives\\_propagation\\_planting.htm](http://www.vetiver.org/g/archives_propagation_planting.htm)

Experimenting and developing techniques to speed up vetiver multiplication in nurseries. (Senegal) (180KB 2/06/02)

Hand Book on Vetiver grass technology -- From Propagation to utilisation -- For Ethiopia (12/16/2000 75KB)

[http://www.vetiver.org/g/archives\\_slopestabilization.htm](http://www.vetiver.org/g/archives_slopestabilization.htm)

Congo Highway Stabilized Using Vetiver [3/8/08 200 KB]

Best Practices Establishing a National Vetiver Diffusion Program: Example of Madagascar, A Country Eroding into the Sea (12/28/99 43kb)

Land Pays... (an example of best practices in Ethiopia) – VIDEO

Vetiver in Madagascar and Railroad Stabilization: Plantation de vetiver sur FCE (kb6 4/29/00)

Renforcement de la Stabilité des Pentes et Prévention de L'érosion par L'utilisation du Vétiver dans les Travaux D'ingénierie (161kb 08/06/06)

Senegal Demonstration Sites – Tambakounda (11/13/02 - 88KB)

Senegal -- Highway stabilization using Vetiver Systems (146KB 10/7/01)

Zimbabwe: Vetiver Grass throughout Zimbabwe. Highway applications

[http://www.vetiver.org/g/archives\\_slopestabilization\\_rivers.htm](http://www.vetiver.org/g/archives_slopestabilization_rivers.htm)

Madagascar Application of Vetiver Systems to Hillsides and River Crossings (4/23/01)

Madagascar. The protection of infrastructure (railroads, ponds, highway) using Vetiver Systems (376KB 12/11/01)

Madagascar -- Marovoay Irrigation project (11/3/01 43KB)

[http://www.vetiver.org/g/archives\\_minerehabilitation.htm](http://www.vetiver.org/g/archives_minerehabilitation.htm)

Mining -- Vetiver and Mining Kimberlite -Research (South Africa)

Rehabilitation and Reforestation of Mining Abandoned Areas in Dakar and Thies Regions - Senegal (4/30/07)

[http://www.vetiver.org/g/archives\\_pollution.htm](http://www.vetiver.org/g/archives_pollution.htm)

Traitement des Eaux Usées Domestiques Test sur les Capacités Épuratrices du Vétiver Rapport Final (49 Kb 08/07/02)

[http://www.vetiver.org/TVN\\_archive.htm](http://www.vetiver.org/TVN_archive.htm) (old archive)

Morocco Workshop summary (4/30/07)

Cameroon experience in putting together a country program

Looking Beyond the Methods and Approaches of Vetiver Promotion in Kenya

Southern Africa Vetiver Network - Miscellaneous Millennial Meanderings of a Vetiver Man (02/11/00)

The need for vetiver in South Africa engaging the main players. (CP4-5) (KB21)

The South African Vetiver Network. Duncan Hay (PD3-3) (KB22)

Comptabilité Nationale Projets Environnementaux : Cas du Projet Vetiver au Mali 9/17/08

Mali Brochure: Projet Vetiver Jardins pédagogiques

Pourquoi le Vétiver (Cepp en Wolof / Sodhordé en Pulaar) est Utilisée dans 120 Pays mais Mal Connu au Sénégal ? (4kb 4/25/01)

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Hengchaovanich D., and Freudenberger K.S. (2003). Vetiver victorious: the systematic use of vetiver to save Madagascar's railway. Tech. Bull. No. 2003/2. PRVN, ORDPB, Bangkok.

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N'Dona, A., P. Truong, (2006). Community mobilization for the control of ravine erosion with Vetiver technology in the DR Congo. Proceedings, ICV-4, Venezuela, October 2006.

Noffke, R. (2008). Erosion Control and Vegetation Management, Ilmenite Project Madagascar. Environmental Management, pp 21-23, July-August 2008.

Pacific Rim Vetiver Network. (1999). Vetiver handicrafts in Thailand, a practical guideline. Technical Bulletin No. 1999/1. Dept. of Industrial Promotion of the Royal Thai Government.

Van den Berg, J. (2006). Vetiver Grass: A tool in the sustainable management of crop pests. Proceedings, ICV-4, Venezuela, October 2006.

### **Presenter Biographical Note**

Dr. Dale Rachmeler has been with the Vetiver Network International since 1996, at that time he was working in Madagascar. He is a professional tropical agronomist and agribusiness specialist. He has worked on projects funded by USAID over a career spanning more than 30 years on the African continent. He is currently working in Ghana on a business sector advocacy project. He has been a senior officer of TVNI since 2003 when he was elected President during ICV-3. He helped start-up vetiver programs in Madagascar, the Democratic Republic of the Congo, Morocco and Ghana.