Mine & Associated Rehabilitation Projects in Africa & the Indian Ocean Islands

by
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It is recorded that practically 95% of the 53 countries on the entire African continent (including Islands) has successfully implemented the Vetiver System for soil & water conservation during the past 200 years.

A short overview of projects in the following countries will be given, illustrating current activities using the Vetiver system:

1. Democratic Republic of Congo
2. Ethiopia
3. Congo - Brazzaville Town
4. Congo - Pointe Noire/Brazzaville
5. Guinea - (a) Simandou & (b) Ashanti Gold
6. Gabon
7. Madagascar A & B
8. Mozambique rail line
9. Ghana

The presentation will reflect the major strides that have been achieved in erosion & sediment control, bio-engineering & vegetation restoration and the participation of local communities in general.
A World Bank financed project for the rehabilitation of the erosion gully in the district of Selembao, Kinshasa, DRC
Construction was carried out by a Congolese company Matla Forrest. Extensive delays resulted in the Vetiver planting taking place during the dry season with limited available water. Financial constraints limited the planting of Vetiver hedge rows at spacings closer than 4 metre intervals along contours. Sand Bags inter-planted with Vetiver was used to repair the extensive erosion caused by surface water runoff.
Sand Bag Reinforced & Stabilised Gully
80,000 Sand Bags were used for the stabilisation of the erosion gullies. Vetiver grass was planted into the Sand Bags.

The project where in 2004 TVNI & Hydromulch formed an established working relationship

- Dr. Paul Truong
- Dr. Dale Rachmeler
- Eng. Alain Ndonna
- Roley Noffke
Project No. 2 - Vetiver System Applications, Ethiopia

SLUF
Debela Dinka Guda
251 91 186 6766
August 2013
Since the establishment of the Ethiopian Vetiver Network (ETVN) in 2009, the VS technology is considered as one of the best biological conservation inputs by government (MoA & ERA) & non-government organizations, farmers & private investors for sustainable land management (SLM) programs.
Vetiver Applications in Community Farming Projects in Ethiopia
Training of Ethiopian Road Authority Engineers organized by SLUF & TVNI in May 2010

Elise Pinners-TVNI Kenya
National & International Co-Operation

Ethiopian Ministry of Agriculture has integrated the VS into its sustainable land management programs.

Ethiopian Roads Authority (ERA) has included the VS for the rehabilitation of all road contracts.

Madagascar

Thailand
Policy Dialogue
The Ethiopian President, EEPCO, ERA & MoA
Ethiopian Philosophy & Consensus

Vetiver is a Proven GREEN Solution!

USE IT!!
Project No.3 - Boukeni Erosion Gully Project, Brazzaville, Congo

Engineer Alain NDONA (TVNI)
Construction is by a Brazilian Company-ANDRADE Gutierez SA. The consultant Engineers for the project -EGIS-INTERNATIONAL. Environmental & Bio-Engineering design, supervision and implementation - Engineer Alain NDONA (TVNI).
Vegetated Side Slopes of Concrete Drainage Channel
Boukeni Rehabilitation site, Brazzaville, Congo

May 2012

May 2014
Project No. 4 - The Pointe Noire to Brazzaville Highway, Congo

Total length of road: ± 600 km
Planned to plant 50 million Vetiver, slips sourced mainly from CHINA.
Side Slope Rehabilitation in progress

45° slope angle with benching at 10 m intervals on average.
Established Side Slope on Highway
Installation of Bio-Engineering Techniques & Hydroseeding on Exploration Site for protection of chimpanzee habitat
Placing of Bio-Jute on steep side slopes around Drill Pads
Bio-Jute Preparation
Bio-Jute Installation and Vetiver planting on Cut Slope Embankments
Established Vetiver & Hydroseeded Slope
Project No. 5 (b) - Anglo Ashanti Gold mine in Guinea
Delivery of Vetiver Grass from Mine Nursery
Vetiver Grass Slips planted in well constructed furrows or rows at Anglo Ashanti Gold
Libreville features a tropical monsoon climate with a lengthy wet season and a short dry season. Annual precipitation averages around 3000 mm. Libreville's wet season is about nine months long (September through May), with violet downpours occurring in March-April. June to August are the dry months with almost zero precipitation. Humidity sometimes reaches 98% and is seldom below 70%.
**GSEZ Nkok, Gabon**

540 ha of tropical jungle situated on the Equator removed in one operation for industrial development resulting in a civil and environmental disaster with only 20 ha side slopes rehabilitated in Phase 1

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**Work Undertaken**

- 60,000 m³ vetiver grass hedge rows
- Bio-Jute – 10,000 m²
- Silt fences - 3,600 m¹
- Sand Bags – 2,500 m¹
- Hydroseeding -200,000 m²

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**Climatic Conditions**

Annual rainfall + 3700mm
2 Rainy seasons – September to December & May to July
The Impact of 750 mm rain in 24 hour period
Excessive Erosion caused by surface water runoff
Vetiver grass was sourced from as far as the Town of Lambaréné, some 200 km from site, where the Albert Schweitzer Hospital, established in 1913, is located. The grass was found growing in rural villages situated along the Ogooué river which is the principle river of Gabon and the 4th largest river in Africa.
Albert Schweitzer’s Hospital in Lambaréné, Gabon

Albert Schweitzer’s House in Lambaréné, Gabon
In Memory of Albert Schweitzer Lambaréné, Gabon
Hydromulch used small boats powered with 15 Hp motors to travel up to 60 kilometres from Lambaréné often taking up to 8 hours per journey sourcing and buying Vetiver grass from the villagers. Over 700,000 plants were sourced from these villagers.
Progressive stages of slope stabilisation using Vetiver (VS), Sand bags, Silt fences & Hydroseeding
Effective use of Silt fences to protect Vetiver (VS) in early stages of growth
Established Side Slopes using Vetiver (VS) & Hydroseeding
Madagascar-Projects

Projects 7 A – Rio Tinto/QMM Ilmenite Mine

Projects 7 B – Sherritt Mining Ambatovy Pipeline
Location of Rio Tinto & Sherritt Mining Project in Madagascar

- Antananarivo
- Sherritt Mining Ambatovy Project
- Rio Tinto Ilmenite Project
Typical Malagasy Mode of Transport
Vetiver Sources

- Vetiver plant material was sourced from surrounding areas within a 50 km radius.
- No planting material was imported or introduced from outside areas.
Vetiver Purchases from Villagers
Andre & Auguste Mahalogny family from the Mangaiky Village.
Environmental work Started in 2006 with 15 communities, expanded to 32 communities (168 families) by 2008.
40 hectares were stabilised and re-vegetated.
4,000,000 Vetiver plants were propagated & supplied by local villagers.
Assisted in setting up Vetiver nurseries and provided the necessary training of the local communities.
Planting of Vetiver Grass Hedge Rows on the Ehoala Dune
Locally trained supervisors implementing “Coastal Dune Sand Migration” Control
Surface Water Runoff control with Vetiver Hedge Rows
Established & Stable Ehoala Dune – 9 ha in extent
Project No. 7 B – Ambatovy Project, Moramanga to Tamatave, Madagascar

- Length of ROW: 220 Kilometres
- Area rehabilitated – 550 hectares
- Rehabilitation period: 3 years
- Vetiver plants & fascines sourced from local communities
Installed Erosion Control Structures & Hydroseeding
Progressive Rehabilitation of Pipeline ROW (Right of Way)

- Length of ROW: 220 Kilometres
- Area rehabilitated – 550 hectares
- Rehabilitation period: 3 years
- Vetiver plants & fascines sourced from local communities
Functional Erosion Control Structures & Established HydroSeeding
Vetiver Nursery in South Africa
6 hectare open ground field with 3 tunnels for plant propagation
Greenhouse trial centre & Soils laboratory
International Vetiver Collection consisting of 18 varieties
Akyem is an open-pit gold mine, wholly-owned and operated by Newmont Mining Corporation located in Birim North District in the Eastern region of Ghana. The Akyem mine site covers a total area of 1,903ha of which, 74ha lies in the Ajenjua Bepo Forest Reserve. Mining activities at the site started in August 2012. The mine employs 1,300 workers and contractors belonging mostly to the communities within the mining area. The estimated mine life of the Akyem open-pit is 16 years.
Maxwell Oduro
A local Ghanaian contractor, with some of his environmental team engaged in side slope stabilisation using Vetiver grass. Maxwell trained and supported by Dr. Dale Rachmeler of TVNI.
Erosion & Sediment Control work currently being carried out by Maxwell Oduro, the local Ghanaian contractor & Vetiver network member.

Work Progress on Site around mining infrastructure
We always seem to have a PLAN B
but we forget that there is “No” PLANET B

The correct application of soil conservation and bio-diversity principles & techniques remains fundamental to our survival.
It is our responsibility to preserve and protect the environment we live in.

Thank you