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

by

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&

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International Erosion Control Association

hydromulch

Planting the Seed of Environmental Success

The Vetiver Network International

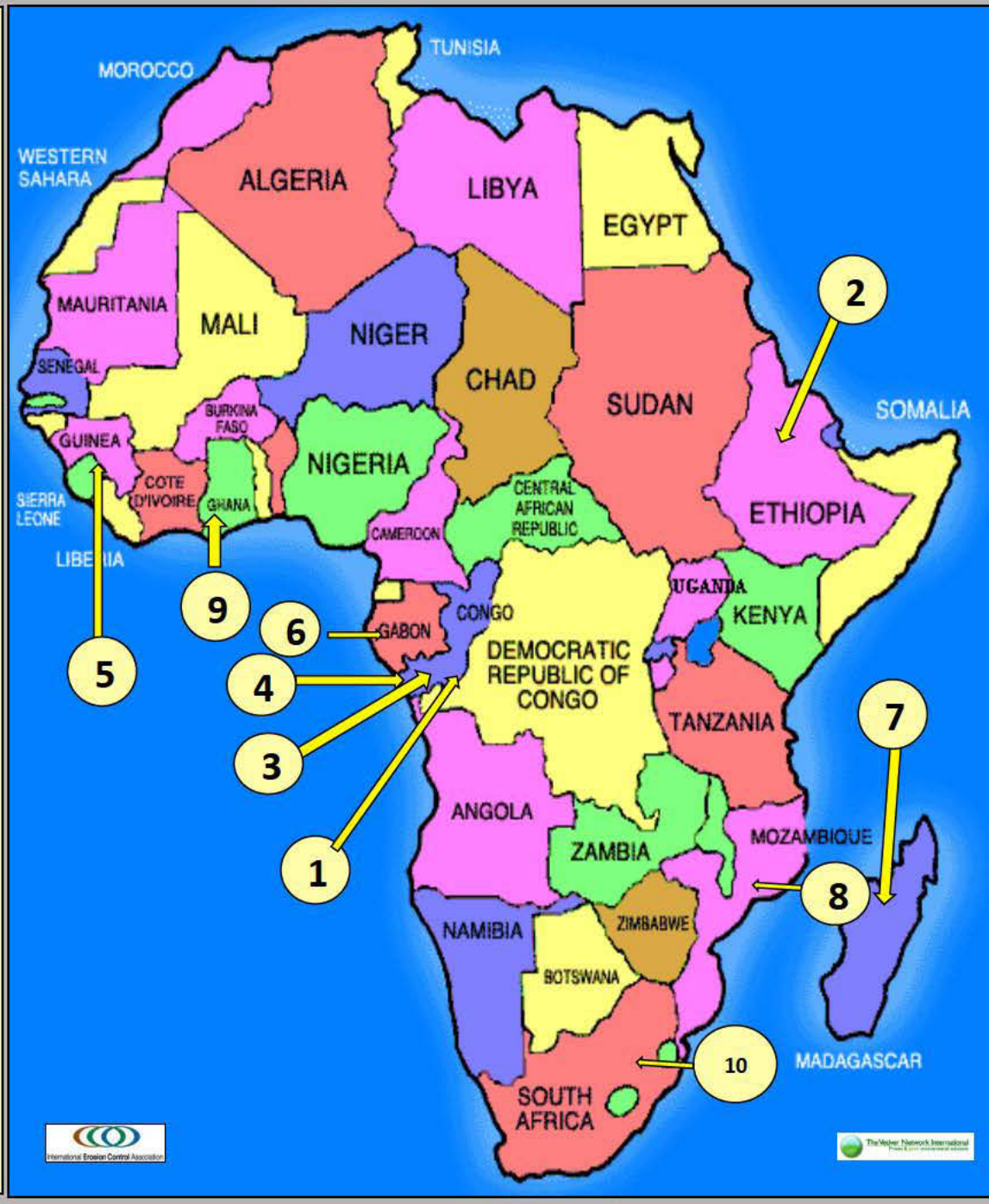
Proven & green environmental solutions

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.



Project No. 1 -Selembao Project, Democratic Republic of Congo

A world Bank financed project for the rehabilitation of the erosion gully in the district of Selembao, Kinshasa, DRC

The Selembao Construction Site

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 Ndona**
- **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.

NATIONAL WORKSHOP ORGANIZED BY SLUF & TVNI, ADDIS ABABA, ETHIOPIA, 2009

NATIONAL WORKSHOP
WORKING COMMITTEE
ADDIS ABABA
ETHIOPIA, 2009

NATIONAL WORKSHOP
DELEGATES
ADDIS ABABA
ETHIOPIA, 2009

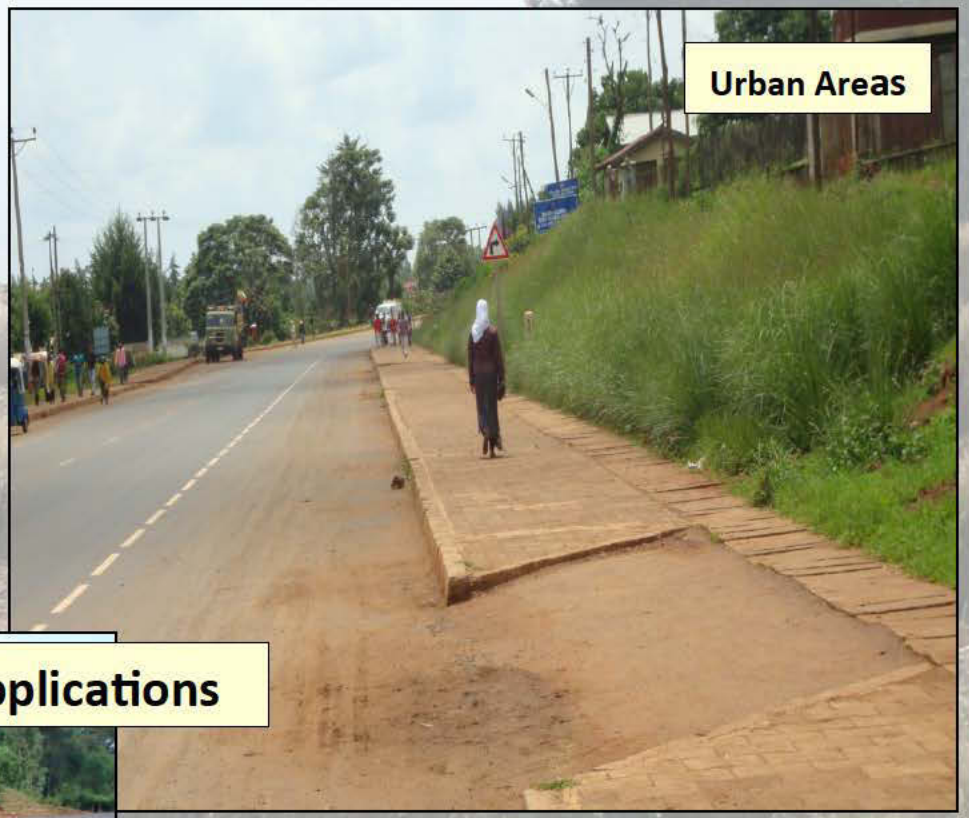
The Vetiver Network International

Vetiver Applications in Community Farming Projects in Ethiopia

Vetiver Applications

Handicrafts

Urban Areas



Roadside Embankments

Canals

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

The Vetiver Network International

Policy Dialogue
The Ethiopian President, EEPCO, ERA & MoA


Ethiopian Philosophy & Consensus
Vetiver is a Proven GREEN Solution!
USE IT!!

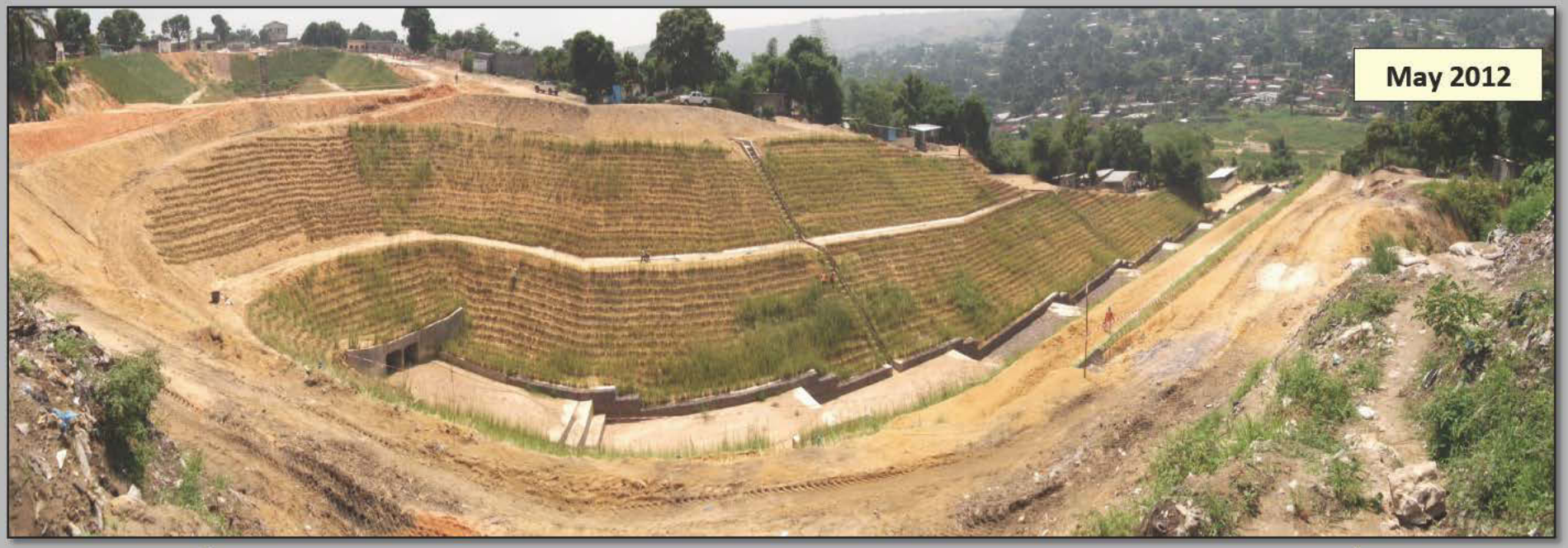
Project No.3 - Boukeni Erosion Gully Project, Brazzaville, Congo

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


May 2014



Boukeni Rehabilitation site, Brazzaville, Congo

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.

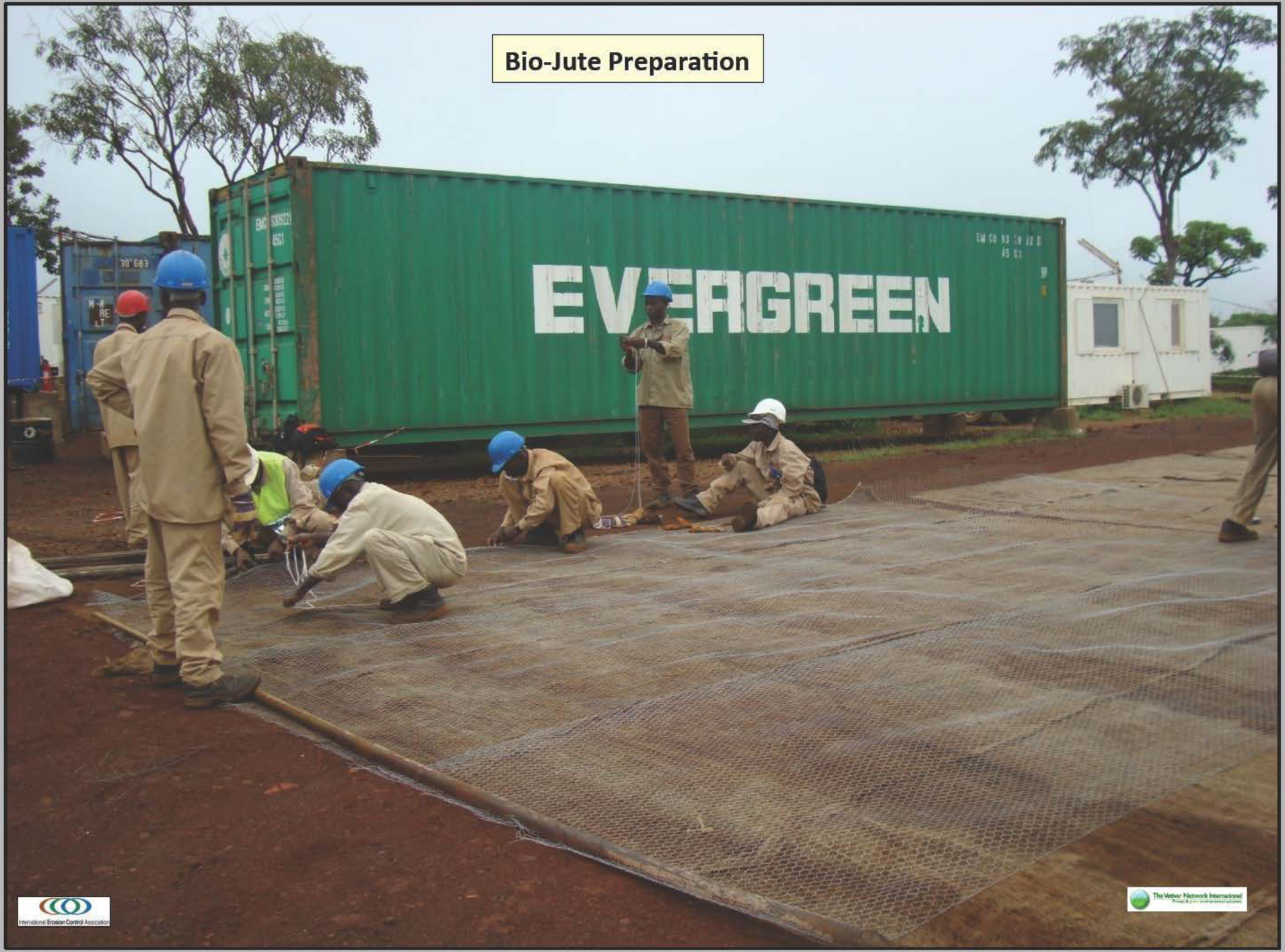

Side Slope Rehabilitation in progress
45° slope angle with benching at 10 m intervals on average.
International Erosion Control Association
The Vetiver Network International


Established Side Slope on Highway

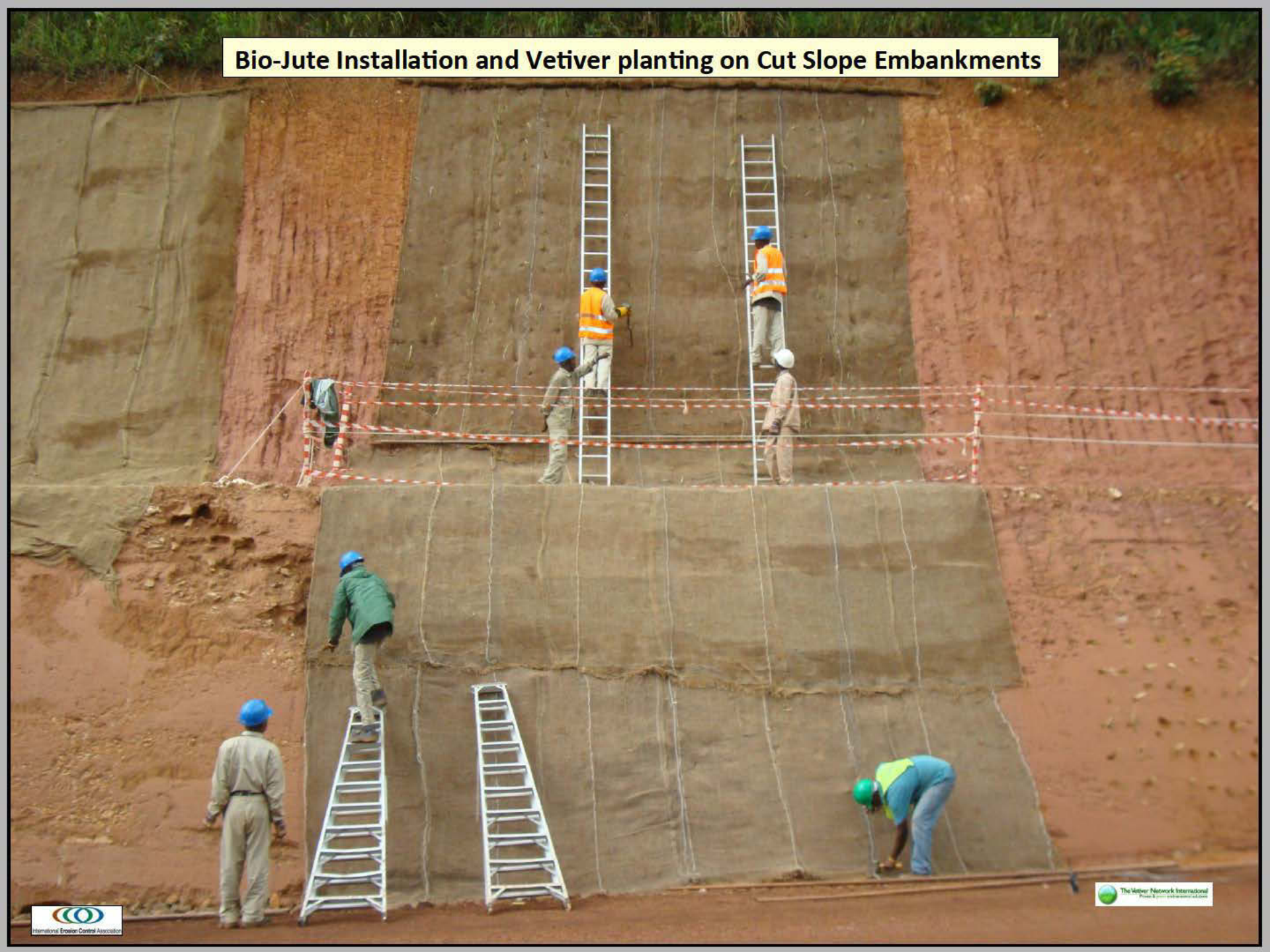
Project No. 5 (a) - The Rio Tinto-Simandou, Guinea

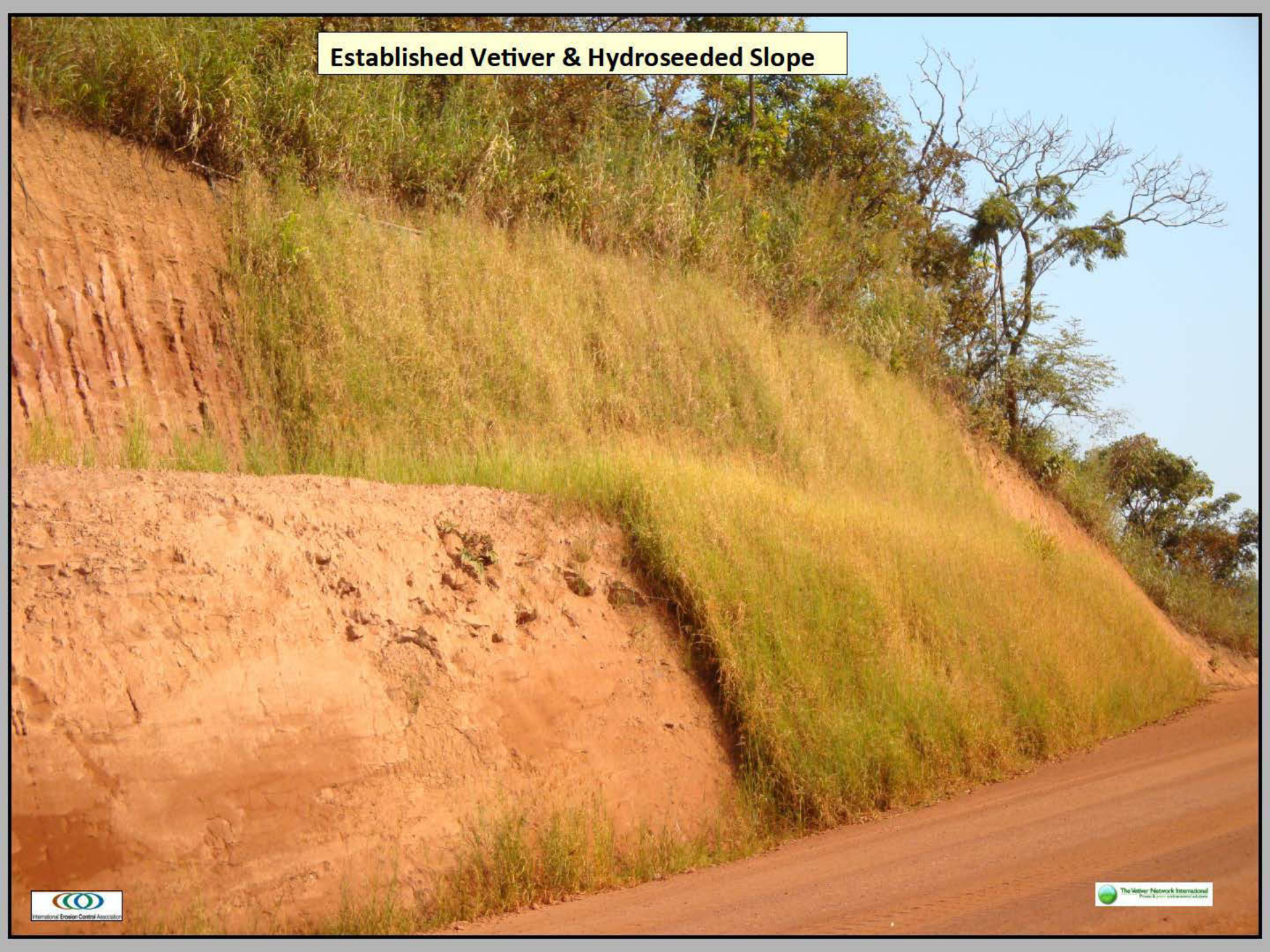
Installation of Bio-Engineering Techniques & Hydroseeding on Exploration Site for protection of chimpanzee habitat


Placing of Bio-Jute on steep side slopes around Drill Pads
The Vetiver Network International
Proven & green environmental solutions
International Erosion Control Association


Bio-Jute Preparation
EVERGREEN

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

International Erosion Control Association

Project No. 6
OLAM GSEZ
Nkok (Libreville), Gabon

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

Work Undertaken

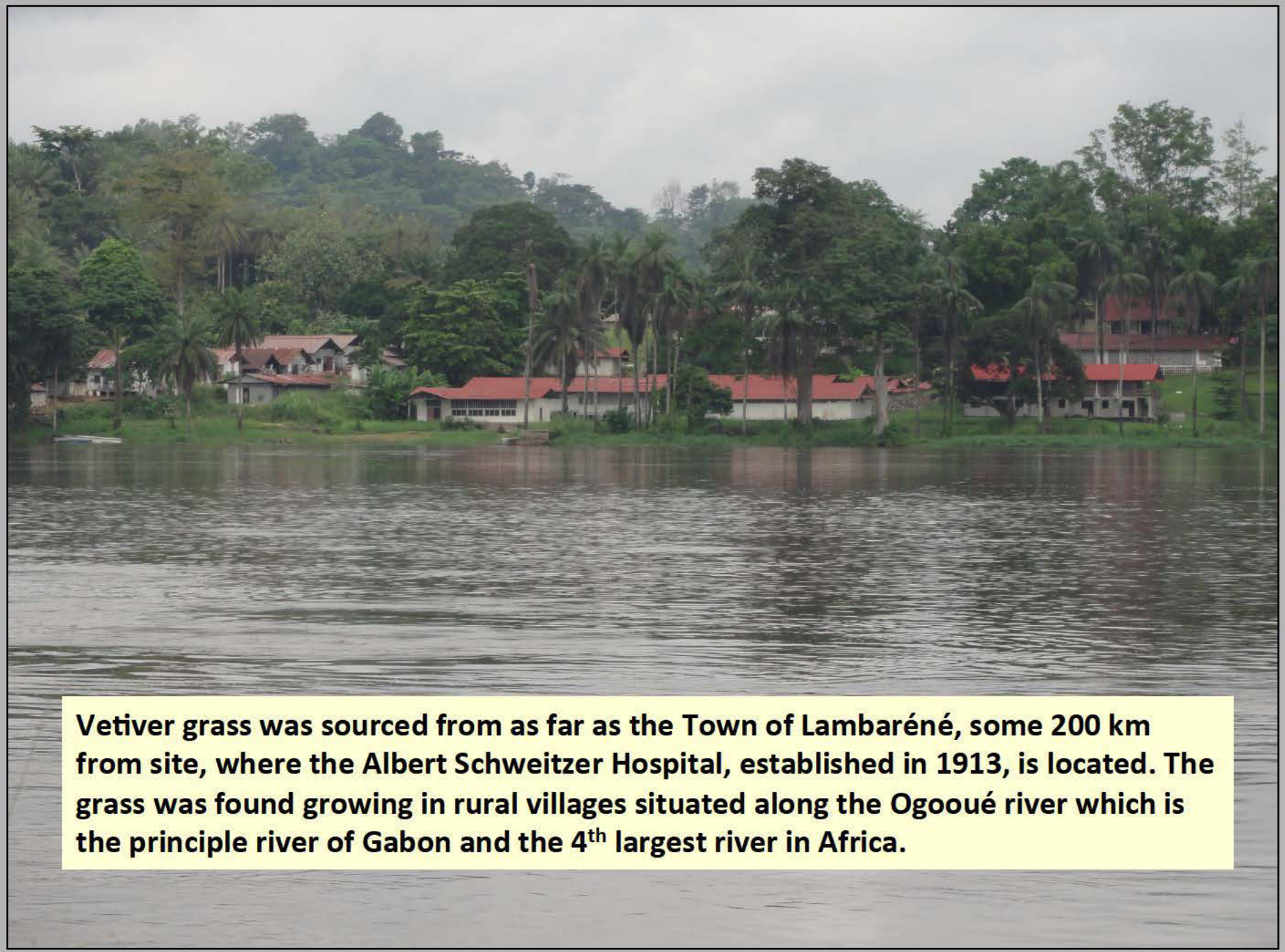
- 60,000 m^1 vetiver grass hedge rows
- Bio-Jute – 10,000 m^2
- Silt fences - 3,600 m^1
- Sand Bags – 2,500 m^1
- Hydroseeding -200,000 m^2

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

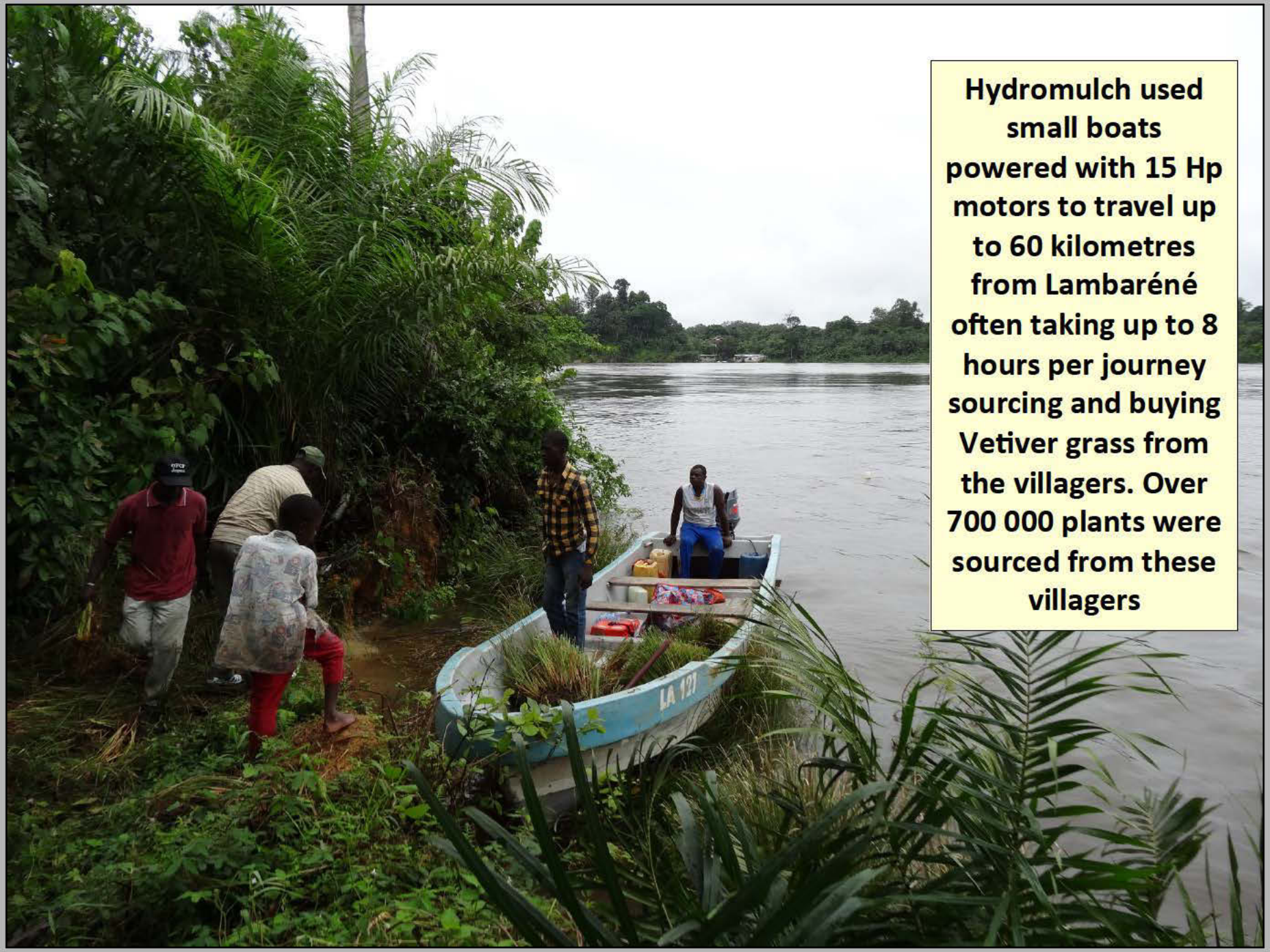


Vetiver grass was sourced from as far as the Town of Lambaréné, some 200 km from site, where the Albert Schweitzer Hospital, established in 1913, is located. The grass was found growing in rural villages situated along the Ogooué river which is the principle river of Gabon and the 4th largest river in Africa.

Albert Schweitzer's House in Lambaréné, Gabon

Albert Schweitzer's Hospital 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

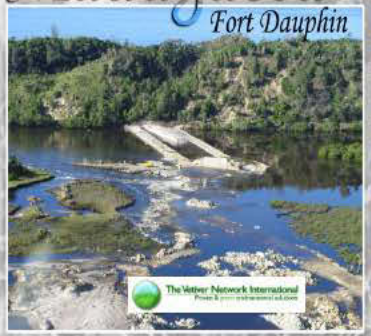
Projects 7 B – Sherritt Mining Ambatovy Pipeline

The Mandena Joint Venture

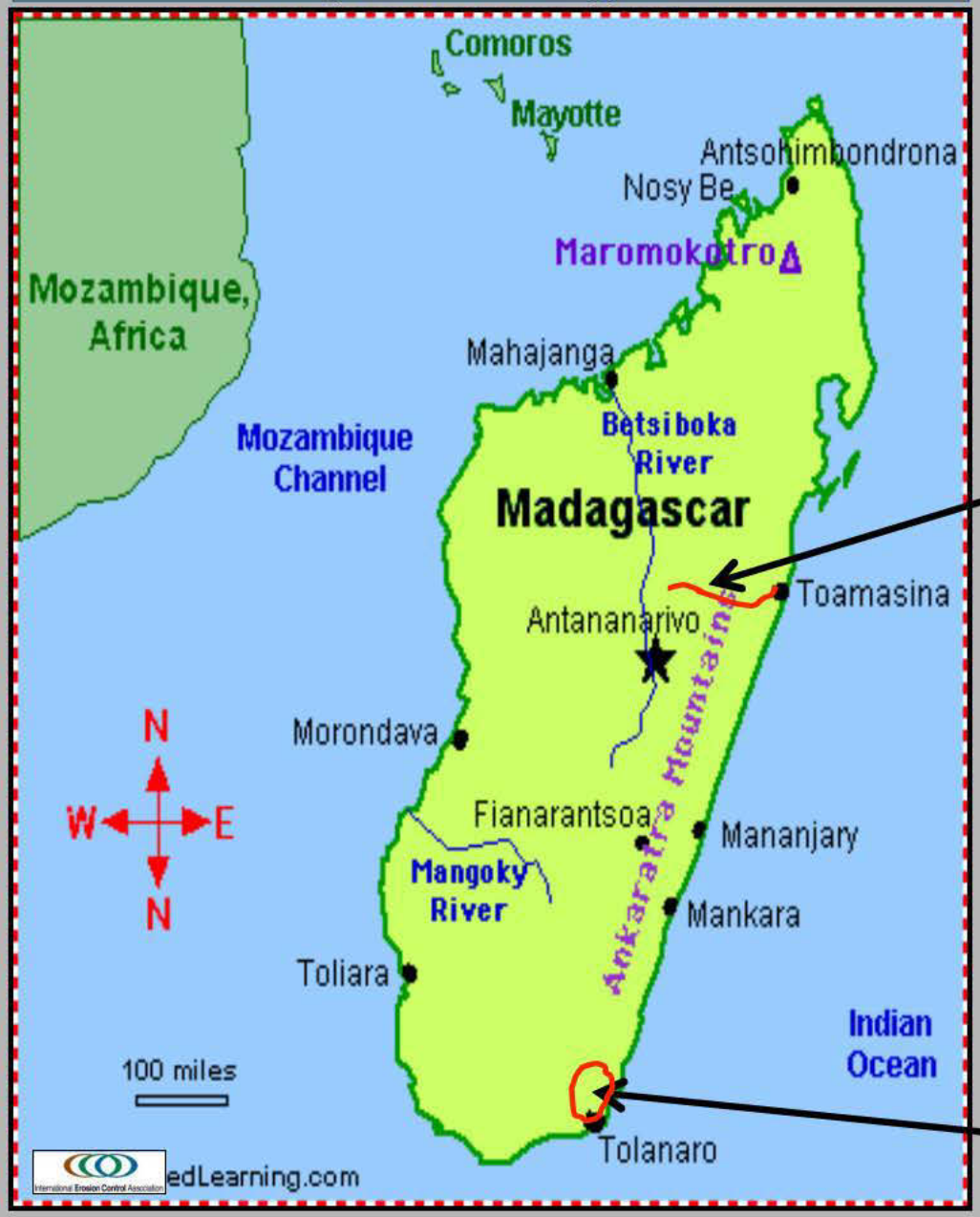
A Rio Tinto Partnership

Madagascar

Fort Dauphin



Location of Rio Tinto & Sherritt Mining Project in Madagascar



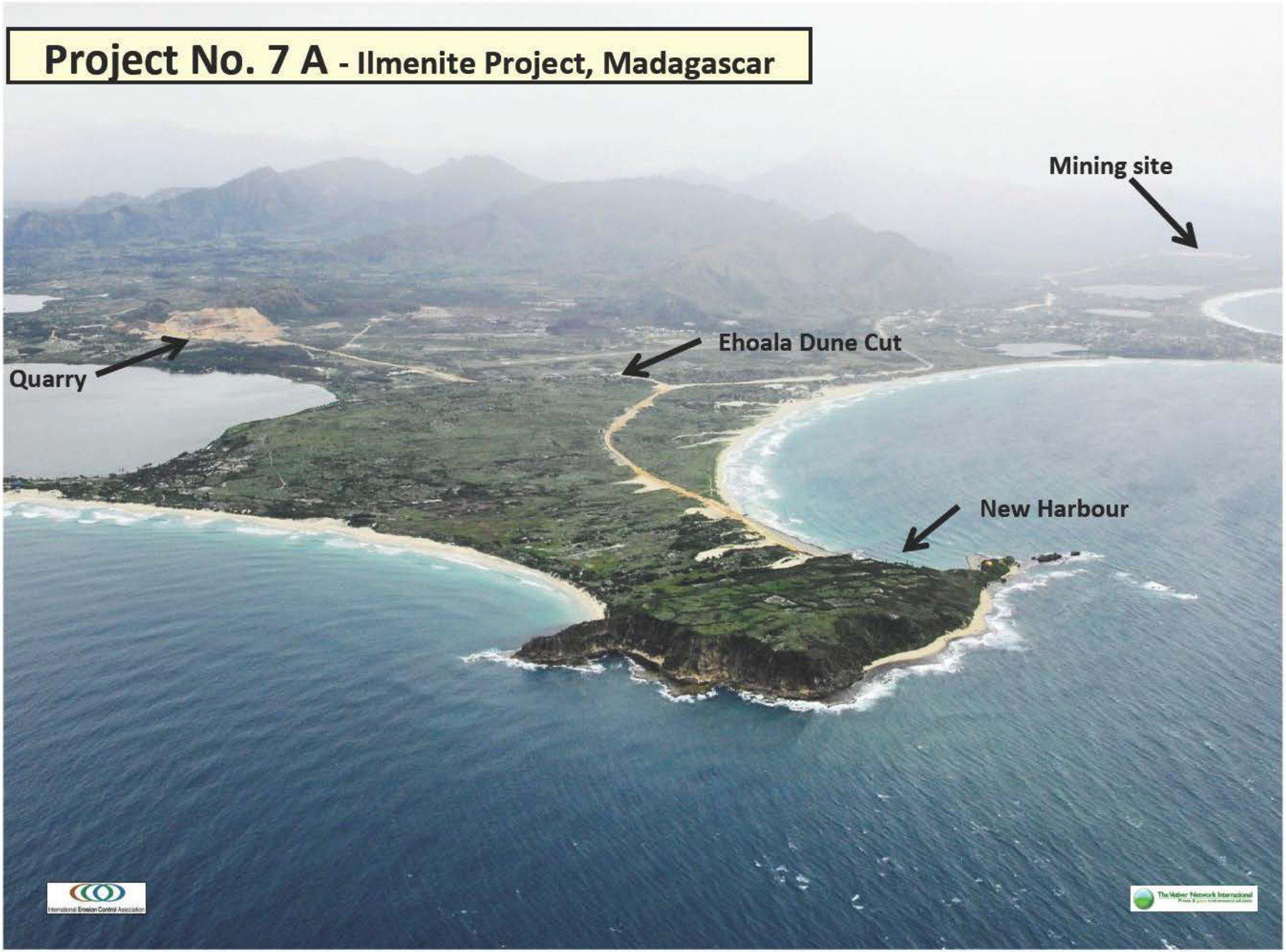
Sherritt Mining Ambatovy Project

Rio Tinto Ilmenite Project

Local Malagasy Community


Typical Malagasy Mode of Transport
PEUGEOT
International Erosion Control Association
The Vetiver Network International

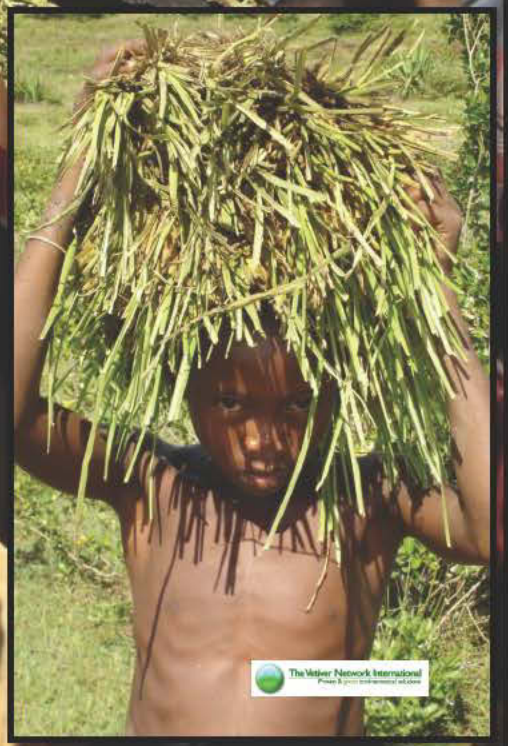
Project No. 7 A - Ilmenite Project, Madagascar



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



International Erosion Control Association


Andre & Auguste Mahalogny family from the Mangaiky Village.
International Erosion Control Association
The Vetiver Network International

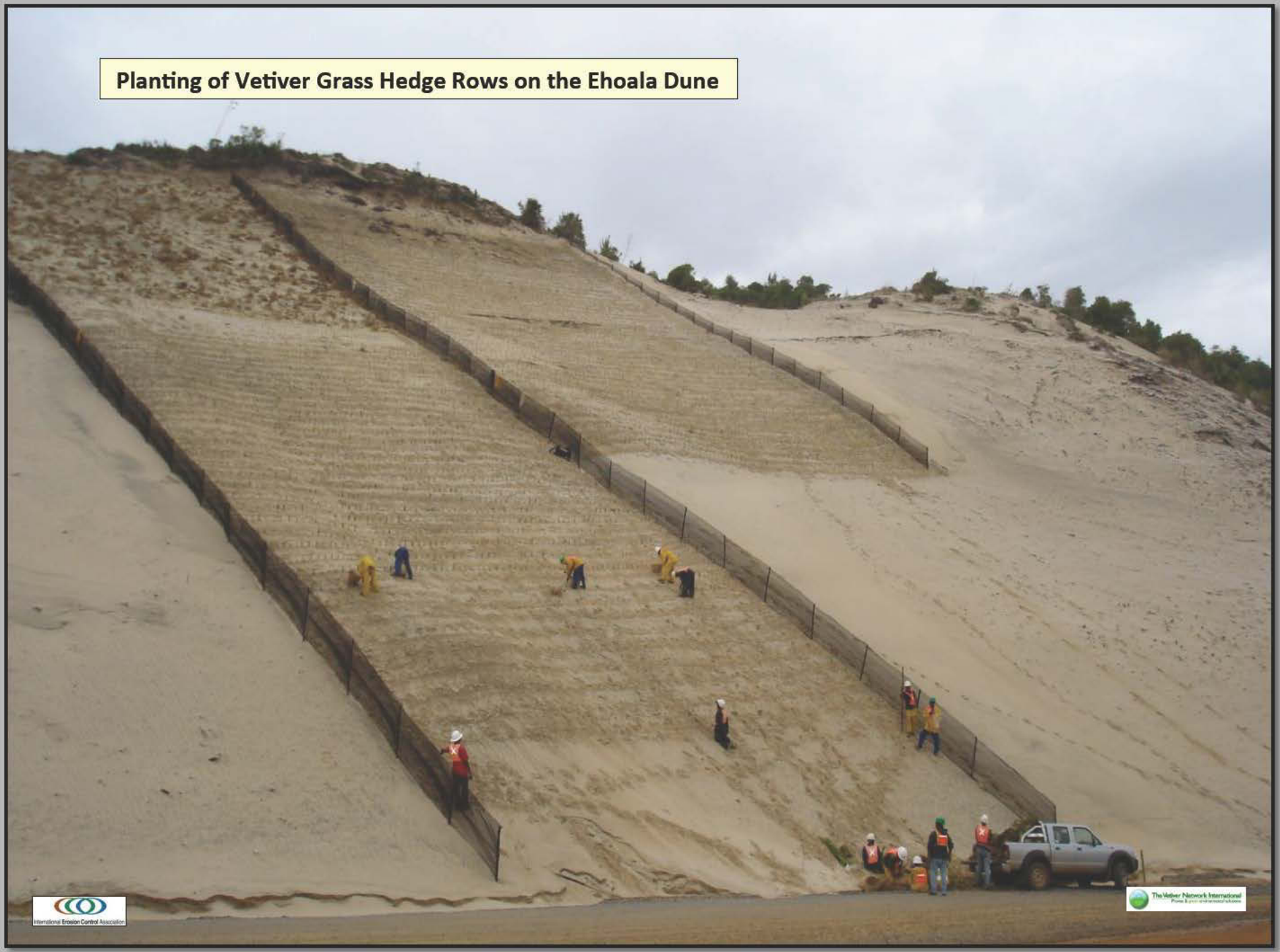
Environmental work Started in 2006 with 15 communities, expanded to 32 communities (168 families) by 2008.

40 hectares were stabilised and re-vegetated.

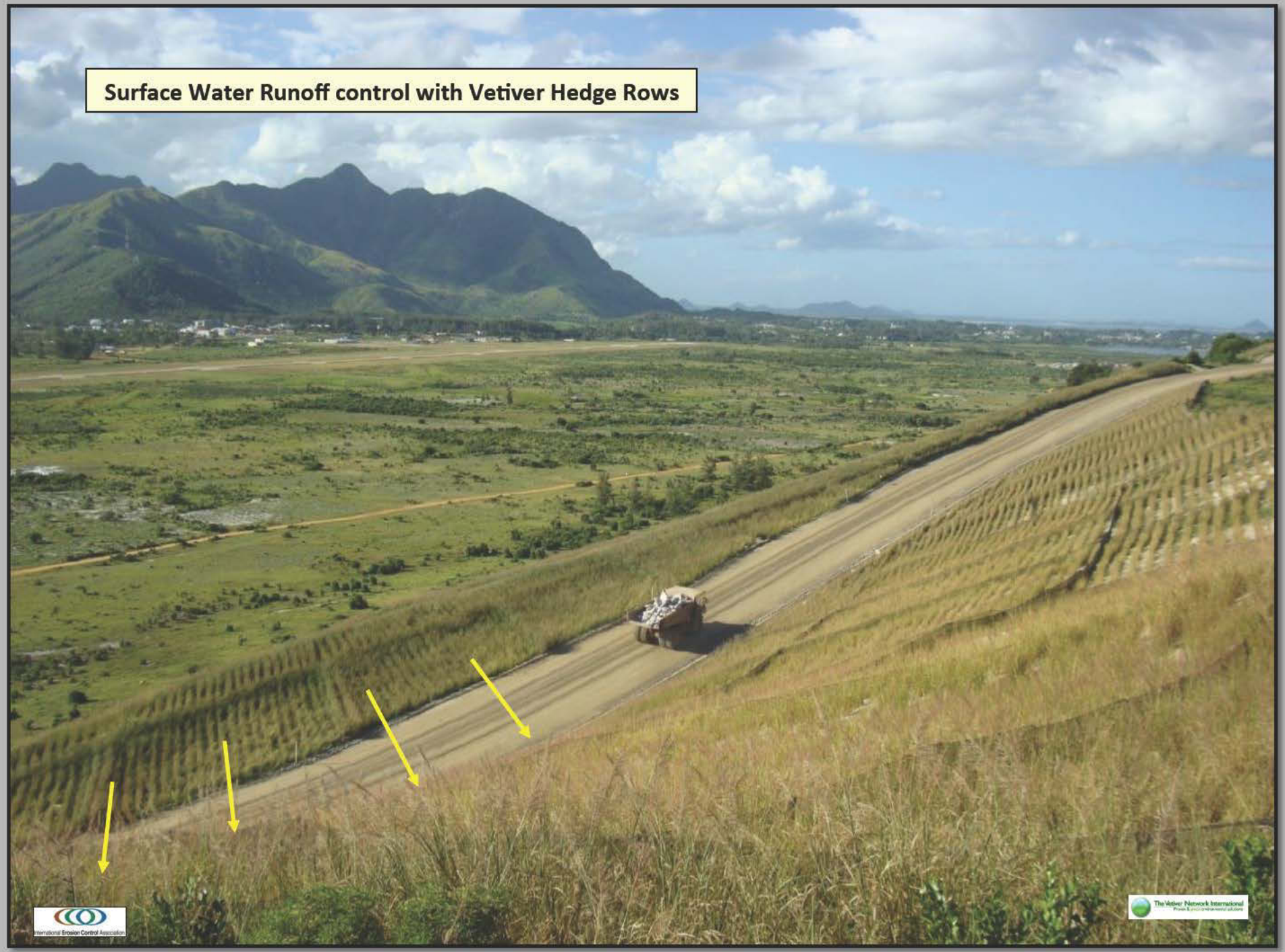
4,000,000 Vetiver plants were propagated & supplied by local villagers.

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

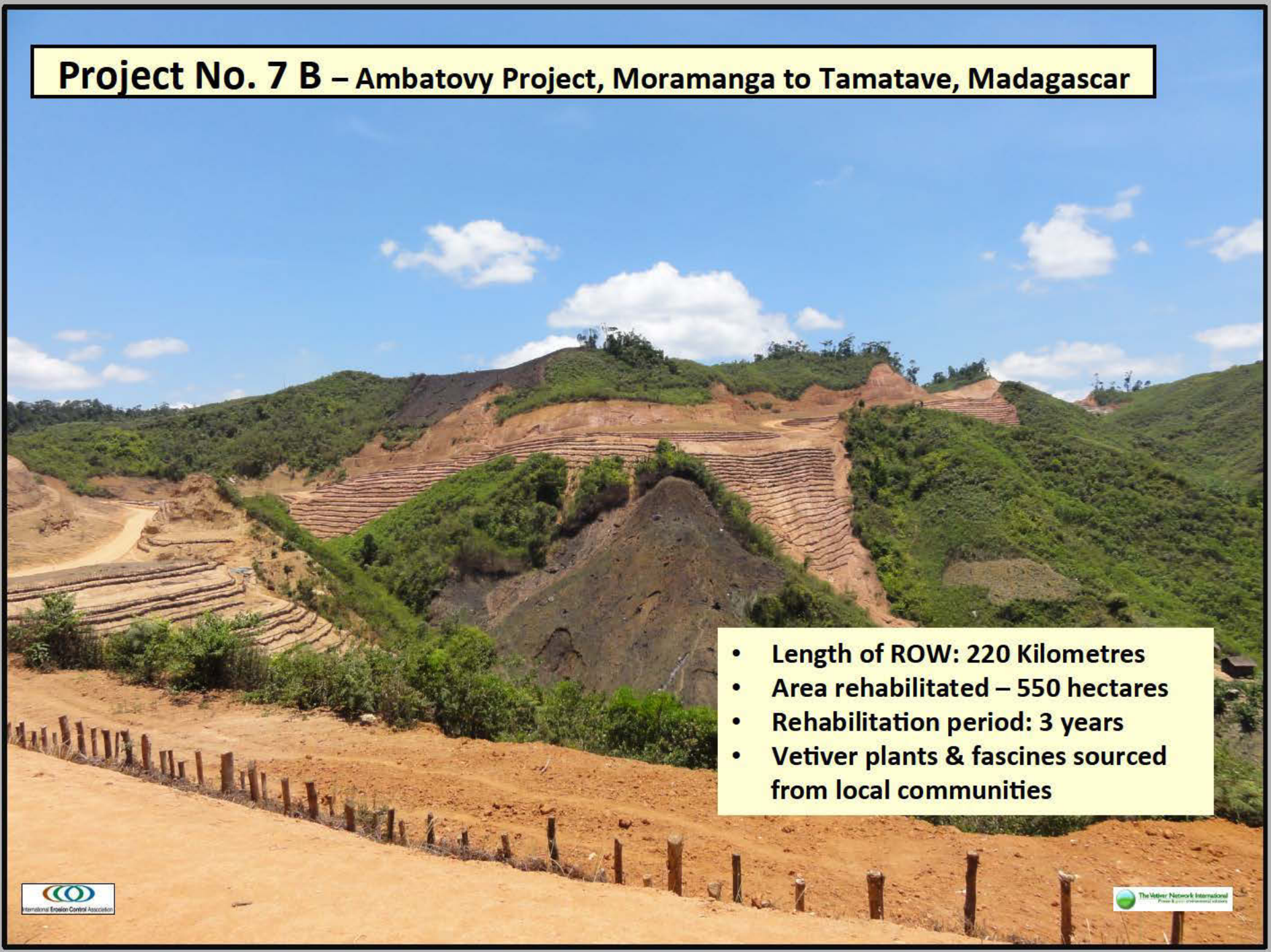



Locally trained supervisors implementing "Coastal Dune Sand Migration" Control
Local Fishing Village
International Erosion Control Association
The Vetiver Network International


Surface Water Runoff control with Vetiver Hedge Rows
International Erosion Control Association
The Vetiver Network International


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
International Erosion Control Association
The Vetiver Network International

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

International Erosion Control Association


Functional Erosion Control Structures & Established HydroSeeding
International Erosion Control Association
The Vetiver Network International

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

Greenhouse Trial Centre

Phytoremediation Pond

Project No.9
Newmont Mine, Ghana

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.

Work Progress on Site around mining infrastructure

Erosion & Sediment Control work currently being carried out by Maxwell Oduro, the local Ghanaian contractor & Vetiver network member.


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