

Contribution of VST in Alleviating Climate Change Disasters



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INTRODUCTION

With the advance of climate changes the Vetiver System has been widely used and proven around the world for its effectiveness in alleviating and rehabilitating damages from disasters and extreme events such as landslides and flood erosion.

This outstanding achievement can be attributed to the remarkable characteristics of Vetiver Grass:

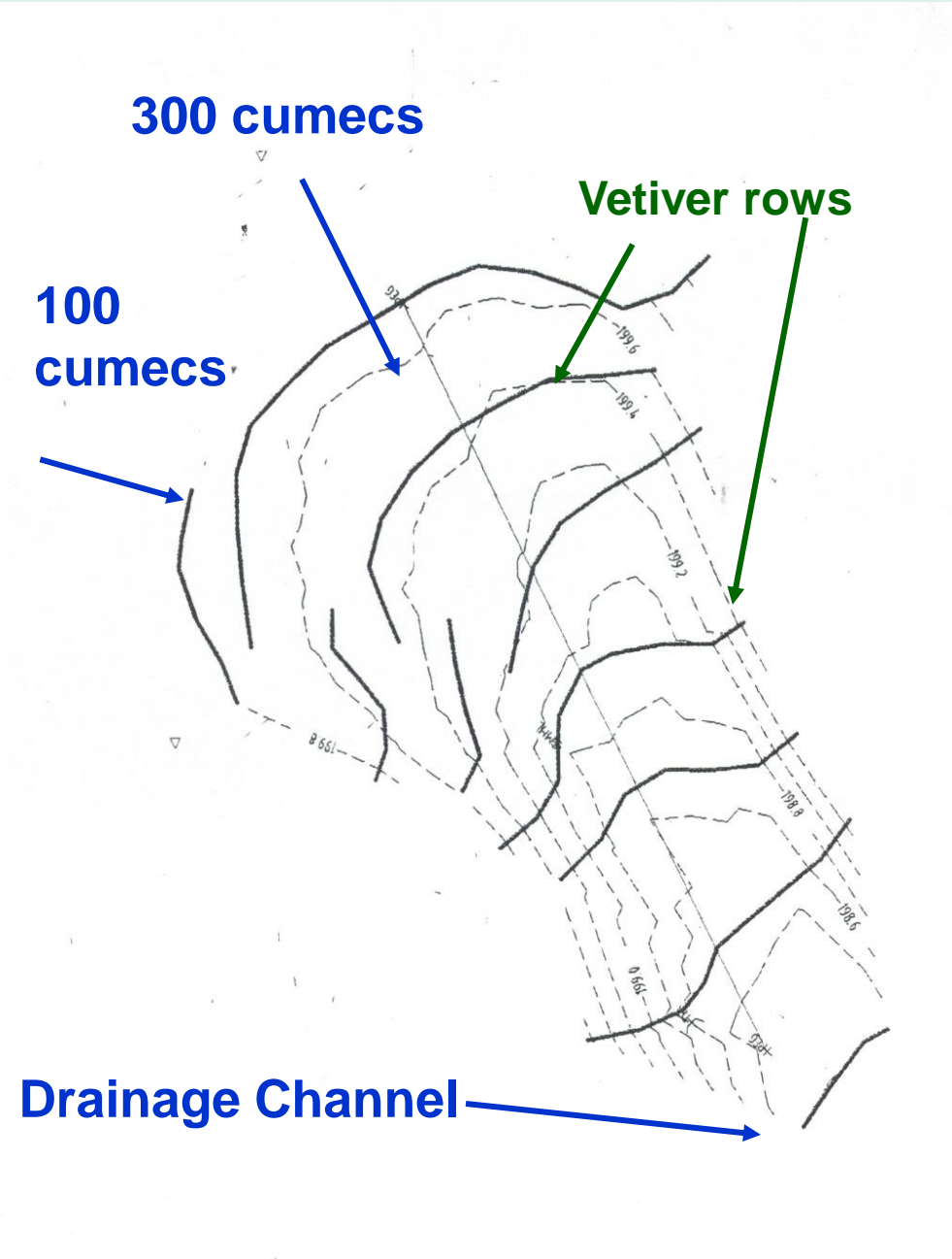
- 1. Extremely deep and massive finely structured root system, with high tensile and shear strength**
- 2. Dense hedges when planted close together**
- 3. Tolerance to extreme climatic variation**

CASE STUDY: Flood erosion control in Australia

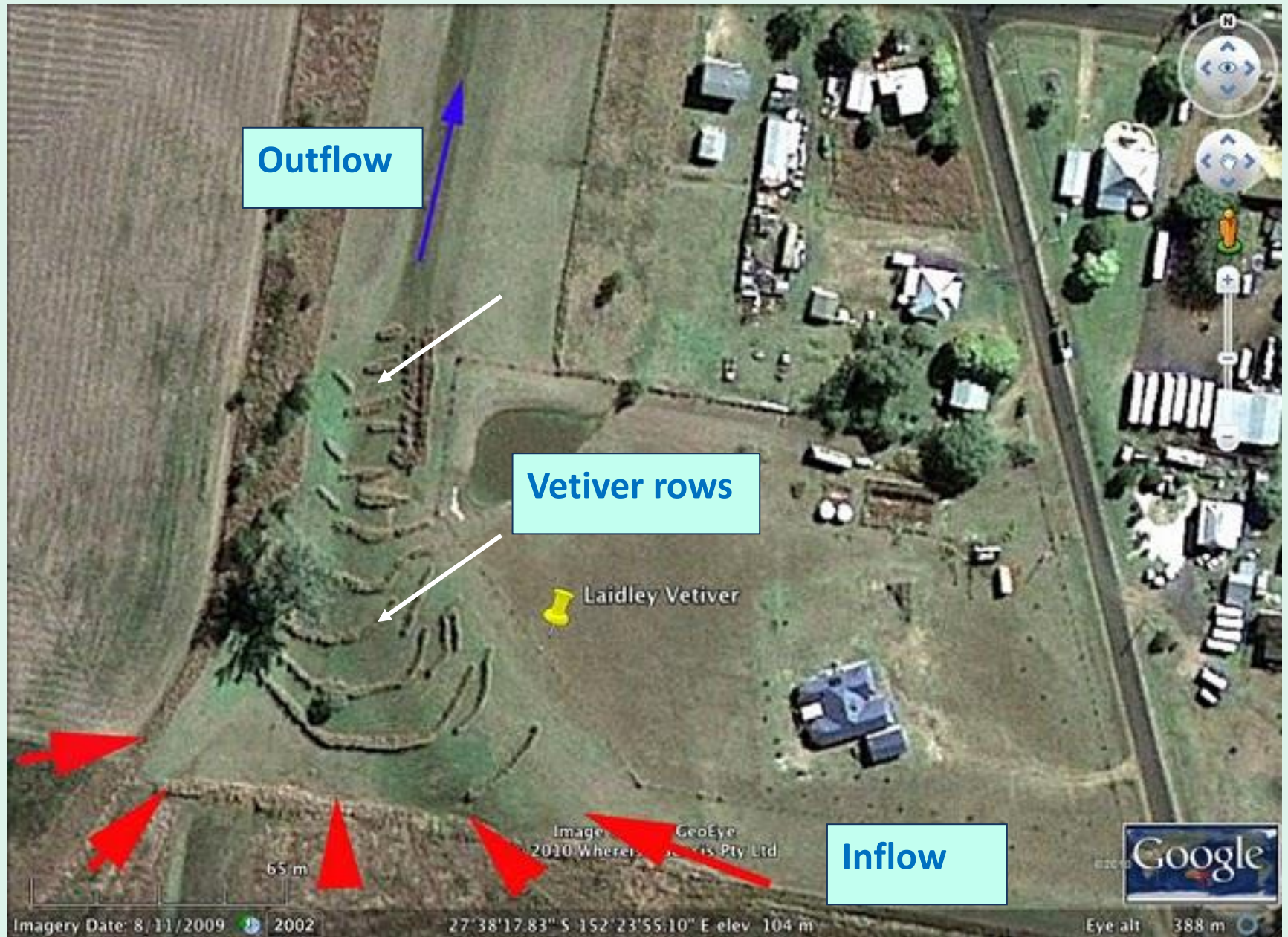
(Truong P.2011).

Flood erosion control in drainage channel at Laidley

Vetiver hedges were established to spread water out and also to divert water to the drain



Flood Erosion Control at Laidley



Flood Erosion Control at Laidley



Flow direction

A big storm hit the area 3 months after planting and the whole site was flooded (Upper section)

Submerged Vetiver hedges

Drainage channel



Although only 3 month old, the young hedges provide a very effective protection with only minimal erosion at the head of the channel



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24 1 2009



24 1 2009

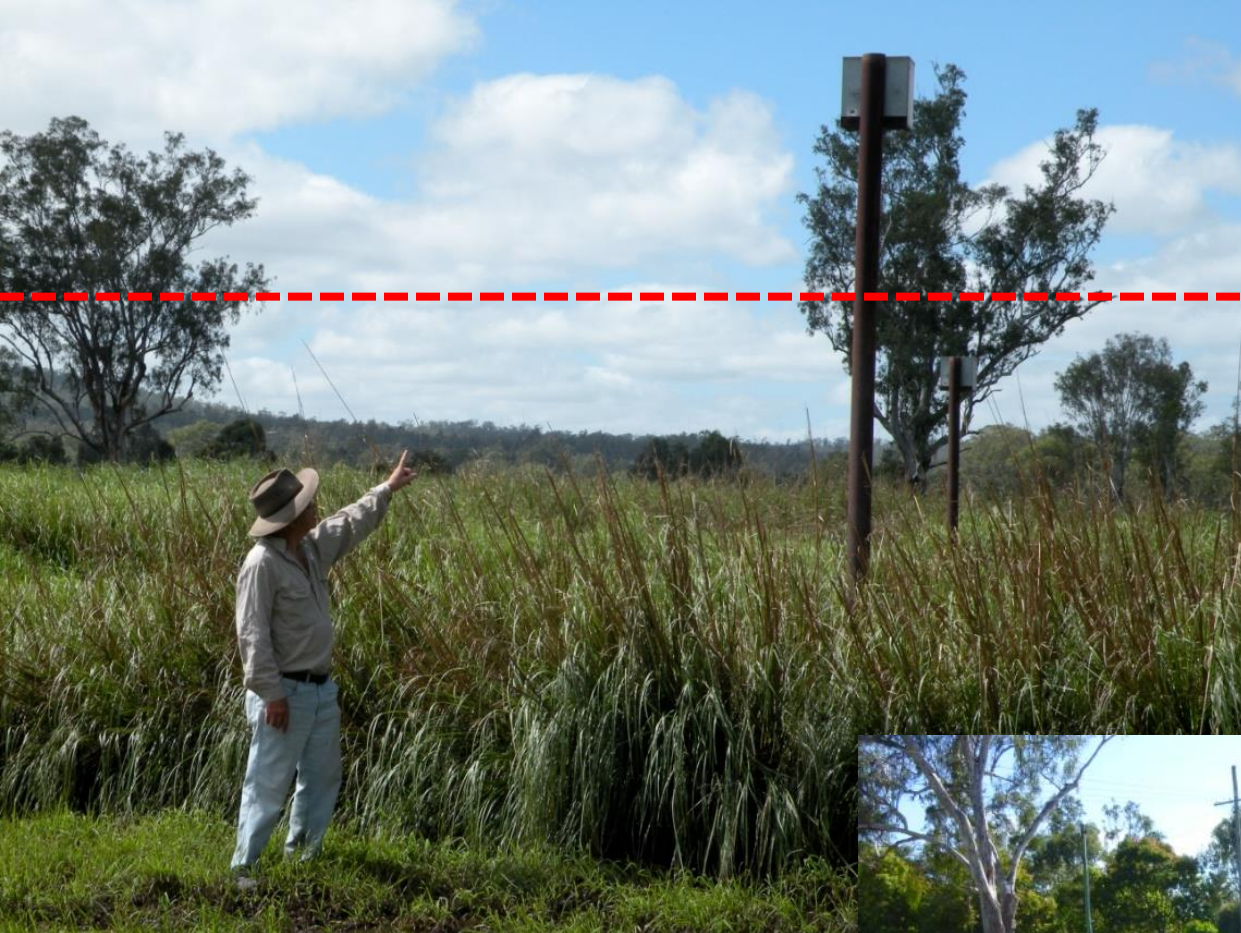
Vetiver hedges before January 2011 flood



24 1 2009



24 1 2009



Flood level





Vetiver hedges after flooding



Shipping container from 23km upstream



While little damage to the vetiver, the fence posts were “uprooted”



CASE STUDY: Landslide Prevention in Australia

Landslide caused by a prolonged high intensity storm.



Site preparation and planting before the intense rain in Jan 2011.



Undamaged by the same record breaking rain



CASE STUDY: Ravine stabilization in Brazzaville Congo

(Ndona, A. 2011)

Boukeni site, February 2009



Initial status at the Boukeni ravine, before placing sandbags containing soil and planting vetiver

Placing bags containing topsoil and vetiver planting on the Boukeni site

Sandbag installation and vetiver planting





Boukeni site, 2 months after planting vetiver directly into the bags of topsoil (April 2009)

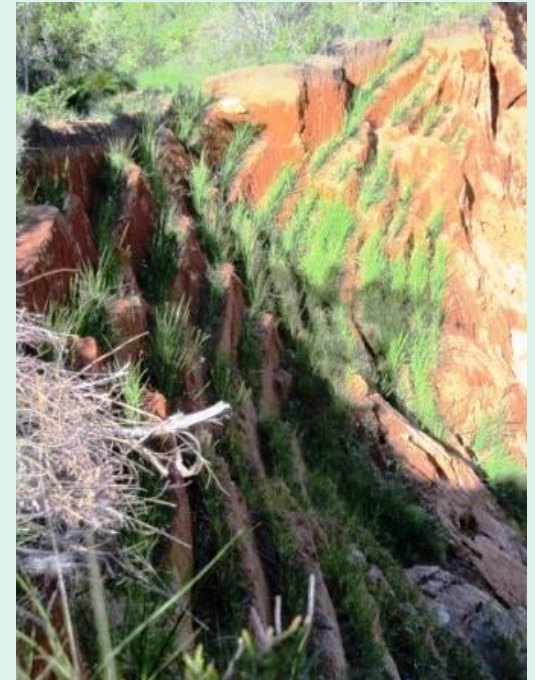


Boukeni site, status of the vetiver cover 10 months after planting (November 2009)



CASE STUDY: Lavaka stabilization in Madagascar

(Coppin, Y. 2013).





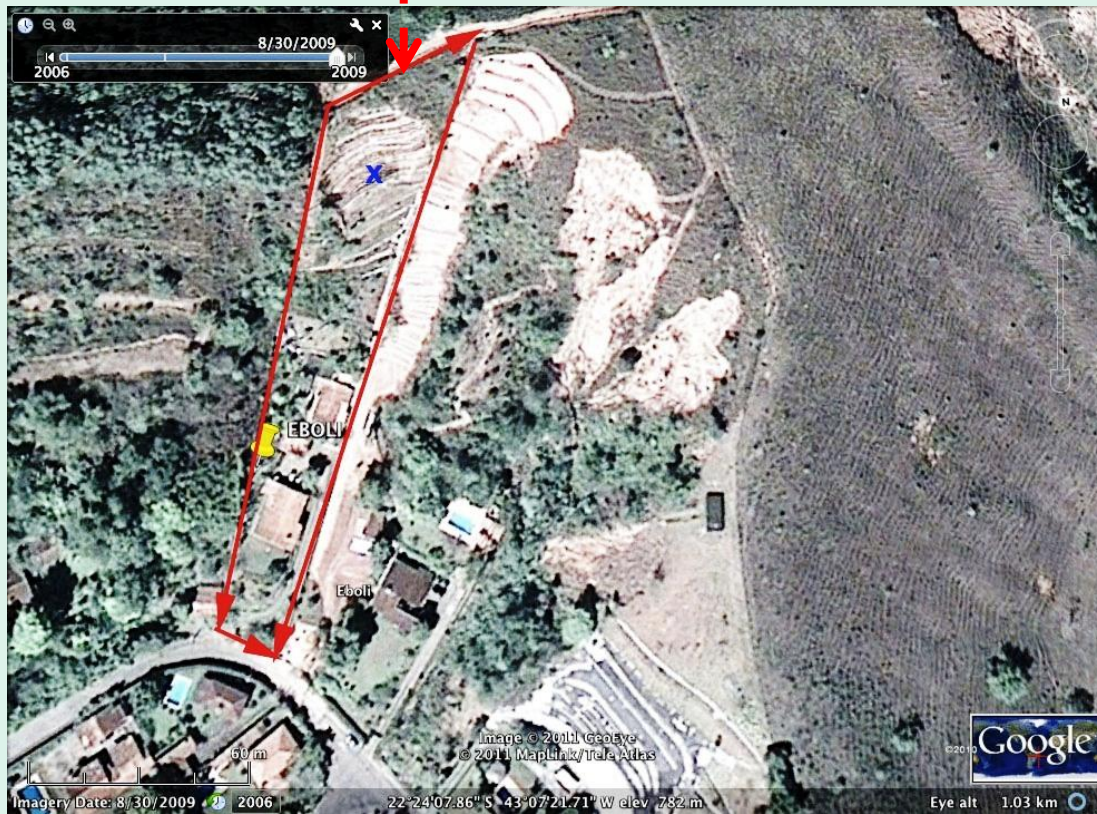
CASE STUDY: Landslide Rehabilitation in Itaipava, Petropolis, Rio de Janeiro, Brazil



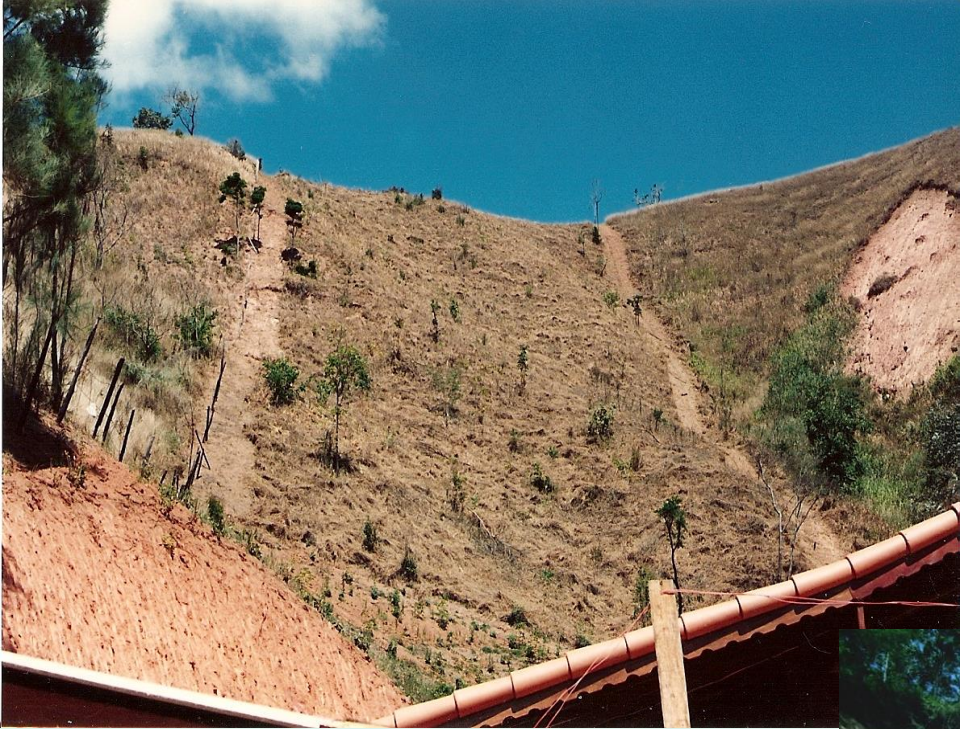
Landslide like this is common in Brazil due to highly erodible soil and extreme weather caused by climate change

Landslide site at Itaipava, Petropolis, Rio de Janeiro

(Eboli, J. and Lucas Vieira, C. 2013)



Google map showing the site landscape



Site before Landslide

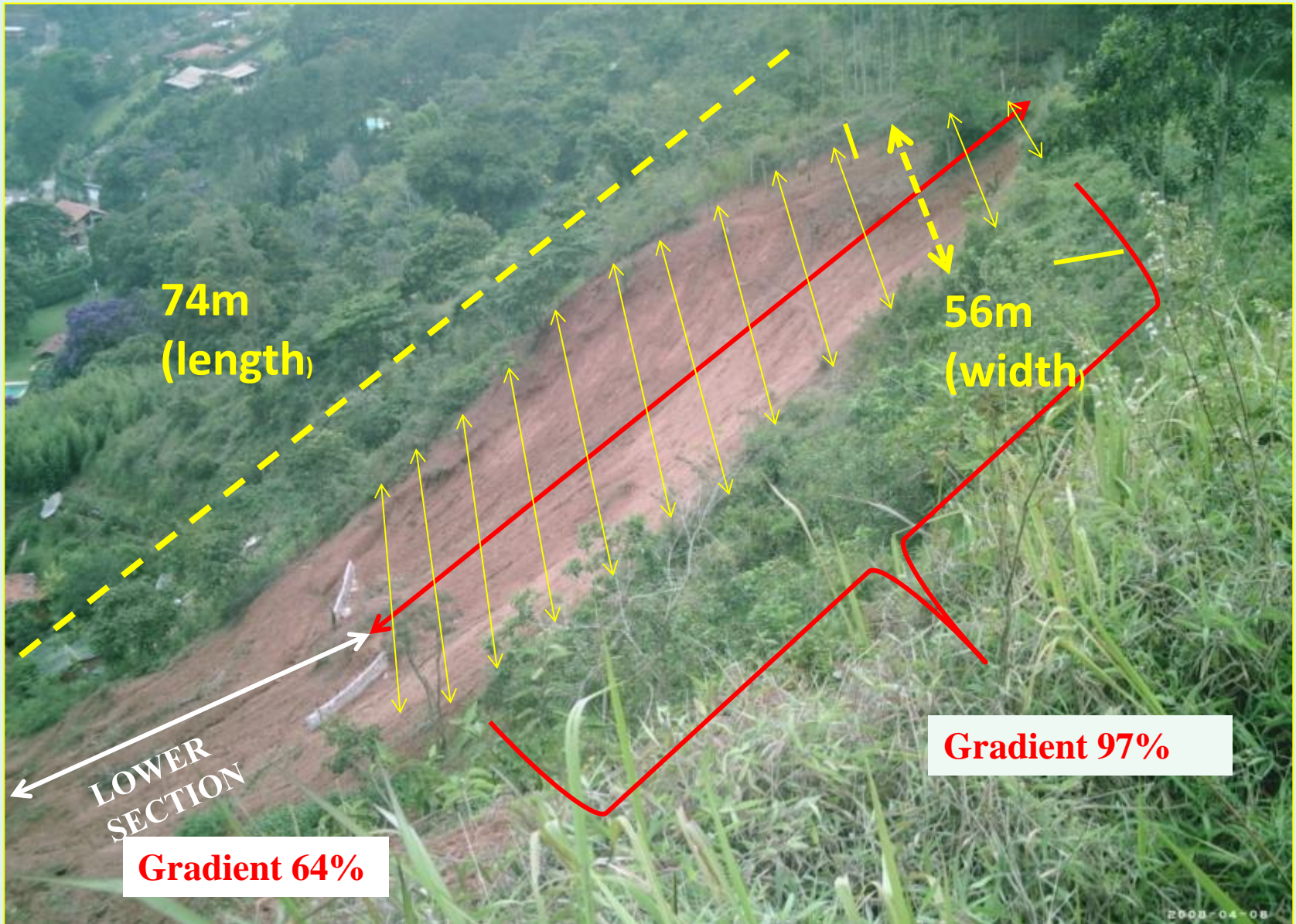
Site after Landslide



Landslide direction



Site steep gradient (66%-97%) and planting layout



Site clean up and preparation for Vetiver planting





Planting on contour lines ay 1m Vertical Interval



Steep slope planting overview





Vetiver planting has successfully stabilized this landslide

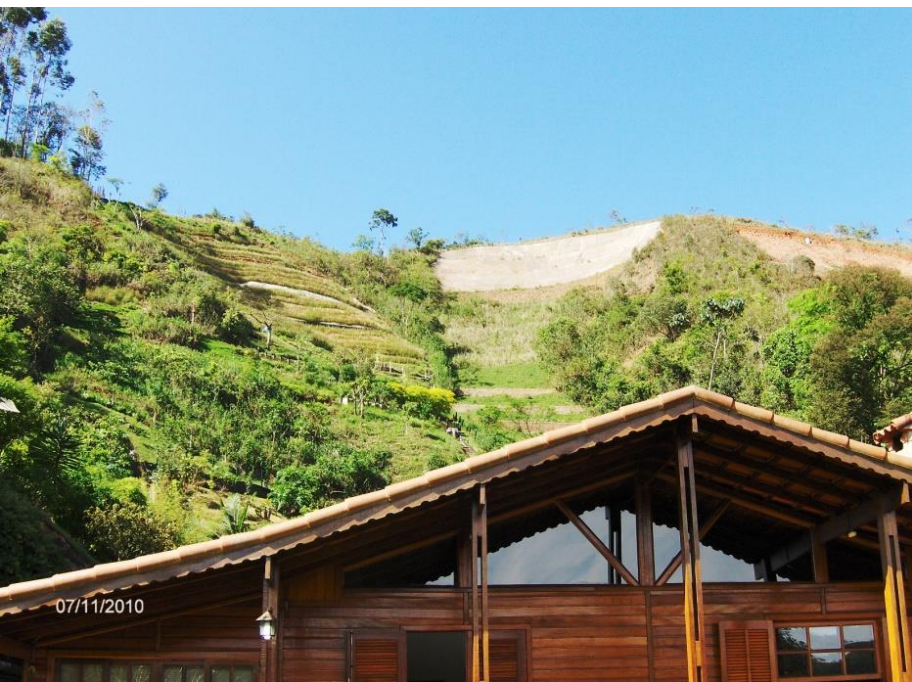


One year after planting





Three years after planting and withstood several intense storms



A green solution: Four years later



Conclusion and Recommendations

(Joao Eboli)

- After four years the slope has maintained its integrity demonstrating and proving that Vetiver grass can rehabilitate and maintain slopes affected by landslides.
- The use of VS for the stabilization of slopes not steeper than 1:1
- The VS will fail when not properly applied or not well maintained.
- The Vetiver when installed and following the correct technical guidelines is a guaranteed success

Perhaps the only real defect of the Vetiver solution is: Too cheap to be true, too cheap to believe when compared to heavy stone structures.

A photograph of two elderly men standing in a field of tall, golden-brown grass. The man on the left has a white beard and is wearing a light-colored polo shirt. The man on the right is wearing a green polo shirt. They are both smiling and appear to be enjoying the outdoors. In the background, there is a hillside covered in similar grass, with a line of tall, thin trees at the top. The sky is overcast. The text 'THANK YOU' is overlaid in large, yellow, stylized letters in the upper right quadrant.

THANK YOU

01/11/2010