

Global Review of 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**

Brief History on the Development of the Vetiver System

Phase 1: Soil and water conservation in farm land

International Vetiver Workshop, Kuala Lumpur, 1999

Phase 2: Land stabilisation: Road, railway batter and river

ICV2: Vetiver and the Environment (Jan 2000, Thailand)

Phase 3: Environmental Protection: Water and land pollution

ICV3: Vetiver and Water (Oct 2003, Thailand)

Phase 4: Socio-economic: Poverty alleviation

ICV4: Vetiver and People (Oct 2006, Venezuela)

Current phase: Combating climate changes

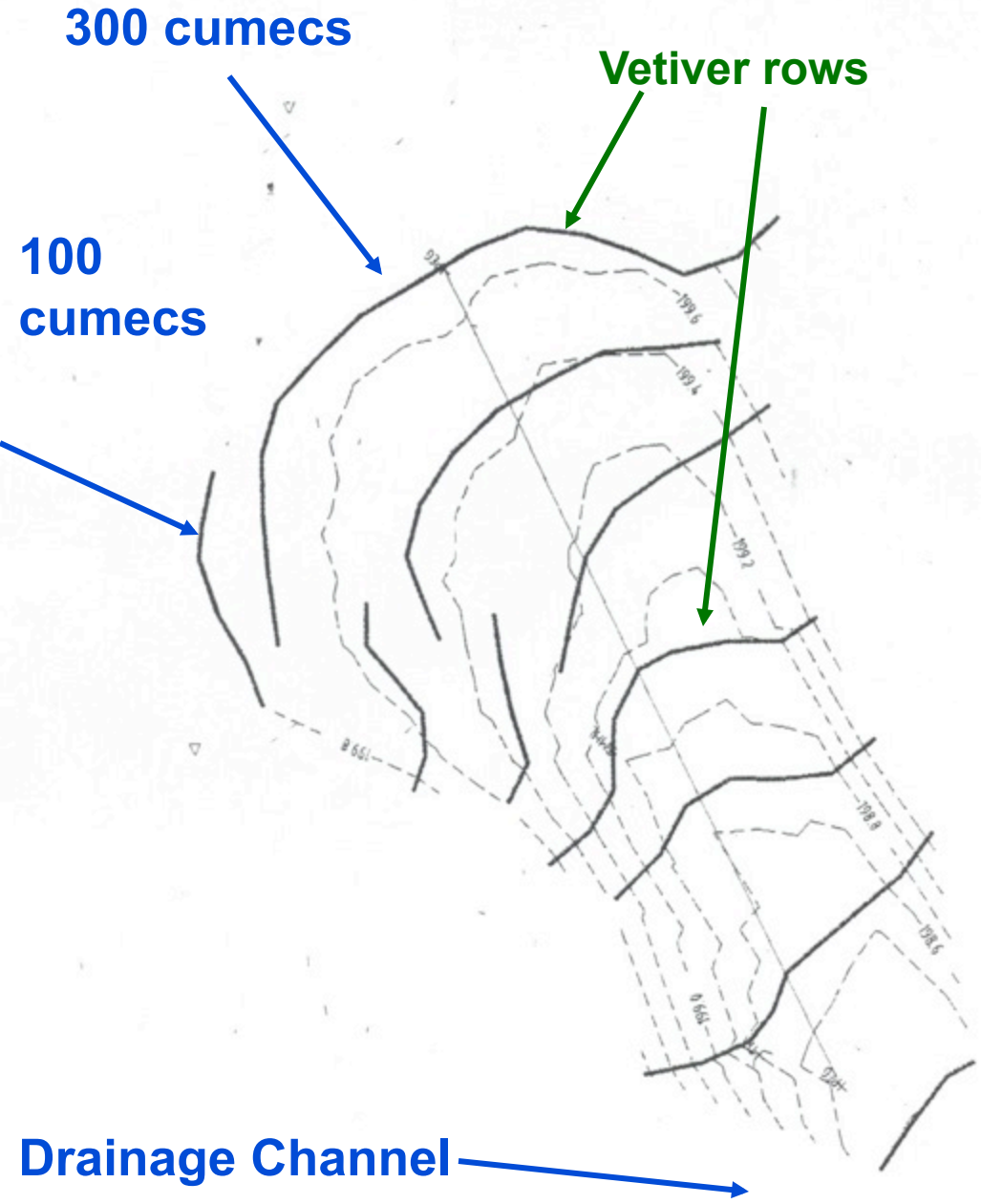
ICV5: Vetiver and Climate Change (Nov 2011, India)

Contribution of VST in Alleviating Climate Change Disasters

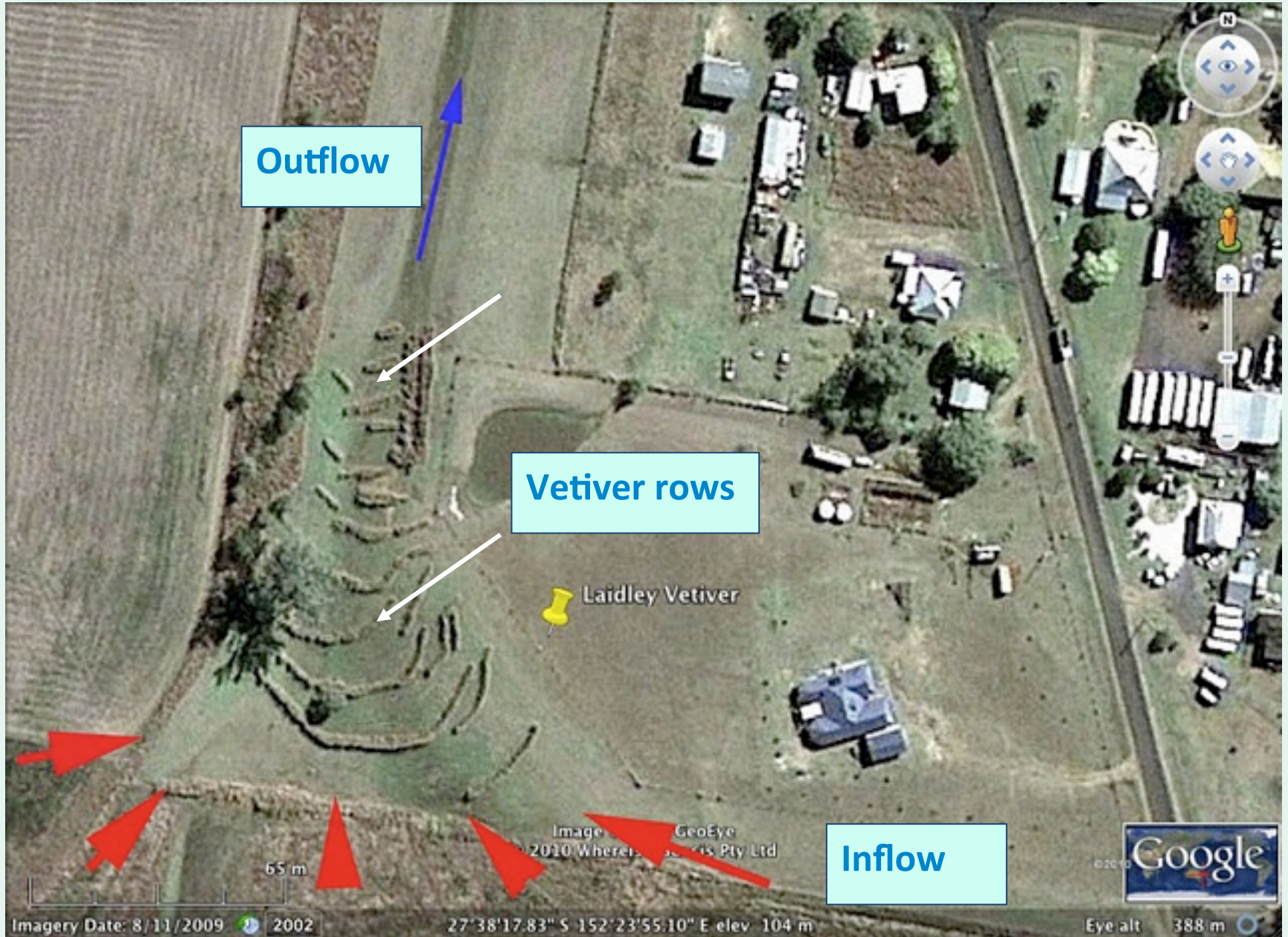
- **OCEANIA: Australia**
- **ASIA: China, India, Thailand and Vietnam**
- **AFRICA: Congo and Madagascar**
- **AMERICA: Brazil, Colombia and Venezuela**

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

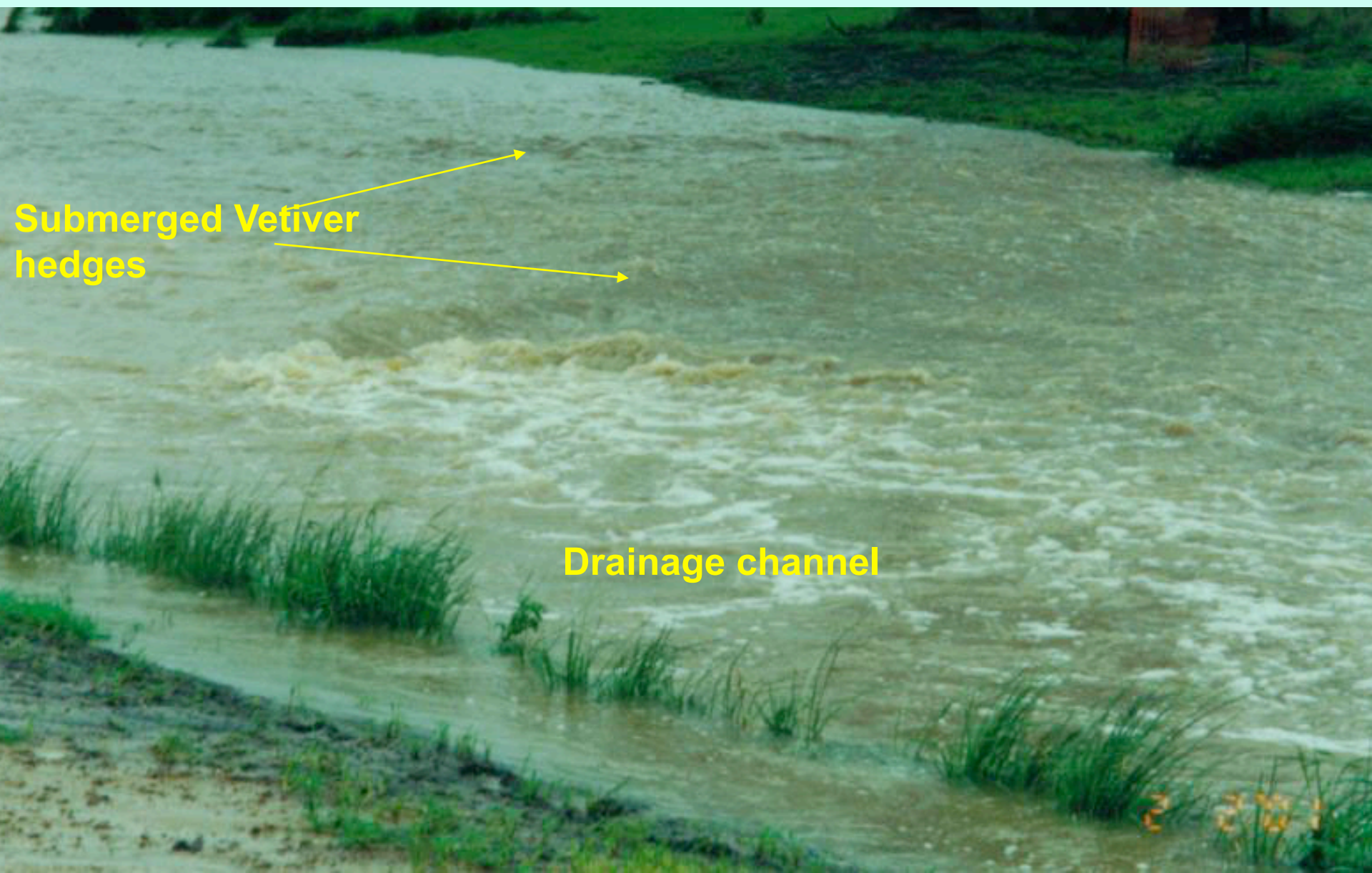


Flood Erosion Control at Laidley



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



Small erosion

8 20 01



Vetiver hedges before January 2011 flood





Flood level





Vetiver hedges after flooding



Shipping container from 23km upstream



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



Flood erosion control on waterway



Badly eroded drain



Site preparation



Gabions



Rock riprap on floor



Rock groynes

Flood level

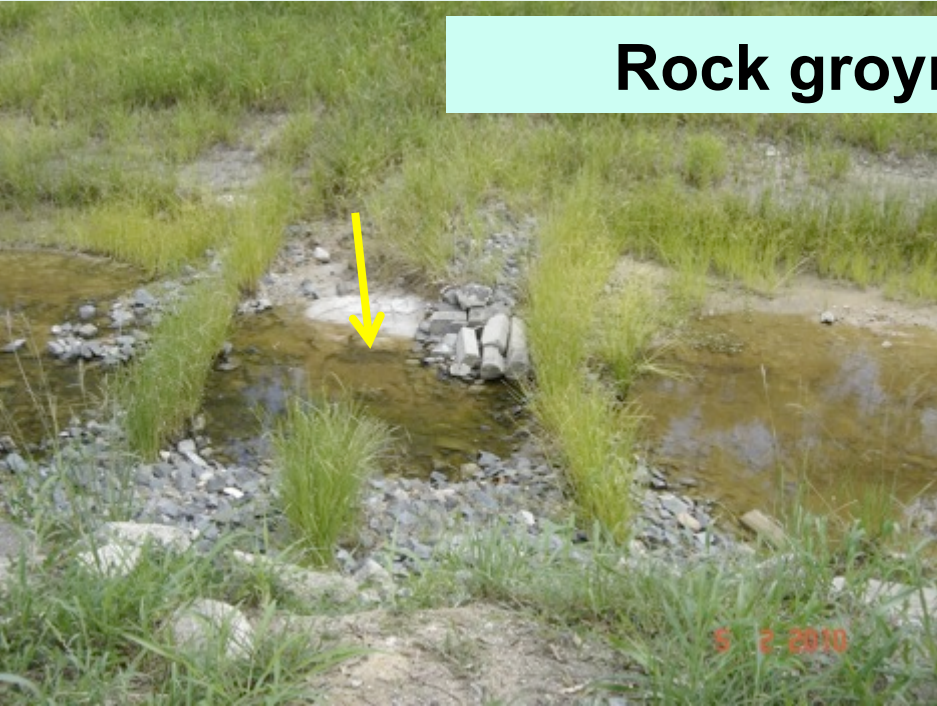


**Vetiver planting
before flood**





Rock groynes before flood



Rock groynes after flood





Vetiver rows on the edges of the groynes remained intact as its roots reached the soil base, the middle row on the top of the mound was damaged as its roots had not reached the ground

Gabion before and after flood



Rock riprap on drain floor before and after flood



Drain before flood

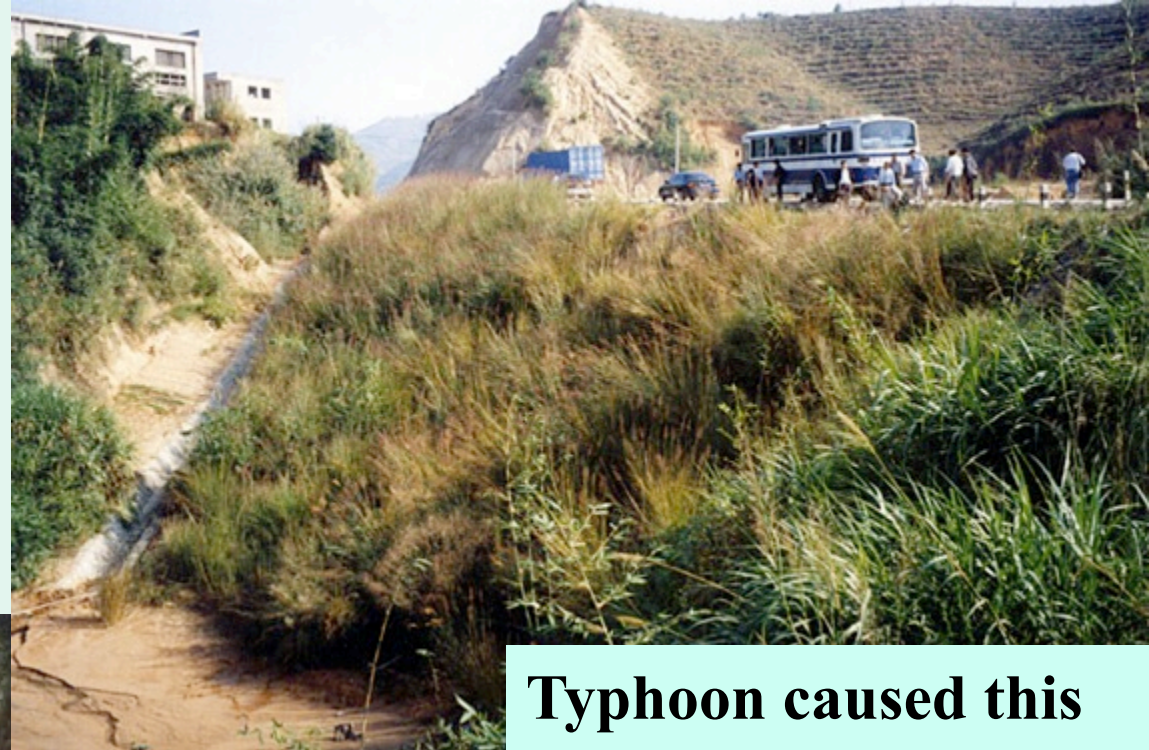


Drain undamaged after flood



Special Characteristics of Vetiver Grass needed for landslide control

The deep, penetrating and extensive root system that binds the soil, and reinforces the soil structure is ideal for landslip control



Typhoon caused this landslip in China. This conventional cement-concrete engineering structure failed to protect this slope. Vetiver planting near this site provided full protection (above)

Landslide Prevention at Samford Valley

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



CHINA: Fujian Province

PC: L Xu



CHINA: Guangdong Province



INDIA (North West): Punjab State



Before and after result of landslide erosion control



Over 60° slope

The site before and after vetiver planting at Noonmati



No vetiver

Vetiver Planting



INDIA: Assam State: Brahmaputra River, Assam



PC: Shantanoo

THAILAND – Kanchanaburi Highway

PC: Surapol



Arachis pintoii



VIETNAM

Ho Chi Minh Highway

Vetiver planting is the main method of stabilisation of deep cut and high fill slope, and landslip mitigation. 7

Concrete wall



Traditional rigid structures can not protect the slopes



Gabion



THE VETIVER SYSTEM SOLUTION



Vetiver is effective low cost to build and maintain



With Vetiver

No Vetiver

VIETNAM: Coastal sea dikes protection

Typhoon storm surges destroyed sea dikes and levees



Vetiver planting provided effective protection on a large sea dike



MADAGASCAR: Sand dune stabilisation and wind erosion control





**MADA-
GASCAR**
Lavaka
stabilization



Brazil: Landslide at Itaipava, Petropolis, Rio de Janeiro





Vetiver planting has successfully stabilized this landslide



Venezuela: Landslide

PC: R Luque



Vetiver planting has successfully stabilized this landslide



Colombia: Landslides rehabilitation using Ecomortar



Vetiver planting has successfully stabilized this landslide



Colombia: Landslides rehabilitation using Ecomortar



PC: G Lodona



Thank You

