

10. POST CONFERENCE FIELD TRIP FROM 9-11 MAY 2015

This trip visited two sites:

- 1- **Phong Nha Cave:** This site showed the use of vetiver for river bank protection:
 - a. Against flash flood and
 - b. Wave erosion caused by motorised river traffic.



Erosion along unprotected river banks



Natural vegetation on riverbank



Waves caused by river traffic



Uncontrolled grazing by buffaloes



Vetiver planted above riprap to protect it against flash flood erosion. Although it was badly affected by animal grazing, its deep and extensive roots still provided adequate protection against flash flood in the last 10 years



2. Ho Chi Minh Highway

- **A brief Introduction to the Ho Chi Minh Highway (HCMHW)
Master plan approved by Government in 1997**
 - Construction started in 2000
 - 40-100m wide (2-8 lanes), composed of sections:
 - Section 1 (Hanoi-Quang Binh): 500km;
 - Section 2 (Quang Binh-Quang Nam): 2 branches i.e. East HCMHW, 364km; and West HCMHW, 514km;
 - Section 3 (Quang Nam-HCM City): 825km;

Connects Cao Bang in the North with Cape Ca Mau in the South, totaling in length 3,200km. Connects with National Route No.1 by 20 traverses totaling 1,700km.



The original HCM Trail, started as a goat tract in 1956, then upgraded for bicycles and eventually for trucks and tanks in the 70s. Now further widened for earth moving equipment. Mostly hidden then under a thick canopy of tropical rainforest.



Highly erodible batters



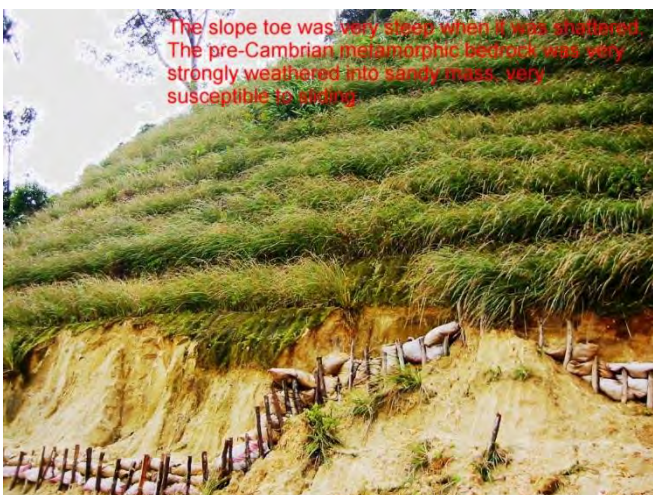
Conventional hard structure solution: Small and large retaining walls



But these massive and costly retaining walls by themselves did not stop erosion during the typhoon season



Vetiver solution



FAST FORWARDS: 15 YEARS LATER *February 2014*

Over the distance of about 1 000km of Sections 1 and 2 of the HCMHW, stretching over a wide range of geology, topography, altitude and climate, it was very pleasing to note that the Vetiver System has successfully stabilized this highway in general .



SOME BEFORE AND AFTER SCENERY







GENERAL OBSERVATION AND SOME CONCLUSIONS

- ***On the whole there are no serious erosion occurs over the length of about 1000km of Sections 1 and 2 of the HCMHW and VST has successfully stabilized these sections of the highway***
 - ***Occasional eroded batters and small slips occurred, partly due to uncontrolled animal grazing and poor internal drainage***
- ***Vetiver has accomplished its mission as a pioneer plant, providing effective erosion control on very steep and hostile slopes, trapping sediment and runoff water, producing a micro environment to facilitate the establishment of endemic plants***
- ***Most importantly, in area where local species did not re-established, vetiver persisted and continue to provide protection***

Vetiver planting created favourable condition for local species to come back and faded away due to shading, but it persisted where local species could not come back.



Site visit 11 May 2015



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