

# CURRENT INFRASTRUCTURE PROTECTION PROJECTS USING VETIVER SYSTEM IN VIETNAM

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## ABSTRACT

Vetiver System standing alone has successfully proved its effectiveness in landslide and erosion control. Meanwhile, as a traditional method of land stabilization, hard engineering structures by themselves are too costly to be productively implemented in the long term in order to protect infrastructures. In Vietnam, Vetiver system has been applied to protect various types of civil constructions from riverbanks to slopes of highway. A combination between Vetiver System and conventional engineering structures has achieved significant results in terms of effectiveness, efficiency and sustainability. This presentation aims to demonstrate the effectiveness of the Vetiver System in different cases in Vietnam.

**Keywords:** Vetiver system, highway, Vietnam, erosion control, landslide, hard structure

## INTRODUCTION

In 2013 Super Typhoon Haiyan with wind blast exceeded 300km/h destroyed coastal towns in central Philippines, rang the alarm bell on the destructive power of climate change. The “Nature Climate Change” magazine on 18/8/2013, reported that flooding will increase in ferocity and frequency damaging coastal towns estimated at USD6B in 2005 and will be gradually increased to USD52B in 2050,

Vietnam, known as one of the countries most affected by climate change, has benefited greatly from the Vetiver System Technology, which was introduced in 1999 for infrastructure protection from massive erosion and natural disaster mitigation. International and local vetiver experts have developed a very effective and sustainable technology adapted to local conditions when applying VST.

## HIGHWAY STABILISATION IN QUẢNG NAM PROVINCE

On the vital highway leading to Tây Giang District, Quảng Nam Province, the batters are steep and composed of very low fertility material, with large gullies on batters affected the stability of the road. To protect this road extensive planting of vetiver was carried out on fill slopes. With correct planting guidelines, vetiver was well established and thrived 6 months after planting.



*Vetiver planting on contour line on steep road batters*



*One month after planting*



*First trimming six months after planting to encourage tiller development*

## **LAGUNA RESORT**

The LAGUNA Resort near Hue, under a very strict environmental guidelines to preserve the naturally spectacular scenery of this bay. The effectiveness of vetiver in reinforcing and protecting concrete structures, which has been well established along the Ho Chi Minh Highway, is once again proven under very steep and erodible slope on the scenic road leading to the resort.





*Without vetiver protection the concrete cellular surface protection measure failed*



## **SOIL NAILING ALAGUNA RESORT**

Instead of protecting unstable steep slopes with concrete structure, soil nailing was used and the slope surface can be revegetated for landscaping purposes. Soil nailing only improves the structural stability of the slope, the slope surface is still subjected to severe soil erosion. This site faces the South China Sea, exposing to strong wind and hot sun. Vetiver was planted with drip irrigation, to control surface erosion and for landscaping purpose. Similar application and good results have been achieved in Colombia.





*Vetiver planting with soil nailing at Laguna Resort in Huế, before and after*



*Vetiver planting with soil nailing at Medellín, Colombia , before and after*

## **RIVERBANK STABILISATION**

In addition to dry land infrastructure protection, VST has been used extensively throughout Vietnam to protect riverbanks, canal, lake and coastal area against wave erosion, resulting from wind and river traffic. Excellent results have been achieved in the Mekong Delta as well as in waterway leading to Phong Nha Cave in Quảng Bình Province.



*Vetiver planting with rock riprap in Quảng Bình Province*

Although VST has been in Vietnam for almost 15 years, its application and research are still far behind Thailand, China, India and Indonesia in our region. In 2015 the four-yearly Sixth International Vetiver Conference (ICV6) will be held in Danang, Vietnam, where local,

regional and international vetiver experts will gather and present their most up to date technical experience for all of us to share. We hope all you can join us there to learn more about this exceptional plant.