

# COASTAL DUNE STABILISATION IN CENTRAL VIETNAM

**Tran tan Van, Elise Pinnars and Paul Truong**

The results presented here are extracts from progress reports of the on growing project: *Introduction of Vetiver Grass Technology to Protect Irrigated, Flood Prone Areas in Central Coastal Vietnam*, which is being conducted by **Tran Tan Van** and **Elise Pinnars**, with Pham Hong Duc Phuoc and Paul Truong as advisers.

## **Introduction**

The 'Geological Hazard Assessment for Coastal Provinces of Central Viet Nam' study conducted by the Research Institute of Geology and Mineral Resources (RIGMR), has identified flood damage to coastal zone and farmland is one of the major hazards of the region and recommended the use of Vetiver Systems (VS) for the reduction of flood damage, particularly the stabilisation of dikes, riverbanks and coastal dunes.

Dr. Tran Tan Van from RIGM is a key person in the Vetiver Network in Vietnam asked Ir. Elise Pinnars, an Agronomist who has extensive field experience in using vetiver for riverbank and roadside stabilisation in Cameroon, West Africa, to assist in providing technical advice and seeking funds to initiate this project.

Through her relentless effort Elise succeeded in obtaining \$US15 000 from the Dutch Embassy SEP (Small Embassy Projects) funds allocated for the poverty reduction program. This project started in 2002 and now is in its second phase of large scale implementation.

## **The Problem**

Farmers in Central Coastal Vietnam are regularly confronted with flood or storm related damage, and have to spend much of their time and money to restore badly damaged structures. The measures they used are not effective enough (e.g. stabilisation of dykes by local grass, which are easily uprooted by flood, or small waves) or of short term measures such as blocking sand dune flow by sand dikes, which themselves are poorly stabilised due to lack of vegetation cover.

In this project area, local farmers have to spend much time and resources to maintain and repair the dikes and dams in their irrigated land. In Quang Binh Province, those farmers who had their land invaded by sand dunes are now facing starvation, and have nowhere to go. In Da Nang during the last flood, farmers feared drowning if the dams breached.

## **Current efforts**

Technical support, when available, has its own problems. Local civil engineers are used to more expensive hard solutions such as rocks and cement (even these solutions are not always effective or durable), they are not used to 'green' and soft methods, and the requirements that go along with these methods: timely planting, involvement of local population at planning, implementation and maintenance stages.

Agro-forestry projects focus on tree planting but it is expensive to implement and slow in growth. Trees are effective for wind erosion control but they give little protection against neither water erosion nor trapping sand eroded by heavy rainfall.

### **Current project**

This project has three sites:

1. Dune and related dike stabilisation in Quang Binh province.
2. Riverbank stabilisation – cum – roadside near Da Nang city
3. Stabilisation of banks of shrimp ponds and nearby gully along the bank, near Da Nang city.

This project was carried out in two stages:

- Establishment of plant nurseries and small demonstration trials
- Large scale planting

### **Site description**

This report concentrates only the coastal dune stabilisation work in Quang Binh province, Le Thuy district. The site is a few hundreds meters from a group of sand dunes bordering a small river. Local authority has built a number of sand dikes to protect farmland from floodwater but these dikes are very unstable and mostly barren, only some sea-pines and wild pineapples are found on these dikes. Farmers have to protect their farmland against sand intrusion from the dunes and the dikes. The erosion was so bad that when it rained they even have to get up at night to guard the dikes.

### **Results**

The planting started early in March 2 002 during the driest and hottest part of the year so it has to be watered until rain. Different rates of farm manure and chemical fertilisers were trialed.

The following photos demonstrate the effectiveness of VS in dune stabilisation.



Typical coastal dunes with planted Casuarina in Central Vietnam

**FIRST PHASE: Establishment of Demonstration trial and Nursery: March 2002**



Overview of the riverbank ( L ) and the sand dike ( R ) before planting



Elise Pinnars supervised the first planting



*One month after planting*



Shifting sand buried vetiver 200mm deep in 4 weeks

Vetiver nursery  
near the dunes



*Two months after planting*



*Three months after planting*



Nursery

***Four months after planting:*** Note other plants grew between and below vetiver hedges.





Digging to 1m depth showed roots was much deeper than 1m

***SECOND STAGE: Large scale planting, 1 000m, October 2002***







The success to date has surprised both local authorities and farmers, they were so convinced on the effectiveness of VS that they have paid Van and Elise their best compliments by ‘pinching’ vetiver from the local nurseries:

- The local authority, without Van’s permission had ‘commandeered’ 15% of his nursery material to stabilise a new bridge abutment (above right)
- Farmers pinched another 15% for use on their own farms.

As a result, the anticipated planting during the second phase of 3 000m was cut back to only 1000m.

