

VETIVER SYSTEM PROTECTS ESTUARY DIKES IN THE MEKONG DELTA, VIETNAM



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June 2015

INTRODUCTION

The estuarine region of the Mekong River in the Mekong Delta is a low lying and flat area, which is subjected to daily tidal movement. Thus rendering it an ideal location for aquaculture, particularly prawn (shrimp) farming.

Due to its flat topography, dikes are needed to protect the prawn ponds from daily tidal movement, king tides, tidal surge during the rainy season and occasional typhoons.

These dikes are built mostly from locally dredged alluvial materials, silt and silty clay, which are highly erodible. So they are often breached and required regular and costly maintenance and rebuilding.

When properly implemented and maintained, the following presentation clearly shows the effectiveness of the Vetiver System in stabilising and protecting two dikes: one for 12 years and another for 8 years from the adverse elements mentioned above.

**A typical estuarine flat
at the mouth of the
Mekong River in the
Mekong Delta, with
native vegetation:
Mangrove on low area
and salt tolerant
species on higher
ground**



12 8 2007

Established prawn ponds



New prawn ponds



This photo was taken in June 2007, four years after the construction of this 11km long dike. It was built as a trial site to determine the suitability of VS in stabilising its batters



**Vetiver grew well on
the sea facing (outside)
batter, which was
subjected to king tides
and occasional tidal
surges**



**Vetiver grew well on
the inside batter,
which was not
subjected to king tides
and tidal surges**



**This outside batter was subjected to regular king tides and occasional tidal surges with highly saline brackish water (not full strength sea water).
Vetiver survived and thrived under this condition.**



**Water level during king
tide**

12 6 2007

Eight Years Later



The same dike 12 years after the construction (8 years after the previous photos) showing excellent vetiver growth



According to the dike maintenance engineer, vetiver planting stabilised the batters, as well as keeping the dike surface drier and firmer thus more stable during the wet season



**Excellent vetiver growth
on both inside and
outside batters**





Excellent vetiver growth in dry season and up to 2m tall in the wet season

Inside batter





Outside batter



NEW DIKE

June 2007



Following the success of the trial, the local authority embarked on building a much larger and longer dike: 42km long, to protect a series of new ponds

**Construction
of new dike
started in
June 2007**



Eight Years After Planting

**A very well protected
dike and stable road**





Outside batter



Inside batter

MAINTENANCE

It is obvious that prawn farmers benefit greatly from Vetiver planting, it also provided an economic incentive to other farmers living along the dike. By law, farmers are not allowed to dig up or destroy vetiver plants but they are free to harvest it for their own uses such as fodder, mulch, thatch or string making and burning to control weeds, as well as grazing their stock on the batters.

**Vetiver
harvested for
fodder in the
dry season**



**Regrowth after
harvesting even in the
dry season**



Burning to control weeds in the dry season



Regrowth after burning to control weeds



**Heavily
grazed in the
dry season**

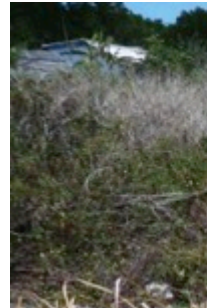


PLANTING DESIGN

The recommended planting design for batters like these is one row near the edge of the road and one at its foot. The space in between to be planted in rows on contour, with VI between 0.8-1.0m, depending on slope gradient.



Although these photos show that either the planting was not carried out as recommended or vetiver died out, it has successfully stabilised these batters, indicating that vetiver root mass is more important than contour rows in stabilising relatively low gradient and short slope, such as these batters.



**Growth in the
wet season**

Keeping road free from debris



CONCLUSION AND RECOMMENDATION

When properly implemented and maintained, Vetiver System is very effective in stabilising and protecting estuarine dikes from the adverse elements commonly experienced in coastal zone.

Participation of local population is the key element to its success. This involves education, providing guidelines, instructions and support to the local people.

Last but not least, the enforcement of a firm regulatory program by the local authority