APPLICATIONS OF VETIVER IN WESTERN AFRICA:

How does it apply to the Gulf States?

KUWAIT FOUNDATION

FOR THE ADVANCEMENT OF SCIENCES

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Region under consideration

Three aspects of vetiver in the region

- Local (Africa) variety: *V. nigritana*
- Introduction of *V. zizanioides*
- Dissemination: approach and Best Practices

1. Local (Africa) variety: *V. nigritana*

- Found in wetlands and wadis
- Multiple uses/multiple names
  - purify drinking water
  - medicinal properties
  - land demarcation
  - considered to have spiritual/mystical properties
  - Cattle will feed on its leaves
  - handicraft
- Not known for soil erosion

Found in wetlands and wadis

Used in drinking water and for medicinal purposes

Roots in drinking water

- Disinfects
- good taste
- nice odor
- eliminates pathogens

Planted as “markers” to demarcate land boundaries

– Helps reduce land disputes since it is difficult to uproot; referred to as “Jema” plant in Mali

In intensive agriculture; demarcates small plots

Its leaves are eaten by cattle (as a last resort)

Near Timbuktu (Mali)

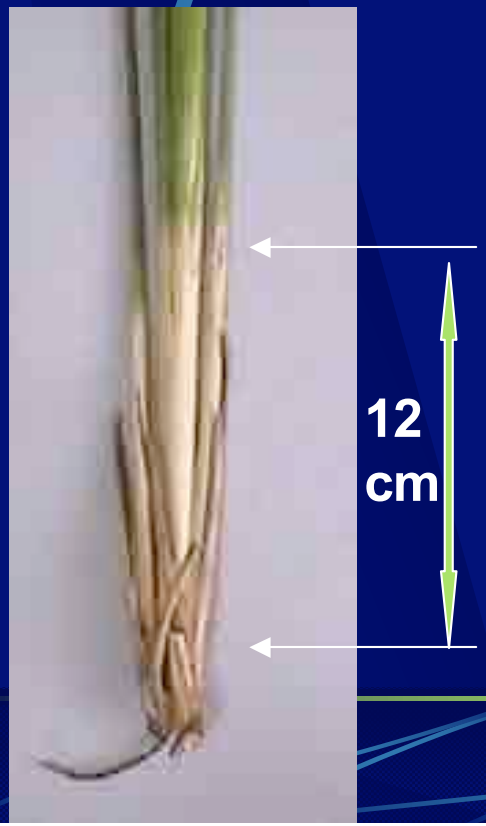
Leaves mixed in adobe construction blocs to reduce cracking

In spite of different uses, there has been little research on *V. nigritana:*

- its medicinal qualities
- its water purification capabilities
- its nutritional value as animal feed
- performance in soil erosion/soil regeneration.
  - Why?

Soil erosion field trials initially show weakness of V.nigritana

After 8 months, a *V. nigritana* hedge trapped 12 cm of sand, yet no sign of adaptive root growth



It seems that *V. nigritana* does not have ability to grow roots on its leaf stem

- This in comparison to *V. Zizanioides,* which grows new roots on its leaf stem when it traps eroded soil

Present status of *V. nigritana:*

- Roots collected in the wild; over harvested
- Dug, dried and sold mostly to purify drinking water and for medicinal purposes
- Very little effort to multiply or propagate
- Plant's survival is threatened in the region

2. Introduction of *V. zizanioides*

- The big picture:
- Last 30 years, Africa region undergoing major changes:
  - Intense pressure on land
  - Drought
  - Deforestation

These changes have led to:

- Loss of arable land
- Reduced agricultural productivity
- Constraints to development and low food security

Enter World Bank and National Science Foundation, and The Vetiver Network

- 1990's: Studies on *V. zizanioides* uses and performance
- Conclusion:
  - In tropical and arid zones, *V. zizanioides* hedges could solve loss of arable land and improve soil moisture retention, lead to better food security
- Past 7 years, impressive new applications and uses of vetiver beyond its soil erosion properties

Root Comparison

V.zizanioides & V. nigritana

V. zizanioides (Khus)

V. nigritana

In Western Africa, a landmark research conducted in Nigeria*

- *V. zizanioides* planted in hedges:
  - Trapped 98% of soil
  - Reduced run-off 130%
  - Crop yield increased

- Set the stage for expanded application of Vetiver in the region

*Babalola, O. 1999, University of Ibadan

Since 2000

- New interest in research and application of the Vetiver System
- Particularly countries bordering Sahara desert; Senegal, Mali and Burkina Faso;
- Attempts made to establish national vetiver dissemination programs
  - Senegal, first country

3. DISSEMINATION: approach and best practices

3.1. Approach:

- Use business sector in collaboration with public institutions and research centers
- Establish demonstration sites/installations
- Promote sustainable quantities of plant material – private nurseries
- Localize the Information about Vetiver
- Put in place a broad communication strategy

DISSEMINATION (CON'T)

- **3. 2. Best Practices**
  - Create diversified "core group;" hold regular meetings
  - Involve big-picture and detail people; people who are busy!
  - Use a LEAD organization; independent, access to resources, credible, results oriented.
  - Organize information days and events
  - Develop "Action Plan"
  - Identify private businesses that can use vetiver, invest in it and use as demonstration sites
  - Create information networks and partnerships among key people and organizations

Applying the dissemination approach

Demonstration site in Senegal:
Initial private contract was with a cement factory for a mine access road

Note drainage culvert

Same site after rains

Same road, same "static" construction but protected with *V. zizanioides*

Events and communications: Demonstrate vetiver plant

Tiller planted in a 1 _ meter box (sand soil and manure)

Leaves used for thatched kiosk in a hotel

Plants in nursery bags

Planted by the meter

In agriculture, wind and pest protection

Cultivate food crops in sand by the sea (30 meters from water line)

Demonstration site (Mali):

New Irrigation canal and access road to sugar plantation

Initial single hedge planting (May)

Same canal and access road (August 2004)

Demonstration/testing vetiver at municipal water treatment plant (Dakar, Senegal)

Disinfection and survival of vetiver when remain submerged in waste water

Cleaning polluted water site, vetiver raft (Senegal)

Community wastewater overflows into squares of Vetiver (Senegal)

Retaining steep slope under dry conditions

(Dakar, Senegal)

Erosion Niger River (Mali). Tree roots are unable to protect the soil

Same river bank protected with vetiver

Stabilization along coast Cap Skirring (Senegal)

Photo: Ndongo Fall DIEYE

Senegal – beachfront protected and unprotected lands

Small well in desert by the coast (brackish water) protected by vetiver

Coastal sand erosion and wind protection

Phosphate mine 6 km conveyer belt protection

(Senegal)

Photo: Ibrahima Diaw

Provide quantities of plant material: small farm level multiplication (Burkina Faso)

Localize information, and reach communities

Events: “Vetiver Day” at the community level

SUMMARY

- Dissemination is a key factor in promoting Vetiver System
- A traditional use/knowledge of the plant is not necessary
- Need a plan, an independent "locomotive" and include a broad spectrum of partners particularly businesses
- Must be flexible, adaptive, innovative

Does Vetiver exist and grow in the Gulf?

Vetiver and Paulownia trees in Dubai

Vetiver worked, but it was too hot for the Paulownia

Choukrane