

Vetiver and its system for community development in Ethiopia

By

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I. INTRODUCTION OF VETIVER

- The vetiver grass found In Ethiopia is *Vetiver Zinzionaides*
- *It was introduced to the country in The 1970 by Ethiopian Institutes of Research*
- *It was introduced for the purpose of protecting coffee plantation from the encroachment of Corch grass*
- *State coffee plantation were the main users of Vetiver grass to protect coffee plantation from the encroachment of Corch grass*

II. Vetiver grass for soil and water conservation

- It was introduced by world bank in 1991
- Its use for soil and water conservation purpose practiced in six regions
- In terms of the agro climatic condition it is practiced in all except Dry kola and Wirch Dega zones.
- Its use also grown road stabilization, water quality improvement, bio-insecticide and source of income.

III. Why is vetiver for soil and water conservation purpose

Physical conservation

measures is not appreciated by farmers

- |Consume considerable amount of arable land
- Results yield reduction of 10 – 20%
- Physical structures harbour rodents
- Labour and maintenance requirements are high,
- Physical structures hinder ploughing operations



IV. Vetiver for soil and water conservation

- Vetiver as soil and water conservation measures were used in farmlands, gullies, Grazing Lands, and hillsides in a different forms.



V. Vetiver Plantation techniques

- Plantation techniques varies depending up on the land use type and agro climatic Zone

1. Low rainfall area

- Polytheened vetiver seedling
- four tillers per pot
- Planted at 8cm spacing

Forms a hedge with in a year time



Vetiver plantation techniques

- High rain fall areas
 - Bare rooted vetiver slip
 - Four tillers per slip
 - Planted during the continues rain
 - at spacing of 10 cm

Forms a hedge with in a year time



Vetiver plantation techniques

- At different land use types
 1. Gully side wall
 - seedling produced according to the agro climatic condition
 - planted as instant hedge
 - at row spacing of 2 m found to be effective

Vetiver plantation techniques

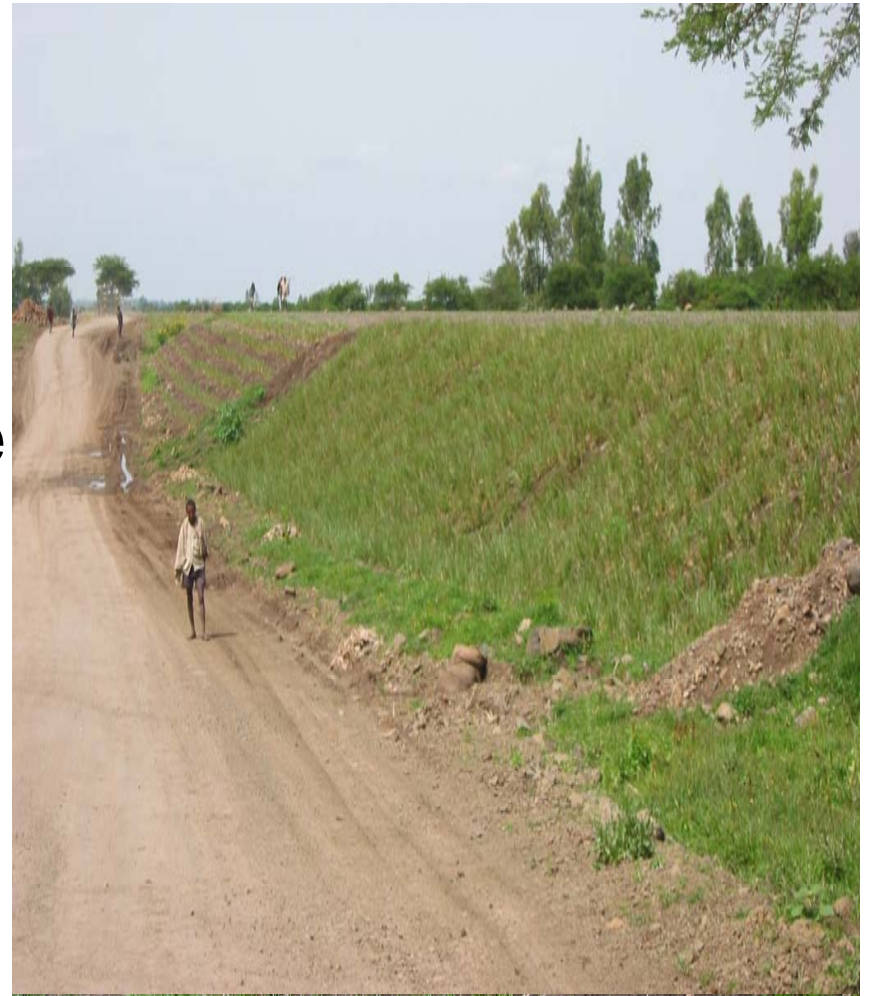
- Hillside land use types
 - Seedling produced as per the agro climatic condition
 - Planted at spacing of 8 cm
 - Row spacing 10 m

Found to be effective

Vetiver plantation techniques

- Road side plantation
 - seedling produced as per the agro climatic condition
 - Planted as instant hedge
 - Planted at spacing of 1.5m and/or diagonal box of 45degree.

Was found to be effective



Vetiver hedge effectiveness in soil conservation

- Its effectiveness are found to be highly determined on
 - the plantation techniques,
 - the maintenance effort,
 - agro climatic conditions,
 - the management measures deployed in the very first year of plantation,
 - the plantation time



Vetiver hedge effectiveness in soil and water conservation

- Soil conservation effect of vetiver various depends up on the land use types, slope class the land management practices and agro climatic conditions.
- Average soil conserved in high rainfall areas per Year
 - 10 - 20 ton in the farm lands,
 - 5-7tone in Gullies
 - 6.5-15 ton in hill side areas.



Vetiver hedge effectiveness in soil and water conservation

- Average soil conserved in low rainfall areas
 - 7-12 tone in the farm land,
 - 3-7tone in the gully
 - 5- 12 in the hill side.



Vetiver Hedge moisture retention capacity

- The research made prevailed that
 - at a depth of 40 cm soil water retention is higher with physical measures
 - While at depth of 70 cm, the vetiver treated plots showed a clearly superior performance
 - At lower depth of 100 cm, the overall performance of vetiver hedge is still significant



Vetiver Hedge moisture retention capacity

- The study conducted at the watershed level by developing at the rainfall and runoff relationship pattern showed
 - Reduction of the peak flows as a result of the vetiver hedges
 - the vetiver hedge enhance the base flow during the transition and dry flow periods.



Other effects of Vetiver hedge

- Vetiver hedge slope reduction effect continuously growing
- It maintains the natural drainage system
- The vetiver hedge takes a smaller area of production
- The area taken by vetiver hedge is lesser by 70% as compared to the other physical structures.



Important remark

- The so far experience showed that Vetiver hedge is
 - The only biological material farm land to replace the physical structures .
 - In gullies and hillside areas there are a number of grasses such as bana grass and green gold.



Cost of Vetiver hedge

- The cost comparison to the most common physical structures clearly describes
 - vetiver hedge establishment in the farm land is cheaper by 50%-70%.
 - In consideration of the maintenance cost it is cheaper by more than 85%.
 - The area could be covered per specified period and labour is higher by 500%.

Cost of Vetiver production

SWC Measures	Establishment Cost (Birr)		Maintenance Cost (Birr)				Remarks
			Year 2		Year 3		
	CfW	FfW	CfW	FfW	CfW	FfW	
Fanya Juu*	1,200	1,896	240	381	360	569	Continuous
Soil Bund*	900	1,422	180	284	270	427	Continuous
Stone Bund*	2,940	4,645	294	465	441	697	Continuous Incl. Costs for stone collection
Vetiver Hedge (bare rooted)**	360	524	144	210	36	53	Incl. Plant Material
Vetiver Hedge (containerized plants)**	916	1,447	50	79	0	0	Incl. Plant Material

Other area of vetiver application

- Vetiver grass for road side stabilization was the progressively growing in Ethiopia.. - The effect of vetiver in road stabilization also proved to be very much effective.
- In orchards vetiver hedge planted around the fruit tree
 - Quite a significant effect in soil moisture improvement recorded specially in low rainfall areas



Other area of vetiver application

- In the hand dug well considerable water yield improvement and quality improvement observed when the up stream are treated with vetiver.
- Vetiver was also used as an ornamental plant around institutional and private compounds.
- private investor informed us that he started to produce cosmetics from vetiver grass roots.

Vetiver adaptability

- Vetivers in Ethiopia performed very well In altitude ranges of 1200- 3200masl,
 - Rainfall ranges of 500- 2200mmper annum,
 - And wide ranges of soil type.
 - Nevertheless there are differences in tillering capacity, growth height, and leaf colour
 - Growth and tillering rates are lower at high altitude ranges
 - Its performance threatened inn termite and mole-infested areas

Propagation techniques

- The most efficient and cost effective methods depends up on the agro climatic condition
 - In the high rainfall areas bare rooted propagation supported with furrow irrigation in the dry season are found to be effective.

Propagation techniques

- In low rainfall areas the most efficient and cost effective proved the two-stage production process
 - multiplication within nurseries in black big polytheen tube,
 - and multiplication for final planting out in the field using white smaller polytheen tube.



Cost of the Propagation Techniques

- The cost of production following the recommendation of low rain fall area per seedling is seventeen Ethiopian cents.
- The cost of production according to recommendation for high rainfall and mid and low altitude areas is ten Ethiopian cents.

Vetiver Effect on Community Development

- Farmers pleased with the performance of the vetiver,
 - Reasoning that it conserves soil and water
 - Provides practically immediate benefit by way of forage, thatching and mattress-stuffing material, green leaves for use in traditional coffee ceremonies, etc.
 - Farmers also appreciate the low labour requirements for hedge establishment, as well as the minimal maintenance



Vetiver Effect on Community Development

- Farmers remove physical structures on their land after the vetiver hedges are sufficiently established,
- vetiver has a dramatic effect in reducing rodent numbers.
- Vetiver is used as bio insecticide
- Generated income by selling the grass and the clump
- Used it for rope making

Vetiver Dissemination Strategy

At farmers level

- The farming communities were introduced about vetiver grass effect demonstration
- Innovative farmers were assisted in planting material provision and technical backstopping.
- Farmers to farmers experience exchange visit organised by different organization
- Further more the traditional information exchange methods explored and used
- These systems in most of the cases were supported with vetiver training program



Vetiver Dissemination Strategy

At national level

- A number of workshops and training conducted.
- Demonstration at bazaars and events made at national and regional level
- Pamphlets about it distributed to organizations and individuals.
- Organised field visiting for a number of international and local NGO's, and bilateral and multilateral organizations
- Organizations supplied with planting material and appropriate information,
- Participate in policy formulation so as to incorporate in the extension packages

Vetiver Dissemination Strategy

At Decision makers level

- Facilitated the visit of the Deputy Prime Minister, the Information Minister, and the President and Vice President to the watershed treated with Vetiver
- In April 2003, the Ethiopian Prime Minister also paid a visit to a vetiver grass treated watersheds to see its effect in relation to water harvesting.
- Facilitated the visit of delegation of ministers from Ethiopia, Sudan and Egypt the visit of watersheds which are in Nile basin and treated with vetiver



Challenges

- FFW or CFW activities which are common in food insecure areas were the major factors contributing much in hindering the scaling up effect of vetiver hedge for soil and water conservation activities.
- Free grazing at early stage of vetiver growth effectively threaten the survival and hedge formation rate of the vetiver grass.
- Lack of proper know how in vetiver technology promotion lead to undesirable effects
- Lack of proper networking hindered the proper flow of information among the users of the technologies.
- The participation of researchers and policy makers in the promotion of the technologies were minimal.