

Ethiopian Farmers Show the way on using the Vetiver System for Sustainable Land Use Practices and a hedge against climate change.

In March 2009, a workshop was organized by Ethiopia's Land Use Forum (SLUF) and the International Vetiver Network (TVNI) to review the Ethiopian experience with the Vetiver System (VS) and in particular the use of vetiver grass hedgerows for on farm soil and water conservation, and the future introduction of other VS applications that would combat climate change and improve incomes. The conclusion of the 165 participants drawn from government, NGOs, bilateral and multilateral development agencies, and the private sector was that VS should be both up-scaled for farm purposes to the country as a whole, and that other VS applications should be introduced for non farm purposes. Additionally it was generally agreed that engineered structures were 5 times more costly than vetiver hedgerows, were less effective, harbored pests, and were disliked and often dismantled by farmers; and that government should desist from promoting such technology. The workshop proceedings and excellent power point presentations can be found at: http://www.vetiver.org/ETH_WORKSHOP_09/ETH-OO%20Proceedings.htm

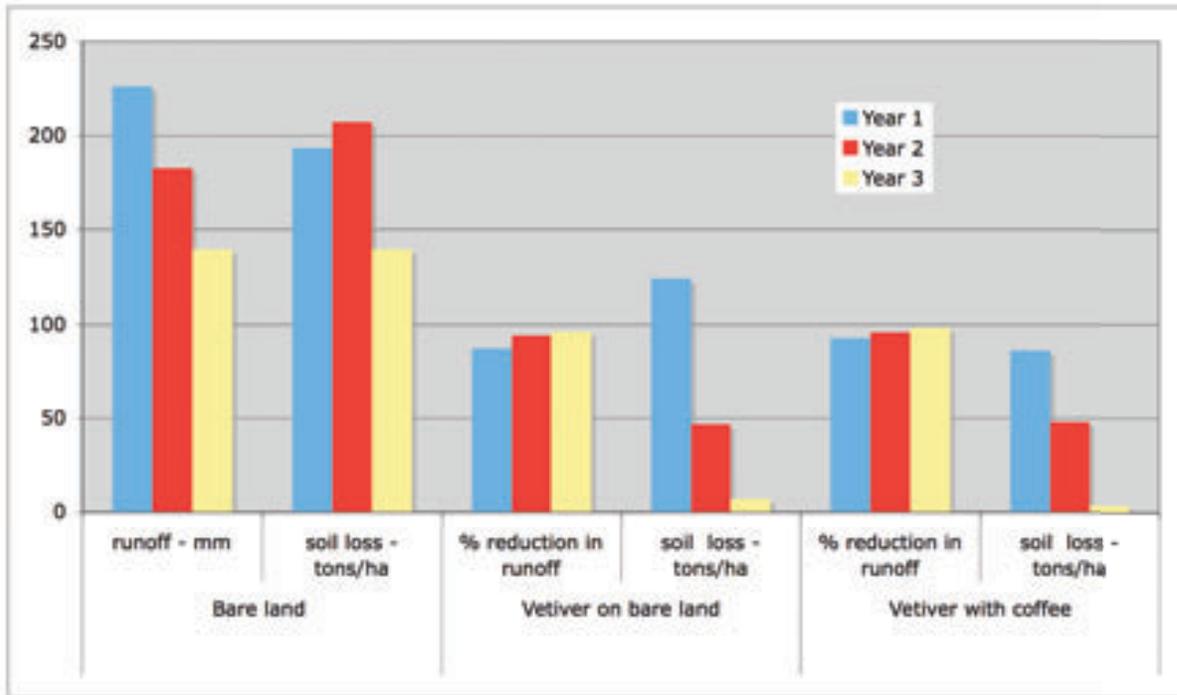
Vetiver grass, *Chrysopogon zizanioides*, was introduced to Ethiopia's Jimma Agricultural Research Center (JARC) in 1971 from Tanzania. In 1990 Menschen fur Menschen (MfM), an Austrian NGO, initiated a vetiver grass program for soil and water conservation in the Metu area of Illubabor Province (south west Ethiopia). Since that time some 17,000 Illubabor farmers are estimated to be using vetiver, with the technology spreading from farmer to farmer, using farmer supplied planting material. In the mid 1990s Alemu Mekkonen (ex MfM) introduced VS to GTZ funded integrated food development projects in northern Ethiopia. By 1999 there were 830 vetiver nurseries supplying plant material to protect some 150,000 ha. of farm land. Today GTZ and SIDA and some 100 NGOs are promoting the technology in Ethiopia.



Left: 1 year old vetiver plant. Right: Some of 250km of hedgerows (11 year old) at Ano Farm.

JARC trials (table 1) show near 100% soil loss and rainfall runoff reductions by the third year – and reflects actual Ethiopian farmer field experience.

Table1: Soil loss and rainfall runoff reductions due to Vetiver hedgerows



These results confirm research carried out in other parts of the world and show how as a vetiver hedgerow ages its efficiency increases. In Ethiopia significant crop yield increases can be attributed to vetiver hedgerows ranging between 30-50%. This is due to improved soil moisture profiles and soil fertility maintenance that allows other practices such as minimum tillage to function effectively. Additionally research by Johnnie van den Burg (South Africa) has shown that Vetiver can reduce the impact of pests on adjacent crops. This is particularly so for *Chilo partellus* – maize stem borer – where vetiver will reduce damage by nearly 100 % (push pull principle). Vetiver significantly deters nematodes resulting in increased yields in bananas and some vegetable crops. A workshop presentation from Madagascar demonstrated the effectiveness of VS as a substitute for “slash and burn” practices.



Metu area: Left: vetiver hedgerows planted on an old manually constructed terrace riser (Food For Work program). Right: Hedgerows planted direct create their own risers in this case 1 meter high.

Ethiopian farmers benefit from vetiver’s use as mulch (improved soil organic matter and nutrient recycling), thatch (long lasting over - 10 years), mattress stuffing (lice repellent),

forage (when cut or grazed regularly), and for religious and ceremonial purposes.



Hassan Ali's farm produces up to 80 ton/ha equivalent of dry biomass used for mulch thatch, mattresses and in the future handicrafts.

At this time of increasing population pressures and climate change vetiver has special relevance for disaster mitigation. Rainfall events are predicted to be more intense and unless controlled, runoff and erosion will increase. Vetiver hedgerows will help prevent these problems. Already in Ethiopia experience shows that vetiver hedgerows are directly responsible for improved ground water recharge, spring flow renewal (Ano Farm), wetland restoration (Wichi wetland), and better stream flow (Shewa). The Ethiopian Wetland Society is one of the strongest promoters of vetiver hedgerows.



Vetiver hedgerows when established at community/watershed scale can result in restored wetlands – Wichi (left), and new and improved all year spring flows – Ano Farm (right).

Ethiopia, like other Great Rift Valley countries, is facing serious problems from drying up of lakes, reduced river flows, and increasing sediment loads, and waste water pollution due to intensive commercial farm operations and urban waste. VS can be used effectively for upstream watershed catchment conservation including wasteland rehabilitation and gully control, wastewater treatment (reduction of nitrates, phosphates and BODs by more than 90%), and sediment and flood control measures on flat flood plains surrounding these lakes.

In Ethiopia, highways and mining operations are significant point source pollutants that impact on downstream water supplies. VS has been used widely in countries like Vietnam to stabilize highway cut and fill slopes and prevent land slides at significantly lower costs

(90% reduction) than traditional engineering methods. Ethiopia should do the same. Likewise because Vetiver can tolerate high levels of toxic heavy metals and hold them in its massive root system it is an ideal tool for mine tailing stabilization and clean up, and for the prevention of excess agricultural chemicals from entering the water supply. These environmental uses impact on agriculture and farmers because the latter can produce the required plant material (vetiver can only be multiplied vegetatively). Ethiopian farmers sell Vetiver at 10 US cents a clump. In Madagascar recently, 30 farm families supplied more than 3 million plant slips (both bare rooted and in tubes) for a mining related operation, and earned over \$200,000. If governments were to establish policies that mandated the use of vetiver for highway and road slope stabilization, apart from construction and maintenance cost reduction, the impact on farm incomes could be substantial.



This Madagascan farmer and his family produced bare rooted and containerized Vetiver plant material (left) for the stabilization of the mining road cut and fill slope – 7 ha. (right). These practices should be extended to most highways and roads in Africa and other tropical countries.

In summary Ethiopian farmers have showed the way for the future. VS works for Ethiopia and will work for most other countries in the tropics if the authorities and funding sources are prepared to promote it vigorously.

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