THE NEED FOR VETIVER IN SOUTH AFRICA ENGAGING THE MAIN PLAYERS

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Introduction

In South Africa, we have two main problems which are related: land degradation and rural poverty. There is a need to look at mechanisms that can assist with land restoration and rehabilitation while contributing to reducing rural poverty.

Over the past decades of droughts, overgrazing and sheet erosion, vast areas have become useless to man and beast. The vetiver system can play a major role in this regard. This will require a change in thinking on the part of the main players. In turn, this demands partnership between the rural poor's commercial operations and the government.

As the Republic of South Africa is a huge country, let the focus be on one area – the Northern Province, adjacent to the Kruger National Park. The people now see the park as an alternative for their herds, crops and fuel as their lands are devastated by degradation and poverty is the norm.

The Problem

The change in thinking among governmental and parastatal bodies can be illustrated through the present situation. Currently the large suppliers of vetiver are DOA, the Railways, Umgeni Water and commercial contractors.

The involvement of the first three effectively destroys the market. What needs to happen is that, instead of being suppliers, they be customers – purchasing stock and services from entrepreneurs. They need to facilitate interaction between large customers (e.g. the mines), large commercial operations and small-scale operators, and large commercial operators need to train and empower small operators within the context of a sound business relationship, thus putting a commercial value to the grass.

Solving the Problem

Government Involvement

In the past, the government supplied funds for mechanically engineered systems. These systems have failed due to the lack of maintenance and for being forced onto the rural people, who did not understand them and were not prepared to do the maintenance. The government must now commit funds from the agriculture budgets and together with commercial firms start awareness training programs and set up nurseries throughout the area of concern. Suitable donors can also be used.

Through the awareness programs, local farmers would be involved in the establishment of nurseries and vetiver hedges would be planted in the badly eroded areas as examples for the people to see the benefits of the vetiver system. It is important that the people be taught the economic and beneficial sides of vetiver.

The People

In the past, no one has really taken the trouble to get to the basic problem of the rural people; hence they have adopted the attitude that everything must be done for them and their demands met. It is a

fact that nobody works for nothing. They must become full partners in the scheme and be paid for their efforts.

Project strategy: A one-hectare nursery site would be selected by all concerned. A commercial firm would then supply the grass for the nursery – 50 m^3. It would be committed to the establishment and running of the nursery while teaching the locals about what was required. The cost of this would be borne by the commercial firm and the government or a donor.

The government would at the same time start training programs in the area. There would be sites planted for the people to see how vetiver works. Once a nursery was available, group and individual extension methods would be used to plant out the vetiver. In year two, as the planting increased, more nurseries would be established.

A vetiver planting subsidy would be introduced to encourage the people to participate. The level of the subsidy would have to be adjusted to suit the local conditions, but the rate set to ensure a good return to the local people and their efforts. In Africa, the main workers will be the womenfolk.

Once a vetiver biomass became available, the locals would be taught the benefits of the plant and how mini cash flows could be generated.

At this stage, the Kruger National Park, which would have been involved only on the financial side, would coordinate the selling of the products through its various outlets. This would create mini cash flows within the communities for all to see.

The people would then be on their own and eager to participate once the project had proved successful.

Benefits

Hedges and Erosion Control

The annual rainfall in the area is 400-500 mm, falling mostly during November to March. The effective rainfall at present is about 100 mm; the rest is runoff causing sheet erosion. Once hedges are established and the runoff controlled, the rainfall will probably become 90-% effective. This has two benefits:

- a rise in the water table causing the streams to flow for a longer time, giving more water to use during the year, and
- by holding the water on the land longer, the natural grass will establish and crop yields will increase. This is of direct benefit to the communities.

Briquettes for Fuel

The greatest single use of wood is for cooking. Its use in the area of concern has by far exceeded the regeneration capacity of trees, thus adding to the problem. The quest for fuel has a negative impact on the people as most of their time is spent searching for something to burn. They have very little time for other duties.

In a paper by Dr. York pertaining to Zimbabwe, it is stated that if the biomass is harvested and pressed into briquettes the pressure to find fuel will diminish.

Biomass for Feed

Harvesting the biomass, pushing it through a hammer mill to break it up and soften the material, and spraying it with molasses will provide feed for the animals. This in turn will relieve some of the pressure on the land.

Handicraft

It is well established that biomass is suited for handicrafts. The Kruger National Park is a well-known tourist destination and has the infrastructure to sell articles of vetiver produced by the communities, such as baskets, mats, etc. A mini cash flow would ensure benefits to the communities.

There are many more effective features of vetiver that could be applied to make a better life for all.

Vetiver and Energy Production

The paper on energy production from vetiver grass by the Vetiver Corp. gave the energy value of dried biomass as 6 000 Z$/lb. Taking that and other figures quoted in the paper along with broad energy levels of fuels and requirements for curing quoted by Mike Bernard, I would estimate the value of vetiver to tobacco farmers in Zimbabwe as follows:

Fuel energy levels: coal – 30 000 joules/kg
wood – 18 000 joules/kg
grass – 10 000 joules/kg

Table 1. Kg of fuel required per kg of tobacco cured

System	Coal	Wood	Grass
Barn	2.0 - 2.5	3.3 - 4.3	4.0 - 5.0
Bulk carrier	1.5 - 2.0	2.5 - 3.3	3.0 - 4.0
Continuous feed	1.0	1.7	2.0

A yield of 16 t/acre/year of 100 dried biomass fuel was claimed for vetiver. This translates into 100 t/ha/yr. (Presumably the Vetiver Corp. has used air-dried grass as fuel: I would have anticipated a rather lower dry matter yield, although this was an irrigated crop.) If the energy value quoted related directly to the matter and mass produced, then 1 ton of cured tobacco would require 4 to 5 t of fuel, or just 0.04 to 0.06 of vetiver grass.

An average farm of 40 ha producing 2 500 kg/ha of tobacco would need 5 to 6 ha of vetiver grass for curing fuel. Translating the quoted US$ cost of grass production into Zimbabwe value, the cost would be Z$1 200/ha/yr. This average tobacco crop would need grass input costs of Z$6 000 to Z$7 000 per year. Put another way, one kg of fuel would cost 1.5 cents and the curing of one kg of tobacco 6 to 7 cents. This is based on the yield values given and on the assumption that the energy level reported relates directly to that. Furthermore, the costs are a direct translation, which may be biased one way or the other depending on relative motive fuel costs and fertilizer prices and labour costs.

Coal may cost between Z$200 to Z$250/t in Zimbabwe, depending on the distance transported (and allowing for a 20-percent price hike this season). At 20-25 cents/kg the cost of coal-fired curing based on the tabulated figures above would be: for barn curing 40-60 cents/kg of tobacco, for bulk curing 30-50 cents/kg of tobacco and for continuous feed curing 20-25 cents/kg of tobacco. Even at twice the input costs or at half the quoted yield, grass would compare favourably with the cheapest, coal-fired method of curing. At both half yield and double production costs, the cost of grass fuel would still equate to the cheapest level of coal-fired curing. Vetiver fuel for curing should then prove competitive with coal-fired curing. The area of grass required for this is not prohibitive.

The grass would be harvested rotationally to meet needs. To allow for the limited growing season, it would be prudent to double the area established. This would allow a season's rest between cropping. Provided land is available at no cost, doubling the area grown would not directly affect the figures given above. To compare favourably with the yields given in the Vetiver Corp. paper, the grass would need adequate water and fertility levels. However, the grass is very robust and will grow in almost any situation in Zimbabwe without irrigation and with minimal fertilizer input. Producing an energy crop from vetiver on a low-input basis would just demand a larger area of crop. Large tracts of land and

highly erodible land in the drier areas of Zimbabwe could be made profitable for energy production in situ or for transportation, while protecting the land.

The use of vetiver for fuel would be of immediate interest to the small-scale grower. Table 2 gives an impression of the area of grass and mass of vetiver fuel needed for crops of different sizes, assuming half the level of grass yield (40 t/ha) given in the Vetiver Corp. paper.

Table 2. Area of tobacco

Tobacco yield t/ha	0.5 t/grass/ha	1.0 t/grass/ha	2.0 t/grass/ha	3.0 t/grass/ha
1.50	3.75 0.09	7.50 0.19	1.50 0.38	2.25 0.56
2.00	5.00 0.13	10.00 0.25	20.00 0.50	30.00 0.75
2.50	6.25 0.16	12.50 0.31	25.00 0.63	37.50 0.94
3.00	7.50 0.19	15.00 0.38	30.00 0.75	45.00 1.13

To have a double or treble block of these, just adjust the values accordingly. It would be more economical, where small-scale tobacco growers are close neighbours, to produce the fuel cooperatively.

It is worth repeating that vetiver would grow almost anywhere in Zimbabwe with minimal inputs, although the area required then would be greater. The potential usefulness of this grass in the communal sector for fuel generation cannot be overstated.

I feel that it would be very informative to assess the role of vetiver in small-scale tobacco curing. If successful, a snowballing process could extend its use beyond tobacco curing, stimulating interest and generating planting material.