OUTSTANDING DISSEMINATION AND APPLICATION OF THE VETIVER SYSTEM IN PERU FROM 2007 TO 2015

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Abstract

Alois Kennerknecht work with vetiver started in 2007 trying to spread the use of vetiver system (VS) as a way to control the soil erosion.

Publications gave him information about the plant that he had doubt at first, but practice made him realize that everything was accurate, and found that vetiver had a lot of characteristics as a way to purify water and as an economic landscape resource for any population.

He started to cultivate the plant to give away to friends and acquaintances all over Peru to share the practical experience. The main feature of vetiver is its versatility, having in mind the diverse climatological and geographical areas that exist in Peru, making it a strong, resistant specimen that needs much less water than other plants, and easily adapted to the different locations where it is cultivated.

The applications of VS were made on the villagers' properties, providing him an opportunity to create awareness of the plant. These experiences allowed him to strengthen my knowledge of VS applications in different ways and designs.

The development of VS has achieved an impact not only in creating a better landscape, but getting a social impact. VS provides means to improve: 1) health aspects, by purifying the local environment; 2) economic aspects, by making possible the reutilization of water, and 3) improving community aspects, by gathering people to create a social space and activating their interaction. This was the main purpose of creating the City maker.

At a slow and continuous rate VS applications started in a small scale, with minimal economical resources and techniques very appropriated to the local settings, and it is growing to bigger scales, continuously improving specific situations to attend further requirements, aiming to convince support from authorities.

Through the years I have recognized the plant as an ecological and economic solution to improve quality of life by wastewater treatment and soil erosion control. Frequently, students of different universities and companies as well, contact me in order to get information and the plant itself for their own research.

Professionally, his only regret is not knowing about the vetiver and its properties much earlier, which is one of the reason I work intensively in promoting its importance in Peru and the world. Then, I am sure that vetiver will be one day recognized as the solution for water and soil erosion problems as had been the potato for hunger starving in Europe a long time ago.

INTRODUCTION

Vetiver grass came over from Asia first to the Caribbean and later to countries in South America like Venezuela for the use of its roots for perfume production about approximately 100 years ago. From there the spread of vetiver grass to other Latin American countries, like Brazil, Bolivia, Chile, Peru, etc was very slow. Knowledge of Vetiver grass and applications of the Vetiver System (VS) in this part of the world was not known until 7 to 10 years ago, therefore VS is still a very new technology in these countries!

The author, **Alois Kennerknecht,** a German agriculturist, after working in Madagascar, Ethiopia, Haiti, Niger and Togo, came to Peru 25 years ago with the German International Cooperation. At the age of 70 years, he is now retired and lives in Peru together with his Peruvian family. Having worked in Peru in community development and alternative gardening/composting, he was searching for a practical and low cost technology in soil and water conservation for the very different natural conditions of Peru.

MANIFESTING THE EFFECTIVE PROMOTION ON THE USE ANDTHE REAL APPLICATION OF VETIVER GRASS

Peru has over 8 million hectares of land affected by severe soil erosion. 35 million hectares of land affected by desertification and on the coast to a great extent by salinization. In 2007 he received the first information about the VS and the first vetiver plants in a very small quantity from colleagues and friends. From here, he started an extension program of the VS in Peru based on hard work and outstanding achievements in Lima and also in different climatic regions of Peru.

- **Following the principle of sustainable development:**

The base of his work has been to find and extend sustainable ways to conserve the natural resources soil and water in Peru. Living and working mainly in Lima, a city with nearly 10 million inhabitants, he works mainly with the poorest components of the society such as the shanty towns of this fast growing city. His main aim now is to support local communities with the VS as an ecological and sustainable solution with a number of uses.

- **VS can be widely applied with no restriction to any particular group**

Through the work of Alois Kennerknecht the VS is known in very different social groups in the mega- city Lima, the capital of Peru, and with agricultural, mining, road construction companies in Peru and Bolivia. Furthermore he applied the VS in cooperation with various institutions, such as military camps, universities, church, drug rehabilitation centers and schools, as well from high-society neighborhoods to shanty towns of Lima.

- **Using appropriate technology that is environmental friendly:**

The VS is a particularly interesting, environmentally friendly and low-cost technology for the extremely dry environment of Lima. Lima is the second mega-city located in desert conditions with a rainfall of 0.9 mm per year. Therefore the VS is of particular useful for water conservation and recycling of wastewater treatment. Despite these conditions, there is still a high rate of water-uses and misuses in Lima, such as irrigation of gardens and parks with clean drinking water. Therefore there is a very urgent need and great potential for the use of VS in wastewater treatment and recycling.

- **Supported by scientific reasons and is widely accepted**

Mr. Alois Kennerknecht is an active member of the still small Peruvian Vetiver group – www.vetiveperu.org and he participated in the First and Second Latin Vetiver Conference in Santiago in Chile in 2010 and Medellin in Colombia in 2013 at he own expenses. Through his contacts and practical works he has accessed to the extensive scientific works of The International Vetiver Network – www.vetiver.org which were conducted in Asian countries over many years. Despite his advanced age of 70 years, Mr. Alois Kennerknecht is a highly motivated and hardworking pioneer; putting scientific information's and reasons into practice under difficult environmental and social conditions.

- **Having appropriate quantity of work done:**

During 2009 up to 2015 he has installed 12 wetlands with Vetiver for wastewater treatment in schools in Lima, as well as hotels in the countryside and private homes. This treated and clean water is used for the irrigation of green areas. On the base of these first positive experiences, further 80 wetlands are planned in the shanty–town areas of Lima in 2015.

In the urban area of Lima in cooperation with the above mentioned institutions, Mr. Alois Kennerkencht installed 8 vetiver nurseries, each with areas from 0.3 – 1 hectare of land. On the base of this vetiver production, excellent vetiver materials are available, there has never been a shortage of vetiver plants, at least in Lima. One of the bigger demands came from the tropical region of Puerto Maldonado with 64,000 vetiver plants for erosion control on the new road construction project of the "Transoceanico Brasil – Peru". This new important

road connects Brazil to the Pacific coast of Peru. This project included the installation and maintenance of this work of a team of workers under the guidance of Mr. Alois Kennerkencht. Other supplies of vetiver plants went to the North of Peru to mining companies and to the center of Peru to agricultural enterprises to control soil erosion in pineapple production, etc... At present the nurseries of Mr. Alois Kennerknecht in Lima are the biggest vetiver plant supplier of excellent vetiver planting material in Peru and neighbor countries like Bolivia, etc.. A very interesting point is that he doesn't own the land of these vetiver nurseries, he produces this supply in cooperation with the above mentioned institutions. In general he can use their land on a 3 year contracts, which include the demonstration of each application so he can use their lands for the vetiver multiplication. In this way a demonstration and extension work to the public, religious and private institutions and their environments are well protected.

This practical work is supported by the participation of Mr. Alois Kennerknecht in conferences, press and television interviews and exhibitions, such as the North American Conference - COP-20 in December 2014 in Lima. More information about the work of Mr. Alois Kennerkecht you can find in Google under the name -- ***Vetiver Alois Kennerknecht*** - and the web-site of www.vetiverperu.org which is part of the Latin American Vetiver network.

Currently Alois Kennerknecht is working with a young and dynamic architectural firm called "Citymakers" in Lima searching for solutions to green up the City with Vetiver grass. The last pictures in this paper show the conceptual design/plan developed by him and "Citymaker" At present they are still searching for financial support.

SUPPORTING PHOTOS

A newly planted vetiver nursery in the desert environment of Pachacamac – Lima under drip-irrigation in 2014.

Reclamation of desert lands for gardening in the rehabilitation center "Escuela de Vida" in Lima for young alcoholics and drug addicts.

Newly planted vetiver on a former garbage collection site, now used as a living place of poor people in the community of "Canta Gallo".

The same planting after 4 months in the dry conditions of Lima, irrigated by the waste water of the community.

Urban gardening in the higher middle class neighborhood Miraflores, with vetiver. Public relation work of Mr. Alois Kennerknecht with the local press in Lima.

As result of this first impact, numerous vetiver plantings in public urban gardening in other areas of the city. This is in the lower-middle class district of "San Juan de Miraflores" in Lima.

Green landcaping in the desert conditions of the outskirts of Lima.

Greening of urban areas on the border of the main road in the district of Villa El Salvador in Lima.

Demonstration plot of vetiver, along the so-called "Costa Verde" (green coast) on the sea-side in Miraflores – Lima in cooperation with the municipality of Miraflores.

A group of young vetiver enthusiast in the districts of Comas in Lima

Participating in the cultural event "Plantón Mobil" in Lima, December 2014 – https://vimeo.com/116386010

In December 2014 the international conference on Climate Change - COP 20 - was held in Lima, Mr. Alois Kennerknecht was invited by the US Embassy in Peru to participate using vetiver plants in an art exhibition in the compound of the embassy.

Treatment plant of domestic waste water with vetiver plants in a private home in Lima (20m^2),.

The poorest of the society and most of the poor new-comers to Lima from the country side live on the dry and barren sandy hills in the backyards of Lima. The gravity-fed flow of wastewater from these hills ended up in a mostly rotten pipe system in the Pacific Ocean.

CONCLUSION

One of the biggest challenges for Lima as the second largest city in the world built in the desert, after Cairo, is the use of wastewater to irrigate urban gardens and parks. At present more than 90% of the used water by more than 9 million people for carwash, factories, etc. ended up in the Pacify Ocean. Although a number of big-scale waste-water treatments plants using expensive technical methods and financed by the international cooperations have been set up but all have failed.

This situation motivated Mr. Alois Kennerknecht to search for alternatives on a small scale and in cooperation with local communities. His first experience was a wetland of **20m^2**, as shown in the photo above. At present he has installed 12 wetlands of this type in different districts of Lima and in the countryside. More are planned in 2015. On the base of this first experiences he installed wastewater treatment plants with vetiver in pipes on roofs, as shown with him in the picture below:

References:

- Presentation in the Second Conference of the Latin American Vetiver Network in Medellin - Colombia in 2013.
- See en Google: Vetiver-Alois Kennerknecht

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CITYMAKER.

Activating **community** for space management.

We efficiently **treat** the **wastewater** from each house, using a technology that takes advantage of the **terrain's slope** and locally the wastewater creates **landscape.**

1. Wastewater enters the tank through the pipe1.
2. It gets filtered by vetiver roots, which take 100% of the toxins.
3. It then passes through fine and coarse gravel as second and third filter.
4. Finally, it exits through the bottom pipe holes for gardening purposes.

EXISTING PUBLIC STAIRS