

Outputs and Outcomes of the Utilization of Vetiver Grass at the Department of Land Development Village

**Piratcha Wassananukul¹ Mena Narkvilai²
Darm Tainsun, Thera Bunsiri² and Ard Somrang³**

¹ *Head of Surat Thani Station sub regional of DLD*

² *Head and Agronomist of Ranong sub regional of DLD Station*

³ *Director General of DLD*

Abstract

The Department of Land Development (DLD) has carried out more researches and a lot of demonstration plots in farmers' fields since 1991. This is DLD's discipline and mandate to convince Thai farmers who live in the steep slope areas and eroded areas to grow vetiver grass. In Thailand, vetiver grass can be found growing in a wide range of areas from highlands to lowlands in various soil conditions. The species which is most common in Thailand is referred to in scientific terms as *Vetiveria zizanioides*. Vetiver grass is a special plant which benefits soil and water conservation in many ways; for instance, preventing soil erosion, absorbing soil moisture and resisting flood for a long period of time. The problem concerning vetiver technology transfer is that Thai farmers cannot understand its direct benefits to the community. Consequently, the Ranong Sub-regional DLD station participated with Tambon Administration Organization (TAO) and their communities to identify the erosion problem in the DLD village in Ranong.

Vetiver grass can be used in various ways; for example, growing around reservoirs, irrigation ponds and drainage canals; growing along the contour lines across the slope; as well as using the leaves for weaving handicraft products, and using the culms and the leaves for mushroom culture. The Ranong Sub-regional DLD Station concentrates on two activities: preparing vetiver seedlings and executing extension work to grow vetiver along the contours of steep slope in orchards and para rubber plantations. This project shows significant difference to improve soil moisture content in orchards and the economic return of fifteen farmers who join the project has increased up to one million Baht in three years from 2000 to 2002.

Introduction



The Land Development Department has been assigned the task of implementing DLD villages in Thailand. Hence, the DLD village under the responsibility of the Ranong Sub-regional DLD Station is considered a representative of such villages in the southern part of the country which implements the cultivation of vetiver grass in the farmers' fields. This is the way to conserve soil and water in steep sloping lands. Contour planting of vetiver across the slopes helps trap soil and water. This effectively reduces not only soil and water

accumulation but also soil erosion, and prevents surface soil from being washed away. Vetiver is also planted around the base of fruit and para rubber trees in order to preserve rainwater, moisture content and plant nutrients in the soil. Vetiver leaves are also used for mulching to maintain soil moisture. On the other hand, vetiver is planted around the reservoirs and ponds, and along the irrigation canals, ditches, and road sides in order to prevent siltation of these water sources and equally important, to impede toxic chemicals present in catchment areas from contaminating the water sources. Surat Thani genotype is a suitable variety in the southern part especially for Ranong province because it is fast growing and tolerant under various soil conditions (DLD, 1998).



Objectives

1. To demonstrate the integrated measures of soil and water conservation practices in the farmers' fields
2. Using vetiver grass for the DLD village versus rapid rural appraisal and management

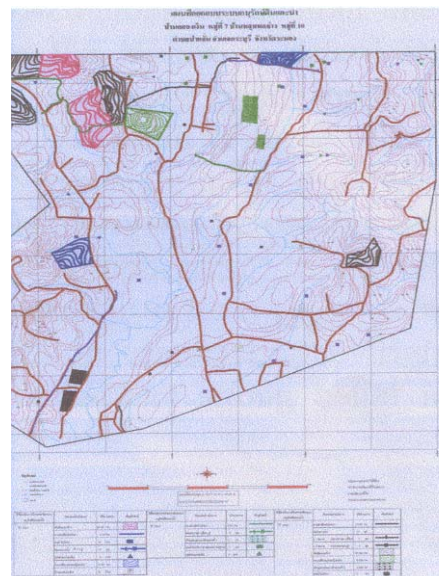
Organizations

The Department of Land Development, the Tambon Administration Organization and their soil doctor volunteers in the communities

Methodology



1. Preliminary study of the community's physical base properties and site selection
2. Strategic and operational planning for the communities including Baan Klong-ane (Moo 7) and Baan Lumepo-long (Moo 10) in Pakechan sub-district, Kraburi district, Ranong province
3. Soil survey and data collecting from the farmers
4. Physical and socio-economic analysis
5. Planning report and specification
6. Coordination among the agencies concerned
7. Seminars and workshops participated by government officers and farmers
8. Project execution
9. Monitoring and evaluation



Topographical Background



Southern or Peninsular Thailand lies between latitudes 5° 37' and 11° N., and longitudes 98° and 102° E. It covers an area of 44,196,992 *rai* and consists of fourteen provinces. The staple crop is para rubber, oil palm, coffee, cashew nuts and fruits. The cultivation of upland crops such as maize, bean and pineapple is mainly restricted to the deep and well drained soils found in erosion surfaces and terraces on the east coast of the Peninsula. In the east coast of the Peninsula found the recent marine brackish water and alluvial

deposits that are subject to flooding during October and December. The tidal flat land is mainly used for mangrove charcoal production. The majority of the soils in this region are Entisols, Inceptisols and Ultisols. Baan Klong-ane (Moo 7) and Baan Lumepo-long (Moo 10) in Pakechan sub-district, Kraburi district, Ranong province, are located about 20 kilometers north of Kraburi district, and lie between latitudes 10° 32' 56" and 10° 34' 42" N., and longitudes 98° 51' 12" E. and L7017, 4730 map sheet. The elevation of this site is 5-120 amsl and covers 5,620 *rai*.

Outputs and Outcomes of the Implementation of the DLD Village in Ranong Province



Vetiver grass was cultivated along the contour lines across the slopes to retard the water flow from up to down the slope. The result of these vetiver hedgerows shows a big significant difference between survival percentage and higher growth rate. In the left corner the fruit trees show water deficit. In contrast, the right corner shows healthy and green because the farmers have a strong belief in vetiver for soil moisture preservation.



In a semi-circle planted around each tree facing uphill in order to reduce soil erosion, vetiver performs effectively and is more powerful. It is grown following a well-designed cultivation pattern. Moreover, single rows of vetiver were planted closely together so that the leaves can be used for mulching to conserve soil moisture content and rainwater in the soil. Moreover, vetiver leaves used as mulching helps to restore

the deteriorated land by enriching the organic matters and plenty of soil micro organisms around the root zone, trapping chemical fertilizers, and allowing slow release of plant nutrients into the soil. For this topographical condition, vetiver grass can be cultivated in any single or integrated patterns such as in rows, semi-circle, circle etc. Vetiver is planted across the slope in para rubber plantations as barrier for soil and water conservation. This is the way vetiver is planted with intercropping in the Southern Region. Vetiver ecotypes are not propagated by seeds. Consequently, vetiver grass is not a weed that is easily germinated in arable lands, such as the ecotypes from India



Therefore, it is safe to grow vetiver grass in orchards, plantations and other agricultural lands. In Ranong province where *Vetiveria zizanioides* is grown for multi-purpose uses; for instance, as embankment for soil and moisture conservation, for controlling gully erosion and water dispersion, for preserving moisture in orchards, and for filtering silts around the pond edges etc. The most suitable seasonal effect for vetiver cultivation is the beginning of the rainy season in which the soil contains enough moisture. If cultivation is carried out in an irrigated area, then vetiver should be planted before the rainy season arrives to enable proper growth performance and ensure effective functioning. In general, it takes at least three months for establishing and regenerating new clumps, depending on the level of soil fertility. Those who work with DLD officers and soil doctor volunteers need to understand the necessity of participation, contribution and administration for their communities. However, for the farmers who grow rice, field crops or cash crops, and are not familiar with vetiver grass in their first contacts with DLD officers, it is therefore critical to identify the goals and objectives to the communities. As a result of this, the farmers will turn to accept the benefits of vetiver grass, thus marking a shift to a new paradigm in terms of the village's culture.



Some people may even use vetiver leaves for roof thatching. Therefore, the faster and more smooth contact of government officers, the better the image and the impact to create reliability. Meanwhile, the Director-General of DLD requests every function involved to promote a serious use of vetiver because DLD is a main organization to work with vetiver. The task is not only to monitor the inputs but also to evaluate the outputs and the outcomes of the utilization of vetiver in the DLD villages. Moreover, the soil doctor volunteers are the activators to prompt every activity more successfully. Therefore, the successful index for the DLD villages can be explained in three dimensions: the farmer's adoption, the existence of vetiver in the communities and the economic return. The outcome of this site shows a much more realistic approach. Fifteen farmers have adopted the DLD's know how using vetiver in their fields and subsequently got approximately 1,110,700 Baht in three years as summarized in Table 1.

Accordingly, a considerable amount of basic information is available for soil and water conservation. The demonstration plots are different from most of the previous efforts. Today, all of the applicable conservation practices are combined, integrated and used in accordance with the needs and capabilities of the lands. The communities' adoption will enhance the DLD officers' attention and efforts in promoting the proper methods and techniques for sustainable use of the farmers' lands.

C o n c l u s i o n



First, the implementation of the DLD village in Ranong province proved very successful because the land owners have accepted technology transfer from DLD. Second, the farmers maintain vetiver to protect against erosion and reproduce in a large scale. Lastly, vetiver grass becomes a new raw material and a product of the sub district that can be purchased. The key point of the success is management such as teamwork, pro-active

operation, continuity, monitoring, improvement or strengthening of the weak points and sincerity to the farmers.

Table 1. The economic return at DLD village, Ranong Province

No.	Farmers Name	No. culms / Baht						Total (Baht)
		2000		2001		2002		
		culms	Baht	culms	Baht	culms	Baht	
1	นางวัลลี ไต๊ะขวัญแก้ว	450,000	45,000	500,000	50,000	500,000	50,000	145,000
2	นายสีบ นาคเล็ก	400,000	40,000	500,000	50,000	1,400,000	140,000	230,000
3	นายปลื้ม เฟ็งโอ	250,000	25,000	300,000	30,000	500,000	50,000	105,000
4	นายมงคล ถ้ำแก้ว	230,000	23,000	90,000	9,000	300,000	30,000	62,000
5	นายสมเวียง เผือกผ่อง	200,000	20,000	200,000	20,000	-	-	40,000
6	นางปราณี ใจตรง	190,000	19,000	200,000	20,000	-	-	39,000
7	นายสุชาติ ภาสภาการ	80,000	8,000	500,000	50,000	200,000	20,000	78,000
8	นายวัลลภ เขาวเลิศ	360,000	36,000	90,000	9,000	-	-	45,000
9	นายสงคราม ดวงจิตต์	80,000	8,000	200,000	20,000	-	-	28,000
10	นายณรงค์ หนูเลี่ยม	50,000	5,000	100,000	10,000	150,000	15,000	30,000
11	นายสมชาย สมศรี	50,000	5,000	150,000	15,000	200,000	20,000	40,000
12	นายศุภชัย เฟ็งโอ	-	-	300,000	30,000	400,000	40,000	70,000

No.	Farmers Name	No. culms / Baht						Total (Baht)
		2000		2001		2002		
		culms	Baht	culms	Baht	culms	Baht	
13	นายสมบูรณ์ เฟื่องเพชร	-	-	227,000	22,700	400,000	40,000	62,700
14	นายอดุลย์ ดวงจิต	60,000	6,000	500,000	50,000	400,000	40,000	96,000
15	น.ส.สุชีพร ขำมาก	200,000	20,000	200,000	20,000	-	-	40,000
	Total (Baht)	2,600,000	260,000	4,057,000	405,700	4,450,000	445,000	1,110,700

Bibliography

Board on science and technology for international development. 1993. Vetiver grass: A thin green line against erosion. National academic press Washington D.C. 171 p.

FAO, 1997. Glory to the land-2. Regional office for Asia and the pacific. Bangkok. Thailand. 31 p.

DLD, 1998. The knowledge of Vetitver., Bangkok, MOA

Office of the Royal Development Projects Board, 1998. Manual factual tips about Vetiver Grass. 103 p.

The World Bank, 2000. Vetiver grass: The hedge against erosion. Washington D.C. 78 p.

Truong, P., 1999. Vetiver grass technology for mine rehabilitation. Edited by N. Chomchalow and S. Vessabutr. Office of the Royal Development Projects Board. Thailand. Bangkok.