

THE PROMOTION AND EXPANSION OF VETIVER HANDICRAFT DEVELOPMENT

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Abstract

PTT Public Company Limited (PTT) first introduced vetiver utilization in 1996 along the Thai-Myanmar natural gas pipeline. Discovering its effectiveness in reforestation project, prompted PTT to expand vetiver cultivation in 2003 throughout its nationwide networks and in outside areas. In 2006, PTT jointly organized a cultivation competition with the Chaipattana Foundation, the Office of the Royal Development Projects Board, and the Land Development Department. The project bore outstanding results in vetiver use for soil and water conservation and PTT was awarded the King of Thailand Vetiver Award .

PTT has utilized, promoted and expanded vetiver cultivation as follows:

- 1) Within the PTT Group's area-based and its networks.
- 2) The Development and Promotion of Vetiver Utilization under Royal initiative project.
- 3) Development of Vetiver handicrafts.
- 4) Development of Vetiver Network of Thailand.
- 5) The Application of Vetiver System and Bio-Engineering for Preventing Soil Erosion

In 2008, PTT shifted its vetiver strategy and adopted the “upstream from downstream” approach, prioritizing the promotion of vetiver handicraft creation to provide economic incentives for farmers to cultivate vetiver for conservation and financial gain. PTT has provided vetiver grass training courses to nearly 3,000 villagers from 21 communities. in design and marketing, as well as joining with the PatPat Shops of Chaipattana, selling high quality and empowering sustainable development by using vetiver as "the miracle grass".

Handicraft development has led to an increase in vetiver use in soil and water conservation too, with 2.23 million saplings, covering over 214,000 rai, planted in 2014 and supplementary incomes totaling over THB 4.39 million from handicraft sales in PatPat Shops alone.

Environmentally, vetiver cultivation rehabilitates depleted soil, making land fertile again. Socially, vetiver cultivation and the handicraft network has created unity within communities and brought communities together. Several vetiver nursery centers around Thailand have been established to provide training and spread vetiver cultivation knowledge both domestically and abroad.

PTT and the PatPat Shops of the Chaipattana Foundation have plans to further develop vetiver design as part of student curriculums, in partnership with higher educational institutes. The aim is to attract new ideas from the younger generation, help pass on local handicraft skills, and continue to protect Thai heritage and conserve the country's precious resources in accordance HM the King's Royal Initiatives; helping the roots of vetiver “grow deeper in all Thai hearts.”

Introduction

PTT Public Company Limited (PTT) first started cultivating and utilizing vetiver grass in 1996 along the Thai-Myanmar natural gas pipeline after realizing its ‘*miraculous*’ benefits. Along with engineering applications, vetiver acted as an introductory plant for the forest restoration and steep slope rehabilitation in Thong Phaphumi District in Kanchanaburi Province. During the first two years, PTT monitored how vetiver revived the soil and mitigated erosion along the pipeline route; playing a vital role in preventing permanent rill and gully erosions by adding soil moisture and rejuvenating the ecosystem. Vetiver promoted gradual reforestation and the return of the environment to its natural equilibrium. In 2003, following on from this success, PTT expanded vetiver cultivation to its subsidiaries nationwide to demonstrate the practical benefits of vetiver utilization. From its modest beginnings within the company, vetiver first branched out to the Huay Kayeng community in Thong Phaphumi District. In 2006, PTT extended vetiver utilization nationally by jointly organizing a cultivation competition with the Chaipattana Foundation, the Office of the Royal Development Projects Board, and the Land Development Department. To disseminate knowledge about vetiver and its benefits, individuals, organizations, and communities with outstanding vetiver programs in soil and water conservation were selected in accordance with the Royal Initiatives of HM the King of Thailand.

For its work with vetiver, PTT won the King of Thailand Vetiver Awards in the category of Outstanding Promotion and Development (1998). The King of Thailand’s Certificate of Excellence: The Vetiver Network Certificates of Technical Excellence (Class 2) in Venezuela (2003), as well as the King of Thailand Awards in Dissemination of Vetiver : Non - Government Agency (2006). These accolades inspired PTT to pursue its vetiver program, extending it widely within its organization and externally. In 2011, PTT was awarded the King of Thailand Vetiver Award for Outstanding Dissemination in the Vetiver System at the 5th International Conference on Vetiver, at the Central Institute of Medicinal and Aromatic Plants, in Lucknow, India.

For the past 18 years, PTT has been increasingly promoting vetiver utilization within communities, to encourage greater interest and utilization. Combining its core knowledge and experience in vetiver utilization, alongside the established the Vetiver Network of Thailand, PTT has successfully expanded its vetiver cultivation promotion program in the following areas:

- 1) Within the PTT Group’s area-based and its networks.
- 2) The Development and Promotion of Vetiver Utilization under Royal initiative project.
- 3) Development of Vetiver Handicrafts.
- 4) Development of Vetiver Network of Thailand.
- 5) The Application of Vetiver System and Bio-Engineering for Preventing Soil Erosion

Vetiver's unique characteristics can be utilized effectively in soil and water conservation, in various applications, such as erosion mitigation, soil rehabilitation, to store up ground moisture, and promoting environmental balance. Furthermore, as vetiver leaves need to be cut every three months, the organic fertilizer and compost from vetiver leaves can be used for non-agricultural purposes. Moreover, they offer excellent value-added opportunities as an ideal material for various handicrafts popularly made and sold in community markets.

In 2008, PTT launched a competition themed, *Vetiver: More than Grass*, to reflect the adoption of the *upstream from downstream* approach to promote and motivate vetiver handicraft development; encouraging farmers to realize the full potential of vetiver beyond soil and water conservation. This incentivized vetiver handicraft development helped solidify vetiver networks. Prize-winning vetiver handicrafts became prototypes, inspiring specific groups within the PTT promotion areas, (e.g. Vetiver Network of Thailand, farmers, Cultivation Competition participants and winners, plus communities within the network of PTT CSR programs such as *the 84 Tambons on the Sufficient Path project*, to have greater involvement in vetiver cultivation. The ambition of the vetiver handicraft development program has borne fruit by providing new knowledge sets, derived from projects such as *Thai Ban*, research in developing vetiver leaf handicrafts. Furthermore, these lessons have been incorporated into education curricula in 4 regions in Thailand. With the cooperation of the Chaipattana Foundation PatPat Shops, vetiver handicrafts were marketed in 7 communities in 2009, which has since expanded to 21. In sharing vetiver knowledge through training courses, from beginner level, to basic level and advance level, PTT hopes to continue developing higher quality vetiver handicrafts to the benefit of all.

To promote vetiver, PTT aims to develop mutual dynamics by developing vetiver networks focused on cultivating and utilizing vetiver for soil and water conservation alongside value-added vetiver handicraft development. This is achieved through marketing partnerships with the Office of the Royal Development Projects Board and the Land Development Department, which is a highly experienced organization proficient in promoting and expanding vetiver to communities across the country. The PatPat Shops, a subsidiary of the Chaipattana Foundation's, which promotes, develops, and sells community-produced agro-handicrafts, has joined PTT's program to develop value-added aspects of vetiver and further drive community commitment to continued development of quality vetiver handicrafts that better satisfy market demands. Creating market-ready vetiver handicrafts ultimately empowers and strengthens Thai readiness of vetiver networks to progress towards self-sufficiency. Consequentially, this also multiplies vetiver cultivation for soil and water conservation and confidently establishes vetiver as a truly '*miraculous*' plant.



Figure 1. Economic Value of Vetiver Leaves

Chapter 1

Promotion and Development of Vetiver Handicrafts

In 2007, PTT began promoting and developing vetiver utilization in accordance with the Royal Initiatives of HM the King of Thailand, in tandem with an overarching development plan to promote vetiver utility in applications inspired by HM King Bhumibol Adulyadej of Thailand's Royal Initiatives, as prescribed by the Office of the Royal Development Projects Board. The main project task was to promote and expand vetiver cultivation and utilization, identifying additional characteristics of vetiver other than soil and water conservation. PTT also recognized and began promoting value-added benefits of vetiver leaves to the community, to reflect the company's corporate principles of environmental, community and Social responsibility. Working principles were adhered to that incorporated the 2E1S symbiosis, as demonstrated below:

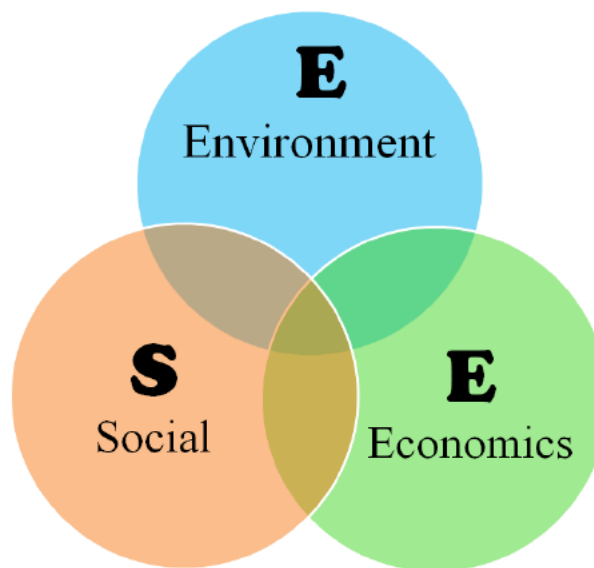


Figure 2. PTT's CSR Strategy

Environment – Motivating communities to get involved with vetiver cultivation and promoting cultivation, including experimentation or where vetiver acts provides a real remedy and tangible benefits. This modifies the rural tradition of monocropping to adapt to multicropping, with the New Theory Agriculture forging a balanced and natural interdependency.

Economic – Increasing the value of over-used vetiver leaf by using this to create handicrafts, and encouraging vetiver cultivators to create vetiver handicrafts to sell at markets to create a supplementary income. This elevates quality of life and enhances community welfare.

Social – Promoting and expanding vetiver cultivation and handicraft development on a wide scale by creating networks to exchange vetiver knowledge and experiences, such as the Vetiver Network of Thailand and Vetiver Handicrafts Community. This helps expand knowledge to individuals and empower nearby communities.

PTT is fully aware that as a business it has a responsibility toward society, communities, and the environment, thus setting its role in vetiver handicraft development in three tiers, as follows:



1. Education, Learning and Creating Networks of Cooperation

In 2009, PTT supported the *Thai Ban Research Project* to study and develop handicrafts made from vetiver leaves. It joined forces with educational institutions to provide design curricula for vetiver cultivating communities with handicraft experience. A new knowledge base sprang from this collaboration, with the creation of prototype designs combining traditional handicrafts with modern art and design. The objective was for the community to learn design basics in order to enhance their vetiver handicraft creations, continue cultivating vetiver, and earn supplementary income. By the time of the project's conclusion, a new knowledge base had been created, to be shared with communities, by PTT, in various ways, as follows:

- 1) The management of fibers in solving problems with the vetiver's vein, which is firm and dry. When it is rolled or folded, the vetiver stem, when dried naturally without undergoing any process, breaks.
- 2) Vetiver coloring techniques to change the natural colors of vetiver, as well as diluting the starch and sugar within the liquid of the fiber vessels to reduce problems with moths and molds. Creating varying colors and shades without dyeing the vetiver.
- 3) Leaf-dyeing techniques in natural tones by using chemical paint. Techniques to produce long-lasting dyed colors.
- 4) Natural color dyeing techniques.
- 5) Adding strength to vetiver leaf fibers and reducing leaf roughness and sharpness.
- 6) Techniques and methods in sealing the exterior of vetiver and finishing furniture by twisting and cutting.
- 7) Techniques to preserve vetiver fibers, soften leaves, and protect against mold. Sundried vetiver leaves can be cured with sulfur in a concealed room or barrel.
- 8) Sewing techniques to solve the problem of vetiver leaves becoming brittle and breaking.
- 9) Techniques to combine vetiver with other materials.

In 2011, PTT conducted a study to develop vetiver handicrafts by concentrating on how to combine vetiver with other materials and boost marketing potentials. PTT joined educational institutions to offer design courses for communities with handicraft skills to jointly develop vetiver handicrafts under the following five topics:

- 1) Using vetiver mixed with recycled paper to better handle weight for household and home décor handicrafts; with the Fine Arts Department at Chiang Mai University and the Royal Vetiver Group of Ban Sang Village in the Mae Rim district of Chiang Mai Province.
- 2) Designing handicrafts using vetiver mixed with natural fibers, (cotton and silk), through various weaving processes to create a new, modern texture; with Loei Vocational College and the Thai Textile Group in the village of Ban Kangpla, in the Muang district of Loei Province.
- 3) Studying and developing the production process of creating artificial wood material from vetiver, as well as using plastic waste to modify designs for home décor handicrafts; with the King Mongkut's Institute of Technology in Lat Krabang and Ban Huay Namsai community in the Sanam Chai Ket district of Chachoengsao Province.
- 4) Studying the use of vetiver with agricultural waste materials and rubber by heating, in the design of household handicrafts; with the King Mongkut's Institute of Technology in Lat Krabang and Ban Huay Namsai community, in the Sanam Chai Ket district of Chachoengsao Province.
- 5) Researching vetiver fiber and designing handicrafts for international markets; PTT worked with the Reed and Vetiver Handicraft Group of Ban Kok-Prong, in the Vichianburi district of Phetchabun Province and the Vetiver Handicraft Group of Tambon Huay Ka-Yeng, in the Thong Phaphumi district of Kanchanaburi Province.

With the support of communities and educational institutions, PTT compiled skill sets and a knowledge base to be developed into formal curricula to further develop vetiver handicrafts. This allows communities to learn techniques to develop higher standard vetiver handicrafts to sell in community stores and the PatPat Shops of the Chaipattana Foundation; the hope being that this will encourage the advancement of vetiver handicrafts widely in rural, agricultural communities.

2. The Promotion and Dissemination of Knowledge to Communities

The main aim of the *upstream from downstream* approach is to maximize vetiver utilization. Vetiver roots, the upstream section, conserve soil and water resources, while the downstream section gives value-added properties to vetiver roots. The lessons learned from various projects were created into practical training courses to develop vetiver handicrafts further, starting with the promotion of vetiver to PTT community networks, the Land Development Department, and education institutions around the country. The various curricula are as follows:

- 1) **Beginner Level** – This course offers basic understanding and knowledge in preparing raw materials and ways to develop vetiver handicrafts. Students learn how to make handicrafts they can use in their household, develop into a supplementary profession or submit competitively.
- 2) **Basic Level** – This course offers basic knowledge on how to add value to raw materials for handicraft projects and handicraft designs for retail opportunities to earn supplementary income or to submit competitively.
- 3) **Advance Level** – This consists of two levels; Level 1 (5-7 days) and Level 2 (3 days). This training develops the style and quality of vetiver handicrafts for retail, with communities coming together to form a group selling vetiver handicrafts. PTT performs the role of advisor and provides professional

designers and support staff on site, with follow-up projects. They also provide advice on design and production, as well as selecting handicrafts to be retailed in the PatPat Shops of the Chaipattana Foundation. Today, many students are proficient enough to have become community trainers and pass on their knowledge; expanding the vetiver handicraft network within their area.

For the advance level, PTT selected community members who have handicraft work skills and who utilize vetiver. The community members who participate in the program, must pass both levels of the advance level. The training topics include various knowledge sets, as shown in Table 1:

Table 1. Training Curriculum for the Real Implementation of Advance level of Vetiver Handicrafts

Curriculum for the Real Implementation of Advance level of Vetiver Handicrafts	
Level 1	Level 2
1 Preparing vetiver leaves for handicraft work.	1 Making gifts and souvenirs.
2 Sewing techniques, (small basket).	2 Making vetiver paper packaging.
3 Creating 3-tier, 4-tier, and 7-tier braids of different sizes as decorative items and gifts, (hats, bags and baskets etc.).	3 Developing new handicrafts, (non-weaving).
4 Twisting vetiver into household goods and decorative items.	4 Making small furniture with other materials.
5 Creating a molding cast from square and cylindrical Styrofoam and making a cardboard frame.	5 Learning macramé knitting.
	6 Making dolls.
	7 Creating home décor items combined with other materials.
	8 Cutting and sowing handicraft linings.
	9 Cutting, sowing, and processing vetiver weaving.
	10 Making artificial flowers.

Since first conducting the vetiver handicrafts training courses for the community, PTT has continuously developed its programs to expand and promote knowledge. Twenty-one communities were initially selected to expand vetiver utilization *from roots to leaves*. The project evolved to become a community support and development program, providing education on handicraft development, vocational training, and community empowerment to create self-sufficiency.

3. Expanding work to become a concrete measure for sustainability

From a lack of knowledge and a misunderstanding that vetiver is either a grass or a weed, farmers were initially wary of cultivation; fearing vetiver would compete with existing crops for water and nutrients. They also believed that vetiver needed constant care and would be a burden, with no economic potential. These beliefs were a major disincentive hindering vetiver promotion and cultivation. The question was raised,

“What can be done to convince farmers that vetiver is an alternative plant that can rehabilitate soil and water resources and has high value-added potential to generate non-agro supplementary income?” Trying to answer this question led to the vetiver handicraft development quest within 21 communities, which was in two parts, as follows:

- 1) Human Resource Development with handicraft skills, through practical training, to develop vetiver handicrafts by providing knowledge and understanding of the characteristics of vetiver leaves along with suitable design basics for the target group. Adding to the community skill set of creating frames, sewing and embroidery, decoration and using vetiver with other materials. This extends to organizing community enterprises toward sustainable self-sufficiency; helping the community integrate these with other community enterprise networks who produce standardized vetiver handicrafts, and for the group to grow qualitatively.
- 2) The selection of quality raw materials and suitable technologies that are environmentally friendly, such as:
 - The most suitable vetiver for handicraft work. At present, the new source of Songkhla 3 variety (*Vetiveria zizanoides*) is favored because of its wide leaves and fine, waxy texture. The leaf, which is soft, shiny, and does not irritate the skin, can be cultivated and expanded in any region, hence its popularity as a handicraft material.
 - The creation of handicrafts that match community demand. Prototype handicrafts are produced according to skills and the partiality of the community. The preservation of the *Mae Lai* (original pattern) of the communities is combined with modern technologies to add economic value to satisfy market demand. Furthermore, suitable techniques are selected to match the abilities of the community.



Picture 1. “Waffle” from Nam Phong, Khon Kaen province



Picture 2. “zigzag 311” from Payao, Sukhothai, Narathiwat province

- The most appropriate vetiver for a project. For example, curved work requires soft, pliable leaves and regular water spraying to maintain moisture while weaving. Knitting and twisting work requires vetiver leaves to be malleable so they can be contorted into various sizes. Frequent water spraying make vetiver leaves softer and more workable. Other handicraft techniques require vetiver leaf strips or leaves for pleating, such as decorative flowers etc.
- Production processes that are environmentally friendly, such as using easy-to-source local materials and reducing costs by coloring vetiver leaves using natural dyes. Communities were encouraged to make dyes from local resources, such as mixed-turmeric with red lime (red), turmeric (yellow), bark of Burma Padauk (reddish brown), pod of golden shower (*Cassia fistula* L.) and bark of Burma Pakauk (chocolate), mango leaves (manure green), jack fruit xylem (yellow),sappan (*Caesalpinia sappan*) (red). The groups that carried out the work consisted of:
 - Handicraft Group of Ban Sakaew, Nam-Pong District, Khon Kaen Province.
 - Vetiver Woven Handicrafts of Ban Kutwa, Nong Song Hong District, Khon Kaen Province.
 - Agriculture Housewives Group of Ban Son, Kukhan District, Srisaket Province.



Picture 3. The demonstration of color from turmeric



Picture 4. A bark of Burma Padauk (reddish brown)

- Production processes that produce the least waste (zero waste). The community can reduce their production costs in a sustainable way by maximizing waste, such as using leftover vetiver leaves as a fertilizer or mixed into organic fertilizer.
- Prototype handicrafts created to market commercially. Handicrafts that won awards from the vetiver handicraft competition were used as prototypes to be sold at market.

Chapter 2

Results and Discussion

The result of the promotion and development of vetiver handicrafts with the community, partnerships, network of educational institutes, and the PatPat Shops, is firmly established knowledge through practical implementation. A knowledge base was created to implement projects in a tangible and concrete way. This impacted the development and promotion of the utilization of vetiver in a multitude of spheres, with quantitative and qualitative achievements.

Output

PTT continuously supported the vetiver handicraft development project since its inception in 2009. This has resulted vetiver utilization to conserve soil and water resources in 307 households, utilizing 2.23 million vetiver saplings encompassing a surface area of 214.625 rai. Vetiver handicraft network groups receiving cultivation support totaled 21 communities, with value-added vetiver leaf handicrafts being retailed to earn supplementary household incomes in excess of THB 4,390,322 (2009 – 2014).

To disseminate knowledge, the vetiver handicraft development project was implemented from 2008 until 2014. PTT compiled all the knowledge and published, distributed, and publicized it in the form of more than 100,000 copies of training documents, manuals, newsletters, pamphlets, handicraft information tags, catalogs, CDs, and multimedia in 3 categories, as follows:

- Category 1 – Development of vetiver handicrafts
- Category 2 – Vetiver cultivation and promotion.
- Category 3 – Public relations.

The development of vetiver handicrafts (Category 1) materials have been used in practical training since 2007, with trainings and materials adapted several times to improve relevance. From 2007 to 2014, three main training courses were available, which were Beginner level, Basic level (two levels), and Advance level. During this period, these courses, among others, provided training to 58 classes, totaling 2,780 graduates.

This newly acquired knowledge led to the development handicraft skills for members, who gained mastery and an understanding of how to action projects and elevate communities to be proficient in crafting vetiver handicrafts. They were able to pass on their knowledge and skills to their network and within their communities.

Outcome

1. The Promotion and Expansion of Vetiver Cultivation

Communities became aware of the value-added benefits of utilizing vetiver leaves through PTT and the Chaipattana Foundation sharing basic knowledge. This enabled them to create value-added handicrafts, teach vetiver handicraft producing skills to increase network members, and to use raw materials within their community and be self-sufficient. This triggered the expansion of various varieties of vetiver cultivation on a wide scale, which in turn, reduced costs while establishing a vetiver expansion plot in the local area, without requiring vetiver saplings from the Department of Land Development or any other

external agencies. The 2009 data shows that vetiver cultivation was promoted within three community members of the network of vetiver handicraft, with a total of 350,000 vetiver saplings produced and supplied. In 2014, the network was expanded to 21 communities, cultivating a total of 2.23 million vetiver saplings. All 21 communities conduct follow-ups and continuously evaluate under the guidance of PTT and other support organizations. This has created a model for vetiver cultivation for the network of vetiver handicraft, as demonstrated below:

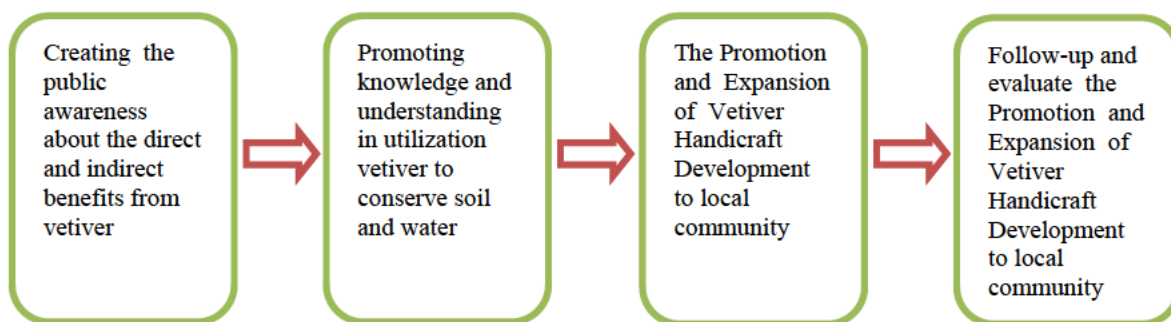


Figure 3. A model for vetiver cultivation by the Network of Vetiver Handicraft

Table 2. 2014 Data of Vetiver Cultivation in network of vetiver handicraft Areas

NO.	Group	Vetiver Amount
1	Vetiver Handicraft Group, Ban Koh Sawad, Narathiwat Province	10,000
2	Vetiver Woven Handicraft Group, Ban Kudwah, Khon Kaen Province	50,000
3	Huay Ka-Yeng Vetiver Handicraft Development Group, Kanchanaburi Province	100,000
4	Prasat Vetiver Handicraft Creation Group, Surin Province	20,000
5	Koksa-Art Vetiver Lovers Community Handicraft Network, Surin Province	100,000
6	Network of Vetiver handicraft, Nonthai District, Nakhon Ratchasima Province	100,000
7	Royal Vetiver Group, Chiang Mai Province	50,000
8	Reed and Vetiver Handicraft Group of Ban Kok-Prong, Phetchabun Province	50,000
9	Ban Sakaew Handicraft Group, Khon Kaen Province	30,000
10	Ban Soen Agricultural Housewives Group, Srisaket Province	50,000
11	Ban Kaemai Vetiver Handicraft Group, Payao Province	40,000
12	Saijathai Women's Co-op, Sukhothai Province	20,000
13	Ban Thanon Hak Vetiver Handicraft Group, Surin Province	1,000,000
14	Piman network of vetiver handicraft Group, Nakhon Phanom Province	300,000
15	Ban Dan Thaptako network of vetiver handicraft Group, Ratchaburi Province	200,000
16	Plad Ma Miang Center network of vetiver handicraft Group, Surin Province	5,000
17	Konburi Community Enterprise Group, Nakhon Ratchasima Province	10,000
18	Ban Sang Dao Vetiver Handicraft Group, Phitsanulok Province	10,000

NO.	Group	Vetiver Amount
19	Artificial Flowers from Natural Materials Group, Chacheongsao Province	55,000
20	Koh Sao Women's Co-op Vetiver Handicraft Group, Payao Province	30,000
21	Huay Plu Handicraft Expansion Group, Ang Thong Province	Undergoing Cultivation
Total		2,230,000

2. The Environment, Economics and Society

PTT adopted the 2E1S principle of responsibility towards society to be implemented in its vetiver program, with the following achievements:

2.1 Environment

- **Soil development and creating natural balance in agricultural areas**

All 21 vetiver handicraft groups took part in activities on the basis of cultivating vetiver for soil and water conservation purposes. After becoming aware of the numerous benefits of vetiver, they were able to adapt it to rehabilitate soil and water resources in their own areas. For example, the Prasat Vetiver Handicraft Creation Group of Surin Province, cultivated vetiver to rehabilitate sandy soil which was lacking nutrients and not maintaining moisture. Cultivation helped add organic materials into the soil, both through the root system and using the leaves as mulch. Vetiver helps absorb and maintain moisture in soil during the dry season. This improves the soil's health and reduces the need to use chemicals, creating a natural rebalance on agricultural land through an ecological relationship with the surrounding environment. This positively triggered a reaction to expand vetiver cultivation widely in the area, with assistance from a local administrative organization. It also became a model for vetiver utilization by the community in various ways, such as vetiver cultivation for soil rehabilitation, erosion prevention, and maintaining soil moisture.



Picture 5. sandy soil in Prasat ,
Surin province



Picture 6. Vetiver cultivation after
participate in the Development of
vetiver handicrafts

- **Increasing Carbon Sequestration Ability**

Vetiver plays an important role in increasing organic materials and helps carbon sink. When one or two rows of vetiver are cultivated to conserve soil and water in an area of 1 rai, 800 vetiver saplings are planted. Vetiver is then able to collect above ground of 24.64 g (C)/sapling and 18.24 g (C)/sapling underground, (Office of Research and Development for Land Management, 2011). The promotion of vetiver cultivation for soil and water conservation on the land of the 21 vetiver handicraft groups, between 2009 and 2014, totaled 2.23 million vetiver saplings. The ability to sequester carbon totaled 111.17 kg (C)/rai, divided into above ground 60.321 kg (C)/rai and underground 50.84 g (C)/rai.

2.2 Economics

By creating a coming together of the communities to form a vetiver handicraft group, vetiver handicrafts were retailed in community markets and in the PatPat Shops of the Chaipattana Foundation. These handicrafts generated supplementary incomes for the 21 communities, as follows:

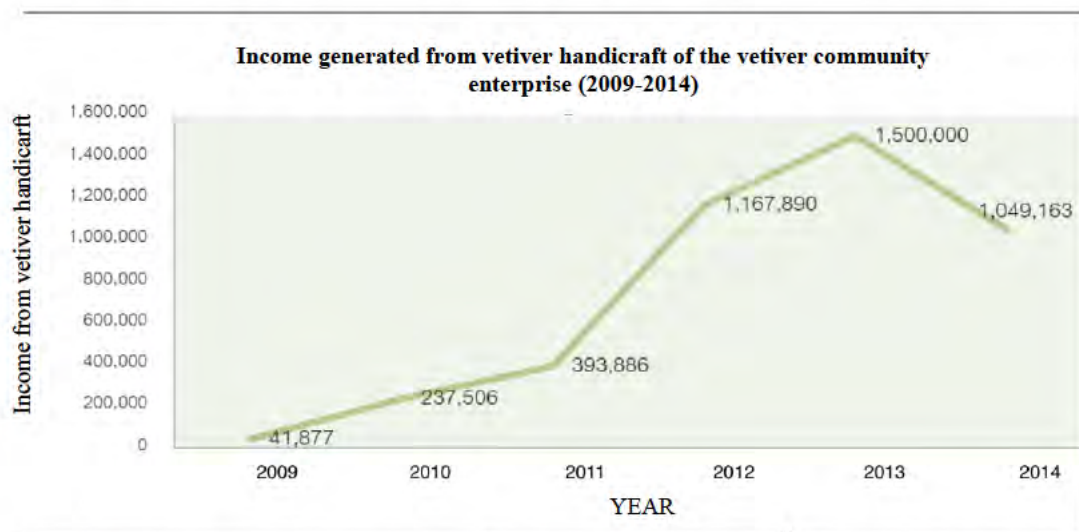


Figure 4. Income generated from vetiver handicraft of the vetiver community enterprise (2009-2014)

Note : Conclusion of network of vetiver handicraft (2009 – 2014); The Vetiver Cultivation Promotion and Expansion Program in Accordance with the Royal Initiatives of the King of Thailand, 2014.

The graph identifies that from 2009 to 2014, the communities were able to generate more income from the sale of vetiver handicrafts year on year; from THB 41,877 (Sept – Dec 2009), THB 237,506 (2010), THB 393,886 (2011), THB 1,167,890 (2012), and THB 1,500,000 (2013) respectively. In 2014, political instability in Thailand affected production, sales, and distribution, with THB 1,049,163 generated a reduction from the previous year. Regardless, comparisons to 2011 reveal a 3.4 fold increase in income, demonstrating the increased capacity of the communities to develop handicrafts for the market. They were able to achieve this through vetiver handicraft development knowledge that PTT supported.

2.3 Society

- **Vetiver... More than just grass**

Promoting and expanding vetiver utilization and vetiver handicraft development within a network of communities created a positive impact, inspiring a better quality of life for individuals, greater knowledge, and income derived from handicraft sales throughout the year. This resulted in supplementary incomes for farmers, strengthened community bonds, and empowered communities to share their knowledge with other members of their community. For example, the village community of Kok-Prong, in the Vichianburi district of Phetchabun Province, originally produced reed mats and received support and assistance from the Chaipattana Foundation. Later, they benefited from knowledge, support, and training in how to utilize vetiver and vetiver leaves, vetiver cultivation, and producing vetiver handicrafts. As a result, the community began focusing on cultivating vetiver in earnest for soil and water conservation. Both vetiver saplings and this knowledge base were provided by PTT, the Department of Land Development, and the Chaipattana Foundation. The community cultivated vetiver to protect against erosion in the community reservoir embankment, with individuals encouraged to cultivate vetiver on their agricultural plots to mitigate erosion and the collapse of slopes, maintain soil moisture, and gain nutrients. Kok-Prong became a model community in vetiver cultivation, with a 2 rai vetiver expansion plot of the Songkhla-3 variety, (160,000 vetiver saplings per year). The vetiver saplings are donated to network members and any interested individuals. Vetiver cultivation was also extended to educational institute properties and nearby communities in several applications, such as planting around a pond, on agricultural plots, and as part of the “School Lunch Program”, etc. Vetiver was also used to create organic compost to help reduce the use of chemicals. The Kok-Prong community has produced many vetiver resource persons and trainers who pass on vetiver knowledge in both cultivation and product-making to other individuals and communities.

Furthermore, communities have grown closer through cooperation and working together, initiating knowledge exchange within the network groups that produce vetiver handicrafts collectively. Members can share technical know-how and secure materials used to produce handicrafts. Presently, there are a total of 365 members of the network of vetiver handicraft groups, incorporating 21 communities, with each member also a member of the Vetiver Network of Thailand, which has more than 2,000 members across the country.

- **Knowledge Exchange Between Generations**

What would happen if local knowledge failed to be passed down to the next generation within the communities? What can be done to enable local communities to receive new ideas about designing handicrafts that match market demands? In 2014, PTT joined with the PatPat Shops of the Chaipattana Foundation and the Faculty of Architecture of King Mongkut’s Institute of Technology (KMUTT), to support students in their final year, learning about the vetiver handicraft group at Kok-Prong Village in the Vichianburi district of Phetchabun Province. This enabled students to learn the community's production processes, from leaf harvest, material management, and vetiver knowledge, as well as the local wisdom about their handicraft works. Students learned various techniques, such as weaving and twisting knots, etc.



Picture 7. Field study of KMITL Students



Picture 8. The designing handicrafts

The objective was to create a working relationship between the younger generation and traditionalists who are adept in rural and folk handicrafts. This created a bonding fusion between traditional handicrafts and modern creative design, to produce innovations and design trends by a new generation of designers. This has also allowed the network of vetiver handicraft members to learn about newer designs to be able to produce more creative handicrafts for international markets in the future.

In December 2014, an exhibition, which was open to the public, displayed 19 prototypes produced by students, under the name “Vetiver... Makeover”, with selected work identified as having the best chance of success commercially. The techniques used in creating these handicrafts are being passed back to the network of vetiver handicraft to create an incentive to empower communities to expand vetiver cultivation in a sustainable way.



Picture 9-12. Vetiver... Makeover Exhibition, December 13 – 18, 2014 at Paeo Town Ramkamhaeng ,Bangkok

Chapter 3 Conclusion

The work by PTT Public Company Limited to promote and expand vetiver utilization and cultivation was carried out in accordance with the Royal Initiatives of the King of Thailand. The project focused on developing a new knowledge base, enhancing the learning process of farmers who cultivate vetiver, and encouraging communities to utilize vetiver in soil and water conservation. This work was carried out in tandem with empowering farmers who cultivated vetiver to attain a better quality of life through knowledge and technology; of how best to utilize vetiver and develop quality vetiver handicrafts. The ability to pass on vetiver knowledge and skills effectively was achieved through a community involvement process, whereby the numerous benefits of vetiver, applied in a multitude of ways, were discovered. Society as a whole benefits from the reduction in state expenditure in farmers' vocational training courses, whilst at the same time empowering farmers to generate work and income without having to leave their community. This coincides with the sustainable development principle of the Sufficiency Economy of HM the King Bhumibol Adulyadej. Hence, it can be established that the Vetiver System truly empowers sustainable development.

The focused and continuous promotion of vetiver handicraft development by PTT has empowered 21 communities to generate income from the sales of handmade vetiver handicrafts retailing at the PatPat Shops of the Chaipattana Foundation and other markets. The project has helped communities experience the 'miracle' of vetiver and motivated them to expand vetiver cultivation, with vetiver nurseries created in several communities in Thailand. Community members can pass on knowledge to other interested parties both domestically and internationally, creating what is today a strong vetiver cultivation network.

PTT and the PatPat Shops of the Chaipattana Foundation have plans to further develop vetiver handicraft design, as part of student curricula, in partnership with higher educational institutes. The aim is to attract new ideas from the younger generation to help pass on local handicraft skills and continue to protect Thai heritage and traditions, while conserving the country's precious soil and water resources, in accordance with the Royal Initiatives and PTT realizes that "*Vetiver is truly a miracle grass*"



Picture 13. The Development and Promotion of Vetiver Utilization under Royal initiative project.



Picture 14. Awarding ceremony of The Development and Promotion Competition of Vetiver Utilization under Royal initiative

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