



**Vetiver system for soil and water conservation on
the Burma-Thailand gas pipeline
and community outreach programs**

by

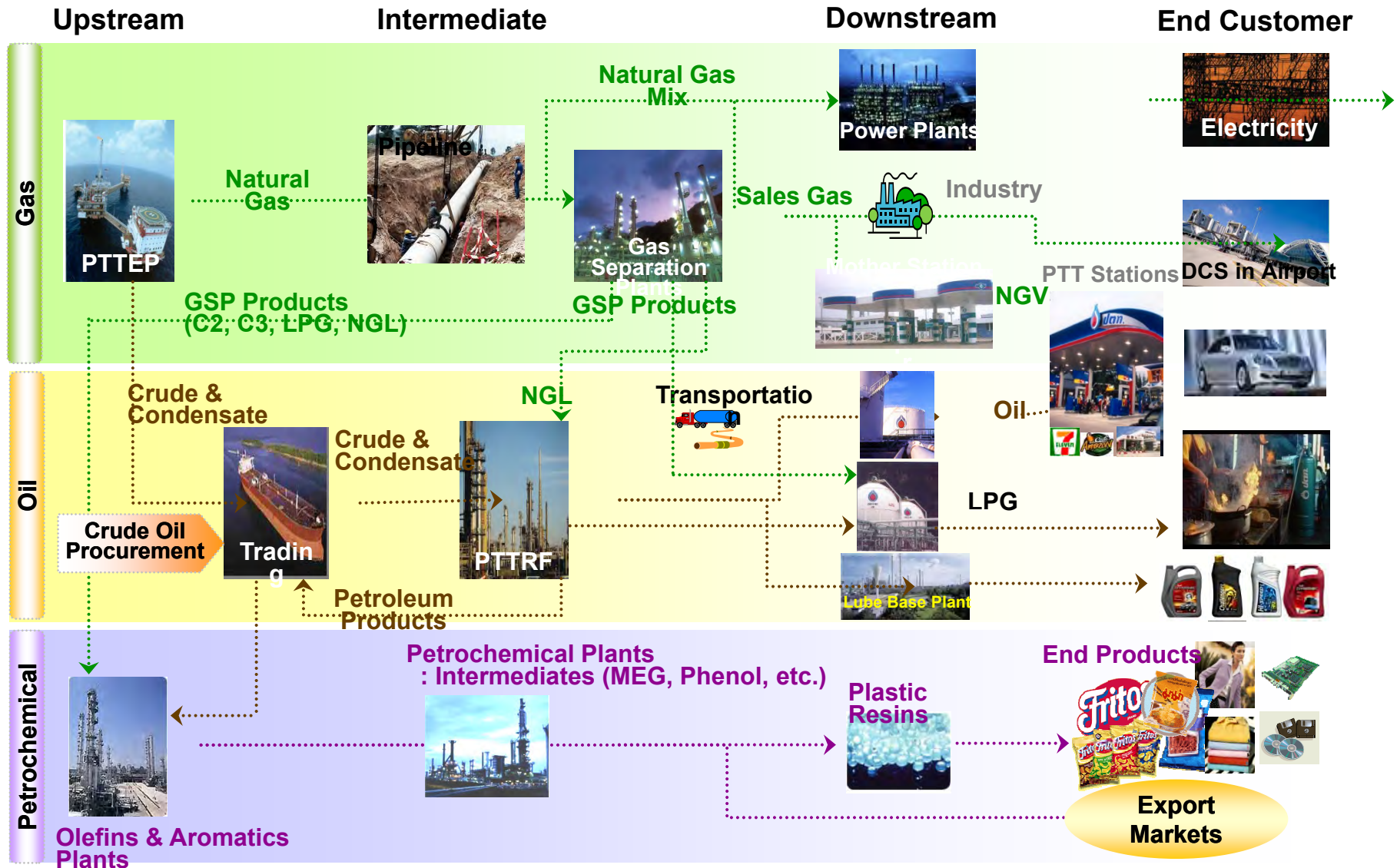
**Dr.Songkiert Tansamrit
Executive Vice President
PTT Research & Technology Institute**

22 February 2008

- **Company profile**
- **The use of vetiver grass system for erosion control and slope stabilization along the yadana gas pipeline project right of way**
- **Huay Khayeng, Thailand vetiver cultivation exemplar**
- **The vetiver development and promotion as initiated by His Majesty the King Contest**
- **Conclusion**

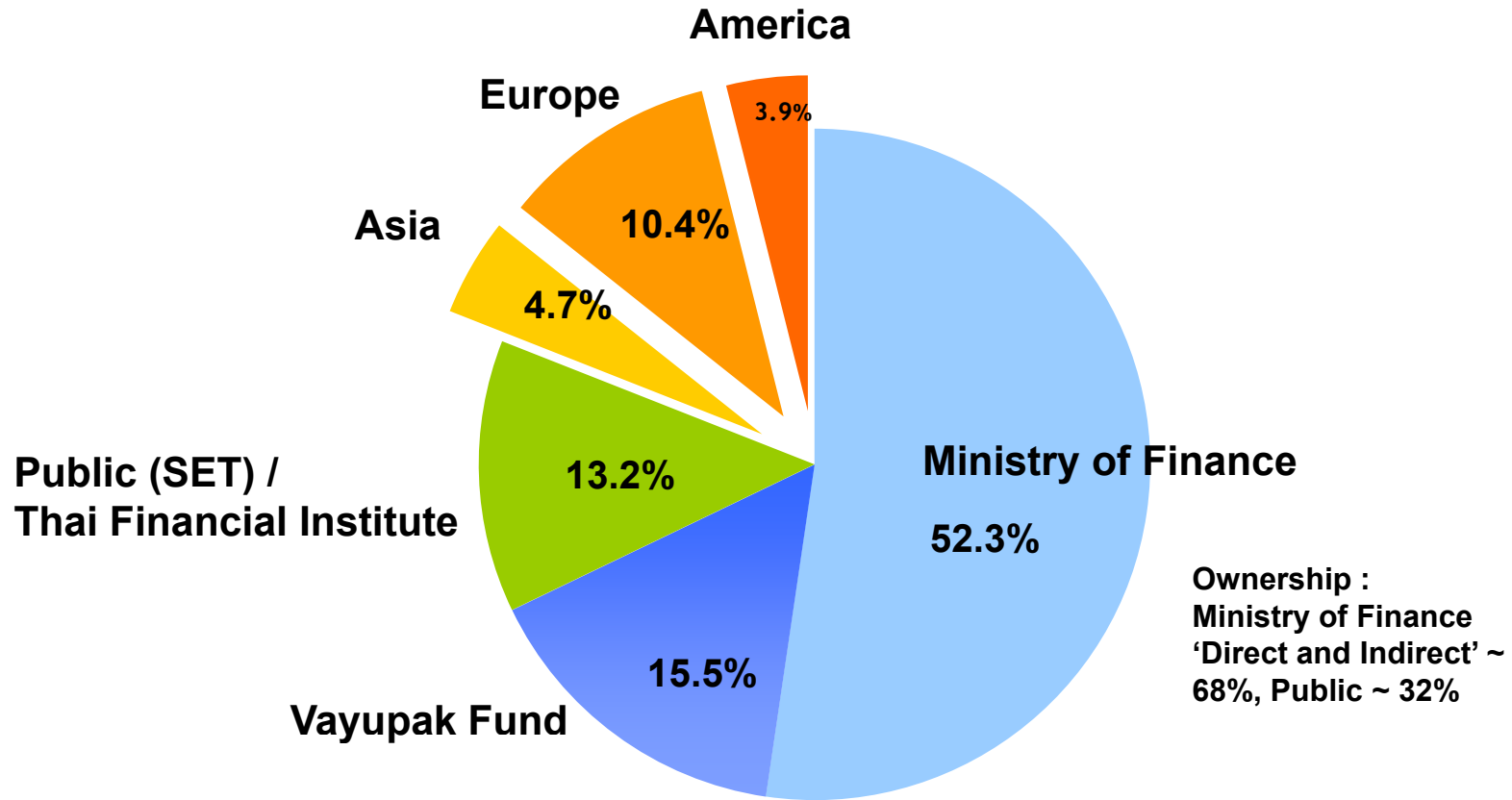


PTT Group Value Added in Business Value Chain





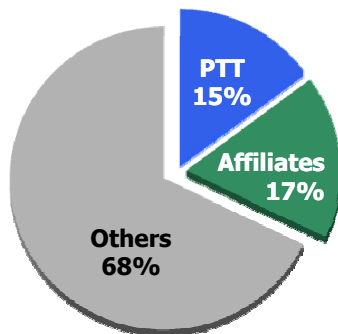
PTT Shareholder Structure





PTT Performance & Recognition

Largest Thai Public Company



Note : All data as of 11 Jan 2008;
SET=796.47 (P/E=11.56), PTT=326 (P/E=10.33)

	Market Cap. (Bt mn)	%
SET	6,211,611	100
PTT Group	1,999,275	32.2
PTT	918,469	14.8
PTTEP	497,910	8.0
IRPC	109,200	1.8
TOP	162,182	2.6
PTTCH	166,119	2.7
PTTAR	120,027	1.9
BCP	14,661	0.2
TIP	5,250	0.08
BAFS	5,457	0.09

Shareholding Structure (as of Sep 20, 2007)

- Ministry of Finance 52.17%, Vayupak Fund 15.50%, Institutional & Public Investors 32.33%

Award Recognitions

FORTUNE 500 2006 ▪ 207th : World's Largest Corporations 2007

Forbes 2000 ▪ 354th : World's 2,000 Leading Companies 2007

asia money ▪ 1st : Large-Cap Corporate of the Year 2005/06 in Thailand
▪ 1st : Best Company in Thailand for CG 2006

FinanceAsia ▪ 1st : Best Managed Company in Thailand 2006
▪ 1st : Best Corporate Governance in Thailand 2006

Platts TOP 250 ▪ 27th : Top 250 Global Energy Companies Asia/Pacific 2007

CorporateGovernanceAsia ▪ CG Recognition Awards 2006 & 2007

TOP 40 ▪ Global Top 40 Executives in Chemical by ICIS 2006

BusinessWeek ▪ 1st : The Top Performers in Asia 2005

EUROMONEY ▪ 1st : Best Managed Company in Asia 2005

EUROMONEY ▪ 1st : Best Managed Company Oil&Gas 2008

THE Asset ▪ 1st : Best in Corporate Governance in Thailand 2005

Institutional Investor ▪ 1st : Best CEO in Thailand 2005

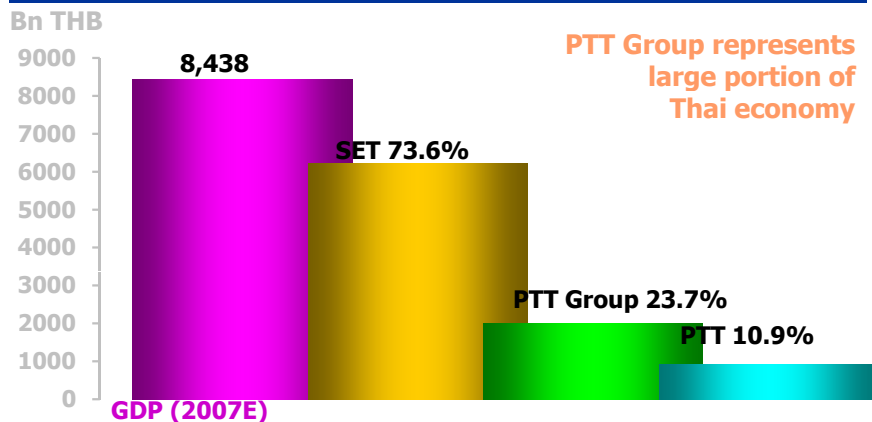
TMA ▪ Commitment to Social and Environmental Issues 2003/05/06
▪ Commitment to Energy Saving 2005/2006

IOB ▪ Board of the Year Awards 2002/2003 & 2004/2005 & 2006/2007

SET ▪ 1st : Best CEO 2005 / 1st : Best CSR / Best CG Report 2005
▪ 1st : Best Investor Relations (IR)2003 / 2006
▪ Distinction in Maintaining Excellent Corporate Report

รางวัลรัฐวิสาหกิจดีเด่น จากกระทรวงการคลัง
▪ ปี 2549 : คณะกรรมการรัฐวิสาหกิจดีเด่น/ คณะกรรมการดีเด่น/ CSR ดีเด่น
▪ ปี 2550 : การบริหารจัดการองค์กรดีเด่น/ ผลการดำเนินงานดีเด่น/ CSR ดีเด่น

Relative Size to Economy



Sovereign Ratings

Foreign Rating	Moody's *	S&P
Thailand	A3	BBB+
PTT	A2	BBB+

* Bond rating

- **Company profile**
- **The use of vetiver grass system for erosion control and slope stabilization along the yadana gas pipeline project right of way**
- **Huay Khayeng, Thailand vetiver cultivation exemplar**
- **The vetiver development and promotion as initiated by His Majesty the King Contest**
- **Conclusion**

Introduction

- **The Yadana Gas Pipeline Project needs to pass through a 50-kilometer stretch of the forest area, along which 20 meters construction right of way (R/W) are used, amounting to 600 - rai area.**



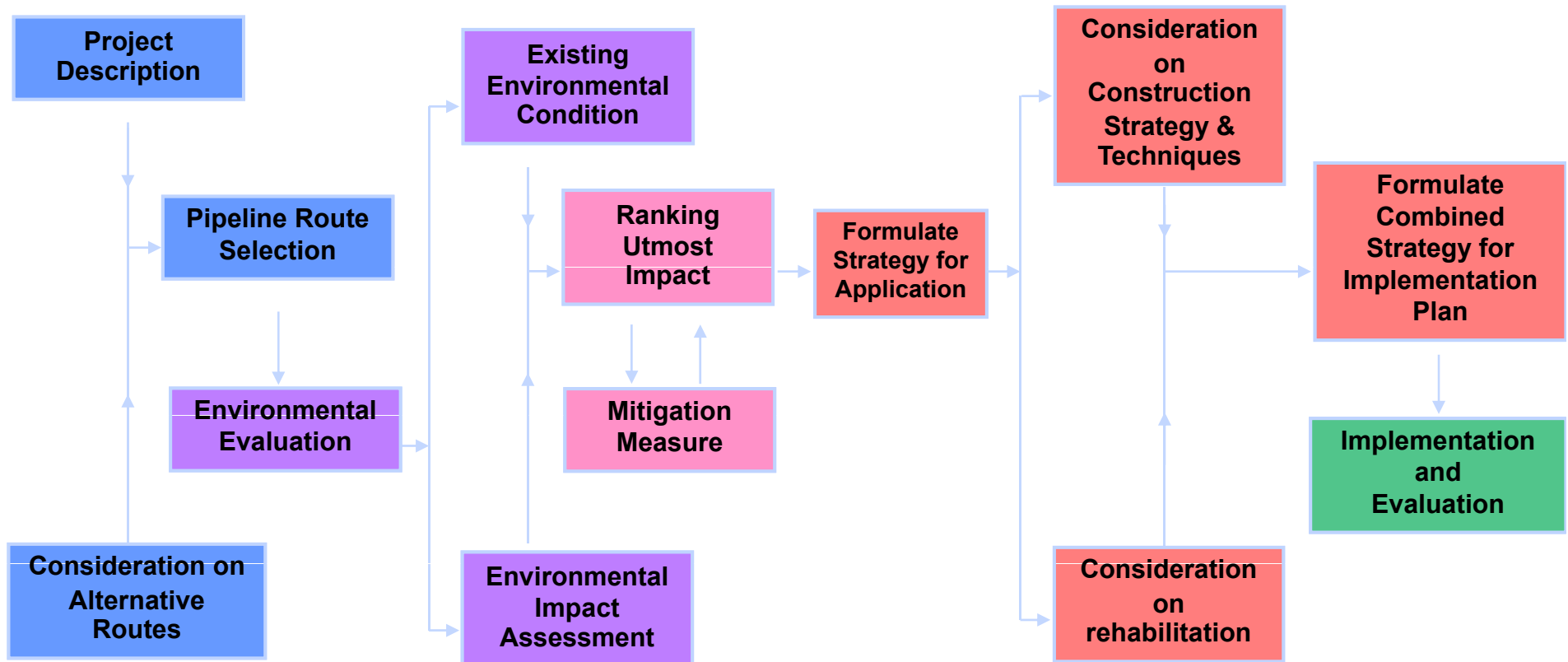
- **Construction involves strip surface clearing, resulting in bare soil after pipeline installation, thereby exposed to immediate soil erosion impact.**
- **Vetiver grass plays a significant role in permanent soil erosion prevention and rehabilitation of the area.**



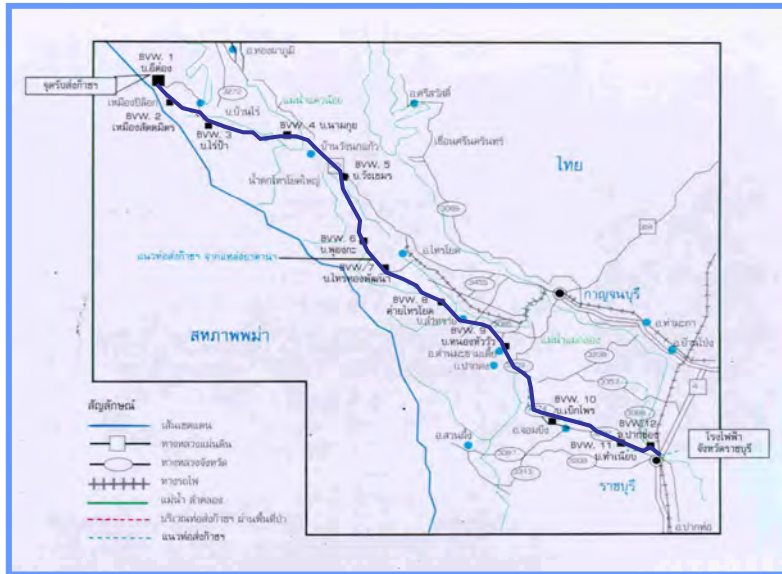
- Thailand is a net energy import country, with 30% domestic production and 70% import.
- At present, Thailand's commercial energy consumption is 900,000 barrels per day of oil equivalent: comprising oil, lignite, natural gas and hydropower.
- Natural gas is cleaner among petroleum fuels. It meets both economic objective and environmental concern, as well as safety aspect.
- As natural gas resources in the Gulf of Thailand is quite limited, replacement and additional supply must be procured from neighboring countries.



The procedures of the use Vetiver Grass System for Control and Slope Stabilization along the Yadana Gas Pipeline Right of Way



Project Description

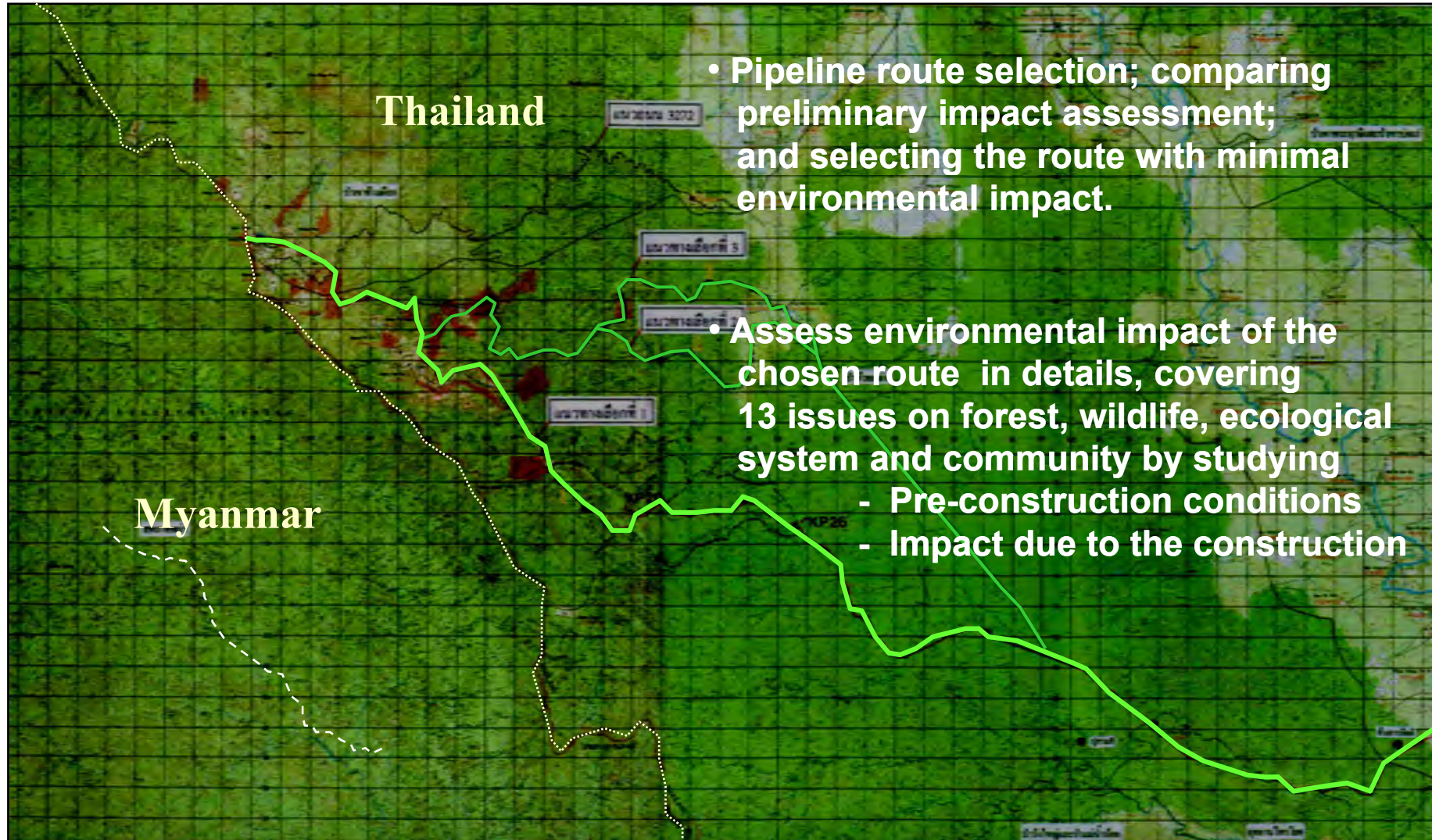


- Laying a 238.5-kilometer natural gas pipeline from Thai border at Ban I tong, Thong Pha Phum, Kanchanaburi province to the Ratchaburi Power Plant. The pipeline construction of the 42-inch diameter (105-centimeter) requires the digging of 2.5-meter-wide and 2.5-meter-deep trench and installation.

- There are 12 block valve stations and one Operation & Maintenance Center in Ratchaburi province to control gas transmission.
-
- Construction began on March 24, 1997 and completed on June 30, 1998. (July 1, 1998 is the Agreement deadline.)



Environmental Impact Assessment





Significant of Environmental Impact

Among the 13 environmental impact issues, soil erosion is prioritized as the utmost immediate impact due to the following reasons :

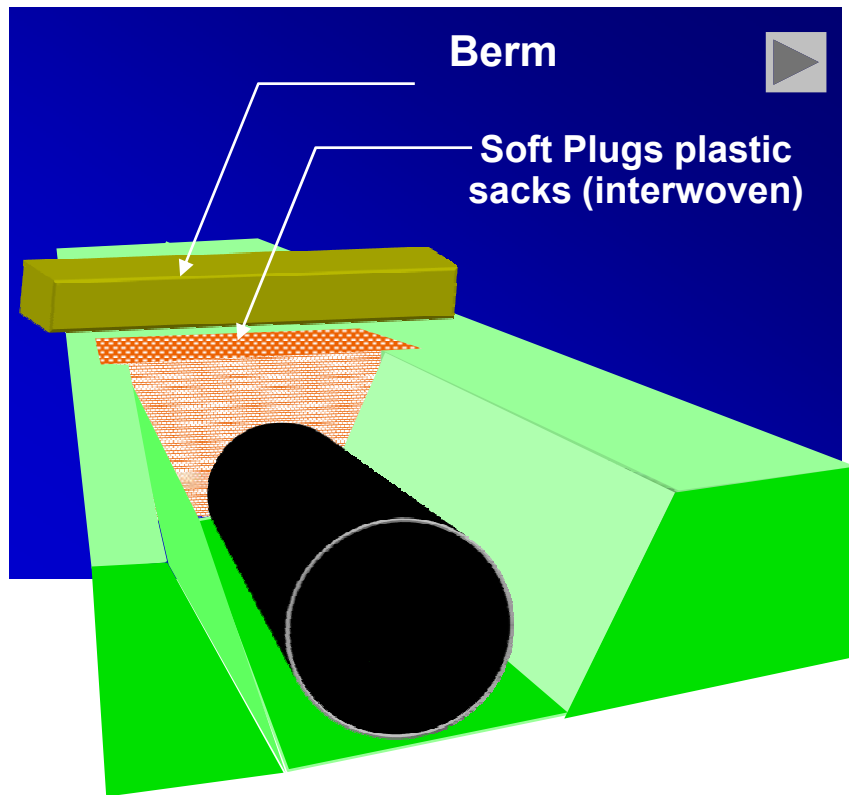


- 1. Characteristics of construction that immediately exposed soil to the erosion impact.**
- 2. Slope Complex Soil Series in the forest area along KP 0 to KP 27 : Erosion rate would increased by 100 times compared with existing conditions of the area.**
- 3. The impact on water quality, soil fertility, community and above all the pipe itself.**



Strategic Approaches : Soil Erosion and Rehabilitation

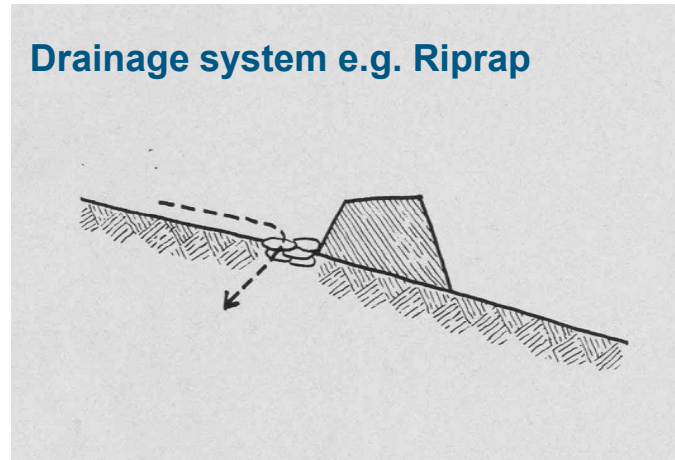
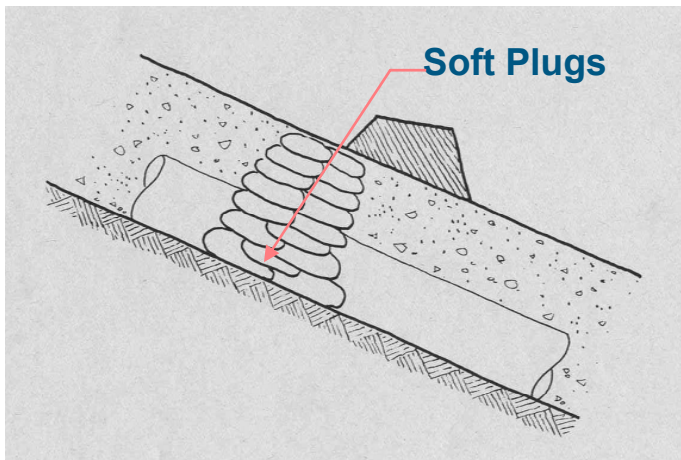
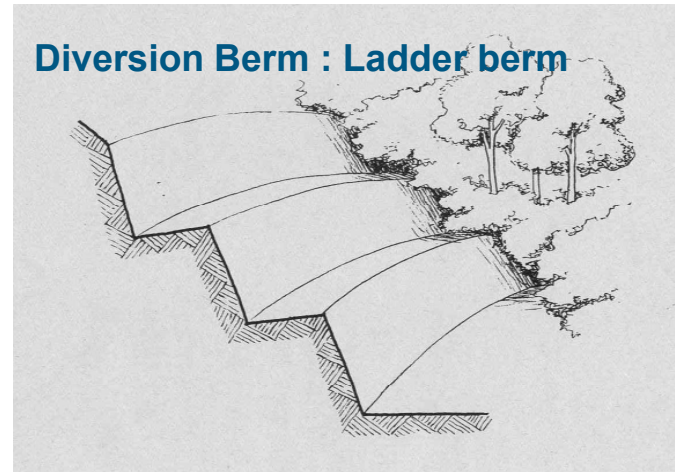
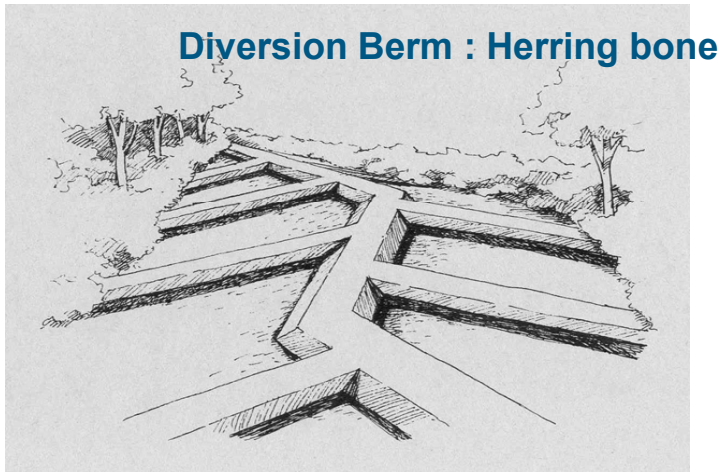
Construction Strategies and Techniques



- In the areas with Slope Complex Soil Series and in high mountain areas from KP 0 to KP 27, construction must be done and completed in one dry season.
- Build Permanent Physical Erosion Control Structure
 - Erosion prevention in the R/W
 - Build berms to divert and water to nearby stabilized areas outside the R/W
 - Build surface drainage control device



Engineering Erosion Control Structure





Physical Permanent Erosion Control Structure with Agronomic and Revegetation Erosion Control



KP 1+800 : 2001

**Jute sacks and vetiver grasses
were used to rebuild berms.**



KP 1+800 : 2001



KP 1+ 800 : 2002

**Live stakes were pegged to hold
the soil-filled jute sacks together
with vetiver grasses.**



The Progress of Vetiver Grass System & Lessons Learned



A total of 5,000 live stakes of 7 native plants were used to peg into the jute sacks.

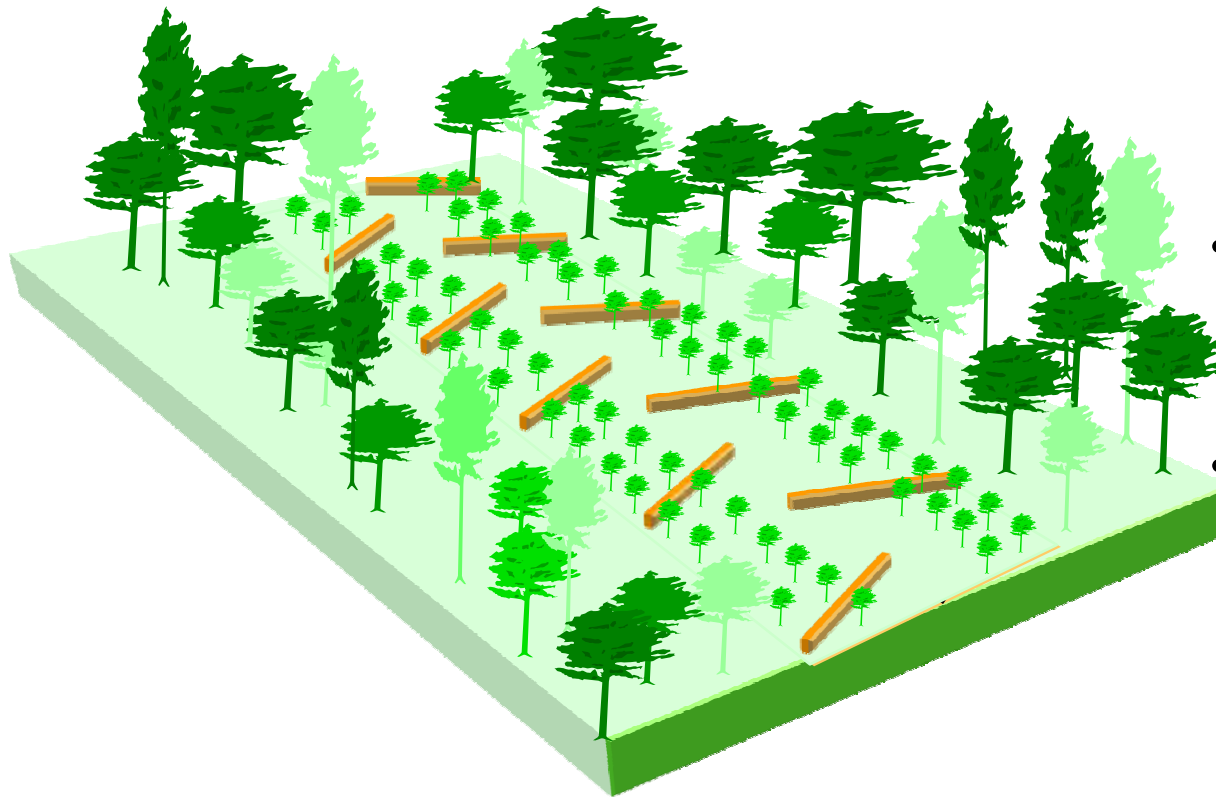
1. *Garuga pinnata* Roxb.
2. *Choerospondias axillaris* (Roxb.) B.L.Burtt & Hill
3. *Pterocarpus indicus* Hasm.
4. *Lagerstroemia tomentosa* Presl
5. *Erythrina subumbrans* (Hassk.)
6. *Cephalanthus tetrandra* (Roxb.) Ridsdale & Bakhf.
7. *Elaeocarpus hygrophilus* Kurz.





Strategic Approaches : Soil Erosion and Rehabilitation

Botanical Strategies and Techniques



- **Grow 1.5 million vetiver grass slips in the areas with high risks of erosion, according to technical principles.**
- **Grow grass and leguminous cover to enhance soil richness.**
- **Grow a total of 61,250 perennial trees, 3 meters from pipeline center along the pipeline R/W**



The Application of Engineering and Botanical Techniques with Vetiver Grass Slip Planting Positioning

Classification	Engineering Erosion Control Structure		Re-vegetation & Agronomic Erosion Control		
	Special Techniques	Soft Plugs&Berms and Drainage System	Vetiver Grass	Tree	Grass + Legume
E_0 = Low Risk	-	-	-	(✓)	✓
E_1 = Moderate Risk	-	-	-	✓	✓
E_2 = High Risk	-	✓	✓	✓	✓
E_3 = Very High Risk	✓	✓	✓	✓	✓

- **Remarks** : In E_0 areas, growing trees may not be required.

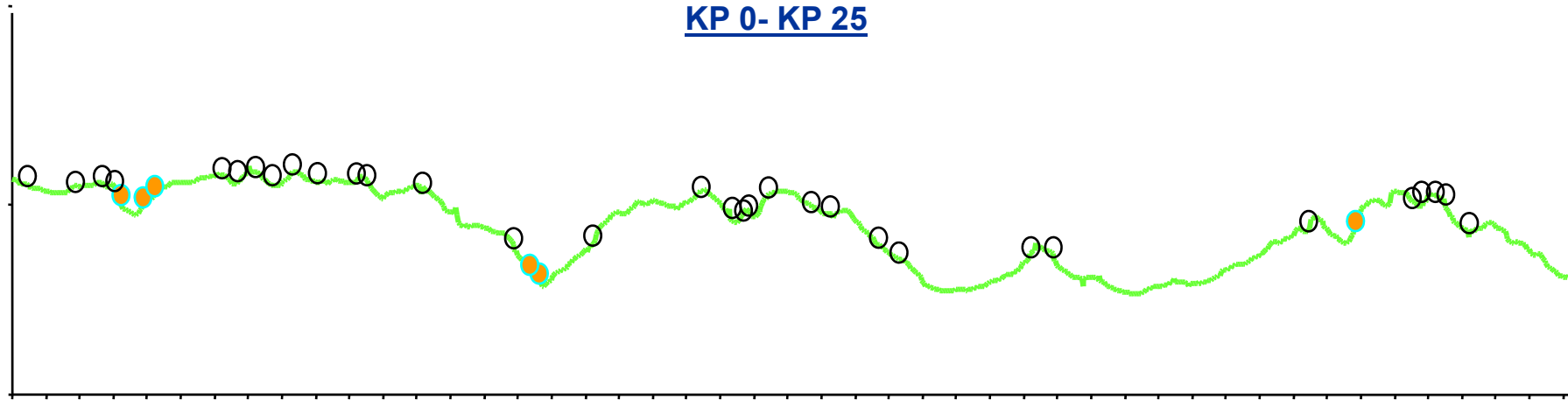


Identify the Erosion Rating Risk R/W Profile

Vetiver grass combined with re-vegetation, agronomic erosion control methodology and construction engineering methodology is a key to erosion control success in the Yadana Gas Pipeline Project

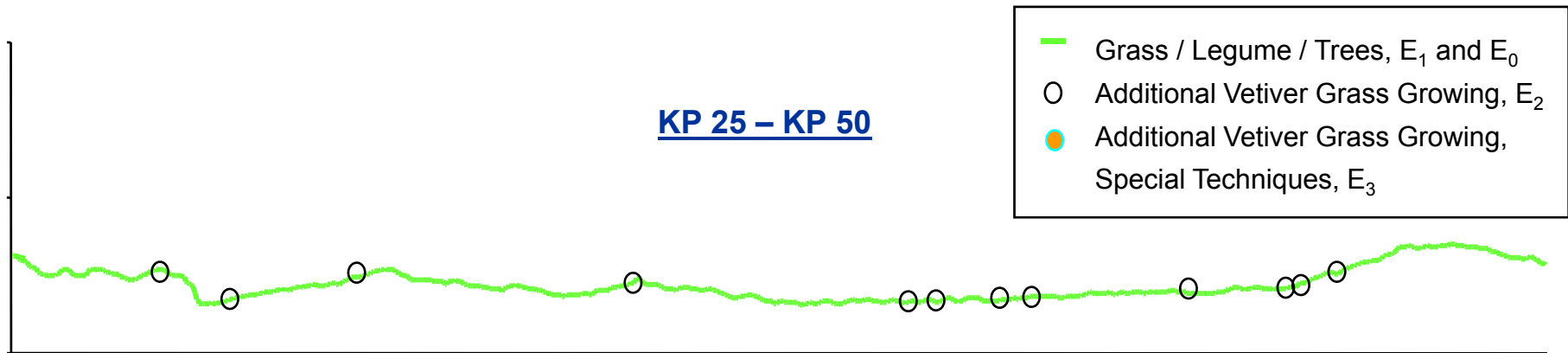
Ground Level (m)

KP 0- KP 25



Ground Level (m)

KP 25 – KP 50





Physical Permanent Erosion Control Structure with Agronomic and Revegetation Erosion Control



KP 19 + 900: March 1998



KP 19 + 900: January 1999



KP 19 + 900: October 1999





The Application of Engineering and Botanical Techniques with Vetiver Grass Slip Planting Positioning



KP 12 + 280: July 1997



KP 12 + 280: September 1999



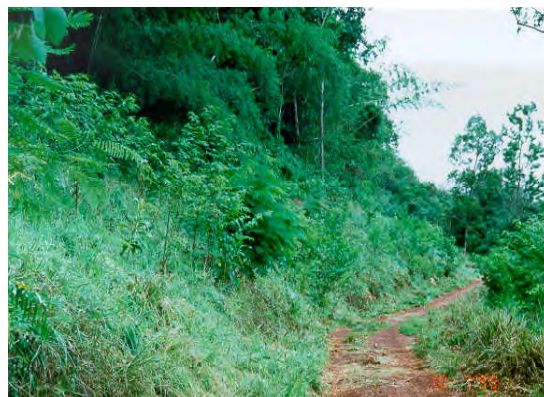
The Application of Engineering and Botanical Techniques with Vetiver Grass Slip Planting Positioning



KP 46 + 300: December 1997



KP 46 + 300: July 1998



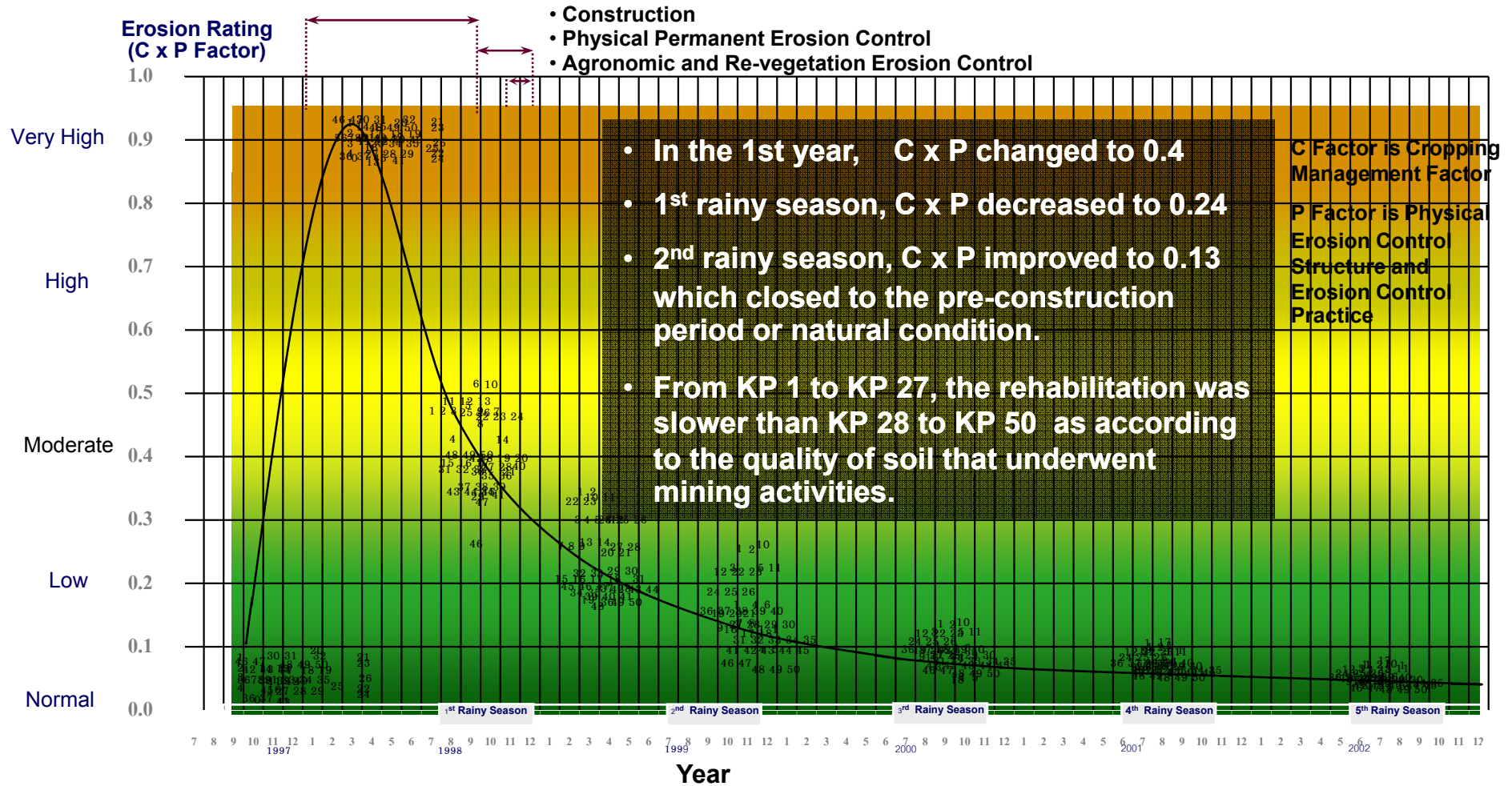
KP 46 + 300: January 1999



KP 46 + 300: October 1998



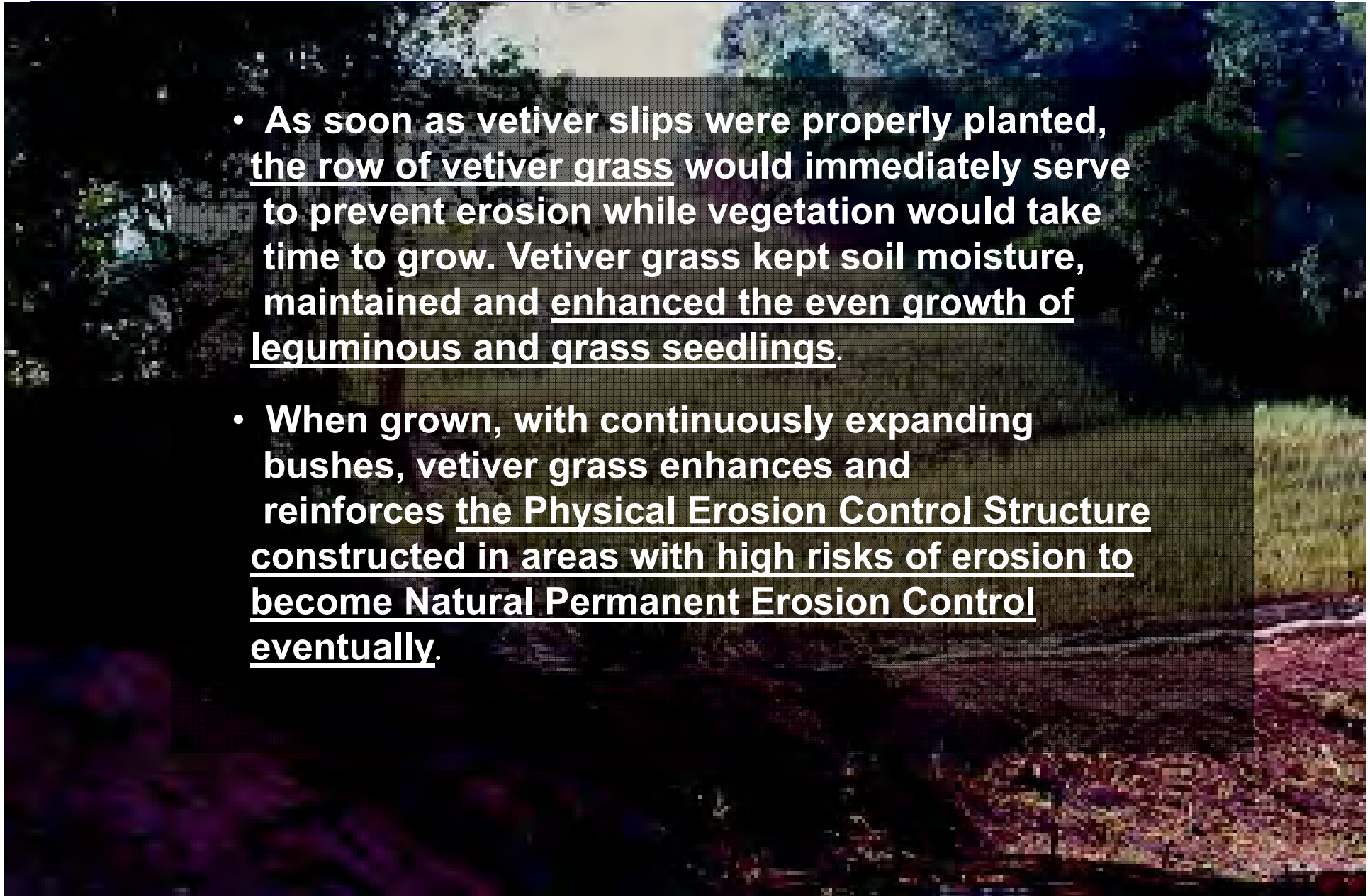
Rehabilitation performance i.e. multiplication results of the C and P Factor for each KP as of the end of the first and second rainy seasons





Significant Role of Vetiver Grass

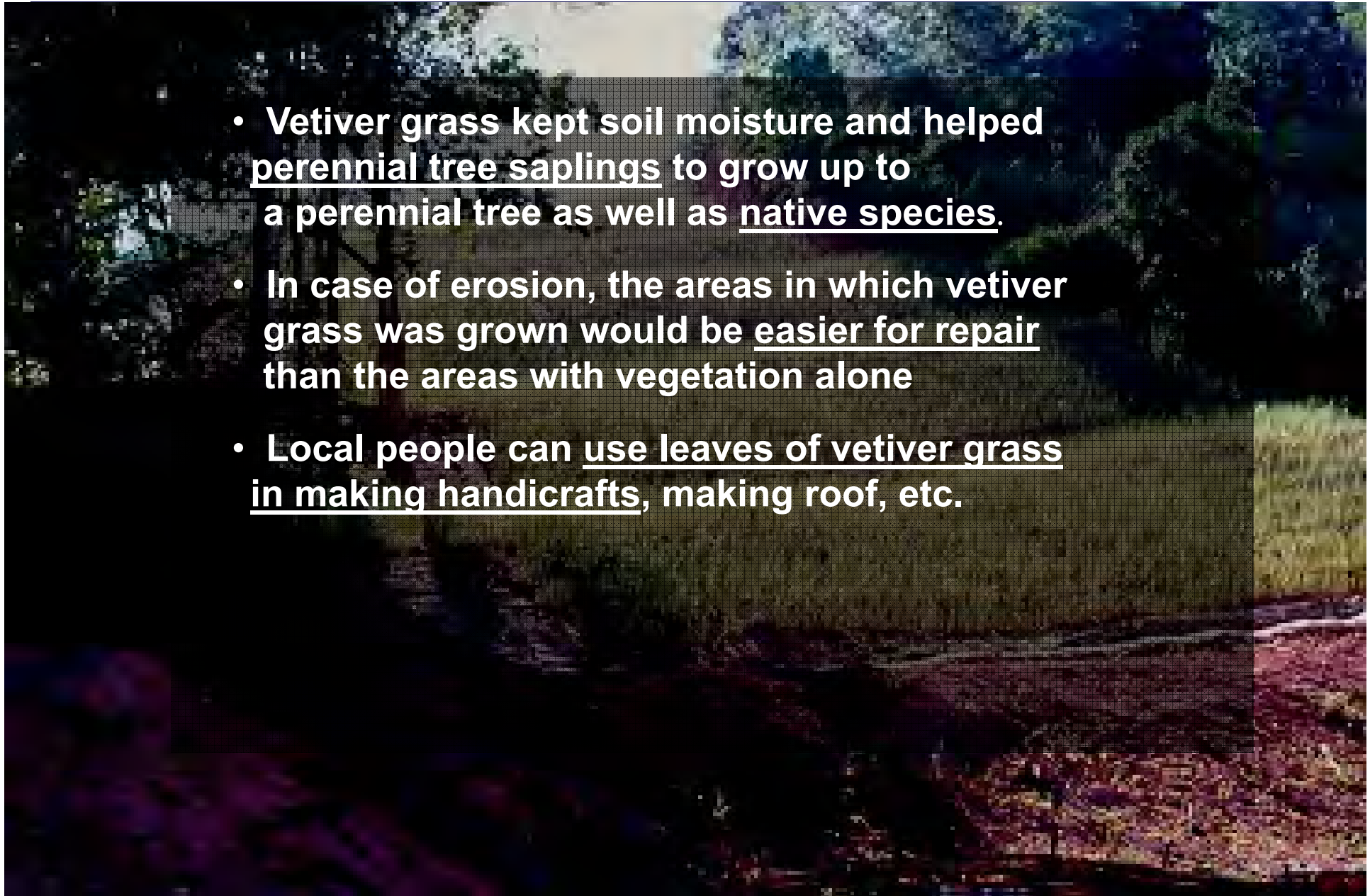
- **As soon as vetiver slips were properly planted, the row of vetiver grass would immediately serve to prevent erosion while vegetation would take time to grow. Vetiver grass kept soil moisture, maintained and enhanced the even growth of leguminous and grass seedlings.**
- **When grown, with continuously expanding bushes, vetiver grass enhances and reinforces the Physical Erosion Control Structure constructed in areas with high risks of erosion to become Natural Permanent Erosion Control eventually.**





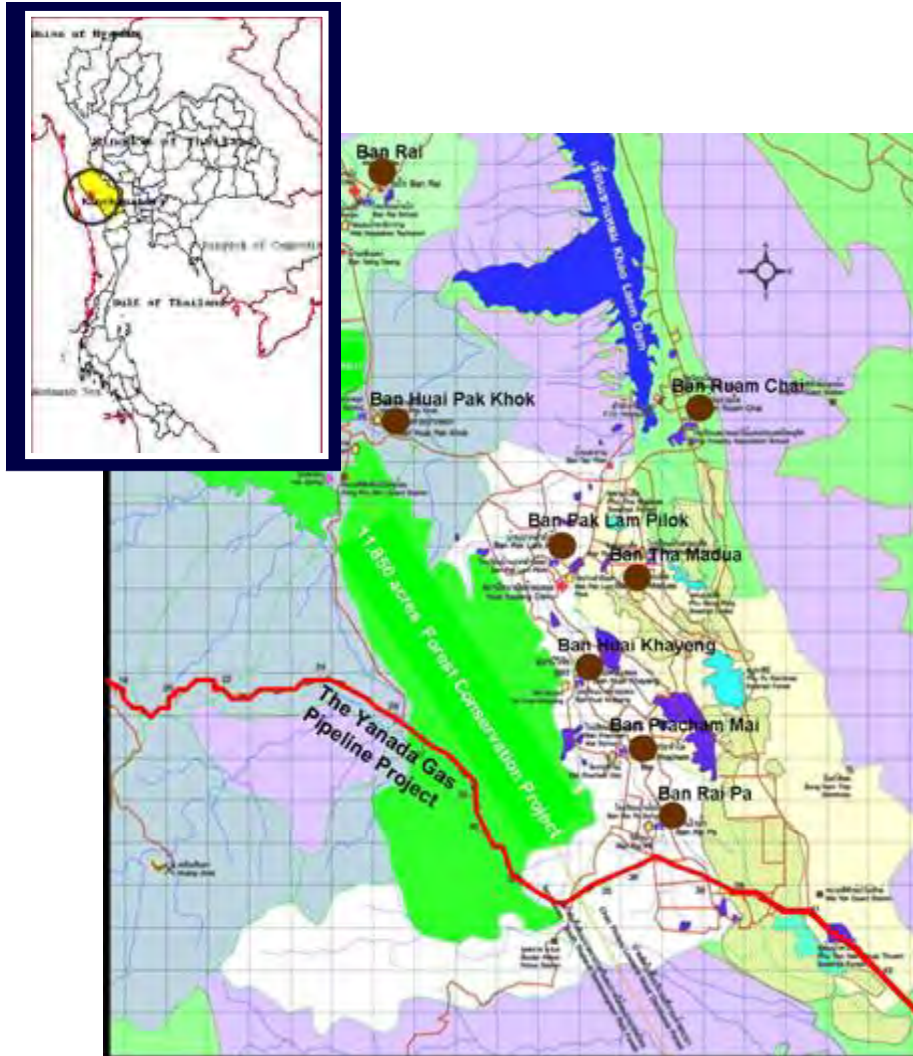
Significant Role of Vetiver Grass

- Vetiver grass kept soil moisture and helped perennial tree saplings to grow up to a perennial tree as well as native species.
- In case of erosion, the areas in which vetiver grass was grown would be easier for repair than the areas with vegetation alone
- Local people can use leaves of vetiver grass in making handicrafts, making roof, etc.



- **Company profile**
- **The use of vetiver grass system for erosion control and slope stabilization along the yadana gas pipeline project right of way**
- **Huay Khayeng, Thailand vetiver cultivation exemplar**
- **The vetiver development and promotion as initiated by His Majesty the King Contest**
- **Conclusion**

Huay Khayeng Community



- **Villages :** Comprised of 8 villages, 10 communities, and totaling 1,315 households (8,457 people)
- **Location:** Limestone mountain terrain 300 meters above sea level; 10 km. from the Thailand-Myanmar border,
- **Occupation:** Predominantly husbandry, i.e. rice, cassava, corn, livestock, etc.; modest labor force
- **Economic status:** Virtually destitute due to ineffective agricultural means; average income equals 12,200 Baht/person/year (2004)



Vetiver Cultivation : Problems and Rationale

- **In response to His Majesty the King's wish to encourage people to grow vetiver for soil and water conservation, PTT initiated full-scale publicity statewide.**
- **Publicity to communities presents a daunting task as benefits from soil and water conservation do not yield immediate results.**
- **Introducing vetiver to local people may amplify existing burden**
- **Vetiver does not yield “instant value”; benefit from soil and water conservation requires time and a high level of management to be sustainable.**



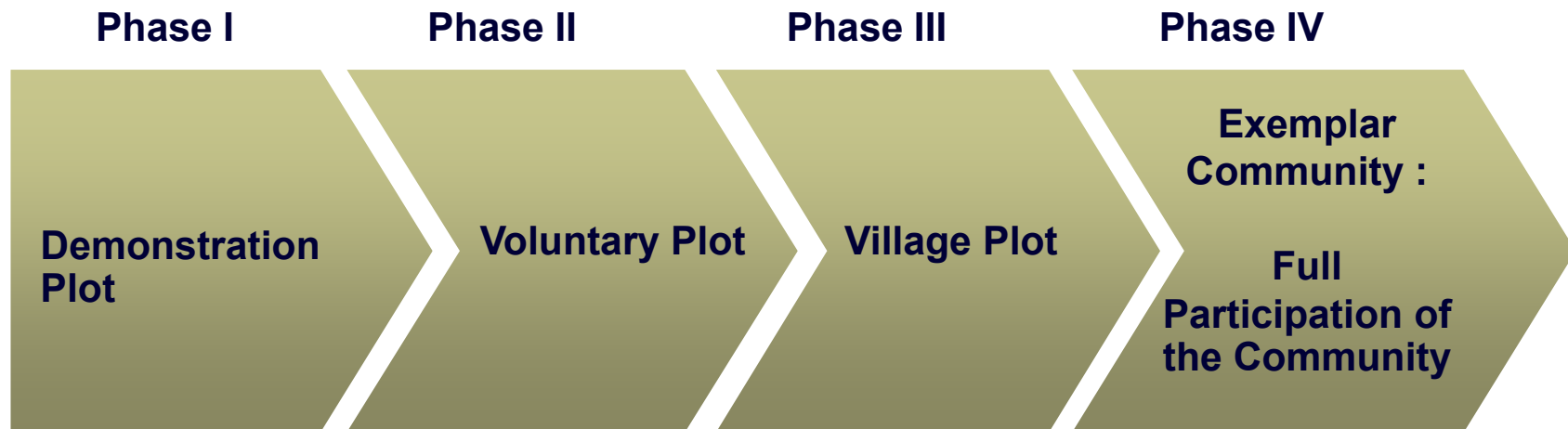
Implementation Strategies

- **The Participatory Process: Promotes mutuality in mentation and practice.**
- **Creating internal desire -- “inside-out” – and on a voluntary basis.**
- **Utilizing the “Sufficiency Economy Family” program as an incentive.**
- **Initiating case studies in vetiver, soil, and water conservation through first- hand accounts of cultivation benefits.**
- **Organizing vetiver- cultivation contests with a royally bestowed award as an inducement to communities to satisfy royal initiative**



Vetiver Growing Promotional Effort

4 Implementation Phases:





Phase I : October 2003 – December 2004



Inspirational Forum



Demonstration Field



Vetiver Growing Day

Inspirational Forum

- Illustration of benefits in vetiver cultivation
- Demonstration of vetiver cultivation on a plot specified by the community.



Phase II : January – September 2005



Home delivery



Introduction of development patterns and utilization of vetiver leaves



Observed guidance and consultation



- PTT fosters vetiver cultivation among willing villagers in their own fields.
- Officers are delegated to villages.
- Villagers offered first directives in self-sufficiency through a multitude of incentives.
- Study tours are organized to thriving vetiver areas with observed guidance and consultation.



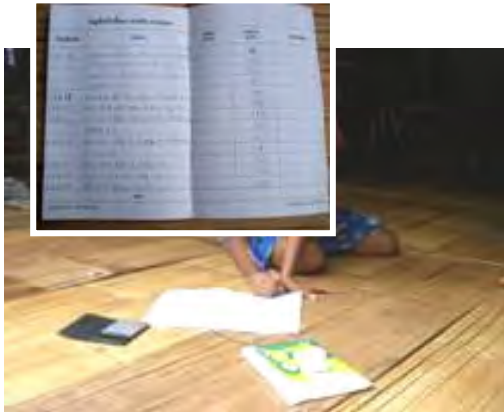
Phase III : October 2005 – February 2006



Community leader council meeting



Heightened registration of vetiver growing



Children helping with income and expense account (top left corner) everyday, sufficiency economy



Families of Sufficient Economy

▪ Encompassed the following criteria:

▪ Each household participating in the project had a responsibility to:

- Cultivate vetiver grass
- Cultivate vegetables
- Regularly save money (one baht a day)
- Abstain from drinking on religious (Buddhist) days
- Explicate family expenses

▪ Binding households are then given the option of 5 hens or 1 pig or catfish within a budget equivalent to 900 baht per family. The number of participants rose from 55 households in the 2nd Phase to 250 in the 3rd Phase.



Phase IV : March – December 2006



Raise laying hens for individual sustenance



Raise pigs for incremental income



Monitor vetiver development

- **Foster further participation in every village to grow vetiver.**
- **Select model households who have successfully applied vetiver for soil and water conservation utilizing the technical principles as prescribed in an efficient manner.**
- **Facilitate understanding within the community regarding the diversified benefits of vetiver, i.e. production expense reduction, soil and moisture preservation, higher yields of produce, etc.**



Huay Khayeng , Thailand Vetiver Cultivation Exemplar

- **Over 593 community households grew vetiver in this project; about 45% grew vetiver over 2.4 million slips (June 2006)**

- **Results:**
 - **An income and expense account is established in every participating household, facilitating introspection, expense reduction, and income increase.**
 - **Economized production expenses e.g. water, fertilizer, insecticide**
 - **Instilled plant pathology pedagogy, i.e. plants can grow well without fungus**
 - **Soil conservation achieved through change by reversal in no-quality soil to quality and reduction of soil surface deprivation esp. in slope areas!**



Community Success Stories

Mr. Sumitr Ming-Khwan, 52 years old

“Now, I understand that the benefits from growing vetiver are soil and water conservation, soil surface preservation, reduction of soil surface wash. Vetiver can prevent soil surface from caving in.”



Mr. Boonniam Duanjan, 52 years old

“My house is on a slope area. After growing vetiver, I found that; firstly soil doesn’t cave in; secondly, nearby plants are rich, able to absorb water well; thirdly, the cut vetiver leaves used to cover soil are turned into fertilizer; fourthly, covering on vegetable plantation, soil will be moistured.”



Community Success Stories



Mr. Khanchit Janpanya, 34 years old

“Now, after growing vetiver, soil condition is recovered. I can feel it’s alive. It’s getting blacker and won’t flow away. Covering soil with vetiver leaves has rehabilitated its condition, with the return of microorganism. Vetiver can hold soil together well and can be used as fences to keep animals such as hens away.”

Mr. Rueang Plongjit, 68 years old

“Vetiver can considerably reduce expenses e.g. water, electricity from over 200 baht to 100 baht.”





Community Success Stories

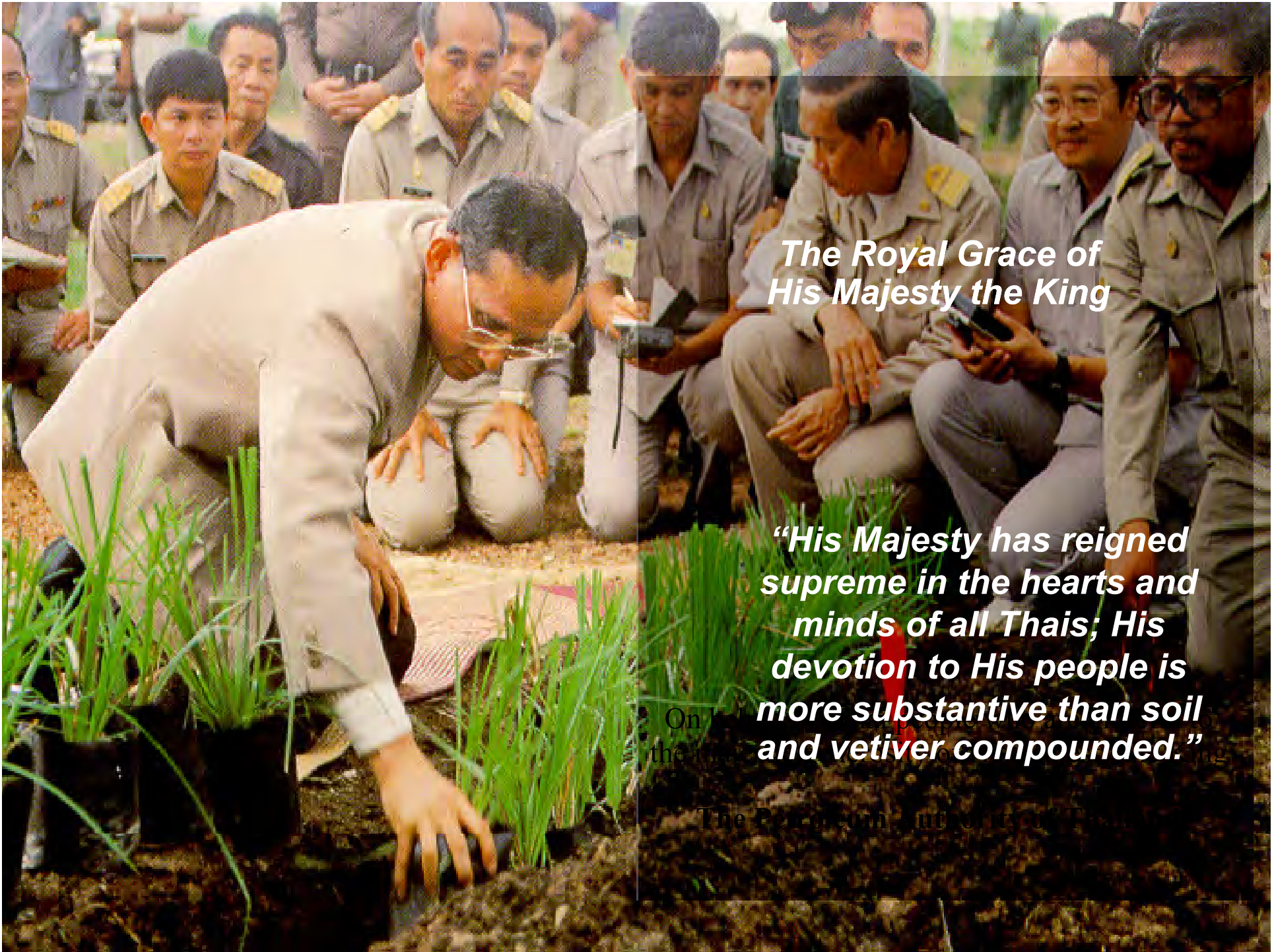
Mr. Jamlong Maneerat, 43 years old

“This year, vetiver has grown a lot. I can see soil moisture with higher looseness. Manure used is reduced by half from 5 tons per month.”



Mr. Khamsaeng Meetha, 48 years old

“After growing vetiver, vegetable plantation has more moisture. Around the vetiver thicket, soil condition is better than other areas.”



*The Royal Grace of
His Majesty the King*

*“His Majesty has reigned
supreme in the hearts and
minds of all Thais; His
devotion to His people is
more substantive than soil
and vetiver compounded.”*

The Perfection of Virtue

- **Company profile**
- **The use of vetiver grass system for erosion control and slope stabilization along the yadana gas pipeline project right of way**
- **Huay Khayeng, Thailand vetiver cultivation exemplar**
- **The vetiver development and promotion as initiated by His Majesty the King Contest**
- **Conclusion**



The Vetiver development and promotion as initiated by His Majesty the King Contest



To commemorate His Majesty's optimizing vision of the use of vetiver grass, PTT, in collaboration with other related agencies, has launched Vetiver Grass Cultivation Program to honor HM the King on the auspicious occasion of the Sixtieth Anniversary Celebrations of His Majesty's Accession to the Throne.

In response to HM the King's initiative and concern towards His people's well-being, the program focal areas are

- Educating of the grass properties, the cultivating, and the promoting of vetiver grass cultivation through the public.
- Arranging the Vetiver Grass Cultivation Contest with 3 categories; Vetiver Plantation, Promote of Vetiver Plantation and Poster



The Vetiver development and promotion as initiated by His Majesty the King Contest

In 2007, the contest was continuously organized with the new project name of “The Vetiver Grass Development and Promotion as Initiated by His Majesty the King Contest” in compliance with The 4th Vetiver Grass Development and Promotion As Initiated by His Majesty the King Master Plan (2007-2011) of RDPB.

This year’s contest was categorized into 3 topics which were

- Vetiver plantation**
- Promotion of vetiver plantation**
- Products from vetiver focusing on product design and/or creativity.**

The total of 420 pieces have been submitted

- | | | |
|--|------------|---------------|
| - Vetiver plantation | 184 | pieces |
| - Promotion of vetiver plantation | 24 | pieces |
| - Products from vetiver focusing on product design and/or creativity. | 209 | pieces |

The 53 pieces awarded and 29 first prizes won the plates of token given from His Majesty the King.



The Vetiver development and promotion as initiated by His Majesty the King Contest

Vetiver Plantation Category (Public Agency) : 1 agency has been awarded



พื้นที่ ๒๕๕๕ ไร่



ปลูกรอบขอบแปลง



ขจัดวัชพืชมั่ว

องค์การบริหารส่วนตำบลเมืองคอง
หมู่ ๓ ตำบลเมืองคอง อำเภอราษีไศล จังหวัดศรีสะเกษ 33160

จุดเด่นผลงาน:

-อบต. เมืองคอง ได้รับการสนับสนุนพัฒนาแหล่งน้ำในปี 2548 แต่เมื่อมาสำรวจก็พบว่าดินที่จะปรับปรุงทำปอน้ำเป็นดินปนทราย แม้ขุดบ่อ ก็จะเกิดการพังทลายของดิน ขอบบ่อ จึงนำหญ้าแฝกเข้ามาปลูกบริเวณขอบบ่อ และทำแปลงขยายพันธุ์เพื่อใช้ในการซ่อมแซมและสำหรับแจกจ่ายให้เกษตรกรที่สนใจ

พื้นที่ที่ดำเนินการปลูกหญ้าแฝก: กำหนดสองหัวสิง หมู่ 12 และแหล่งน้ำขนาดเล็ก เพื่อสาธารณสุขประโยชน์

จำนวนพื้นที่ปลูกหญ้าแฝก

- ปลูกรอบขอบแหล่งน้ำ เนื้อที่ 60 ไร่ จำนวน 3 แถวๆ ละ 1.5 กิโลเมตร
- ปลูกสองข้างขอบถนนบริเวณโครงการ รวมระยะทางประมาณ 6 กิโลเมตร
- ปลูกสองข้างร่องระบายน้ำ รวมระยะทางประมาณ 4 กิโลเมตร

รวมระยะทางที่ปลูกประมาณ 16.5 กิโลเมตร ใช้กล้าแฝกแบบเป็ลือยราก รวมกว่า 2 แสนกล้า

พันธุ์หญ้าแฝกที่ปลูก: สงขลา และร้อยเอ็ด

เริ่มดำเนินการปลูก: กรกฎาคม 2548

ผลที่เกิดขึ้นหลังจากการดำเนินงาน: ใช้ใบหญ้าแฝกแทนฟางข้าวในการคลุมแปลงปลูกพืชผัก มีแปลงขยายพันธุ์ และขายกล้าหญ้าพันธุ์ให้สำนักงานพัฒนาที่ดินศรีสะเกษ



The Vetiver development and promotion as initiated by His Majesty the King Contest

Vetiver Product Category (Decoration) : 13 products have been awarded



“ดอกไม้ทะเล”
แจกันและถาดใส่ของ
โดย นายนพชัย ภูจักรเกษม
จ.ปทุมธานี



“ตุ๊กตาหญิงไทย”
โดย นางนงนุช แก้วเรือนดี
จ.เชียงใหม่



“แจกันสานสายน้ำไหล”
โดย นางบุญเสก สภาแก้ว
จ.สุโขทัย



The Vetiver development and promotion as initiated by His Majesty the King Contest

Vetiver Product Category (Decoration) : 13 products have been awarded



“โคมไฟ กินทร์” โดย
นางสาวเบญจมาศ วัชชัย
จ.เชียงใหม่



“หอคำ” โดย
นางบุญถึง ฤทธิ์เกิด
จ.นนทบุรี



“แจกันสานสายดอกพิกุล”
โดย นางวันทา ดาวกรุง
แก้ว จ.สุโขทัย



“โอ่งน้ำสานสายสอง
สลัปลี” โดย
นางเทียม เนยสูงเนิน
จ.สุโขทัย



The Vetiver development and promotion as initiated by His Majesty the King Contest

Vetiver Product Category (Decoration) : 13 products have been awarded



“น้ำเต้านसान” โดย
นางเพลิน จงเจริญ
จ.สุโขทัย



“แจกันและภาตผลไม้” โดย
นางพรรณพร ชาญภิญโญ
จ.กรุงเทพฯ



“มู่ลี่ตุ๊กตาหญ้าแฝก”
โดย นางสาวนัชพร บุคสิงหา
จ.อุดรธานี



The Vetiver development and promotion as initiated by His Majesty the King Contest

Vetiver Product Category (Decoration) : 13 products have been awarded



“ควายชิงวิ่งยกล้อ”
โดย นายพีชิต คลังวิจิตร
จ.นนทบุรี



“เรือนไทย” โดย
นายประศาสน์ พรมสุวรรณ
จ.อ่างทอง



“กรอบรูป”
โดย นางนงนุช แก้วเรือนดี
จ.เชียงใหม่



The Vetiver development and promotion as initiated by His Majesty the King Contest

Vetiver Product Category (Household Application) : 13 products have been awarded



“เก้าอี้ ช้างไทย”
โดย นายอิทธิพล มหารวัน
จ.เชียงใหม่



“เบาะนั่งและหมอนหนุน”
โดย นางนุริต บุตรวงษ์
(กลุ่มแม่บ้านเกษตรกรบ้าน
โสน) จ.ศรีสะเกษ



“เด็กดอย ตะกร้าใส่ผ้า”
โดย นางสาวอัจฉราภรณ์
ยอดคีรี จ.กรุงเทพฯ



The Vetiver development and promotion as initiated by His Majesty the King Contest

Vetiver Product Category (Household Application) : 13 products have been awarded



“ม้านั่งทรงไข่” โดย
นางสาวปรีดา แตรวิจิตรศิลป์
จ.กรุงเทพฯ



“โถเอนกประสงค์”
โดย นางสาวนฤดี ภูรัตนรักษา
จ.กรุงเทพฯ



“ก้อนดินหญ้าแฝก”
โดย นายธรรมบุญ เสงษ์ภูิกุล
จ.กรุงเทพฯ



“เบาะรองนั่งรถยนต์”
โดย วิทยาลัยเทคนิคจันทบุรี



“ตะกร้าปรับความสูงได้” โดย
นางสาวเสาวลักษณ์ ก่อศักดิ์วัฒนา
จ.กรุงเทพฯ



“ชุดพานพุ่ม”
โดย กฤษณา กุณาศล



The Vetiver development and promotion as initiated by His Majesty the King Contest

Vetiver Product Category (Household Application) : 13 products have been awarded



“กระเป๋้า”
โดย นางจินต์ เทพกำเหนิด จ.นราธิวาส



“ตะกร้าสานลายดอกพิกุล”
โดย นางหรร่อน่า เหนี้ยดบุตร จ.กระบี่



“กล่องของขวัญ”
โดย นางสาวชื่นชม ศกพิชญ์นาม จ.ชลบุรี



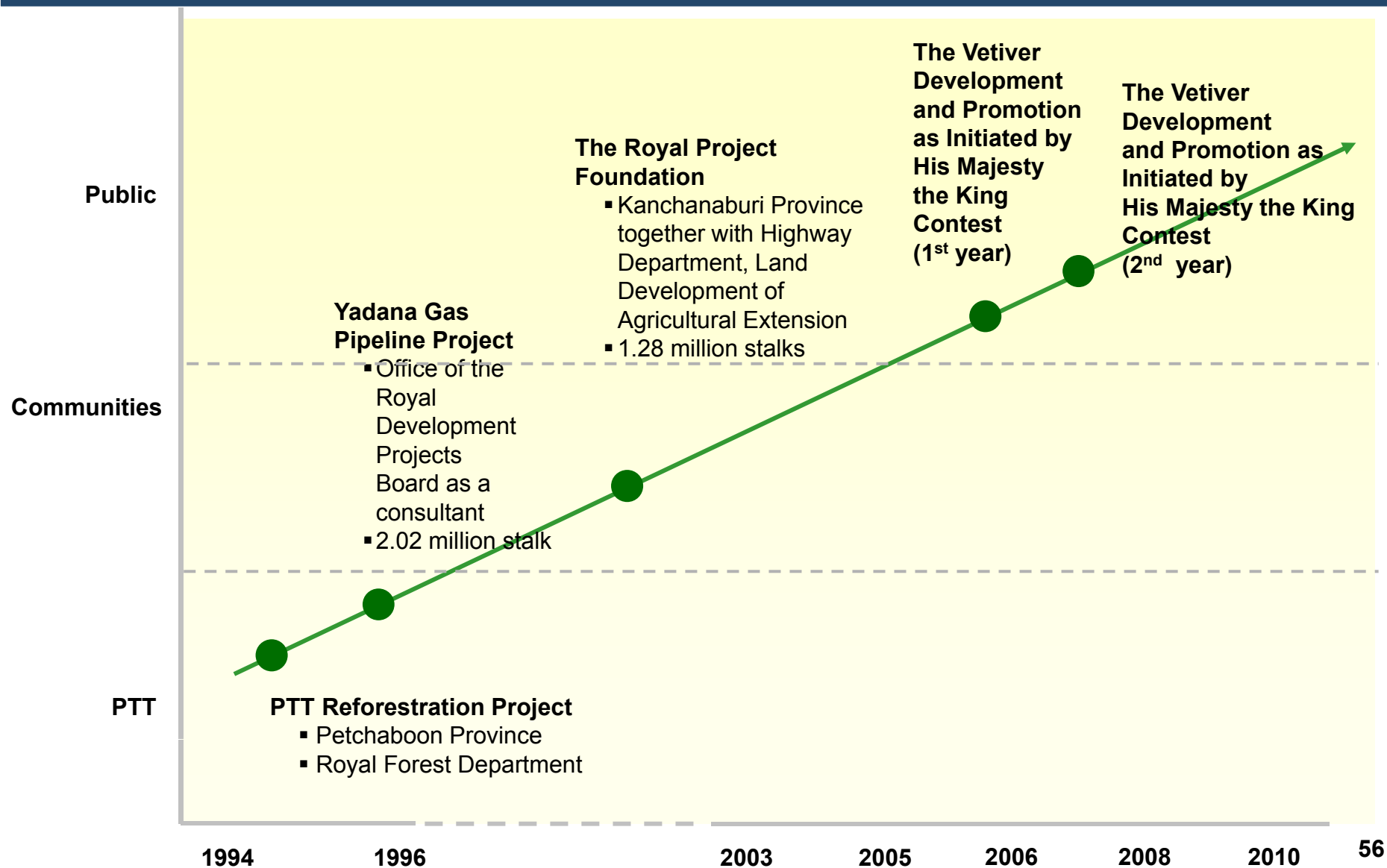
“เสื่อม้วน” โดย นายศักดาดี ป่องทอง และ
นายวัชรพงศ์ สิทธิมาตย์ จ.อุดรธานี

- **Company profile**
 - **The use of vetiver grass system for erosion control and slope stabilization along the yadana gas pipeline project right of way**
 - **Huay Khayeng, Thailand vetiver cultivation exemplar**
 - **The vetiver development and promotion as initiated by His Majesty the King Contest**
- **Conclusion**



Conclusion

Details of an overviewed vetiver planting activities by PTT





Thank you