

Study on Vetiver Grass Planting in Problem Soils and Spatial Database Performed in the Office of Land Development Area



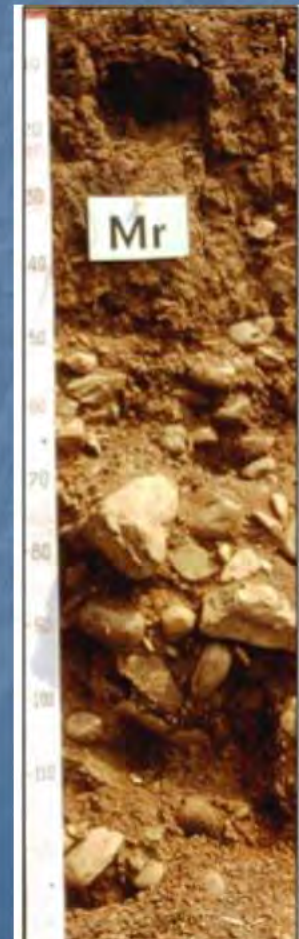
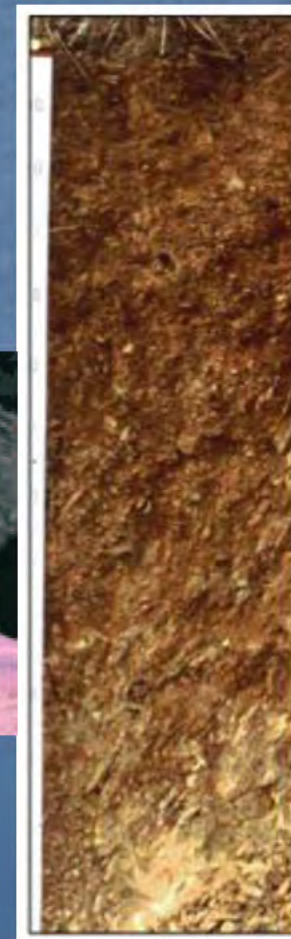
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Introduction

Five types of problem soils, i.e. salt affected soils, sandy soils, shallow soils, acid sulfate soils, organic soil and soil with more than 35 percent of steepness covered 15,361,117.44 hectares (LDD, 2004).



Introduction

- Problem soils are not suitable for cultivating as well as land which cannot be utilised.
- The most effective solution to the problem of soil erosion is by conservation of soil and water with combination of vetiver grass planting.
- The vetiver grass assists in slowing down the ground water flow which causes the soil to erode and keeping soil particles and organic matters with it, can be utilised for soil quality improvement in either uplands or lowlands, assists in keeping soil moistness and helps reduce pollutions in the environment (LDD, 2007).



**High Land
Area**

Objective

This survey research collects vetiver grass planted in problem soils and a spatial database is created, based on soil information found in the areas of responsibility of LDD6.



Scope of Study

- Survey of vetiver grass on problem soils.
- Collect soil group data in the areas of responsibility of LDD6.
- Collect vetiver grass distribution data.
- Create spatial database of vetiver grass planting area.
- Educating on how to plant and nurture vetiver grass corresponding with problem soils should be offered to people more seriously.

Study area

The areas of responsibility of LDD6

- Chiang Mai Land Development Station
- Lampang Land Development Station
- Lamphun Land Development Station
- MaeHongSon Land Development Station
- The Royal Project's Land Development Center

Study period

3 years (October, 2008 - September 2011)

Materials and Methods

Phase 1 : Preparation

- Study area selection within the responsibility of LDD6 (4 stations and 1 Center, 4,982,800 hectares)
- Data Collection ;
 - Soil group ; colour, upper and lower content, depth, drainage, topography, problems of soils in the studied sites, and problem soil contents and sites.
 - Vetiver grass distribution ; grass varieties, no. of distribution and distributor organisations.

Study vetiver grass characterization



Materials and Methods

Phase 2 : Vetiver grass survey

- Varieties of vetiver grass, cultivating patterns, and methods of utilisation were collected by random sampling.
- Recorded and classified by their varieties, cultivating patterns, number of distributed grass in each site and comparative survival rates.
- Samples of soils were randomly collected and analysed for their chemical properties , i.e. soil reaction and fertility.
- The information was scrutinised in details for correctness before importing to the database.

Conditions of study

- Soil group ; MaeRim, BanChong, DoiPui and Li series and etc.
- Topography ; Lowland between mountainous area, High land (with and without S&W)
- Soil reaction (pH) ; rather acid to neutral
- Vetiver grass data gathered from 2004 to 2,007.
- Surveying by random from farmers or interested individuals who had been distributed vetiver grass more than 10,000 sprouts.

Soil profile



DoiPui series (high land area, red) and MaeRim series (shallow soil)

Pattern of planting



Planting around the ponds



Prevent soil slide into the pond

Planting in soil and water conservation





Planting in School



**Planting in school at Phrao district ;
cutting, utilized vetiver leaf as
compost and cover
for soil moisture protection.**



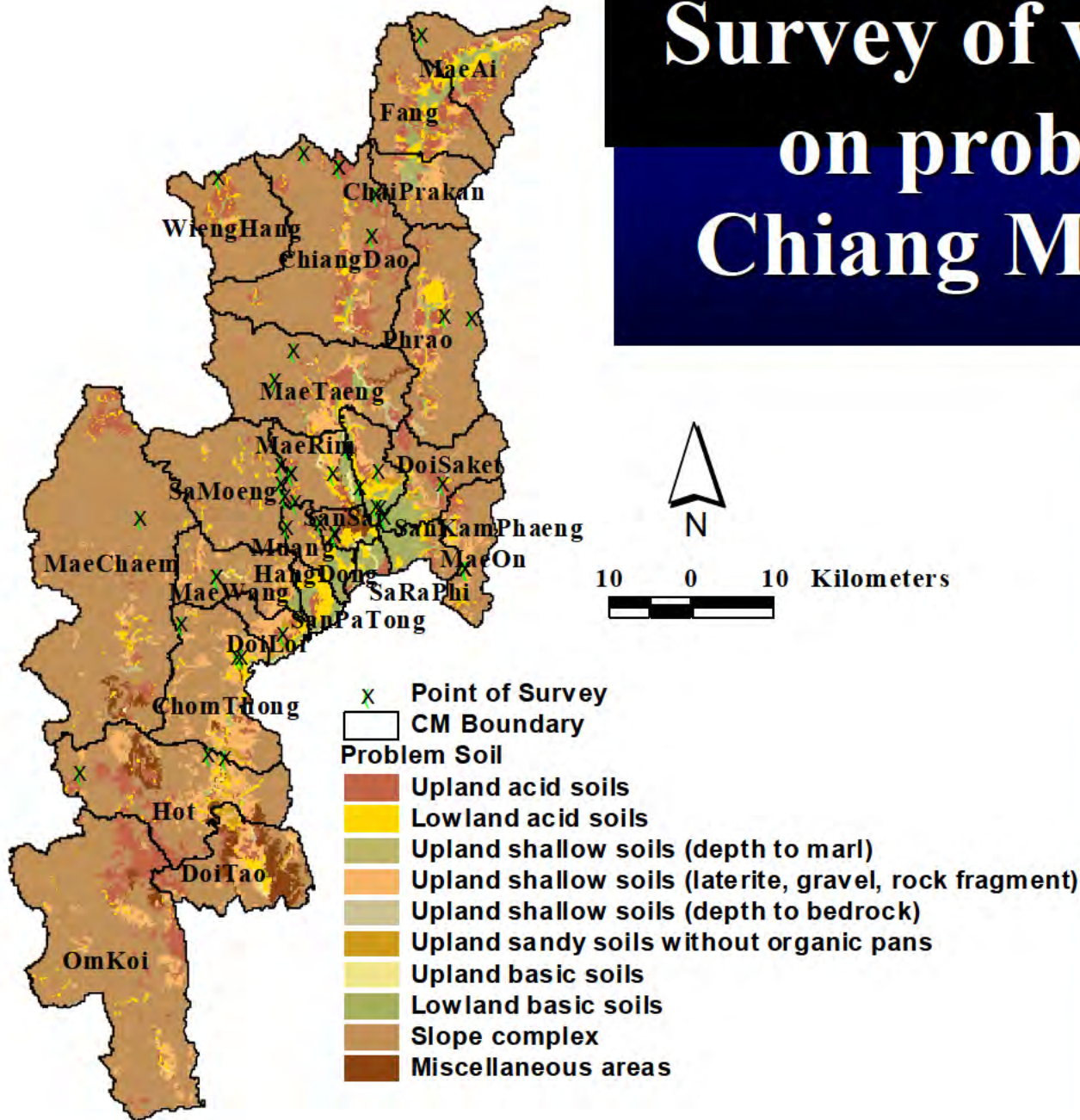
Planting at Ban Sang MaeRim district, Mae Hae varieties and MaiHuayWai as transplanting beds, natural fence, along the roads and make value added product.

Materials and Methods

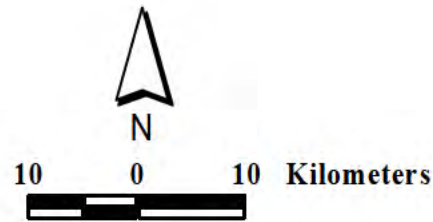
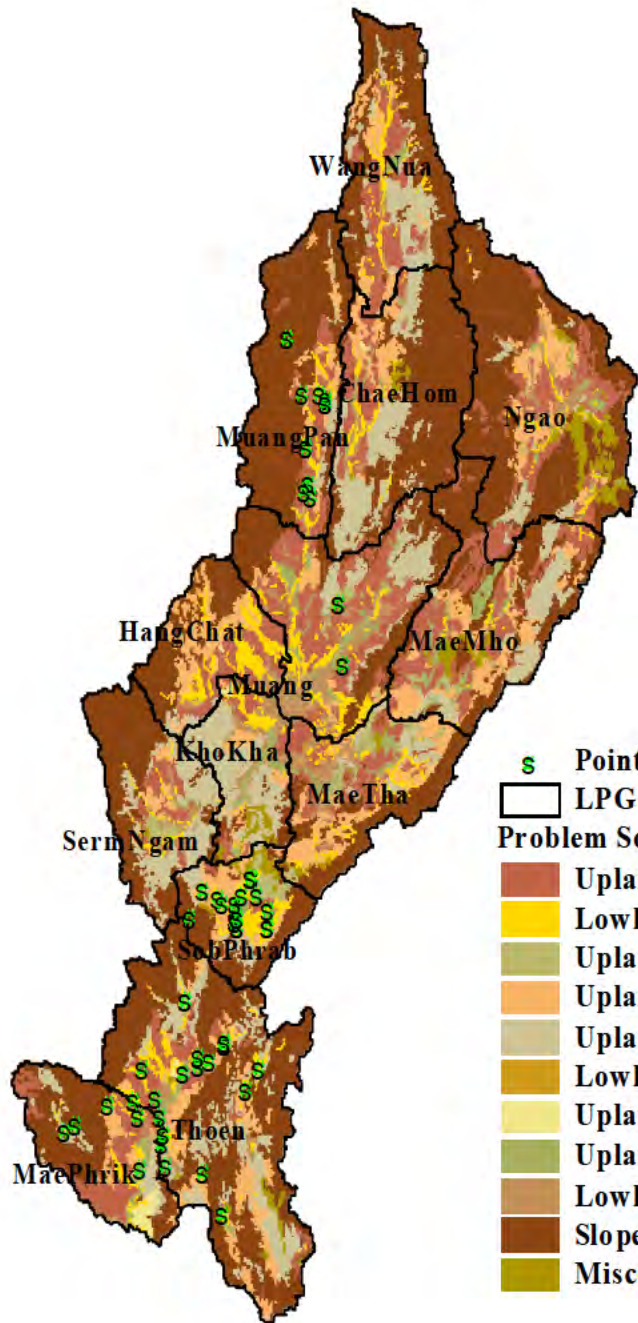
Phase 3 : Data analysis and distribution














- The analysis was conducted by correlating the soil data with the vetiver grass data in the GIS.
- The correlated data sets were proved for correctness and created in a spatial database .
- Distributed map and data to interested individuals.

Survey of vetiver grass on problem soils, Chiang Mai province

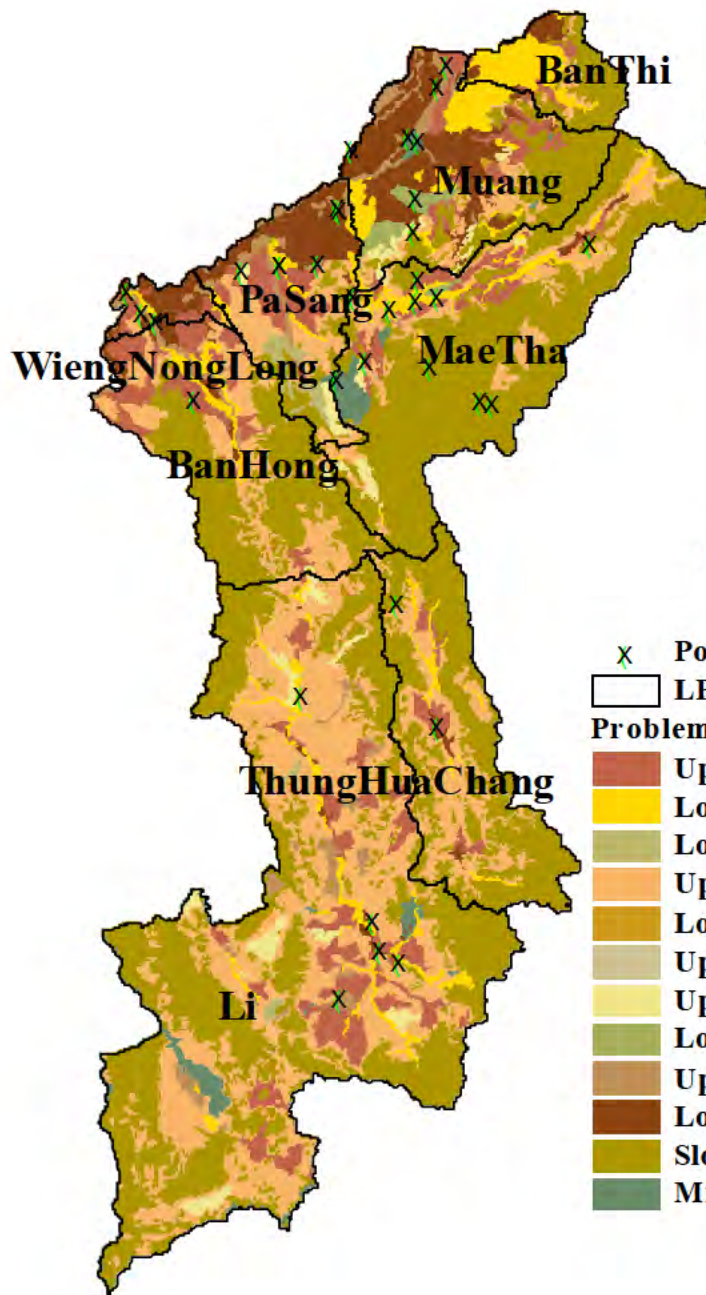


Survey of vetiver grass on problem soils, Lampang province



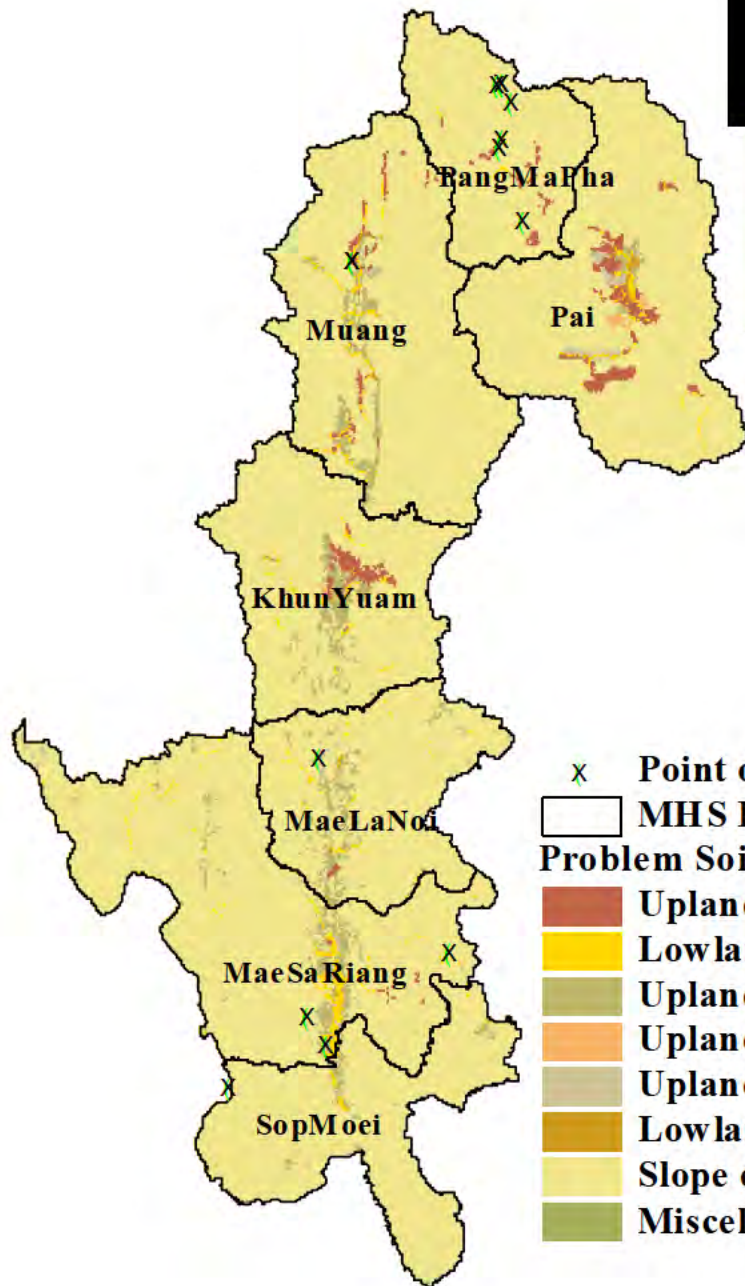
-  Point of Survey
-  LPG Boundary
- Problem Soil**
-  Upland acid soils
-  Lowland acid soils
-  Upland shallow soils (depth to marl)
-  Upland shallow soils (laterite, gravel, rock fragment)
-  Upland shallow soils (depth to bedrock)
-  Lowland shallow soils (laterite, gravel)
-  Upland sandy soil without organic pans
-  Upland basic soils
-  Lowland basic soils
-  Slope complex
-  Miscellaneous areas

Survey of vetiver grass on problem soils, Lamphun province

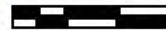


- x Point of Survey
- LPN Boundary
- Problem Soil**
- Upland acid soils
- Lowland acid soils
- Lowland shallow soils (depth to marl)
- Upland shallow soils (laterite, gravels, rock fragment)
- Lowland shallow soils (laterite, gravels)
- Upland shallow soils (depth to bedrock)
- Upland sandy soils without organic pans
- Lowland sandy soils
- Upland basic soils
- Lowland basic soils
- Slope complex
- Miscellaneous areas

Survey of vetiver grass on problem soils, Mae Hong Son province



10 0 10 20 Kilometers



- x Point of Survey
- MHS Boundary
- Problem Soil**
- Upland acid soils
- Lowland acid soils
- Upland shallow soils (laterite, gravel, rock fragment)
- Upland sandy soils without organic pans
- Upland basic soils
- Lowland basic soils
- Slope complex
- Miscellaneous areas

Correlations of vetiver grass with soil data

	Chiang Mai	Lampang	Lamphun	MaeHongSon
Soil group	62 / 5 (Hd-sic1A) / 48 (Mr)	35 (Hc) / 48 (Mr)	40 (Sp-s1B) / 48 (Mr-g-gslC)	62 / 48 (Mr)
Limitations	Steep Slope, high erosion / Low fertility prolonged inundation / shallow soil, sandy soil	Low fertility, slope prone to be eroded easily / shallow soil	Sandy soil prone to be eroded easily / shallow soil	Steep slope, high erosion/ shallow soil
Densely found areas	Mae Rim, Samoeng, Mae Wang, Mae Ai, Doi Saket, Fang, Chom Thong, Hot, Mae Chaem, Muang, Saraphi, San Pa Tong, San Kamphaeng, Mae Rim, Hot	Hang Chat, Mae Phrik	Ban Hong, Li	Pang Mapha, Mae Sariang, Sop Moei, Khun Yuam / Khun Yuam, Mae La Noi
Vetiver grass varieties	Sri Lanka, Mae Hae, Royal-bestowed	Royal-bestowed	Sri Lanka	Sri Lanka
Survival rate	Relatively high/ Relatively high/ Relatively low	Relatively high/ Fair	Relatively high	Fair / High

Varieties and survival rate of vetiver grass

Grower	Varieties	Survival rate (%)	Varieties	Survival rate (%)	Varieties	Survival rate (%)	Varieties	Survival rate (%)
1. Soil Doctor volunteers	Sri Lanka	77	Royal-bestowed	83	Sri Lanka	85	Sri Lanka	86
2. Farmers	Sri Lanka	58	Royal-bestowed	60	Sri Lanka	61	Sri Lanka	46
3. Academic institutions	Sri Lanka	45	Royal-bestowed	70	Sri Lanka	60	Sri Lanka	43
4. Centres / stations of Royal Initiative Project	Sri Lanka, Mae Hae, Royal-bestowed	91	-	-	-	-	Sri Lanka	84
5. Land development learning centres	-	-	Royal-bestowed	88	-	-	-	-
6. Municipality learning centres / public places	-	-	-	-	Sri Lanka	68	-	-
7. Others	Sri Lanka	73	Royal-bestowed	25	-	-	Sri Lanka	80
Average		68.8		65.2		68.5		67.8

Vetiver grass planting problems

- **Lack of knowledge in planting and nurturing (Low survival rate)**
 - **Planting in unsuitable area and wrong planting**
 - **Lack of water in the beginning or cultivation**
 - **No nurturing after planting**
 - **Leave sprout dry longer before planting**



No cutting, w/o weed control, misunderstand planting, burning



Planting problems in school



Soil slide into the pond and vetiver grass strip also collapse,
planting w/o watering in beginning

Results and Discussion

- 5 types of growers: Soil Doctor volunteers (Mo Din volunteers), farmers, Royal Initiative Project's stations or centres, academic institutions, and others.
- Cultivation patterns ; Transplanting beds, in lines on slope in S&W
- The grass grown by academic institutions had the lowest survival rate (45 %).
- 3 land development stations distributed Srilanka. Lampang distributed the royal-bestowed and LDD in high land distributed both and MaeHae varieties.
- Knowledge transfer in cultivation and right nurturing would increase survival rate.
- Selection or transplanting of suitable varieties for particular sites.



Thank you for your attention

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