



### Socio-Economic and Marketing Sustainability under Alternative Development: Community Forest Conservation and Development

### Sapit Diloksumpun

Kasetsart University, Thailand

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### Socio-Economic and Marketing Sustainability under Alternative Development



# Sustainability: Social, Economic and Environmental Aspects



# **Past: Highland natural resources**



# Hill evergreen forest >> Degraded lands



# Past: Situations of the highland





# **Royal Visits**

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# **Royal visits**



- The Royal Project is one of initiated projects of H.M. the King Bhumibol, established in 1969
- The Royal Agricultural Station (RAS) Angkhang, Chiang Mai Province, was then established as the first station.
- The Royal Project Foundation was established in 1992







# ROYAL PROJECT FOUNDATION



#### Cr: Dr. Bunvong Thaiutsa

# **Objectives of the RPF**

- To eradicate opium poppy cultivation,
- To improve life quality of hill-tribe people
- To conserve and rehabilitate the watershed forests



# **HIGHLAND REFORESTATION**



# **PROJECT** 1981



And South and

# H.M. the King Bhumibol's Initiatives

- Cultivation of substitution forests
- Reservoirs through reforestation
- Cultivation of three kinds of trees for four benefits
- Creation of wet firebreak
- Reforestation without planting
- Land use initiatives
- Multi-species plantation initiatives



# **Highland Reforestation Project**

- Started in 1981 in collaboration with Kasetsart University, National Taiwan University and Taiwan Government
- Key exotic tree species native to Taiwan





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# **Highland Reforestation Project** Planting schemes

#### Scheme 4: Bamboo planting (Exotic & Native species) for multiple uses





Scheme 2:

1983-1999

Area expansion



Scheme 3: Exotic and native mixed stand 1991-1996 Exotic mixed stand "Village Forest Project"

Scheme 1: **Exotic monoculture** 

1982-1988 **Species trials and demonstration** 

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# **Evaluation of Highland Reforestation Project**

through Low Emission Support Scheme (LESS) by TGO

- Evaluation of the carbon sequestration in biomass and soil of the reforestation after 34 years of planting
- Evaluation of its economic, social and environmental co-benefits providing ecological services



# **Reforestation area**

- Total station area 1,260 ha
- Reforestation area
  - Exotic monoculture 28.43 ha
  - Exotic mixed stand 61.40 ha
- Exotic and native mixed stand 27.73 ha
  - Bamboo planting 13.64 ha
- Reforestation area (excluding bamboo planting) <u>117.56</u>
   <u>ha</u>



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# Stand characteristics <u>Scheme D Exotic monoculture</u>

- Planted species: Fraxinus, Acacia, Liquidambar, Cinnamomum, Cunninghamia etc.
- Native species from natural regeneration







# Stand characteristics <u>Scheme 2 Exotic mixed stand</u>

- Planted species: Fraxinus, Acacia, Liquidambar, Cinnamomum, Cunninghamia etc.
- Native species from natural regeneration







# Stand characteristics Scheme Village Forest Project

- Planted species: Fraxinus, Acacia, Liquidambar, Cinnamomum, Cunninghamia etc. and <u>native tree species</u>
- Native species from natural regeneration





# **Carbon sequestration**

### Baseline (1981): Deforested area

- Carbon storage in the total biomass of trees and saplings = 0 Mg/ha
- Carbon storage in the soil
   = 56.08 Mg/ha (calculation based on IPCC default)



# 2017: Reforestation in 3 planting schemes

- Carbon storage in total *biomass* (above and below ground) of trees and saplings
- Carbon storage in soil







# **Carbon sequestration**





 <u>Utilization of thinned woods:</u> furniture, souvenirs, high quality charcoals, wood vinegar





 <u>Utilization of bamboos:</u> food (bamboo shoots), supporting tools, farm buildings, high quality charcoals, wood vinegar









- Demonstration center for wood technology and utilization established in 2004
  - Transferring appropriate wood technology for local people and visitors
  - Career development and extension





 Activities to develop people participation and conservation awareness eg. tree planting and management, forest fire control





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 Beautiful scenery of the reforestation area for tourist attractions and learning center







- Biodiversity and natural regeneration of native tree species
  - 64 tree species in 31 families
  - Evaluation on biodiversity of non-woody plants, animals and insects is ongoing





# Natural regeneration of different planting schemes (in 2017)

### Number of native tree species





- Conservation of watershed area for ecological services
- Conservation of water and soil through terraced planting





# **LESS Letter of Approval**





โครงการสนับสนุนกิจกรรมลดก้าซเรือนกระจก (Low Emission Support Scheme: LESS)

เพื่อแสดงว่า

#### การกักเก็บคาร์บอนของการปลูกป่าบนพื้นที่สูง ณ สถานีเกษตรหลวงอ่างขาง จังหวัดเชียงใหม่

ดำเนินการโดย

#### สถานีเกษตรหลวงอ่างขาง มูลนิธิโครงการหลวง

ได้รับการประเมินว่าสามารถลดก้าซเรือนกระจกได้

#### 67,830 ตันคาร์บอนไดออกไซด์เทียบเท่า

(ปี พ.ศ. 2525 - 18 กรกฎาคม พ.ศ. 2559)

ให้ไว้ ณ วันที่ 10 มีนาคม พ.ศ. 2560

นางประเสริฐสุข จามรมาน ผู้อำนวยการองค์การบริหารจัดการก็าซเรือนกระจก



## Angkhang



#### 22 December 2019



Socio-Economic and Marketing Sustainability under Alternative Development

### Sustainability: Social, Economic and Environmental Aspects

# Sustainability for highland development: Maintaining ecological services through landscape restoration

# Landscape highland restoration

# *H.M. the King Bhumibol's* philosophy and initiatives:

- Self sufficiency economy
- "Help them to help themselves"
- "Planting 3 kinds of trees to provide 4 benefits"
- Land use initiatives





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## Maintaining ecological services through landscape restoration

### **Current land use classification**



### Improving livelihood of hill-tribe people through temperate fruit and forest trees



## Maintaining ecological services through landscape restoration

### **Current land use classification**



 Improving livelihood of hill-tribe people through temperate agricultural crops

 About 90% of the hill tribe people are farmers engaged in the Royal Project



## Maintaining ecological services through landscape restoration



### **Practices**

- Allocation of planting areas e.g. fruit trees, annual crops, cut flowers, tea, herbs
- Supports training and technology transfer to farmers
- Product design and development and marketing







# Best practices of landscape restoration for highlands

Improving livelihood of local people through fast growing trees and temperate agricultural crops Reforestation through tree species selection and appropriate silvicultural practices

People participation and engagement including government, institutions, private sectors and local people

Land use zoning and its appropriate implementation Landscape highland restoration Environmental concerns: to minimize negative environmental impacts in all activities



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## For more information: Sapit Diloksumpun <u>(sapit.d@ku.ac.th</u>)