Name

International Sustainable Development Studies Institute
สถาบันการศึกษาการพัฒนาที่ยั่งยืนนานาชาติ

Experiential Learning Workbook

Sustainable Food Systems

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Northern Thailand Plant Identification

This activity will introduce you to a variety of plants that are utilized by communities in Northern Thailand.

There are many species in Northern Thailand that are used for food, fiber, construction, medicine, or for ceremonial purposes. A number of these also have a market value. Traditionally people would grow these or gather products from the forests and fields surrounding their homes.

In this activity you will identify the species you find and understand their role in the community and ecosystem. Throughout your time you will have opportunities to ask local people about the plants in their surrounding environment. They will help you identify various species and provide information on their usage, and preferred habitat. You will combine this local knowledge with your own illustrations in the Plant ID pages to create a useful catalogue of these plants. You will need to ask a variety of people and make your own observations to complete the Plant ID pages. Cite all sources of information (informant and location).

Complete **8 entries** in the Plant ID pages with as much detail as possible. Pay attention to both cultural and commercial use.

Plant Identification Study # 1

Species name in English _____ Thai _____

Scientific name _____

Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.):

Ecological context / placement in the garden / forest / field:

Propagation:

Care:

Harvest:

Sketch of leaf / flower / fruit (as appropriate) including context if needed

Plant Identification Study # 2

Species name in English _____ Thai _____

Scientific name _____

Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.):

Ecological context / placement in the garden / forest / field:

Propagation:

Care:

Harvest:

Sketch of leaf / flower / fruit (as appropriate) including context if needed

Plant Identification Study # 3

Species name in English _____ Thai _____

Scientific name _____

Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.):

Ecological context / placement in the garden / forest / field:

Propagation:

Care:

Harvest:

Sketch of leaf / flower / fruit (as appropriate) including context if needed

Plant Identification Study # 4

Species name in English _____ Thai _____

Scientific name _____

Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.):

Ecological context / placement in the garden / forest / field:

Propagation:

Care:

Harvest:

Sketch of leaf / flower / fruit (as appropriate) including context if needed

Plant Identification Study # 5

Species name in English _____ Thai _____

Scientific name _____

Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.):

Ecological context / placement in the garden / forest / field:

Propagation:

Care:

Harvest:

Sketch of leaf / flower / fruit (as appropriate) including context if needed

Plant Identification Study # 6

Species name in English _____ Thai _____

Scientific name _____

Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.):

Ecological context / placement in the garden / forest / field:

Propagation:

Care:

Harvest:

Sketch of leaf / flower / fruit (as appropriate) including context if needed

Plant Identification Study # 7

Species name in English _____ Thai _____

Scientific name _____

Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.):

Ecological context / placement in the garden / forest / field:

Propagation:

Care:

Harvest:

Sketch of leaf / flower / fruit (as appropriate) including context if needed

Plant Identification Study # 8

Species name in English _____ Thai _____

Scientific name _____

Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.):

Ecological context / placement in the garden / forest / field:

Propagation:

Care:

Harvest:

Sketch of leaf / flower / fruit (as appropriate) including context if needed

Polyculture Survey

In this activity you will examine the different ways Thai farmers and households utilize polyculture (mixed species farming) in their farms and gardens. The use of polyculture cultivation can have numerous benefits including more efficient use of space, the exploitation of beneficial relationships between organisms, and weed and pest control, to name a few. The activity will show you how polyculture farming and gardening benefits farmers and households.

Identify at least **three examples** of polyculture through observation and interviews with farmers, gardeners, or local experts. Complete an entry for each example of polyculture in the spaces provided below. Include a sketch of relationships and placement as appropriate.

Polyculture 1
Names of the plants or animals

Context (garden, farm, food forest, etc.)

Relationship between organisms

Use/benefits

Polyculture 2
Names of the plants or animals

Context (garden, farm, food forest, etc.)

Relationship between organisms

Use/benefits

Polyculture 3
Names of the plants or animals

Context (garden, farm, food forest, etc.)

Relationship between organisms

Use/benefits

Field Transect

Farms and fields are very diverse. One good way to capture this diversity is to complete a transect — a study of diversity along a specific line. For this activity you will use a 20 meter transect line to do your survey. Working in groups of 3-4 students:

- Place your transect line to capture maximum diversity
- Record all plants directly along the transect line
- Record any other organisms (insects, etc.) that you observe in and around your transect

Sketch of placement of transect line in context

List of plants along transect line

List of other organisms in/around transect line

Annotated map of transect line

Agroforest Transect

Agroforests are characterized by density and diversity. Like the Farm Transect, this will use a 20 meter transect line to do your survey. Working in groups of 3-4 students:

- Place your transect line to capture maximum diversity
- Record all plants directly along the transect line, including trees directly adjacent to the transect line
- Record any other organisms (insects, etc.) that you observe in and around your transect

Sketch of placement of transect line in context

List of plants/trees along transect line, noting approximate hight in meters

List of other organisms in/around transect line

Annotated map of transect line

Seed Origins and Seed Saving

Seeds and their control is a critical part of food sovereignty. Sourcing and saving seeds is an essential part of farming and gardening. Farmers utilize a number of strategies to locate, buy, trade and save seeds. Some seeds are purchased, some traded with others, and some saved either on the farm or from locally managed seed banks. Record at least **3 types of plants** and where the seeds come from.

Plant 1:

Plant 2:

Plant 3:

Animal Integration

Animals have always played a critical role in agriculture including in nutrient cycles, crop waste disposal, up-cycling of inedible waste, labor, pest control, and more.

What animals have you observed in and around the farm?

What are their roles / how are they used?

Farm Survey and Map

Farms, especially for small holders in the tropics, often have a specific layout to aid in crop production and harvest. **Draw and annotate a map of the farm**, noting each area and what it is used for.

Fresh Market Survey

Fresh markets are a feature of most communities in Asia. The focus of this study is the *origin* and *price* of products in the market. **Choose 4 agricultural products** and list what they are, where they are from, their price, and what they are used for.

Product 1:

Product 2:

Product 3:

Product 4:

Village Survey

The use of space and the built environment tells us a lot about a community. Use the space below to **draw and describe observations** about the village, including housing (common features), infrastructure (roads), and other observations.

Organic Fertilizer

On-farm production of fertilizer and compost is a critical part of organic farming and sustainable food production. **Describe and illustrate** the process of organic fertilizer production below.

Comparative Soil Assessment

Building healthy soils is one of the core practices of regenerative agriculture. This activity is a rapid assessment of soil quality and health.

You will do a rapid assessment of soil quality in three places: organic polyculture farm, agroforest, commercial (chemical) mono crop.

Complete in groups of 3-4.

Equipment
- Metal ruler
- Trowel
- Square plastic cardboard 50 cm / side

1. Selection: Choose a place to study that will be reasonably representative of where the soil is healthiest — under crops, plants, etc.
2. Size and depth: Mark with a central point and then dig a circle 20 cm in diameter to a depth of 20 cm (this will be pretty big!)
3. Quality assessment: As you dig note any changes in color, moisture, and texture as you dig deeper. Note depth where you see changes in color, moisture, and texture.
4. Soil organisms: As you dig, put the soil on the plastic square and separate it to observe, count, and sketch any soil organisms (insects, worms, etc.)

Soil colors: black, brown, gray, sandy, white, etc.

Soil texture: soft, hard, sandy, loamy, clumping, etc.

Soil moisture: wet, moist, dry, etc.

Soil study #1: Organic polyculture

Location of study (include sketch if needed)

Depth	Color	Moisture	Texture

Number and diversity of soil organisms

Soil study #2: Agroforest

Location of study (include sketch if needed)

Depth	Color	Moisture	Texture

Number and diversity of soil organisms

Soil study #3: Chemical mono crop

Location of study (include sketch if needed)

Depth	Color	Moisture	Texture

Number and diversity of soil organisms

Coffee Cash Crop Practicum

The purpose of this activity is gain a fuller understanding of coffee as a cash crop in Thailand including the biology and ecology of the coffee plant, farming and post-harvest processing, and the economic role to small and medium-scale farmers. This practicum also provides you with an excellent context to examine existing and potential sustainable and regenerative farming practices and principles used in coffee production. You will learn about coffee through farm visits, processing facility visits, and discussions with farmers and experts.

To complete this activity you will be asked to draw and identify coffee, chart out the farming and processing methods, and answer discussion questions. You will complete the activity using your first-hand observations while in the field and your discussions from farmers and experts.

Coffee Plant Illustration
In the space below, draw a coffee plant.

Coffee Plant Details
Draw the following in the space below

Coffee leaf

Coffee flower

Coffee bean (fresh, unprocessed, including interior structure)

Coffee Farm Map and Description
In the space provide below, draw a map of a coffee farm you visited, or if the farm is extensive, a representative section of the farm showing the context and layout of the coffee plants.

Name of the farm _____

Coffee Farm Discussion

Using a regenerative agricultural framework, how would you describe this farm? What practices are regenerative, if any? What more could be done to move it into a regenerative framework?

Coffee Harvesting and Processing

In the space below, draw and illustrate a flowchart describing each stage from farming to a cup of coffee. Include harvesting, post-harvesting processing, and each value-added step along the way. Show each exchange and any brokers / sales that many take part in the product's journey. Try and detail the money captured at each step and by whom.

Tea (Chai) Cash Crop Practicum

The purpose of this activity is gain a fuller understanding of tea (chai) as a cash crop in Thailand including the biology and ecology of the chai plant, the farming and post-harvest processing, and the economic role for small and medium-scale farmers. This practicum also provides you with an excellent context to examine existing and potential sustainable and regenerative farming practices and principles. You will learn about tea through farm visits, processing facility visits, and discussions with farmers and experts.

To complete this activity you will be asked to draw and identify tea, chart out the farming and processing methods, and answer discussion questions. You will complete the activity using your first-hand observations while in the field and your discussions from farmers and experts.

Tea Plant Illustration

In the space below, draw a tea plant, the structure and where leaves are harvested

Tea Plant Details
Draw the following in the space below

Tea leaf (young / for harvest)

Tea leaf (old / not for harvest)

Branch / leaves and where leaves are picked

Flowers

Tea Farm Map and Description

In the space provide below, draw a map of a tea farm you visited, or if the farm is extensive, a representative section of the farm showing the context and layout of the tea plants

Name of the farm _____

Tea Farm Discussion

Using a regenerative agricultural framework, how would you describe this farm? What practices are regenerative, if any? What more could be done to move it into a regenerative framework?

Tea Harvesting and Processing

In the space below, draw and illustrate a flowchart describing each stage from farming to a cup of tea. Include harvesting, post-harvesting processing, and each value-added step along the way. Show each exchange and any brokers / sales that many take part in the product's journey. Try and detail the money captured at each step and and by whom.

Cannabis Cash Crop Practicum

The purpose of this activity is gain a fuller understanding of cannabis as a cash crop in Thailand including the biology and ecology of the cannabis plant, farming and post-harvest processing, and the economic role for small and medium-scale farmers. This practicum also provides you with an excellent context to examine existing and potential sustainable and regenerative farming practices and principles used in cannabis production. You will learn about cannabis through farm visits, processing facility visits, and discussions with farmers and experts.

To complete this activity you will be asked to draw and identify cannabis, chart out the farming and processing methods, and answer discussion questions. You will complete the activity using your first-hand observations while in the field and your discussions from farmers and experts.

Cannabis Plant Illustration
In the space below, draw a cannabis plant.

Cannabis Plant Details
Draw the following in the space below

Cannabis leaf

Cannabis buds

Cannabis flowers

Cannabis Farm Map and Description
In the space provide below, draw a map of a cannabis farm you visited, or if the farm is extensive, a representative section of the farm showing the context and layout of the cannabis plants

Name of the farm _____

Cannabis Farm Discussion

Using a regenerative agricultural framework, how would you describe this farm? What practices are regenerative, if any? What more could be done to move it into a regenerative framework?

Cannabis Harvesting and Processing

In the space below, draw and illustrate a flowchart describing each stage of cannabis production from farming to final product(s). Include harvesting, post-harvesting processing, and each value-added step along the way. Show each exchange and any brokers / sales that many take part in the product's journey. Try and detail the money captured at each step and by whom, well as any controls on flowers/seeds and chain of custody.

Cacao Cash Crop Practicum

The purpose of this activity is gain a fuller understanding of cacao and chocolate as a cash crop in Thailand including the biology and ecology of the cacao plant, farming and post-harvest processing, and the economic role to small and medium- scale farmers. This practicum also provides you with an excellent context to examine existing and potential sustainable and regenerative farming practices and principles used in cacao production. You will learn about cacao through farm visits, processing facility visits, and discussions with farmers and experts.

To complete this activity you will be asked to draw and identify cacao, chart out the farming and processing methods, and answer discussion questions. You will complete the activity using your first-hand observations while in the filed and your discussions from farmers and experts.

Cacao Plant Illustration
In the space below, draw a cacao plant.

Cacao Plant Details
Draw the following in the space below

Cacao leaf

Cacao flower

Cacao pod (including inside structure)

Cacao Farm Map and Description
In the space provide below, draw a map of a cacao farm you visited, or if the farm is extensive, a representative section of the farm showing the context and layout of the cacao plants.

Name of the farm _____

Cacao Farm Discussion

Using a regenerative agricultural framework, how would you describe this farm? What practices are regenerative, if any? What more could be done to move it into a regenerative framework?

Cacao Harvesting and Processing

In the space below, draw and illustrate a flowchart describing each stage from farming to a bar of chocolate. Include harvesting, post-harvesting processing, and each value-added step along the way. Show each exchange and any brokers / sales that many take part in the product's journey. Try and detail the money captured at each step and by whom.

5 Principles of Regenerative Agriculture

Farmer Gabe Brown's Five Fundamentals of Soil Health

1. DO NOT DISTURB

Avoid plowing the soil, and abstain from harmful chemical amendments. These practices are like demolishing a house, making it difficult for the complex soil ecosystem to thrive.

2. KEEP ARMOR ON THE SOIL

Covered soil (living plants or trampled/dead plant material covering the soil surface) reduces soil erosion from wind and rain and helps keep soil temperatures down.

3. DIVERSIFY

Growing a diversity of plants ensures nutrient-dense soil, increases soil carbon, and reduces the risk of pests and diseases.

4. LIVING ROOTS

Keeping living roots in the ground year-round (or as long as possible) provides a steady source of food for organisms in the soil. In turn, the soil microorganisms help prevent soil erosion, increase water infiltration rates, and provide the plants with key nutrients.

5. ADD ANIMALS

Including animals in the farming system closes the nutrient loop and reduces the need for imported fertilizers. Of course, the correct farm animals to use will depend on the ecosystem.