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SUSTAINABLE DEVELOPMENT IN THE IFUGAO RICE TERRACES

Youth Capacity Building and Exchange Program towards Sustainable Development and Conservation of Ifugao Rice Terraces

Ifugao Rice Terraces as Satoyama Landscape Book Series

SUSTAINABLE DEVELOPMENT IN THE IFUGAO RICE TERRACES

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Sustainable Development in the Ifugao Rice Terraces

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This book is part of the Ifugao Rice Terraces as Satoyama Landscape Book Series

Published in the Philippines by the University of the Philippines Open University through the Youth for Ifugao Rice Terraces Project

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ISBN (print): 978-971-767-229-8
ISBN (ebook): 978-971-767-230-4

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Printed in the Philippines

FOREWORD

This book is part of the Ifugao Rice Terraces as Satoyama Landscape Book Series, and is in support of the two United Nations 2015 Sustainable Development Goals (SDG):

- SDG 13: Take urgent action to combat climate change and its impacts; and
- SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Satoyama, a Japanese term that has taken global significance, is a framework that highlights human-nature interaction. In a satoyama landscape, human-nature interaction is expected to be at its best because there is harmony, there is no destruction, there is sustainability, and there is resiliency (Buot, 2017). This interaction is evident in the daily living of people relying heavily on the goods and services provided by the environment. Studying and understanding the individual components of communities and determining their connections and relationships with their environment are important for satoyama initiatives to operate synergistically and sustainably. An evidence-based presentation of connections and relationships will allow stakeholders to acquire a broader perspective on the "domino effect" of their actions on the landscape.

With this definition, the Ifugao Rice Terraces is a clear example of a Satoyama landscape with its inherent human-nature interactions and the various social, political, cultural, and economic issues present in the world heritage site.

#Y4IRT Team

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IN THE IFUGAO RICE TERRACES

OBJECTIVES

At the end of this book you should be able to:

1. Describe sustainable development in relation to the Ifugao Rice Terraces landscape; and,
2. Identify the dynamics of the human-nature interaction with the inherent issues and concerns affecting the Ifugao Rice Terraces.



SUSTAINABLE DEVELOPMENT
IN THE IFUGAO RICE TERRACES

CHAPTER 1: NATURE AND IMPORTANCE OF SUSTAINABLE DEVELOPMENT

OBJECTIVES

At the end of this chapter, you should be able to:

1. Define sustainable development;
2. Describe the nature and importance of sustainable development;
3. Describe the sustainable development goals and indicators; and,
4. Discuss the challenges of sustainable development in the IRT community.

Hello. My name is Bugan, and together with Wigan, we welcome you to our book. We will be assisting you in learning the topics at hand, and we hope you enjoy learning the topics included here.

This book focuses on the sustainable development of the IRT. You will further learn about the nature and importance of sustainable development; approaches and best practices in sustainable development; and developing eco villages.

Before all of that, familiarize yourself first with the concept of *satoyama*.

Hi. I'm Wigan. Do you know what *satoyama* is?

Satoyama is a Japanese term comprised of two words: "*Sato*" meaning home or native place, and "*Yama*" meaning mountain or woodland. In simple terms, *satoyama* describes a village and its populace and their relationships with the mountain or woodland.

'sato' + 'yama'

Hello! In this first chapter, you will try to develop a baseline understanding of sustainable development, its goals and other factors that promote or hinder its attainability.

Are you ready to learn these things? Proceed to the first topic.

TOPIC 1

WHAT IS SUSTAINABLE DEVELOPMENT?

To begin the discussion, read the video transcriptions in the following pages which describes sustainable development and sustainability.

The videos were adopted from FN-sambandet Norge and Complexity Labs (Youtube channels), respectively.

The first video transcription is a simple introduction to sustainable development and the Sustainable Development Goals (SDGs). The film is produced by Animaskin on behalf of the UN Association of Norway and UNICEF Norway, as part of an interdisciplinary learning program for students on primary and secondary level.

The second video transcription discusses sustainability as a concept that affects the world and our place within it, and how we manage and design systems in the 21st century as it impacts our economy.

The Banaue Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

Sustainable development is to make the world a better place for everyone without destroying the possibilities for the next generations. If you wonder if something is sustainable, you can ask yourself, can we do this repeatedly? Sustainable development means that we need to keep three things in mind at once. Climate and environment, economic development and social progress.

First, we have to take care of our planet. We have many natural ecosystems that must be in balance for us to live here, and the climate system is one of them. This system ensures that the temperature on Earth is correct. When we emit harmful greenhouse gases such as carbon dioxide, we clog the atmosphere, causing changes in the temperature, which affects our development. How we produce and use energy is important. Oil and coal are examples of energy we may run out of. Water, wind, and the sun, however, will always be here. Using the lasting sources of energy that renew themself is good for the planet and can provide jobs for years to come.

Economics. Nature provides us with almost everything we develop, buy, and trade. The smarter we use our natural resources, and the better systems we create for fair distribution, the more sustainable we are. One way to contribute to a more even distribution is to be more aware of what we buy and how it is produced.

Social progress. We humans are part of nature, but we are also important resources for the world, just like water and the sun. We have the capacity to create and build things. However, having equal opportunities in education, safety, food, and medicine will enable each one of us to be the best versions of ourselves. This will benefit us and the planet as well.

Sustainable development occurs when these three things work together. And there is a plan for this, a joint plan for sustainable development of the United Nations, wherein we need to cooperate for this plan to work.

The Banaue Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

Sustainability is a concept that affects our understanding of the world and our place within it, and how we manage and design systems in the 21st century as it impacts our economy.

Ecosystems make up our environment and our societies are dependent upon its various services such as water, materials, food, and energy. The environment is a combination of the natural ecosystem and the human economy or the socio-ecological system. As we developed new technologies, institutions, and tapped new energy sources, the nature of the socio-ecological system has changed dramatically.

These changes in technology, economy, society, and ecology are set in a motion of a series of changes that continued urbanization up to this day. Changes in major earth systems became directly linked to changes largely related to the global economic system. The natural ecosystem was disrupted, and large-scale calamities emerged.

To address these problems, humanity is continuously thinking of ways to effectively and efficiently use the services of the natural ecosystem. This is where the concept of sustainability enters.

Sustainability is defined as the ability of a system or a process to endure over time. How sustainable something is can be understood in terms of its overall efficiency, in terms of how effective the whole organization is operating within its environment. When a system is inefficient in operating in its own environment, it consumes more resources and produces more waste; hence, it is unsustainable.

Sustainability is how parts of a system work together as a whole to result in an effective outcome. Optimizing a system's individual parts would not make

the system sustainable, since sustainability is a complex and holistic challenge that involves the whole system and its environment.

Sustainable development is a development wherein individual technologies, organizations and systems are managed. It is a concept of utilizing resources to address present needs without compromising the opportunities of future generations on meeting their needs.

We must be able to learn the concept of sustainability in order for us to truly understand sustainable development. Without understanding and practicing sustainable development, what would become of us, of the future generations, of the planet in a few years' time?

LEARNING ACTIVITY 1

After reading, discuss your reflections from the videos with family members, friends or colleagues. You can discuss with them sustainability and how it can affect or help you.

RESOURCES

Before proceeding to the second topic, you might want to watch the Webinar on Sustainable Agriculture and Tourism, which contains a talk by Prof. Ivan Anthony Henares on The Establishment of a Sustainability Science Demonstration Pilot Project on the Rice Terraces of the Philippine Cordilleras

You can view this at the University of the Philippines Open University (UPOU) Networks website networks.upou.edu.ph.

TOPIC 2

THE 17 SUSTAINABLE DEVELOPMENT GOALS

To begin the discussion, read the transcription below of a video adopted from the United Nations (Youtube channel) about the 17 Sustainable Development Goals.

Sustainable development goals. Photo by United Nations.

The United Nations developed 17 SDGs that serve as the blueprint to achieve a better and more sustainable future for all humankind. These address the global challenges that we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice.

The goals interconnect with each other, and in order to leave no one behind, it is important that we achieve each of these goals and targets by the year 2030. Let us discuss each goal in a little bit more detail.

SDG 1 is "**No Poverty**." It means to eradicate extreme poverty which means living on less than P70 per day. It also aims to reduce at least half the proportion of men, women, and children of all ages living in poverty.

SDG 2 is "**Zero Hunger**." It aims to end all forms of hunger and malnutrition by 2030, making sure all people, especially children, have access to adequate and nutritious food all year round.

SDG 3 is "**Good Health and Well-being**." It aims to have death be avoided through prevention and treatment, education, immunization campaigns, and sexual and reproductive healthcare. It commits to end the epidemics of AIDS, tuberculosis, malaria and other communicable diseases by 2030.

SDG 4 is "**Quality Education**." It aims to achieve inclusive and quality education for all which reaffirms the belief that education is one of the most powerful and proven vehicles for sustainable development. It also aims to ensure that all girls and boys complete free primary and secondary schooling by 2030.

SDG 5 is "**Gender Equality**." It aims to end all forms of discrimination against women and girls everywhere. This includes, but not limited to, labor force, leadership positions, and access to healthcare.

SDG 6 is "**Clean Water and Sanitation**." It aims to ensure universal access to safe and affordable drinking water for all by 2030 through investing in adequate infrastructure, providing sanitation facilities, and encouraging hygiene at every level. It also aims to protect and restore water-related ecosystems such as forests, mountains, wetlands, and rivers to mitigate water scarcity, thereby helping in achieving the goal.

SDG 7 is "**Affordable and Clean Energy**." It aims to ensure universal access to affordable electricity by 2030 by investing in clean energy sources such as solar, wind, and thermal. Expanding infrastructure and upgrading technology to provide clean energy in all developing countries is also a crucial goal.

SDG 8 is "**Decent Work and Economic Growth**." It promotes sustained economic growth, higher levels of productivity, and technological innovation. Its goal is to achieve full and productive employment and decent for all men and women by 2030. It aims to set in place effective measures that will eradicate forced labor, slavery, and human trafficking.

SDG 9 is "**Industry, Innovation, and Infrastructure**." It aims to increase investment in infrastructure and innovation to drive economic growth and development. With the increasing population living in cities, mass transport and renewable energy are becoming more important, as well as growth of new industries and information and communication technologies.

SDG 10 is "**Reduced Inequalities**." Income inequality is on the rise, with 10% at the top accounting for about 40% of the total global income, while the 10% at the bottom only account for the 2-7% of the total global income. It aims, therefore, to solve inequalities by improving regulation and monitoring

of financial markets and institutions, encouraging development assistance, and foreign direct investment to regions where the need is greatest. Facilitating the safe migration and mobility of people is also a solution it aims to implement.

SDG 11 is "**Sustainable Cities and Communities**." It aims to make cities safe and sustainable which means ensuring access to safe and affordable housing and upgrading slum settlements. It can be attained through investment in public transport, creation of green public spaces, and improving urban planning and management in a way that is both participatory and inclusive.

SDG 12 is "**Responsible Consumption** and Production." It can be attained through efficient management of our shared natural resources, and the way we dispose of toxic waste and pollutants. Encouragement of industries, businesses and consumers to recycle and reduce waste, and support developing countries to move towards more sustainable patterns of consumption by 2030 is also one of its goals.

SDG 13 is "**Climate Action**." It aims to mobilize $100 billion annually by 2020 to address the needs of developing countries and help mitigate climate-related disasters. It also aims to help more vulnerable regions, such as landlocked countries and island states, to adapt to climate change.

SDG 14 is "**Life Below Water**." It aims to sustainably manage and protect marine and coastal ecosystems from pollution, as well as address the impacts of ocean acidification. Enhancing conservation and the sustainable use of ocean-based resources through international laws will also help mitigate some of the challenges facing our oceans.

SDG 15 is "**Life on Land.**" It aims to conserve and restore the use of terrestrial ecosystems such as forests, wetlands, drylands and mountains by 2020. It also aims to halt deforestation to mitigate the impact of climate change and reduce the loss of natural habitats and biodiversity which are part of our common heritage.

SDG 16 is "**Peace, Justice, and Strong Institutions**." It aims to significantly reduce all forms of violence, and work with governments and communities to find lasting solutions to conflict and insecurity. The key to this is strengthening the rule of law and promoting human rights, as well as reducing the flow of illicit arms and strengthening the participation of developing countries in the institutions of global governance.

Lastly, SDG 17 is "**Partnerships for the Goals**." It aims to improve access to technology and knowledge to share ideas and foster innovation. Also, coordinating policies to help developing countries manage their debt, as well as promoting investment for the least developed to achieve sustainable growth and development is one of its solutions. It also aims to enhance North-South and South-South Cooperation by supporting national plans to achieve all the targets. Promoting international trade and helping developing countries increase their exports is all part of achieving a universal rules-based and equitable trading system that is fair and open and can benefit all.

LEARNING ACTIVITY 2

In this learning activity, state your opinions regarding the 17 SDGs. If you are chosen to be someone who will help in addressing these goals, what will be your top three choices that you will address first? Why did you choose these?

TOPIC 3

SUSTAINABLE DEVELOPMENT AND YOU

To begin the discussion, read another video transcription about the 17 SDGs. The video was produced by the Youth for Ifugao Rice Terraces project about global missions that need to be accomplished by 2030: fight global inequality, fight extreme poverty, and respect our planet.

A female farmer harvesting crops near her rice field. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

By 2030, we must be able to complete these global missions: fight global inequality, extreme poverty, and respect our planet. How can we do those goals – with creativity and power.

These goals may seem huge, but if you start making a difference on where you live, then it is already a big help in achieving these goals. Again, you might ask, how? There are three ways on how you can help. You can invent, innovate, and campaign.

You can invent things that will help improve the current condition of your home, and of the planet. Examples of inventions are natural plastic and water-saving toilets. A girl from Istanbul, Turkey created a plastic from banana skins, while a boy from India invented a toilet that only uses half of the usual water used when flushing the toilet.

Second, you can innovate. You can have new ideas or methods that can be applied to have better solutions to current problems or situations. If you want to be an innovator, get inspiration from a group of teenagers in North Philadelphia who built a farm growing fresh, healthy and safe food; or a group of girls in Nigeria created a phone application for proper waste collection and management.

Lastly, you can start your own campaign. You can campaign against the use of some materials that harm the environment; such as with plastics polluting the ocean, harming marine life, and harming Bali, Indonesia, two sisters organized petitions, beach cleanups, and campaigned against plastic bag use. On the other hand, you can campaign on your political or social stand. In Syria, a girl campaigned to convince parents to keep their daughters in school, and to not make them marry at a young age.

Just like these persons in the examples, you can also change the world for good. You can be an inventor, an innovator, or a campaigner, even at a young age. You just need to care for your home, for your environment; to be creative and to collaborate. If we all do that, by 2030, the global goals will be achieved, and we have made the world a better place.

As a continuation of Learning Activity 2, think of your role in achieving the top three SDGs you have chosen. What can you do and how will you achieve it?

LEARNING ACTIVITY 3

This activity is in connection to your discussion on Learning Activity 2.

Think of your role in achieving the top three SDGs you have chosen.

What can you do and how will you achieve it?

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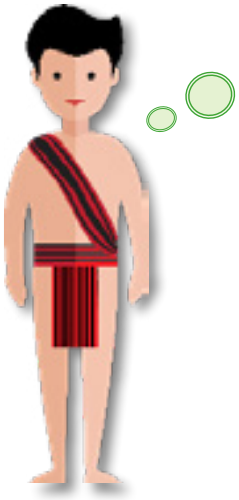


Are you done with the first three activities? Don't you love thinking of possible solutions to help your community? We do hope you will pursue endeavors that will help address the problems your community is facing.

You may now proceed to the next topic

TOPIC 4

CHALLENGES OF SUSTAINABLE DEVELOPMENT

This topic will discuss the challenges you may or will face in achieving the SDGs. To start, read this video transcription about the SDGs and the problems that confront society today. The video is from NowThis World (Youtube channel).

The seventeen Sustainable Development Goals or the 15-year plan to make global change, were launched in 2015 by the United Nations (UN). These global goals focus on addressing and improving the world's biggest problems.

Here are some of the world's biggest problems. Poverty is an issue almost across all developing countries. One in seven people around the world live with less than $1.25 a day, or roughly Php 67. Closely tied with poverty is hunger and malnutrition. Inadequate nutrition is one of the leading causes of death among children worldwide. Around 800 million people do not have access to enough food to live healthy lives.

Just like food, water and sanitation are necessary for a healthy life. The number of people who do not have access to food also do not have access to enough water. Not having adequate sanitation results in higher risks to diseases.

Elementary students in an event by the Faculty of Management and Development Studies-UP Open University (FMDS-UPOU). Photo by FMDS-UPOU. Used with permission.

Educational opportunities are also lacking, and the UN reported that if all the students had the basic reading skills, world poverty can be reduced. Specifically, more women are illiterate than men, causing less work opportunities, and affecting a country's economic progress since an educated workforce is lacking.

The 17 global goals of the UN, are therefore, hopeful approaches to solve the problems of the world, from small-scale to large-scale. Although there have been significant and considerable progress made, countries and individuals must still continuously cooperate to achieve these goals.

LEARNING ACTIVITY 4

You have already chosen three goals you think should be prioritized, and you already have thought about ways you can do to achieve these goals from the previous learning activities.

Now, in this learning activity, you will be focusing on the problems you may face in achieving these goals. Identify at least two problems in relation to each of your chosen goals. After identifying these problems, think of ways on how to avoid or address these problems.

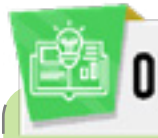
RESOURCES

In addition to the foregoing discussion, you might want to watch Mr. Marlon Martin's Webinar on the IRT and Sustainable Development and his discussion about Sustainability and Conservation Initiatives of the Save the Ifugao Rice Terraces Movement (SITMo).

You can access the webinar through the FMDS-UPOU page.

SUSTAINABLE DEVELOPMENT
IN THE IFUGAO RICE TERRACES

CHAPTER 2: APPROACHES AND BEST PRACTICES IN SUSTAINABLE DEVELOPMENT WITH EMPHASIS ON AGRITOURISM AND ZERO-WASTE MANAGEMENT



OBJECTIVES

At the end of this chapter, you should be able to:

1. Determine approaches to sustainable development in different cultures across the ASEAN region;
2. Discuss case studies or examples of organic farming;
3. Discuss ways in which agritourism activities can alter environment positively or negatively;
4. Explain gender roles by looking into past and present best practices in agritourism; and,
5. Formulate concepts in zero-waste management.

In this chapter will discuss approaches and best practices to sustainable development, giving emphasis on: organic farming, agritourism, zero-waste management, and gender roles in past and present agricultural practices

TOPIC 1

REVISITING THE ORGANIC FARMING METHODS OF IFUGAO

Familiarize yourself with the organic farming methods of Ifugao by reading a few video transcriptions below. If you are an Ifugao youth, some of these may be familiar to you if these are still being practiced by your family. For those who reside outside Ifugao, you may have heard about these practices or you may also have practices in your communities.

Ifugao Traditional Rice Production (adopted from the YouTube channel Nurturing Indigenous Knowledge Experts (NIKE) Ifugao).

The Ifugao traditional rice production is divided into two phases: field preparation and rice production. These phases are further subdivided into four seasons in the agricultural calendar.

The Ifugao traditional rice production is divided into two phases: field preparation and rice production. It is further subdivided into four seasons in the agricultural calendar: Kiwang (off-season), lawang (field preparation and planting season), tiyalgo (dry season), and kahitulu/ahi-ani (harvest season).

Agricultural work within a year was carefully planned by the Ifugao forebearers by considering astrological and seasonal changes that affect crop yield. Since then, this planning en abled farmers to employ organized and efficient tasks in agricultural work.

Tinawon rice. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

Among the four seasons of the agricultural calendar of Ifugao, kiwang/iwang is the longest and is characterized by rainy and cold days and typhoons. This season spans from late July, or after the last ritual holiday of the previous harvest, until November. Agricultural work in this season focuses on leaving rice fields to fallow to regain fertility, planting woodlets, and harvesting and replanting swiddens. Since kiwang follows harvest, there is an abundance of food and feasts are usually held during this time.

A farmer making a mound in a rice paddy. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

By early August, rice paddies are cleaned of dead and rotting rice plants by small groups of women. These rotten plants are left in the rice fields to decay in the soil and to enhance its fertility. Rotting rice plants and weeds are also used to make mounds, called inado or pingkol, in the center or sides of a rice

paddy. Mounds are set up for planting vegetables. Clearing of terrace walls, paddies, dikes and surroundings, and blocking of waterways to elevate water levels in the rice paddies are also done. Fishes and shells can be gathered from the rice ponds. Damages to the rice terraces, especially its walls, from the previous agricultural calendar are repaired by the farmers.

The season following kiwang is the lawang, or field preparation and planting season that spans from late November until March. When the women have cleared the fields from the last season, the men now work in the fields by repairing and reshaping dikes, leveling and draining ponds, preparing seed beds, and removing living organisms that might eat the seeds.

An Ifugao native chicken. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

Rituals are first performed before bringing out and sewing the rice grains. One chicken is offered to the deities to gain their favor for the seeds to germinate well and for these to be protected from pests and calamities. For sewing, carefully selected rice grains are brought out to the fields. To prevent fowls from eating the seeds, seeding is only done during the afternoon with the rice panicles laid one by one.

After planting, a ritual rest day called tungo is observed in which no one is allowed to go to the rice fields to prevent provoking the deities that may cause poor seed germination and growth. When seedlings have matured and are ready to be transplanted after a month, transplanting commence which spans from December to March. However, before transplanting could occur, the bolnat ritual is performed for the deities to allow the seedlings to grow well and yield abundantly.

The tulmonak, the village's agricultural leader who owns the biggest rice field, is the first person to do transplanting. They will be followed by other farmers who will transplant seedlings into their respective rice fields. After transplanting, a ritual will be performed to thank the deities for successful transplanting. Every farmer joins this ritual wherein rice wine is prepared.

Aside from giving thanks to the deities, they are also asked to protect the crops from pests and calamities.

The third season is tiyalgo or dry season which spans from late March until late June. During this season, farmers devote their time in maintaining their crops. Since it is the dry season, water sources and irrigation channels are regularly monitored to ensure that adequate water supplies reach the rice fields. Irrigation in the rice fields is distributed by bamboo channels. Spillways in the rice fields also maintain water balance. During the rainy season, these are expanded to facilitate the exit of water; while during the dry season, these are closed to keep water.

The hagophop rituals are performed by the farmers to seek permission from the deities before weeding the rice fields to prevent the rice crops from wilting. Chickens are offered to the deities, and certain restrictions are observed. The hulin ritual, which uses wooden implements and bamboo clappers, is performed to drive away rats that threaten the rice fields. When spikelets appear from the crops, farmers would set up scarecrows and strings to ward off birds that would eat the crops.

Rice fields in the Hungduan Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

Lastly, the ahi-tulu or harvest season is the shortest season which spans from late June to July and concludes the agricultural year. The hanglag ritual is held to test the rice grains if these are ready for harvest. Crisp rice is made from early bundles of rice grains ripped from the fields. On the day of harvest, the tulmonak is also the first one to yield their rice field/s.

A small group of women, during the early morning before other harvesters arrive, select the best grains for sewing in the next season. While these women harvest grains, they create a cheerful atmosphere to ease their fatigue through chanting. Men transfer the harvest to the village, and rice wines are prepared and served to relieve the thirst of the farmers. For increasing crop

yield and protection against thieves and calamities, the deities are sought by the mumbakis. After the day of harvest, the grains are dried under the sun for three days, and then stored in granaries or houses. For a continuous abundant yield, rice fields and granaries are blessed.

Before taking out the rice grains from the granary, the apuy ritual is held to ask the deities to make the supplies last until the next harvest. Another ritual, the bakle ritual, is held wherein rice cakes are prepared in the granary of the tulmonak and drinking and feasting are done as well. Rice granary gods are brought out so that they can partake in the feast. In the making of the rice cake, glutinous rice is pounded into flour by farmers. Finally, to close the harvest season, the ohap ritual is held wherein all instruments used during the agricultural ritual performances are stored.

Women farmers harvesting in the Batad Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project.

Pest management is practiced in the maintenance of the Ifugao Rice Terraces

Pests, such as earthworms, rodents, birds, and golden apple snails, are rampant when rice seedlings are growing in the rice terraces. This video was adopted from DrizzleHarmony (Youtube channel).

Pest management is practiced in the maintenance of the IRT. Pests are rampant when seedlings are growing. Aside from giant earthworms, rats, and birds, golden apple snails also infest the rice fields and damage the rice seedlings. Farmers must collect golden apple snails and its eggs after transplanting rice to prevent further reproduction of these pests in the rice fields.

After transplanting rice, water levels in the rice fields must be maintained between 0-2 centimeters because golden apple snails thrive and increase in number in a field full of water.

Tinawon rice. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

However, golden apple snails can be utilized as a component of composing, as a fertilizer, as animal feed, as an ingredient for processed products such as biscuits, cookies and cakes, and as a viand.

By practicing pest management, cleanliness of the rice fields, maintaining water levels, problems such as entry of rats and growth of golden apple snails will prevent young transplanted rice from being damaged.

Land should be prepared first before planting rice seedlings in the Ifugao Rice Terraces

To do so, read the transcription below to know the steps to be done. This video was adopted from the YouTube Channel Consortium for Unfavorable Rice Environment-International Rice Research Institute.

Rice paddies in the Hungduan Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

In traditional rice production, land should first be prepared before planting rice seedlings. To do so, the following steps must be done:

1. Clear the field, dikes and paddies before harvesting. Crops are harvested during the harvest season. Main crops are harvested in July, while ratoon rice crops (heirloom red rice) are harvested in September.
2. Make mounds, by piling the cleared weeds, on the center or sides of the rice fields to grow vegetables. Rice stalks and mud are mixed to the mound as well. Upon harvesting vegetables, mounds are spread on the rice fields before transplanting rice to enhance soil fertility.

The Ifugao Rice Terraces, used for agricultural production, has four parts: bawang, longyah, lobah, and banong. This video was adopted from NIKE Ifugao.

A portion of the Batad Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

The IRT is used for the agricultural production of the Ifugaos. The terraces have four parts: bawang (rice field), longyah (downhill embankment), lobah (uphill embankment), and banong (dike). Terrace building is done with respect to the agricultural cycle, hence work is done from July to November, during kiwang.

Terrace building or terrace production is divided into seven processes.

1. Site Selection

The main consideration for selecting a site is water supply. Continuous water supply is necessary for preventing soil erosion, for maintaining the rice fields, and for crop growth. Soil type and slope are considered as well, preferring clay and loamy soil, and less steep slopes.

2. Dam Construction

Dams are constructed in an upper elevation, filled with water, and then canals are made to lead water and materials to the rice ponds below. Materials such as water, soil, gravel and stones are transported to lower elevation with the use of a strong water force. Dam construction is usually done during the peak of the rainy season, which is from July to September. Aside from rice field production, this process also enables rice field widening and clearing erosions.

3. Building Terrace Walls

There are two kinds of terrace walls: stone/tuping and mud/min-i. Stone walls, made with river stones or boulders, are commonly built to protect the rice terraces. Additionally, terrace walls must be built at an angle of 65-90 degrees to withstand the overturning moment made by active soil pressure. Buttresses or wall supports are constructed as well. Terrace walls not built with the prescribed angle are signs of poor embankment building.

4. Stone Walling

Stone walling is best done during the dry season when the soil is compact. If stone walls are built during the rainy season, these walls will also collapse since the soil is too loose. To construct stone walls, slopes are excavated first, and big stones or boulders are placed in the bottom of the excavation to serve as foundations, then it is filled back with stones and soil. Bigger stones are placed on the bottom, then stone size decreases as the top is reached. When the desired stone wall height is achieved, the terrace bed is then filled with soft clay-top soil, called luyok, and leveled.

5. Dike Formation

Dikes are constructed at the outside ring of the rice paddy. Soil is laid first, moistening it with water and softening it with heel thumping, plastering the outer ring with the soil, and pressing it into place with the heel of the foot.

6. Water Sealing

To prevent landslides in the terraces, terrace beds should be moist for a whole year.

7. **Irrigation and Drainage**

Irrigation is essential in the terraces to ensure that water supplies are available for a whole year. Water from rivers and springs are distributed to rice fields through irrigation channels and bamboo troughs. The natural course of water is the basis in the construction of water channels to prevent soil erosion. Spillways enable the constant maintenance of the flooding and drainage of the rice fields. During the rainy season, spillways are expanded to facilitate the exit of water; while, during the dry season, these are closed to prevent water loss.

For terrace repair and maintenance, it is only done after the harvest season, but repairs that would not greatly affect crops may be done immediately. Rituals are performed as well to gain favor from the deities. When boundary disputes arise, wrestling matches between representatives of the individuals in dispute occur. When a wrestler is laid flat, that is when locations and boundaries can be set by the winner.

For most Ifugaos, their survival depends on the rice terraces, and this necessitates the preservation and conservation of the rice terraces.

LEARNING ACTIVITY 5

Don't you feel proud of ingenious practices done by the Ifugaos? What are your thoughts about these practices continuing in the future? Do note that the farming methods in IRT are considered organic farming. These methods are also environmentally-friendly and sustainable. Maybe you can learn something of note from this which you can share In your communities.

RESOURCES

In addition to these video transcriptions, you might want to watch the Webinar on Sustainable Agriculture and Tourism with a talk from Dr. Lucille Elna F. De Guzman, tackling Sustainability of Organic Agriculture in the Philippines.

You can view this at the University of the Philippines Open University (UPOU) Networks website networks.upou.edu.ph.

TOPIC 1

ECOTOURISM IFUGAO

In this topic, look into ecotourism and how it is practiced in Ifugao. Ecotourism was defined by The International Ecotourism Society in 2015 as the "responsible travel to natural areas that conserves the environment and improves the well-being of local people and involves interpretation and education." Therefore, a walk through the rainforest is not ecotourism unless that particular walk somehow benefits that environment and the people who live there. A rafting trip can also be considered ecotourism if it raises awareness and funds to help protect the watershed.

The Nagacadan Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

In the municipality of Kiangan in Ifugao province, the Nagacadan Rice Terraces can be found. It is one of the five rice terraces in Ifugao inscribed by UNESCO as a World Heritage Site.

Tino-on is a type of native rice which can only be harvested once a year in Kiangan. Aside from rice production, the Nagacadan Rice Terraces now gain interest as a tourist attraction, specifically as an open-air museum. Old houses were turned into galleries, and weaving houses can be found in the open-air museum. Moreover, these components of the open-air museum showcase the culture of the Ifugao people through artifacts and clothing.

LEARNING ACTIVITY 6

For this learning activity, read the video transcription about the open-air museum in Kiangan. The video was adopted from GMA News (Youtube channel). After reading, do the following activity.

Do you agree that the Open Air Museum is an ecotourism activity? Defend your answer. You may discuss it with a friend or colleague, and formulate your defense with the help of the following guide questions:

1. How does the Open Air Museum benefit the community?

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2. How does it help promote the Ifugao culture?

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3. How does the Open Air Museum educate the tourists?

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4. What are the possible negative effects of the Open Air Museum?

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CULTURE AND SUSTAINABLE ECOTOURISM

Now, comprehend the link between culture and sustainable tourism development.

Ding and Pigram in their 1995 study recommends that tourism needs to be developed to satisfy three broad principles:

1. To improve the quality of life of the host community;
2. To provide a high-quality experience for visitors; and
3. To maintain the quality of environment on which both the host community and the visitors depend.

In case you have not realized it yet, tourism in Ifugao revolves around the IRT and the Ifugao culture, making it a complex combination of commercialism and conservation. However, as a heritage site, Ifugao is now faced with the challenge of promoting the rice terraces as a tourist product and at the same time protecting it from undue outside influence.

An example would be the celebration of summer festivals in the Ifugao municipalities. Cultural practices are featured in the summer festivals, making it unique and interesting. Tourists can sometimes take part in the celebration. This situation can also display the "complex combination of commercialism and conservation."

Ifugao wooden bicycles. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

For the next learning activity, read this brief video transcription about Ifugao traditional games. This video was from GMA Public Affairs (Youtube channel).

Afterwards, you may answer the questions provided.

Some Ifugao traditional games are:

1. ***Guyyudan*** - similar to tug of war
2. ***Batawel*** relay - runners, who are barefoot, have to carry a batawel and pass it to the next runner until their team's last runner reaches the finish line
3. ***Hinnukting*** - similar to sumo wrestling, but in this game players inside a ring have to hold one foot up and move the opponent outside the ring

4. ***Bangngunan*** - two players lay flat opposite each other and hold the other by the shoulder; one of their legs has to be interlocked to the other player's leg, and push his opponent's leg to stand up, forcing him to stand up and making him lose
5. ***Akkad*** - racing while walking on sticks
6. ***Kadang-kadang*** - racing wherein coconut shells tied to a string are used as their 'running shoes'

LEARNING ACTIVITY 7

1. Would ethnic games be an interesting tourism product?

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2. How could the people involved gain or earn money from featuring ethnic games?

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3. How would featuring the ethnic games help cultural conservation?

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4. How would it desecrate or damage culture?

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Considering your answers above, analyze if featuring ethnic games in festivals is a good tourism product.

Write your analysis or position after your answers to the questions above.

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LEARNING ACTIVITY 8

Tourism can also bring about negative effects. In a study by the Save the Ifugao Terraces Movement (SITMo) in 2008, Ifugao is aware of these negative effects.

> "More importantly, through community participation in the planning stage, local residents are able to define the extent of acceptable environmental and socio-cultural changes that tourism can bring. For instance, community members living in the World Heritage rice terrace clusters have decided not to conduct staged performances of rituals outside their proper context for the consumption of tourists. For them, it would desecrate their culture and local beliefs, and as such, should not be encouraged. Likewise, in the rice terrace communities of Nagacadan and Julongan of Kiangan, the local communities have enacted village ordinances prohibiting the construction of inappropriate buildings that would block the view of their rice terrace clusters and the conversion of rice fields to residential lots. These ordinances were enacted in anticipation of physical changes to their built environment caused by tourism." SITMo (2008, p. 85)

As a response to this challenge, do the following activity.

Imagine you are writing a letter to the Mayor on a possible tourism activity in your area or community. Why did you think of that activity? What makes it special? Defend your planned tourism activity and describe its advantages and disadvantages.

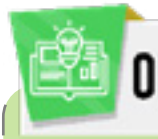
RESOURCES

In addition to the discussion, you might also want to watch Ms. Sayako Koyama's talk on Rural Tourism Activities by Bicycle Ride in Notojima Island (1:35:17 mark), this is a part of the Webinar on Sustainable Agriculture and Tourism.

You can view this at the University of the Philippines Open University (UPOU) Networks website networks.upou.edu.ph.

SUSTAINABLE DEVELOPMENT
IN THE IFUGAO RICE TERRACES

CHAPTER 3: DEVELOPING AN ENVIRONMENTALLY SOUND, SOCIALLY SENSITIVE AND ECONOMICALLY LUCRATIVE ECO VILLAGE



OBJECTIVES

At the end of this chapter, you should be able to:

1. Explain the concepts of sustainability in support of the eco-village initiative; and,
2. Develop a sustainable eco-village plan that is attainable and can be sustained by the Ifugao community.

In the context of social development, a "better" quality of life is attained by farmers if they reside in a better environment. A better environment may have their health and education improved, their job opportunities and savings increased, and their family and community empowered.

The result of such an environment is a sustainable type of development that leads towards self-sufficiency.

By developing the eco-village initiative, you can capitalize on what the community can offer by coming up with an environmentally-sound, socially sensitive and economically lucrative plan in support of a self-sufficient and empowered community.

TOPIC 1

SELF-SUFFICIENCY AND ECOLOGY

For the learning activity for this topic, read this video transcription on environmental literacy and the four laws of ecology followed by the lecture by UP Los Baños Assistant Professor Mark Anthony F. Rabena who elaborated on the concept of ecology in relation to the IRT landscape. This lecture was filmed during the Youth for Ifugao Rice Terraces Youth Exchange Activity at Batad, Banaue, Ifugao in September 2018.

Hungduan Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

Environmental literacy is characterized as making informed decisions, wanting to improve the well-being of others and the global environment, and wanting to participate in civic life. To become environmentally literate, one must first comprehend the concept of ecology. Ecology is the study of how organisms interact with one another and with their environment. Ecology can be further characterized by four laws.

The first law of ecology is "Everything is connected." With the various species and people on Earth, this concept is essential to understand since we only have one Earth. We are connected to our natural ecosystems, and vice versa. For example, when fossil fuels are burned, carbon dioxide is produced and causes an overload in the global carbon cycle. This in turn triggers changes in temperature, or climate change, weather patterns, sea levels, and even government budgets.

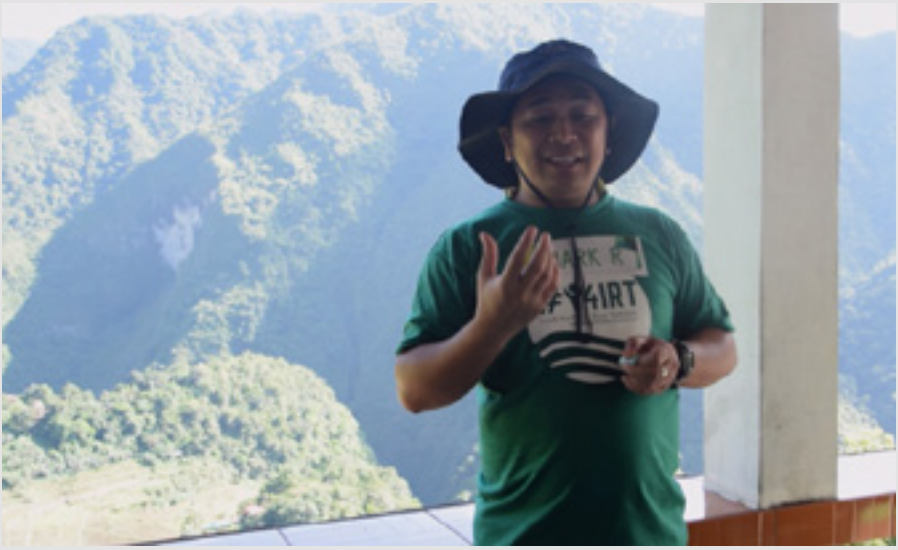
The second law of ecology is "Everything must go somewhere." Since Earth is providing us with resources, we continue to extract these resources to use

them as materials for the things we create and build. These resources, that have been converted into new forms, are discharged into the environment, causing an accumulation of harmful amounts of material in places in nature where they do not belong. The approximate eight million metric tons of plastic in our oceans is a good example.

The third law of ecology is "Nature always knows best." As inhabitants of Earth, it is our obligation to keep it 'healthy'. Major man-made changes in our natural ecosystems are detrimental to those systems, even if those changes were to improve upon nature.

Lastly, the fourth law of ecology is "There's no such thing as a free lunch." This law states that goods come with a cost. The resources we extract from nature must be replaced, but we must not avoid paying the 'price', but we can delay it. But delaying it for too long poses warnings such as the environmental crisis we are facing today.

Explain how each law of ecology relates to you and the IRT



Asst. Prof. Rabena discussing ecology during the urban youth exchange program of the Youth for Ifugao Rice Terraces (Y4IRT) Project. Photo by the Y4IRT Project. Used with permission.

In a community, in an environment, regardless of scale and as long as an interaction is involved, there is an ecosystem. The Ifugao Rice Terraces is one big ecosystem. The ancestral Ifugaos engineered the rice terraces in a way they can tap and use water from its forests. They were aware that water can come from the forests, and they utilized that and they came up with the rice terraces. Their agricultural area is significantly different from those in the lowlands where rice fields are flat. In Ifugao, slopes were utilized to make a rice terrace. Through the Ifugao peoples' experience and relationship with nature, they have learned the ecosystem principle.

The rice terraces are for water storage and retention. Ifugao forefathers inferred that if they made a rice terrace instead of a flat rice field, the water will remain in a rice paddy and soil erosion will be prevented. They were also aware that nutrients can be delivered to paddies through water irrigations. Ifugao forefathers did not have formal education, but they have this concept. Ifugaos possess a vast knowledge of nature because of their intimate relationship with it.

Humans get their resources from nature. We interact with nature. In the rice terrac-es, humans farm and tend the soil. They prepare the area for farming which later becomes their source of food. Water was tapped from the forests for irrigation through pipes or channels.

Human ecology is the study of the interaction of humans with the environment. In Ifugao, the people and the rice terraces are deeply connected. If something were to happen to the rice terraces, something would happen to the livelihood

of the people. That's why it is important that you do not just look at the rice terraces as a simple structure for tourism.

In human ecology, there is a concept of ecosystem services. These are the benefits we can get from different landscape units. In the global perspective, there are four services. First is provisioning. Provisioning is the different provisions of each system such as water, food, raw materials, medicine, fiber, fuel, wood, furniture, fencing, etc.

In addition to rice terracing, Ifugao farmers also plant vegetables. They took ad-vantage of the space along the dike of the rice terraces. They have an area for planting vegetables for additional sources of food. Rice terraces also have ponds which contain aquatic animals such as snails, fish and other edible aquatic organ-isms. If they have grasslands, they utilize those for the leaves for the roofs of their houses. They also have kaingin (tree cutting) areas in the forest. But their practice of kaingin is different. The Ifugao people perform rituals and regulate their tree cut-ting, unlike in other areas. A specific spot in the forest is only utilized every time they need to cut down trees, and they replant trees for use in the next harvest.

The second ecosystem service is regulating. In this classification, it emphasizes that you have to regulate your use of natural resources. Example, flood regulation and water for erosion prevention are regulatory functions of the ecosystem. Ero-sions occur because no trees hold the soil, or the soil is very loose. This causes difficulty in planting vegetation. But in the rice terraces, landslides are prevented since the forests are intact—there is something that holds the soil.

The third one is very distinct because we have indigenous groups—cultural ser-vices. Foreigners flock to the country, to the rice terraces because of its beauty and serenity. The rice terraces have psychological and cultural values. You feel calm and in awe when viewing the landscape. Ifugao traditions, culture, and values are highly based on their relationship with the rice terraces and nature.

Finally, supporting services. All the three classifications cannot happen if this last classification is missing. Supporting services are characterized by nutrient cycling and energy flow. Example, a seed needs nutrients, water and sunlight to grow. If a field rat eats it, the rat will gain energy from the seed. When a snake eats the rat, the snake will have the rat's energy. And when the snake dies, it will decompose but it will remain in the soil. What if it rains, where will the energy of the snake go? The nutrients of the snake will flow and stay in the soil as heat.

Do you see the connections? That's why you have to be mindful of your interactions to appreciate more the value of what you see in your surroundings. Every component of the system matters, each component has a role. Trample on the ants and grass, but it does not change the fact that they have a role in the ecosystem.

TOPIC 2

THE ECO-VILLAGE CONCEPT

For this topic, learn about the concept of an eco-village by reviewing the video transcription below. The video was adopted from United Nations University (Youtube channel).

A community in the Batad Rice Terraces. Photo by the Youth for Ifugao Rice Terraces Project. Used with permission.

Growing their own food and connecting to nature are the mindset of people who wish to partake in agriculture through adapting the lifestyle of an eco-village. In an eco-village, residents live communally and engage and share agricultural duties that would benefit all the individuals in the eco-village community. However, adapting this lifestyle would mean giving up an individualistic lifestyle, individual possessions, and personal space.

Instead of gaining profit, the residents in an eco-village do their duties for a self-sufficient lifestyle. They believe that this kind of lifestyle is critical for human survival, and that it should be emphasized to all humans on Earth.

One of the concepts practiced in eco-villages is food miles. When a country is food insecure, it imports goods from other countries. Food miles is the concept associated with the fuel utilized to cover the distance or miles a food item has travelled from producer to consumer, and it is associated with global warming. In eco-villages where residents grow their own food, they then have considerably low food miles.

Ecological footprints, defined by the Global Footprint Network as "how much

land and water area a human population requires to produce the resources it consumes and to absorb its wastes," are also considerably low in eco-villages.

An eco-village can do business through selling their products that they cannot consume. The profit that they will gain from this can be used to pay for the community's expenses like electricity, water, and transport fuel.

Moreover, living communally has fewer negative impacts on the environment as energy costs are lower.

Eco villages should be designed on sufficiently sized areas that can accommodate all types of necessary tasks and services. Eco villages centralize on the principle that it should be sustainable and self-sufficient. Therefore, the following features, to name a few, must be present in the village: water supply, sustainable forests (for future building materials that would originate from the village), crop fields or gardens, etc. These agricultural services, as well as possibly recreational, educational and medical services, and opportunities for arts, entertainment, and other activities are essential in an eco-village. However, with the amount of service in it, the village should be in a small enough area to keep a cohesive communal living and for it to be walkable—avoiding the need for transport within the village.

LEARNING ACTIVITY 10

Do you think an eco-village is possible in your community? Why?

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Draw or design an eco-village concept in your own community. Write your thoughts behind why you designed it as such

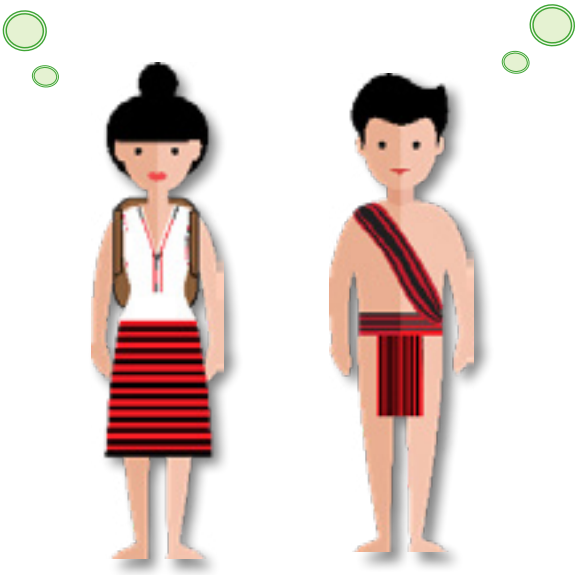
RESOURCES

Lastly, you might want to watch Ms. Mikiko Nagai's discussion on Collaboration Activities between OUIK and local communities: OUIK's role as an international organization in Noto GIAHS site and Dr. Yoshihiko Iida's talk on Connecting to the local and international community: Efforts in Mount Hakusan, a designated MAB Biosphere Reserve as part of the Webinar on Sustainable Agriculture and Tourism.

You can view this at the University of the Philippines Open University (UPOU) Networks website networks.upou.edu.ph.

That's it for the book! See you on the next one!

Congratulations on completing the activities!



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ACKNOWLEDGMENTS

We would like to extend our gratitude to the following people, institutions and organizations that have contributed greatly to the development of this book.

Foremost, the team would like to thank the Mitsui & Co. (Asia Pacific) Pte. Ltd and the Satoyama Development Mechanism of the International Partnership for the Satoyama Initiative for providing the funding and giving us the opportunity to conduct relevant activities in Ifugao and further contribute to the body of knowledge about one of the important socio-ecological landscapes in the Philippines.

Special thanks goes to Ms. Liza Sato, Mr. Richard Yap, and Mr. Norichika Kuzuhara for their assistance in various project accomplishments since 2017;

To our partner universities, Kanazawa University, Ifugao State University (IFSU), and University of the Philippines Los Baños;

To Prof. Koji Nakamura and Dr. Rizalita Edpalina for their valuable input and unwavering support from the proposal phase and to the publication of this book;

To Dr. Serafin Ngohayon and Pres. Eva Marie Codamon Dugyon, and leaders and faculty members of IFSU;

To the elders, culture bearers, and community members from the municipalities of Kiangan, Hungduan, Mayoyao, Lagawe, and Banaue in Ifugao;

To the Save the Ifugao Rice Terraces Movement (SITMo) led by Mr. Marlon Martin; VolunTourismo Group led by Mr. Jonathan Martin; Ms. Vanessa Pineda of the Ifugao Museum; Members of the Ifugao Intangible Heritage Performing Arts Society (IIHPAS) led by Mrs. Mary Lydia De Castro;

To the former governor and mayors of Ifugao: Atty. Pedro Mayam-o, Joselito G. Guyguyon (Kiangan), Hilario T. Bumangabang (Hungduan), Ronie H. Lumayna (Mayoyao), Jimmy P. Padchanan, and Jerry U. Dalipog (Banaue);

To Mr. Ramon Dinali, Mr. Donato Ogay, Ms. Jennilyn Illag, Mr. Pedro Addug, Mr. Rolando Addug, Mr. Job Punghan, and Mr. Magellan Illag of Brgy. Batad, Banaue;

To the staff, trainees, and alumni of the Ifugao Satoyama Meister Training Program;

To the youth participants of #Y4IRT; and,

To our translators Ms. Josephine G. Pataueg, Ms. Rebecca W. Bumahit, Mr. Gregorio Umingli, Mrs. Florentina D. Dulnuan, Mrs. Emilia B. Manglib, Mr. Julian P. Manglib and Ms. Raynalyn Pepe.

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