Participation of Asian Graduate Students for Geo-information Project-based Learning: Designing Analysis Framework of Degraded Areas for Implementing Vetiver Grass to Support Restoration

By **Yaowaret Jantakat**[1](Speaker), Pongpun Juntakut[2], Pradeep Kumar Shresth[3], Chomphak Jantakat[4] and Waneeporn Srisang[5]

1 and 5 Rajamangala University of Technology Isan, Nakhon Ratchasima, 30000 Thailand
2 Chulachomklao Royal Military Academy, Nakhon Nayok, 26000 Thailand
3 Pulchwok Campus, Tribhuvan University, Kathmandu, 44618 Nepal
4 Vongchavalitkul University, Nakhonratchasima 30000 Thailand

Presented on The Seventh International Conference on Vetiver (ICV-7)
"Vetiver for Soil and Water Conservation: In Commemoration of His Majesty King Bhumibol Adulydej The Great"
on 29 May – 1 June 2023 @Chiang Mai, Thailand
At https://icv7.rdpb.go.th/

Topics for presenting

➢ Introduction

➢ Objectives

➢ **Method using geo-information project-based learning**

➢ Results

➢ Conclusions

Introduction

➢ This study focuses on **classroom action research** under subject of Applied Geo-information System Technology (AGST) that is part of the Master of Science Program in Applied Information and Communication Technology (ICT), Faculty of Sciences and Liberal Arts, Rajamangala University of Technology ISAN (RMUTI), Thailand.

➢ Consequently, lecturers and graduate students have to develop or improve and learn **Geospatial Technologies** (GTs).

➢ This is **Geography Education** (GE) is related to the application of GTs and has a high commonality in twenty-first century education which is facing a tremendous impact and change with developing geospatial tools and technologies.

➢ Thus GE should rethink its **educational strategies** within the digital networking arena. GTs can be used to develop **project-based learning pedagogies** and help students to acquire spatial reasoning and spatial citizenship skills in the context of education for sustainable development.

Objectives of this study

To develop knowledge and skills of Asian graduate students using geo-information project-based learning **in a case of the designed framework of degraded areas' analyzing with implement of vetiver grass to support restoration**

Methods using geo-information project-based learning

This research used **purposive sampling with 12 Asian graduate students (8 Thai people, 3 of Khmer people and 1 Nepali people)**. They were assigned to design the research framework together under the assigned topics of research process as:

1) Identify the problem

- Finding an issue or formulating **research questions** were the first step.

- A well-defined problems were supported for the researcher through all stages

of the research process, from setting objectives to technique choosing.

- For example, a preliminary survey, case studies, interviews with concerned experts, and observational survey.

Methods using geo-information project-based learning (Con't)

2) Evaluate the literature

- Once a problem has been found, the investigator or researcher needs to find out more about it.
- This stage gives **problem-zone background**.
- It teaches the investigator about previous research, how they were conducted, and its conclusions.

- The researcher can **build consistency between his work and others through a literature review**. Such a review exposes the researcher to a more significant body of knowledge and helps him follow the research process efficiently.

Methods using geo-information project-based learning (Con't)

3) Create hypotheses

- Formulating an original **hypothesis** is the next logical step after narrowing down the research topic and defining it.

- A belief solves logical relationships between variables.

In order to establish a hypothesis, a researcher must have a certain amount of expertise in the field.

- It is important for researchers to keep in mind while formulating a hypothesis that it must be based on the research topic.

- Researchers are able to concentrate their efforts and stay committed to their objectives when they develop theories to guide their work.
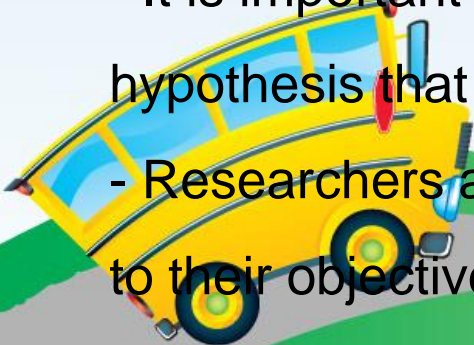
Methods using geo-information project-based learning (Con't)
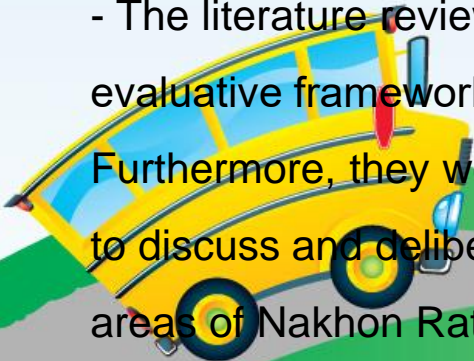
4) Design research framework

- The research design aims to minimize the time, money, and effort required to acquire meaningful evidence. This plan fits into four categories: data collection, data analysis and data reporting/displaying. The assigned topics above, the issues and concerns of using vetiver were checked by proceeding open ended interviews and interactions with geographers, biologists, engineers, planners, landscape architects, and practitioners who have used vetiver as a green infrastructure tool.

- Interviewees were consulted in person, **by telephone, and by email in August-October 2022 with questions** tailored to information needs and gaps in the published literature.

- The literature review and feedback from the interviews were used to develop an evaluative framework for using vetiver in projects of degraded areas' restoration. Furthermore, they were assigned to also join concerned workshops/seminars/conferences to discuss and deliberate for implementing vetiver grass to support restoration in degraded areas of Nakhon Ratchasima province.

TOPIC FOR PROPOSAL

TOPIC 1
"Climate Change and Health Research"

TOPIC 2
Environment on the t...
"Low Carbon Society"
Subtopic I : Systematic Understanding of
Environment, and People's Action Chang...
Subtopic II : Recycling of batteries and de...
alternative materials for new technology...

NET-ZERO
CO

>>>>>>>>

Shinji Otsuka   AMED Naoko KOJIMA
NRCT

As a research leader, what do I look for to people I want to work with?

You are viewing Jojo Nem Singh's screen   View Options ▾

A participant has enabled Closed Captioning   Who can see this transcript? Recording On   ✕

➤ Work ethics – output oriented, self-starter, transparent about their skills and shortcomings

➤ Capacity to work within a diverse team setting – international research, interdisciplinary

➤ Balance between individual performance and team deliverables – ERC projects are team efforts. Balance is always hard to get right

ASEAN RESEARCHERS DEVELOPMENT PROGRAM

TH_ICD NSTDA

● Recording

Mullika Kulsiripruck   Natnicha Phintuyothin   PMU-B   Shinji Otsuka

Varavan Ishikura

JST Katsumata Takumi

Unmute   Stop Video   Participants 333   Chat   Share Screen   Record   Show Captions   Reactions   Apps   Leave

Unmute

01:10:48   Webinar Info

Participants   Q&A

Environment o...

Understanding the Status
t, and People's Action

t for the Thai researcher over
3-year period is up to THB 3M
(2 Projects)

of batteries and development
ve materials for batteries

for the Thai researcher over
-year period is up to THB 9M
(2 Projects)

t for a project may differ each year,
ding on the content of activities

How to apply
• Thai applicants who are interested to be granted by NRCT must submit a national proposal to NRCT through NRIIS:

Close call (NRIIS system)

Must submit to NRIIS system No later than 16:30 (Thai time) 26 April 2023

● Recording   Webex

ZOOM13 Vongchavalitkul   Chutiyaphak Varith   ชลิต เฉลิมพิพาย   ผู้ดำเนินรายการห้องที่ 2 - ...

บริรักษ์ คณะศึกษาศาสตร์ มหาวิทยาลั...   Chokdee Kuthaweekul   WORRAYA ROJCHANAPAPH...   Tharinee_aun

กิตติวินท์ ชุฒ...   วราเทพ สุวรรณกษาปกรณ์...   บริรักษ์ อามาลยาลักษ...   yuphadee thongkhot

Pittaya Ponklang   ดร.ปรเมษฐ์ บุญนำศิริกิจ (Poram...   ดร.อธิ์ธ์ ตัวะตะศีรา   ชุติภักญ์วณ์ นาคนคุณ...

กมลชนก อินทนา   จอมภัค จันทะคัต   20 วราพร ไชชน์เ...   Chatchapon So

กมลชนก อินทนา   จอมภัค จันทะคัต   20 วราพร ไชชนิกอ...   Chatchapon Songsoonth...

Unmute   Stop Video   Participants 45   Chat   Share Screen   Record   Reactions   Apps

Results

- Definition of the problem
- Literature review
- Hypothesis
- Research framework

Results (Con't)

1. Definition of the problem

Defining this research problem was studied from the preliminary survey, case studies, interviews with concerned experts, and observational survey, and then was set questions to be guided for finding issues and scope of study respectively as follows:

1) What are **key functions and considerations** for finding specifically degraded areas to implement vetiver grass?

2) What are studied **data-based key functions and considerations** from concerned agencies?

3) What are **geospatial technologies** for identifying specifically degraded areas for implementing vetiver to restore?

4) Where are **specifically degraded areas** for implementing vetiver grass to support restoration using geo-information technologies?

Results (Con't)

2. Literature review

They gave topics of literature review for this study comprise of as below:

1) **Background and definition** of vetiver

2) Using vetiver grass for **restoring degraded areas**

3) **Key functions and consideration** of vetiver for restoration

Results (Con't)

3. Hypothesis

1) What are key functions and considerations for finding specifically degraded areas to implement vetiver grass?
 - Research Hypothesis: it is hypothesized that key functions and considerations for finding specifically degraded areas have importance to implement vetiver grass.

2) What are studied data-based key functions and considerations from concerned agencies?
- Research Hypothesis: it is hypothesized that key functions and considerations for implementing vetiver grass have importance to determine the studied data from concerned agencies.

3) What are geospatial technologies for identifying specifically degraded areas to restore with implementation of vetiver?
 - Research Hypothesis: it is hypothesized that geospatial technologies have importance to identify specifically degraded areas to restore with implementation of vetiver.

Results (Con't)

4. Research framework

Step 1: Collecting data

Land use | Roads | Stream | Contour | Key functions and consideration-based other related articles

Step 2: Preparing data

GIS technique (Extract by Select by Attribute)

GIS technique (Spatial Analyst Tools-based Surface)

Abandoned and degraded areas

GIS technique (Checked by Editing Tools)

DEM | Slope | Aspect

Step 3: Analyzing data

GIS technique (Analysis analyst and statistics tool))

Abandoned and degraded areas of around Lumtakong reservoir for implementing vetiver grasses

Step 4: Implementing vetiver grasses
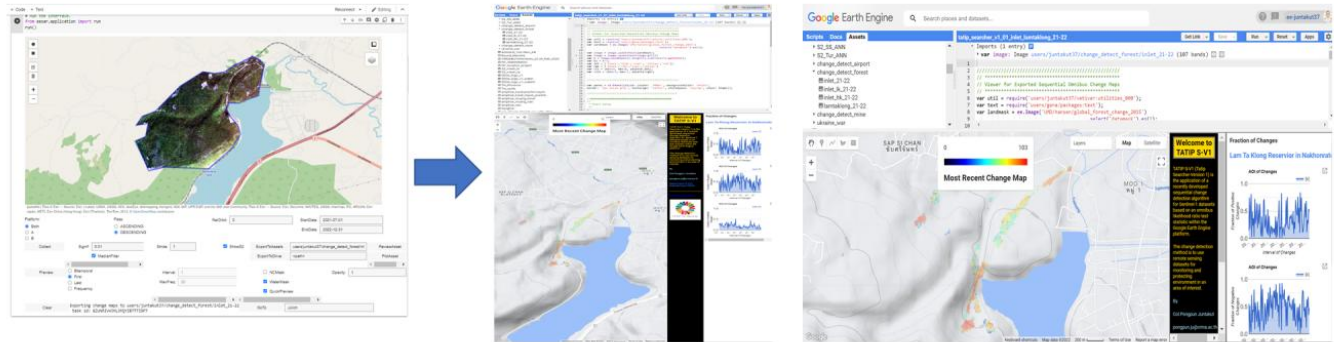
Using satellite images and change detection on Google Earth Engine

Change detection on Google Earth Engine in sampling no.1 for implementing vetiver grass surrounding Lumtakong reservoir
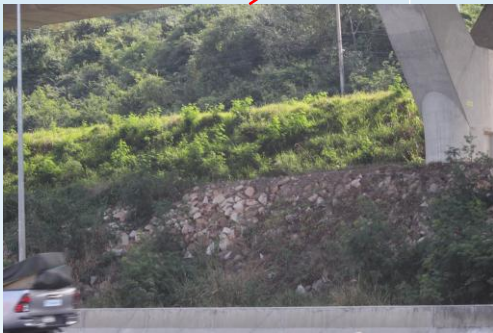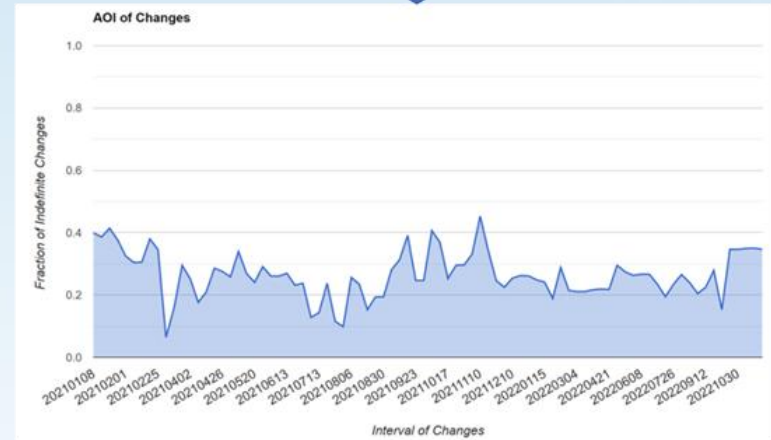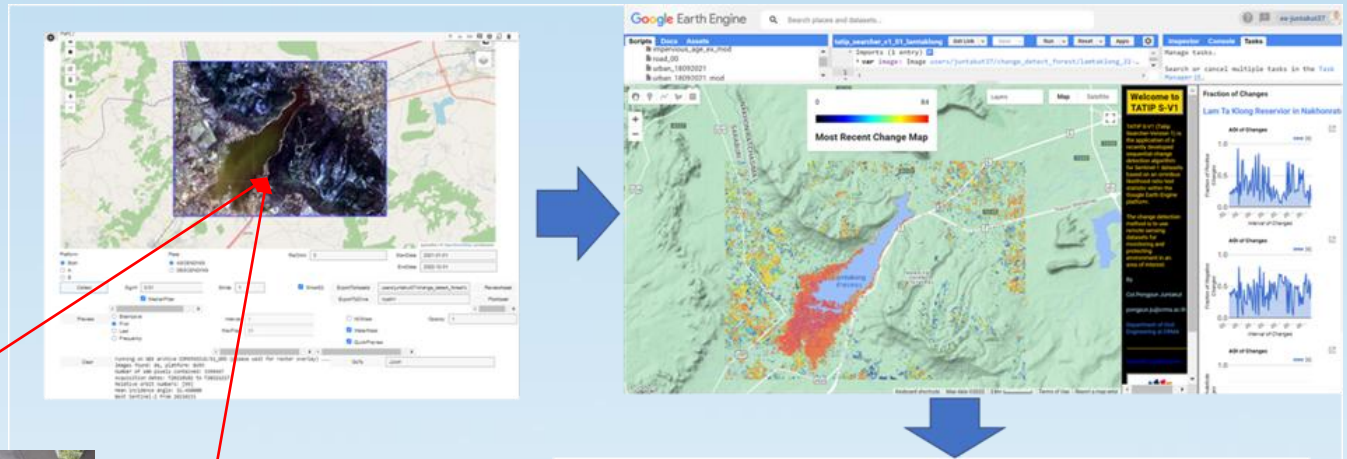
Change detection on Google Earth Engine in sampling no.2 for implementing vetiver grass surrounding Lumtakong reservoir
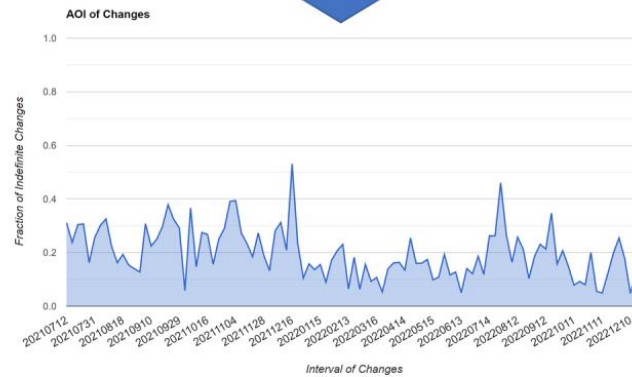
Conclusions

Using project-based learning, participation of 12-Asian graduate student are determined by purposive sampling, **they can generate research framework** of geo-information project-based learning in case of the designed research framework of degraded areas' analyzing with implement of vetiver grass to support restoration.

Moreover, they can **find answer for assignment of lecturer to design the research framework together** under topics of research process steps such as identify the problem, evaluate the literature, create hypotheses and design research framework.

Further **research project-based learning** is recommended on the theories that can help explain and guide the development of Asian graduate students' geospatial knowledge and skills in both formal and informal education, and effective ways to incorporate geospatial thinking into teacher preparation programs.

Thank you for attention