



PROJECT REPORT

Yogyakarta, Indonesia

July 10 – 28, 2017



SUSTAINABILITY TRANSITIONS SUMMER SCHOOL FOOD SECURITY AND CLIMATE CHANGE

INTEGRATED FORESTRY
FARMING SYSTEM:
A TRANSITION TO FOOD SECURITY
IN A CHANGING CLIMATE?



Co-funded by the
Erasmus+ Programme
of the European Union

UNIVERSITAS GADJAH MADA



SUSTAINABILITY TRANSITIONS SUMMER SCHOOL 2017

Opening Remarks

It is our utmost to host the Sustainability Transitions Summer School 2017. This Summer School is part of the Food Security and Climate Change initiative co-funded by the Erasmus+ Programme of the European Union, and the Southeast Asian University Consortium.

The Summer School is organized by Universitas Gadjah Mada in collaboration with the University of Natural Resources and Life Sciences (BOKU) Southeast Asian University Consortium (UC), and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) of the Southeast Asian Ministers of Education Organization (SEAMEO).

Held in Yogyakarta, Indonesia from July 10-28,

participants from Europe and Asia will have a real-life educational opportunity to learn about sustainability transitions by working together with farmers and other stakeholders around Yogyakarta. The participants will get a comprehensive understanding of how land degradation and climate change threaten food systems.

The three-week course will enable participants to experience integrated agroforestry systems in the highlands of Java, Indonesia through a mixture of lecture/theory, case studies, group discussion, and field visits.

We welcome all participants and guests to the Summer School – learning that makes a difference.

Aim of the Summer School

- 01 | Enabling participants to become agents of change for sustainability
- 02 | Experience the complexity of food systems and their ecological, social, and economic dimensions in terms of global changes.
- 03 | Analyze challenges such as climate change, land use, aging farming populations, livestock, and water availability.
- 04 | Identify leverage points for inducing transitions to sustainability, for example integrated farming practices.

Learning Outcomes



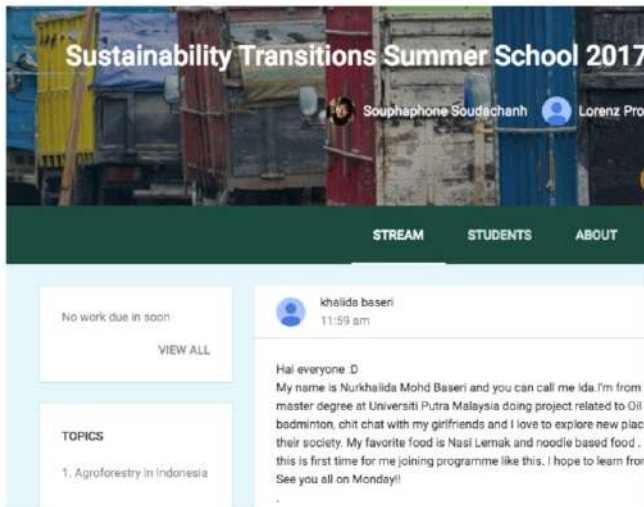
Participants

Students from universities around the world have enthusiastically signed up for the Summer School to join their peers in Indonesia. These participants come from many parts of the Asian and European regions, including from Austria, Cambodia, Czech Republic, Finland, France, Germany, Indonesia, Laos, Malaysia, Myanmar, Morocco, Spain, Philippines, and Thailand.

Instructors

Professionals from various institutions across the globe will assist and guide the participants throughout this Summer School. We are very glad to welcome instructors from University of Natural Resources and Life Sciences (BOKU), Agrinatura, Institut Pertanian Bogor, Universiti Putra Malaysia, Kasetsart University, University of the Philippines Los Banos, and Universitas Gadjah Mada.

Getting to Know Our Program



E-Learning

Learning prior to the Summer School was facilitated through Google Classroom. Participants were able to learn, interact, and extend their knowledge on food security and climate change.



Preparation

Participants are exposed to theoretical and practical knowledge to prepare for a week of research learning in the field. Facilitators from all partnering institutions guide the participants through these sessions.



Exposure

This year, we have excursions to Nglanggeran to learn about integrated Dairy Goat and Cacao Processing as well as to Wanagama to learn about Transitions from Critical Land towards Productive Land. The objective is to relate the classroom learning to the real world.

Action Learning & Research in a Community



Participants will have the opportunity to learn with farmers and other stakeholders. The formats include group discussions, participatory rural appraisal interactions, and sampling of for example soil to gather data about social, economic, and ecological realities of the farming system. Desa Leksana and Desa Banjarnegara are the field learning and research sites. This activity will take place from July 14–20, 2017.



Interdisciplinary

To conduct the field study on sustainability transitions, the participants have to apply skills from their own disciplinary background, train others in these skills but also learn new skills from others. This creates a truly interdisciplinary social learning.



Trans-disciplinary

Learning with farmers is a gift from the farmers to the participants – sharing their knowledge and spending their precious time. In a dedicated feedback workshop, the participants attempt to give back some of their learning and discuss it in detail with the farmer group and the individual stakeholders they have visited.

Scientific Analysis

Participants will be trained in translating the collecting field data into a more scientific format (multivariate data analysis).



Becoming a Family

Alone, no one will make a difference – together, our participants as decision makers of the future can make this difference. We want to create the spirit of a family with a shared vision and mission.



SUSTAINABILITY TRANSITIONS SUMMER SCHOOL FOOD SECURITY AND CLIMATE CHANGE

INTEGRATED FORESTRY FARMING SYSTEM: A TRANSITION TO FOOD SECURITY IN A CHANGING CLIMATE?

Francis M.C.S. Setyabudi (UGM) and Lorenz Probst (CDR-BOKU)

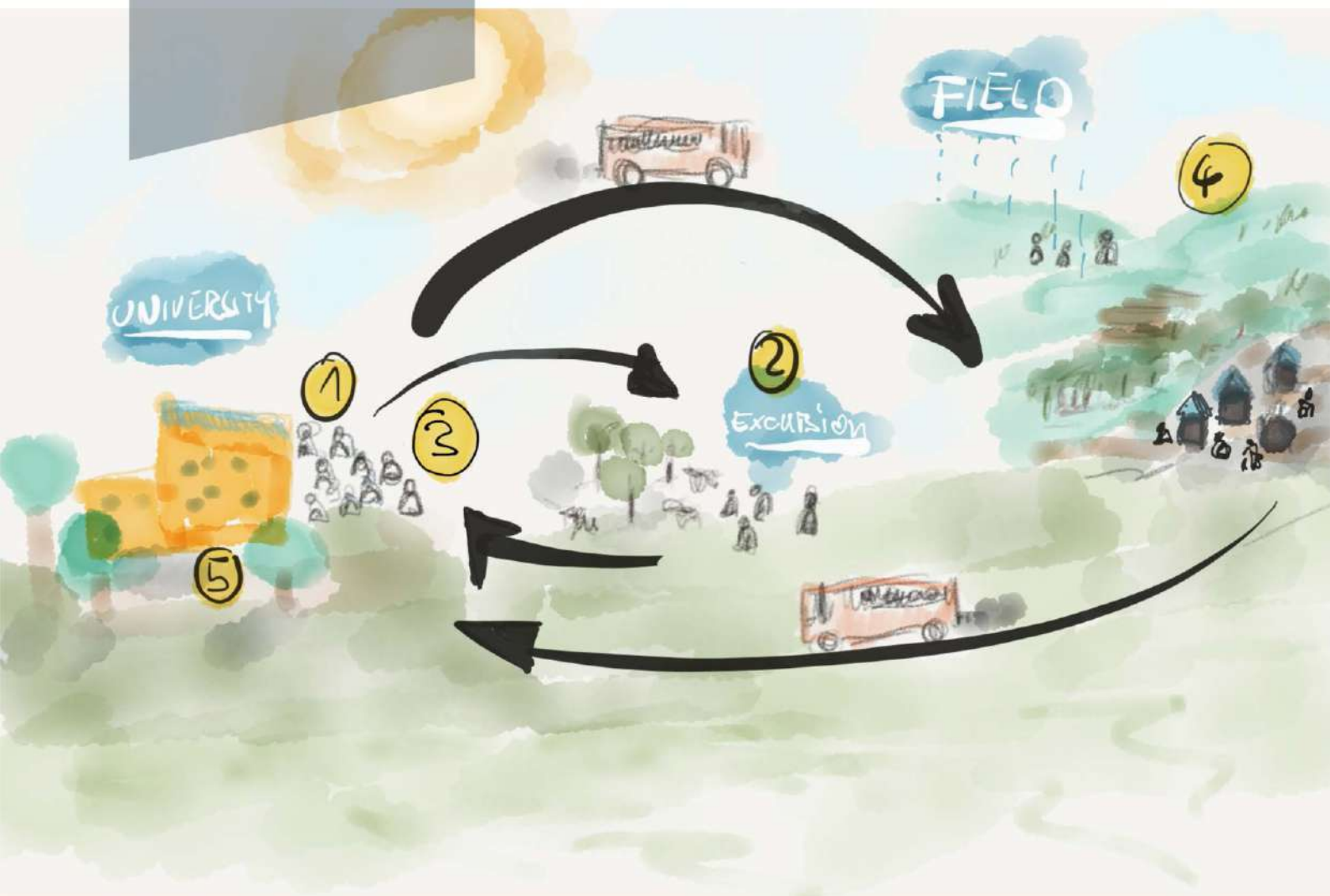
Universitas Gadjah Mada (UGM) hosted the Sustainability Transitions Summer School 2017, held in Yogyakarta and Central Java, Indonesia from July 10-28, 2017. The Summer School is part of the Food Security and Climate Change initiative co-funded by the European Union and the Southeast Asian University Consortium. For the implementation, UGM collaborated with the University of Natural Resources and Life Sciences (BOKU), the Southeast Asian University Consortium (UC), and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) of the Southeast Asian Ministers of Education Organization (SEAMEO). Participants from Asia and Europe explored pathways for a sustainability transition by learning together with farmers and other stakeholders in and around Yogyakarta. After an introduction phase at the home universities, linked through e-learning, the students (including 17 students of the MS in Food Security and Climate Change, MS-FSCC) met at UGM Yogyakarta on July 10, 2017. The first two weeks of the school addressed both MSFSCC students and other students from Europe and SE Asia. The third week addressed MSFSCC students only. The overall program is described in this narrative report.

Didactically, the Summer School comprised of lectures/theory, case studies, group discussions and field visits. Outside of campus, the participants visited a demonstration of integrated dairy goat and cocoa production and the Wanagama Educational and Experimental Forest.

During the field stay, participants analyzed integrated agroforestry systems in the highlands of Java in comparison with intensive cash crop production. These real-life examples were an important element of the overall experience as summarized in following section.

July 10 – 28, 2017

NARRATIVE REPORT



SUSTAINABILITY TRANSITIONS SUMMER SCHOOL FOOD SECURITY AND CLIMATE CHANGE

INTEGRATED FORESTRY FARMING SYSTEM:
A TRANSITION TO FOOD SECURITY IN A CHANGING CLIMATE?

COURSE PROGRAM

STSS-FSCC PROGRAM



Introduction

- Getting to know the course, the learning objectives, and learning outcome.
- Getting to know each other: Exploring food security challenges, climate change and sustainability transition.
- Seminars



Implementation

- Field Work and Method Test at Penanggungan and Leksana Villages.
- Multivariate data analysis and visualization.



Reflection

- Feedback: Sharing Insights in a Participatory Manner with Farmers.
- Conference: Further Channeling Insights into Scientific Formats for a public Presentation.
- Evaluate the overall goal achievement and provide mutual feedback, developing strategies to take forward the shared vision.

STSS-FSCC PROGRAM

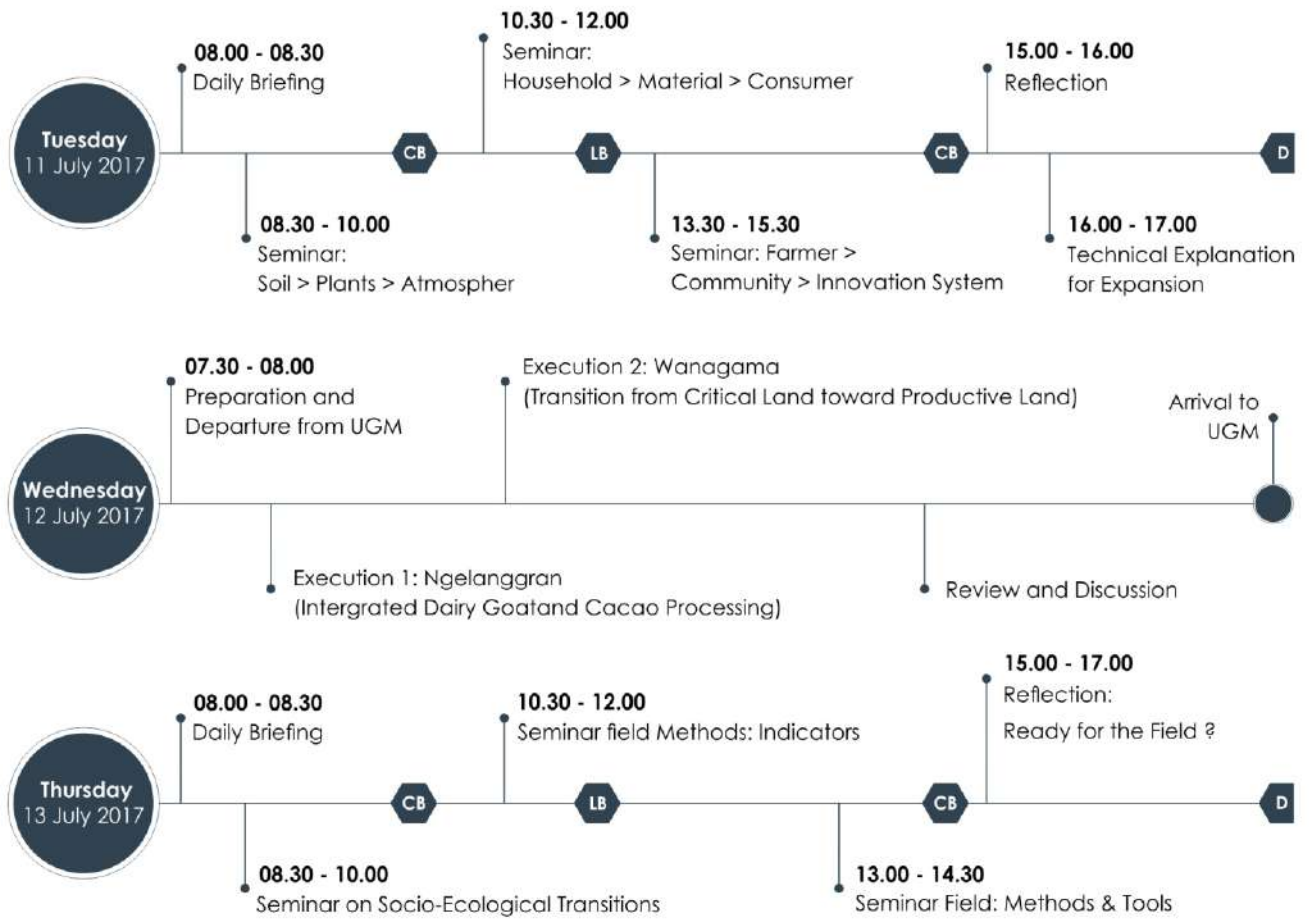
SCHEDULE

PHASE 01

10 - 13 JULY

Introduction

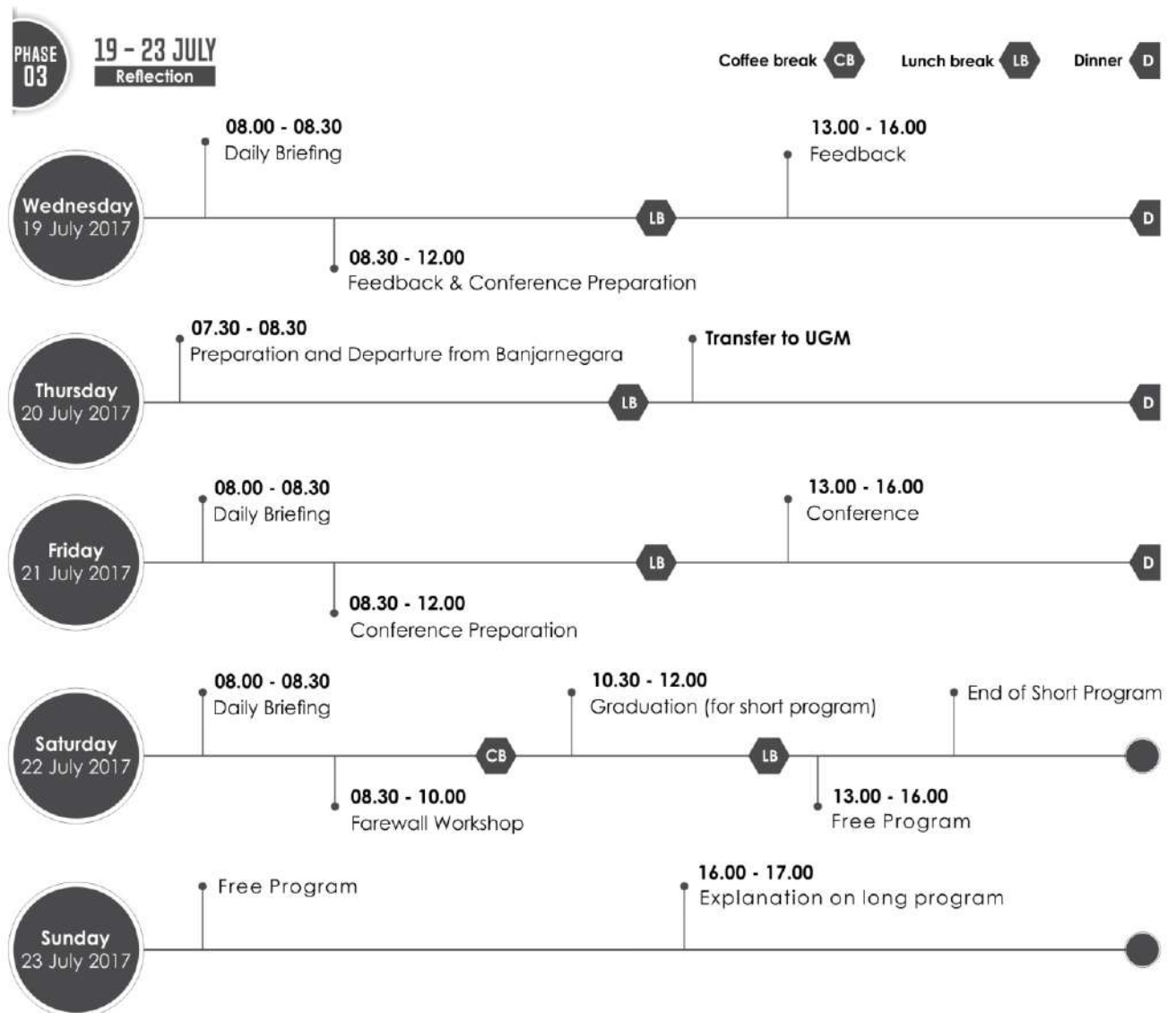
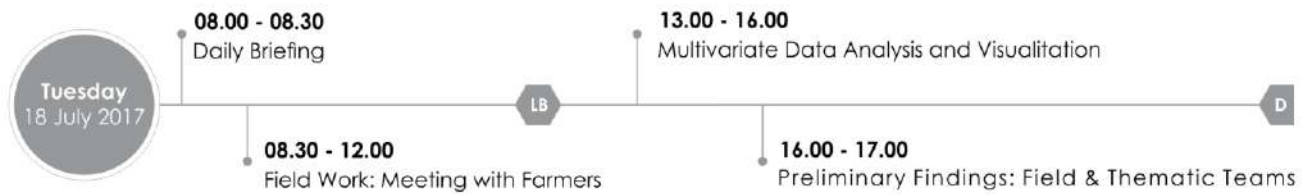




PHASE 02 **14 - 18 JULY**
Implementation

Coffee break **CB** Lunch break **LB** Dinner **D**





Sustainability Transitions Summer School
School Food Security and Climate Change
INTEGRATED FORESTRY FARMING SYSTEM: A TRANSITION TO FOOD SECURITY IN A CHANGING CLIMATE?
July 10- 26, 2017
SEARCHA



Welcome & Introduction

FSCC 2017 began with a welcoming ceremony and introduction to the course. The participants were introduced to the objectives of the Summer School.

They also got general information about the condition of the agro-food systems in Southeast Asia and the need for a sustainability transition.



Exploring Food Security Challenges, Climate Change, and Sustainability Transitions

In the introductory seminars, the following aspects were addressed through inputs and group work:

- complex agro-food systems
- food security
- climate change and other challenges
- realities in Indonesia and the students' respective home countries
- sustainability transitions

The Indonesian student team underlined the challenge of the lack of food self-sufficiency, propounded by overpopulation that reduces food availability.

In Europe, according to the student team, the problem is rather at utilization and consumption scale. Food waste, the dominance of few corporations and the high use of energy pose big challenges.

Students from Southeast Asia, including Myanmar, Laos and the Philippines, agreed that climate change leads to more extreme weather events such as storms but also drought.



DAY 2

July 11, 2017

Seminar: Soil, Plants, Atmosphere

This seminar addressed soil, water, erosion, and horticulture and integrated forestry farming system concepts with a particular focus on Java. Participants were able to explore the ecological dimensions of the agro - food system in Java in detail, including issues of soil and erosion, crop and animal production, as well as climate and climate change. As one of the learning outcomes, participants were asked to brainstorm possible indicators to assess the sustainability state of these dimensions. As a result, they could identify the interlinkages of these dimension with other sustainability dimensions (social and economic).

Seminar : Household, Market, Consumer

In this seminar, well-being as ultimate outcome of a sustainable agro-food system was established. The discussion focused on value chains and market dynamics in Javanese agriculture, as well as consumer preferences and its change. The seminar connected the value chain from household level to market and to consumer.



Seminar : Farmers, Community, Innovation System

Participants were introduced to the basics of innovation system thinking as part of the wider social structure. The discussion introduced wellbeing, demography and migration, institution, learning and extension as important aspects to be considered in analysis. As the learning outcomes, participants were able to explain social dimensions of typical agro-food systems in Southeast Asia at household, community and wider innovation system level.



The reflection integrated the three dimensions of social, economic and ecological sustainability. Specific exercises were facilitated to show the interconnectedness of systemic elements and the complexity of changing agro-food systems.

DAY 3

July 12, 2017



**Excursion 1 : Nglanggeran
(Integrated Dairy Goat and
Cacao Processing)**



**Excursion 2 : Wanagama
(Transition from Critical Land
towards Productive Land)**

DAY 4

July 13, 2017



Seminar on Socio - Ecological Transitions

This seminar operationalized the concept of transition in economic, ecological, and social aspects. The seminar helped participants to start to structure their ideas into domains that could be assessed and discussed with farmers and other stakeholders.

Seminar Field Methods: Indicators, Methods, and Tools

This seminar equipped the participants with tools to assess aspects of sustainability. They co-developed indicators of transition and sustainability assisted by the facilitators. The trainers explained the necessity of valid, relevant, realistic, reliable, and ethical research instruments.

**DAY 5**

July 14, 2017



Deployment to Leksana and Penanggungan Villages

Introduction to The Host

Field Method Test



Participants tested the data collection procedure and identified shortcomings and needs for adaptation.

DAY 6

July 15, 2017

Adaptation and Further Training Field Methods

Together with the facilitators, the participants revised the data collection methods.



Field Work: Meeting with Farmers



DAY 8
July 17, 2017

Meeting with Officials and Key Informants



Field Work: Meeting with Farmers

Data Entry

Entry of data into a joint data base for later analysis.

Demographic Information

Geographic Position



- Elevation**
Leksana and Penanggungan: >1000 masl
- Slope Ranges**
Leksana and Penanggungan: 15% - 40%
- Annual Rainfall**
3000 mm

DAY 9

July 18, 2017

Data Collection



Multivariate Data Analysis and Visualization

The students started to process the empirical data and impressions into more abstract and condensed forms.

Preliminary Findings:

Field and Thematic Teams

In this session, participants worked out the main topics and messages they want to share with farmers and stakeholders.

Date of Starting IFFS

Date of Starting IFFS	Leksana	Penanggungan
Earliest	1967	1999
Latest	2016	2015

Additional Information

Leksana	Penanggungan
1.To get extra income 2.Traditional culture 3.Get information from government	1.Traditional culture 2.Get information from government

Head of Household

Leksana	Penanggungan
100% Male	100% Male

Farmer's Age



Conference Preparation

DAY 10

July 19, 2017

Preparing the feedback workshop with the farmer group. Students learned how to embrace the principles of participatory and ethical communication through presentation.



Farmer feedback workshop

The participants shared their research insights in a participatory manner with the farmer community. In the presentation, three different topics were covered: ecology, economics, and social aspects in Leksana and Penanggungan.

The findings showed that in Leksana, the average number of different crops per cropping system is 2.3 with the maximum number of 4, whereas, in Penanggungan, the maximum number of crops is 3. The crop diversity comprised of chilli, potato, cabbage, maize, albizia, cassava, bean, coffee, grass, mustard, radish, and red beans in a declining order. Integrated farming practices in

Leksana and Penanggungan. In Leksana village, animal ownership varies and includes goat, chicken, and fish. The market access in Leksana village shows that the majority of the farmers can choose a market channel and negotiate. The farmers consider education, purchase of animals, and the ownership of farmland and house top the investment priorities. In Penanggungan village the majority of respondents do not have any animals. Regarding market access, the majority of farmers in Penanggungan can choose a market channel and negotiate prices. Regarding the investment priorities, Penanggungan farmers consider house, land, and education the most important ones.

In conclusion, the cropping system in Leksana village is horticulture and forestry whereas, in Penanggungan Village, the cropping system is intensive horticulture. Both villages have soil erosion problems. The way to manage soil erosion is through mulching, terracing and trees planting. The farmers in both villages are already well-equipped with technical knowledge. The source of income in Leksana is more diversified than in Pernanggungan.



Transfer to UGM

The participants expressed their gratitude to their host families, and left Banjarnegara in good spirit.

DAY 11
July 20, 2017



DAY 12

July 21, 2017

Conference (Public Workshop)

The participants summarized their findings and presented them to a wider academic audience. The students interacted with the public, debating on current challenges. From the field, participants concluded that the transition to sustainability is still in the making.



PUBLIC WORKSHOP

Research Justification

1. Sustainability

The ability to maintain provision of natural resources at a certain rate, provide decent life for all, present and future generations.

2. Food System

All processes and infrastructure involved in feeding a population.

3. Food Security

The state of having reliable access to a sufficient quantity of affordable, nutritious and safe food.

4. Definitions of Transition, Sustainability

Transition and Food Sustainability Transition

■ **Transition** was defined by Gazheli *et al.* (2012:338) as a “*combined societal-technological transformation - gradual or discontinuous - in which society or important subsystems of it as well as prevailing social practices and cultures undergo a fundamental change*”.

■ Markard *et al.* (2012:956) defined **sustainability transitions** as “*long-term, multi-dimensional and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption*”.

■ **Food sustainability transitions** refer to structural change processes in food systems that give rise to new production and consumption modes and practices that are more sustainable, both socially and environmentally (Spaargaren *et al.*, 2012).

5. Challenges in Java

Agro-forestry

- Soil erosion
- Land slide
- Climate change

Growing of **woody plant** on the same unit of land as agricultural **crops** and/or animal either in some form of spatial **mixture** or sequence (Nair, 1993)

Advantages of agro-forestry

- Improved **soil fertility**
- Increasing of **yields / productivity**
- Improved food security and nutritional status (cf. crop diversification)



- Conservation of biodiversity
- Reducing soil erosion
- mitigating climate change
- Ecosystem services (cf. provisioning, regulating, cultural).

(Oduol, et al. 2006)

6. Research questions

- RQ1: Is there a **transition**?
- ▶ If yes, why there are differences in pathways between two villages [Leksana and Penanggungan] although they are in a similar context?
- RQ2: Which **farming system** is more **sustainable** from **ecological, economic** and **social** points of view?
- ▶ Is agro-forestry more sustainable than intensive farming in Java?

7. Referenced Cited

- **El Bilali H. & Probst L. (2017)**. Towards an integrated analytical framework to map sustainability transitions in food systems. VIII International Agriculture Symposium “AGROSYM 2017”; 5-8 October 2017; Jahorina, Bosnia and Herzegovina.
- **Gazheli A., Antal M., van den Bergh J.C.J.M. (2012)**. Behavioural aspects of sustainability transitions. Proceeding of the 3rd International Conference on Sustainability Transitions; Track E “Theory Development and Critical Perspectives”; August 29-31, Copenhagen; pp. 337-359.
- **Markard J., Raven R., Truffer B. (2012)**. Sustainability transitions: an emerging field of research and its prospects. *Research Policy* 41: 955–967.
- **Spaargaren G., Oosterveer P., and Loeber A. (2012)**. Sustainability transitions in food consumption, retail and production. In, *Food practices in transition: Changing food consumption, retail and production in the age of reflexive modernity*, G. Spaargaren, P. Oosterveer, and A. Loeber (ed.), 1–31. New York and Oxon: Routledge.
- **Nair, P. K. R. (1993)**. An introduction to agroforestry. Kluwer Academic Publishers; pp. 3-17.



PUBLIC WORKSHOP

FIELD STUDY: SUSTAINABILITY TRANSITIONS SUMMER SCHOOL 2017

Significance of Agriculture

- In 2016, Agriculture contributed 15% of the total economy in Central Java (2nd to Industry sector, 35%)
- While in Banjarnegara, Agriculture contributes about 40.25%

Data source: Badan Pusat Statistik

Production and Major Producing Areas

Banjarnegara (102,400 ha, total area)

- Cassava – 10,361 ha. (234,941.05 MT)
- Paddy rice field – 25,684 ha. (157,022.24 MT)
- Cabbage – 5,045 ha. (142,331 MT)
- Corn – 19,101 ha. (84,344.69 MT)
- Potato – 7,300 ha. (99,756.30 MT)

The Case of Penanggungan and Leksana Village

Banjarnegara District, Central Java Province, Indonesia

- Compare and Analyze the difference between Agroforestry (Leksana) and Intensive Farming (Penanggungan).

Population Banjarnegara

945,154 (2012)

Source: Banjarnegara dalam Angka 2013

Leksana – 3,560 (2015)

Source: Karangobar dalam Angka 2016

Penanggungan – 2,038 (2015)

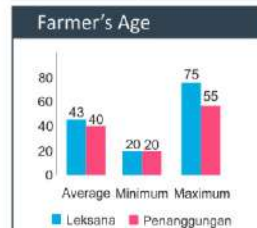
Source: Wanayasa dalam Angka 2016

Approximate Percentage of Agroforestry Area (%)

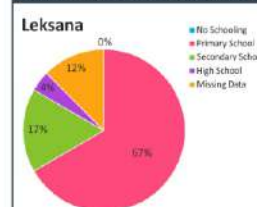


Demographic Information

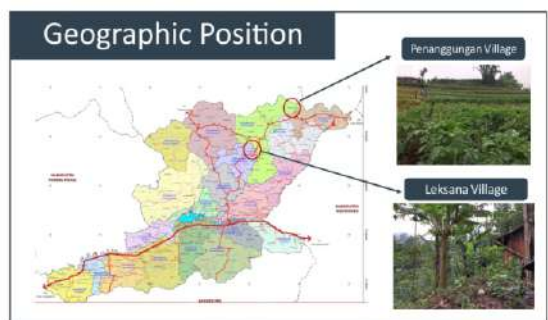
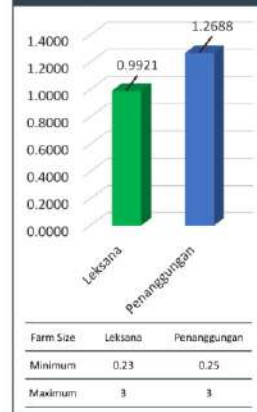
Head of Household	
Leksana	Penanggungan
100% Male	100% Male



Farmer's Level of Education



Farm Size (Ha)

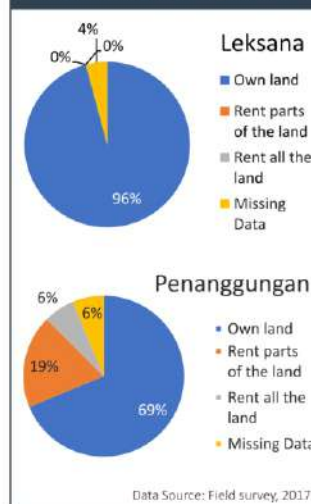


Geographic Information

- Elevation**
Leksana: 1,025 MASL Penanggungan: 1,287 MASL
- Slope Ranges**
Leksana and Penanggungan: 15% - 40%
- Annual Average Rainfall**
Leksana (Karangobar Sub-District) : 4,121 mm
Penanggungan(Wanayasa Sub-District) : 3,379 mm
Central Java : 3,151 mm

Date of Starting Agro-Forestry			Reason for Using Agro-Forestry	
Date of Starting	Leksana	Penanggungan	Leksana	
Earliest	1967	1999	1.To get extra income 2.Traditional culture 3.Get information from government	
Latest	2016	2015	Penanggungan	
			1.Traditional culture 2.Get information from government	

PERCENTAGE OF LAND TENURE





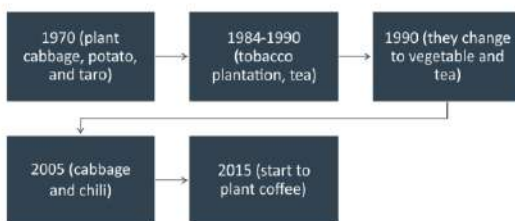
PUBLIC WORKSHOP

Technical Landscape

1. Sustainability transitions analytical framework



2. Timeline



3. Agro-forestry as a bridge between different sectors



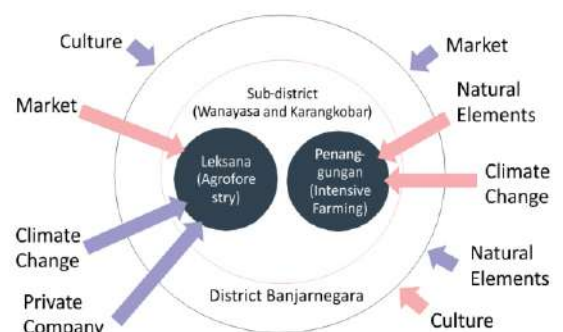
4. External Factors impacting Agro-Forestry

	Factors	Opportunity	Pressure
AGRO-FORESTRY	Climate Change	-High Adaptability -Resilience -Indonesia -Commitment of CC	
	Culture	Traditional way	Opposing communities
	Market and Trade	International Demand (exotic fruits, etc.)	Standards
	Private Companies	Corporate Social Responsibility Program promoting AF	
	Natural Elements	Steep topography	

5. External Factors impacting Intensive Farming

	Factors	Opportunity	Pressure
INTENSIVE FARMING	Climate Change		Low Resilience
	Culture	Commercial farming mindset	-Science -Innovation
	Market	High productivity	Standards
	Natural elements	-Flat topography -Easy access -availability of water	-Steep topography -Erosion

6. Factors impacting the Villages “Niches and Regimes”



7. Referenced Cited

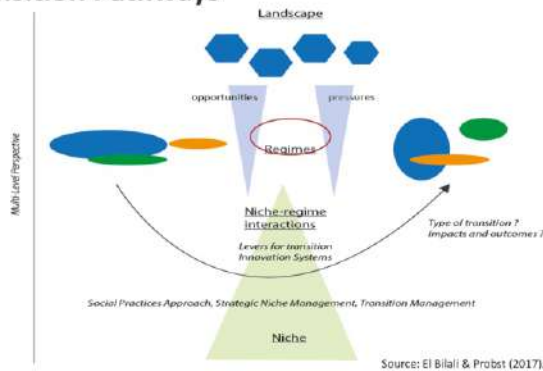
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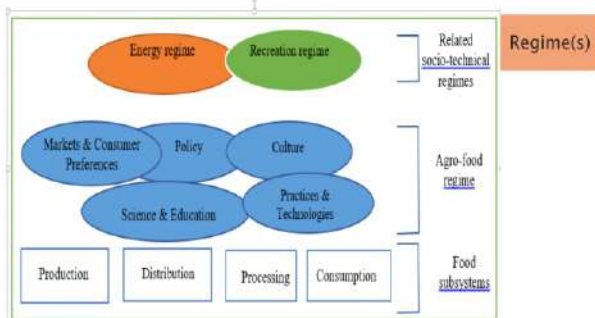
PUBLIC WORKSHOP

Regime

1. Transition Pathways



2. Elements of Agro-Food Socio-Technical Regime



3. Culture

Leksana	Penanggungan
Their old/traditional practices and new technology are now being incorporated in their farming practices.	Main goal is for higher income Hard to change their mindset

4. Market and Consumer Preferences

Leksana	Penanggungan
Farmer can choose buyer (75%)	Can choose (69%)
Market price is dictated by middle men	
Families prefer food diversification	

5. Policy

Agroforestry

Green Economy Policy

- One of the programs used to educate farmers to apply environmental friendly practices. Planting some trees to prevent soil erosion and improve water quality.
- Didn't allowed to cut some productive trees.

Intensive Farming

- Government provides subsidies for synthetic fertilizers.

5. Science and Education

Leksana	Penanggungan
Intervention conducted by research institutions, government is widely accepted	Some farmers have reservations to adapt <ul style="list-style-type: none"> • planting trees to protect their farmlands • planting trees within the cropping areas would decrease production

6. Practices and Technology

Leksana	Penanggungan
Integration of new technology to the farming activity: Agroforestry, inter-cropping, multi-cropping, mulching, terracing and ridge techniques	Monocropping, mulching, intensive use of pesticides, insecticides and synthetic fertilizer

7. Conclusion

- Culture
- Practice and Technology
- Market preferences

Referenced Cited

- El Bilali H. & Probst L. (2017). Towards an integrated analytical framework to map sustainability transitions in food systems. VIII International Agriculture Symposium "AGROSYM 2017"; 5-8 October 2017; Jahorina, Bosnia and Herzegovina.



PUBLIC WORKSHOP

Ecology



Soil Description & Soil Analysis

Universal Soil Loss Equation (USLE)

$$A = R \times K \times L \times S \times C \times P$$

A = average annual soil loss in t/a (tons per acre)

R = rainfall, **run-off** and erosivity index

K = soil erodibility factor

LS = topographic factor - L is for slope length & S is for slope

C = cropping factor

P = conservation practice factor

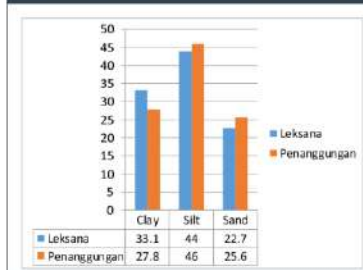
Annual Erosion of the whole SERAYU watershed is 6.65 M ton/year



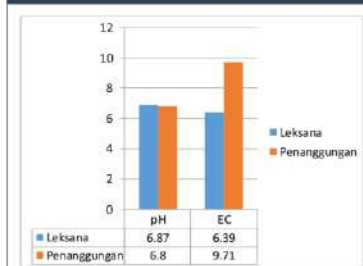
Conclusion

- Soil and ecology parameters show a sustainable production system in Leksana, due to
 - lower risk of soil degradation, erosion and land sliding,
 - as well as production management (fertilizer use, pest control, water use efficiency...)

Comparison of Texture [%]

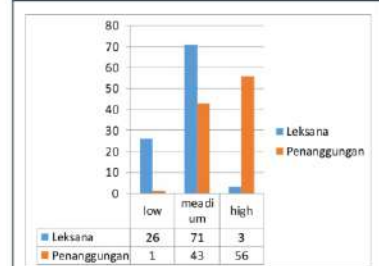


Comparison of pH and Electric conductivity [$\mu\text{S cm}$]

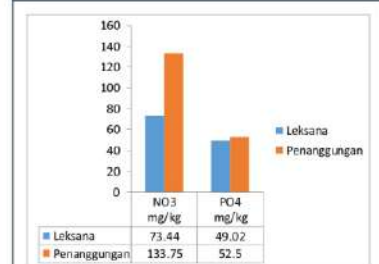


Optimum pH for normal plant: 5.5 – 6.5

Comparison of Organic Carbon [%]



Comparison of NO_3 [mg/kg] and PO_4 [mg/kg]



Summary

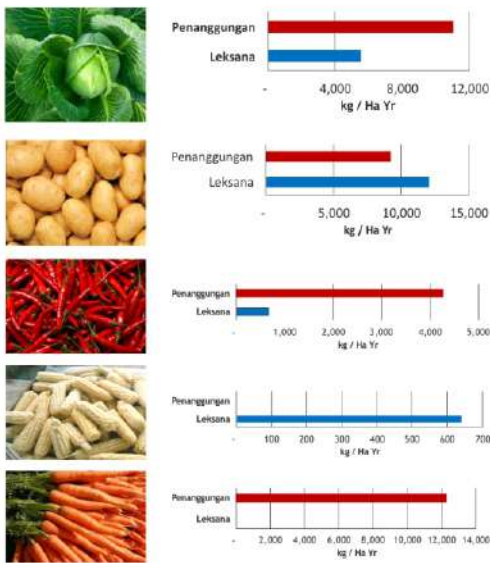
- Soil development and degradation differs among villages
 - Penanggungan shows more degraded soils resulting already in losses of soil functions (higher risk on land sliding)
 - Leksana shows expected soil development according to the ecosystem and climatic conditions
- Soil in Leksana is more protected from soil erosion due to agroforestry production system.
- Phosphorous efficiency is more sustainable in Leksana
- Farmers have **knowledge** about their **soil quality**
- Farmers from both villages rely on both mineral and organic fertilizer with way higher expenses for Penanggungan farmers for external products.
- In both villages farmers feel the need of increasing chemical fertilizers
- Both villages generally manage pests and weeds by pesticide and intercropping management, with a trend of Penanggungan farmers towards **more pesticides**, and Leksana **more intercropping** practice
- Majority of farmers in both villages **agree** on an increasing **unreliability** of the weather



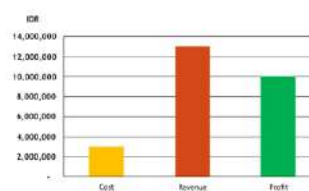
PUBLIC WORKSHOP

Economic Aspect

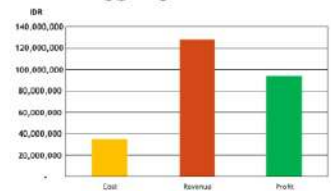
1. Main Crops Productivity



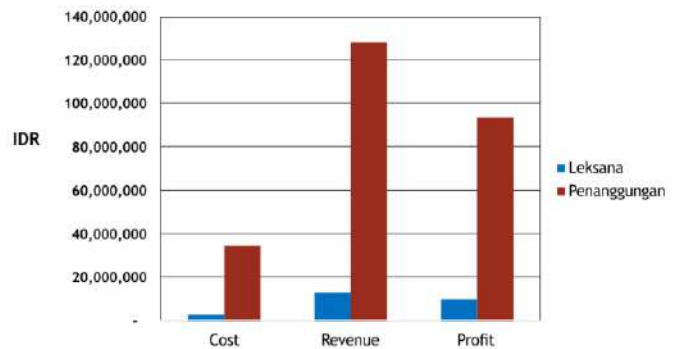
Leksana



Penanggungan



Cost, Revenue, and Profit Comparison



2. Market Access (Leksana)

Choose (/) Negotiate (/) 62.5%
 Choose (x) Negotiate (/) 30%
 Choose (x) Negotiate (x) 7.5%

(Penanggungan)

Choose (/) Negotiate (/) 87.5%
 Choose (x) Negotiate (/) 12.5%
 Choose (x) Negotiate (x) 0%

3. Cost, Revenue, and Profit

Types & Cost of Expenditures

Item	Leksana	Penanggungan
Seeds	681,000	12,036,000
Fertilizers	901,000	9,557,000
Pesticides & Herbicides	281,000	5,788,000
External Labor	439,000	8,466,000

Revenue-Cost Ratio

Location	Ratio
Leksana	4.33
Penanggungan	3.70

4. Investment Priorities

Rank	Leksana	Penanggungan
1	Education (children)	House
2	Purchase of Livestock	Farmland
3	Farmland/House	Education (children)

5. Conclusion

Leksana is economically more sustainable than Penanggungan.

6. Recommendation

- Productivity should be increased in Leksana
- Include more processing on farmer level

PUBLIC WORKSHOP

Social

1. Food Diversity

Leksana & Penanggungan

1. Rice
2. Corn
3. Cassava

In general, farmers of Central Java can also afford:

- Meat
- Egg
- Fish & Seafood
- Pulses and nuts
- Milk & Milk products
- Oils & fats

Finding

Current food access:

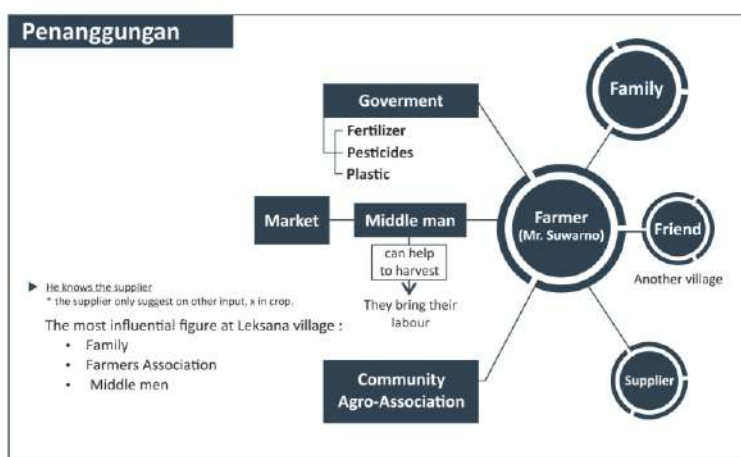
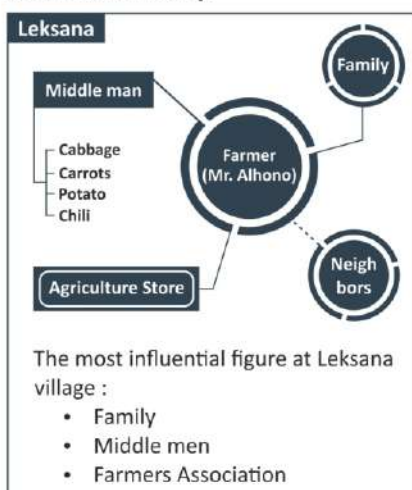
- Able to afford all different type of food;
- no significant difference between Leksana and Penanggungan

Food security:

Farmers produce crops that they don't consume; e.g. production of potatoes to sell on the national market.

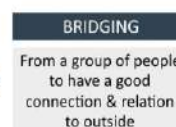
2. Social Relations

Method: Net Map



Social Capital

A form of economic & cultural capital in which social networks are central, transactions are marked by A form of economic & cultural



capital in which social networks are central, transactions are marked by reciprocity, trust & cooperation, and market agents produce goods & services not mainly for themselves but for a common good.

The most influential figure towards agro-forestry

Leksana village :

- Family (3.00)
- Farmers Association (3.00)
- Other Farmers (2.62)
- Middle men (2.31)

Penanggungan village :

- Family (2.67)
- Other Farmers (2.47)
- Middle men (2.44)
- Farmers Association (2.13)

Public opinion about farmers

Farmers feel **ACCEPTED & APPRECIATED** and experience farming as a source of happiness (none farmer disagreed) **STILL**.



PUBLIC WORKSHOP

Research Question

RQ 1. Is there any transition?

No, we have transition in the making !



We have mosaic of systems that exist together

- In the Leksana from forestry to agroforestry, but in some places they also have deforestation.
- In Penanggungan the trend is **extensification** and **diversification**.

Why do we have different pathways?

Leksana	Penanggungan
People are more open for innovation/ changes	People prefer to follow the mainstream (intensive farming)
Limitation of topography; steep slopes	Less steep slopes/ lower slope

- Landscape elements that dominate are climate change, globalization, topography (natural landscape)
- Regime elements that dominate are culture, practices and technology, market and consumer preferences

RQ 2. Which system is more sustainable?

Agroforestry is more sustainable

- ✓ Ecology
- ✓ Economy
- Social

Conclusions

Answering Research question

- RQ1: Transition is in the making more research is needed to understand transition dynamic and processes
 - Interaction between social technical landscape and regime with agroforestry are useful to understand the state of art agroforestry development in the study area
- RQ2: Proof of agroforestry as a more sustainable farming system than intensive farming

Recommendations

Government should act in such a way to make the landscape and environment more supportive for the development of agroforestry in the study area

Agroforestry will not be developed unless there are deep changes in culture science and education, market and consumer preferences, agro food policy, while making appropriate technology and practices for farmers

Learning, experiences and best practices among farmers practicing agroforestry and intensive farming actors should be improved

DAY 13

July 22, 2017



Farewall Workshop

Graduation for Short Program

In the graduation, participants were given their certificate of completion of the Summer School. Besides that, a short video created was presented as a farewell remark along with some farewell speeches from the coordinators and the Head of Office of International Affairs. The Master of Ceremonies closed the short-program of the Summer School by a closing remarks that "you will always have a home in Indonesia".



DAY 14

July 23, 2017

Explanation on Long Program

COURSE PROGRAM

MS-FSCC PROGRAM

PHASE
01

Introduction

- Seminars: Understanding the FSCC program, Climate Changes in Southeast Asia and the world, and its causes and consequences.
- Greenhouse effect, GHG emission, Agricultural contribution to emission, Global and Regional Climate Models, etc.

PHASE
02

Implementation

- Excursion option: Community-based Disaster Management in Volcano Area.

PHASE
03

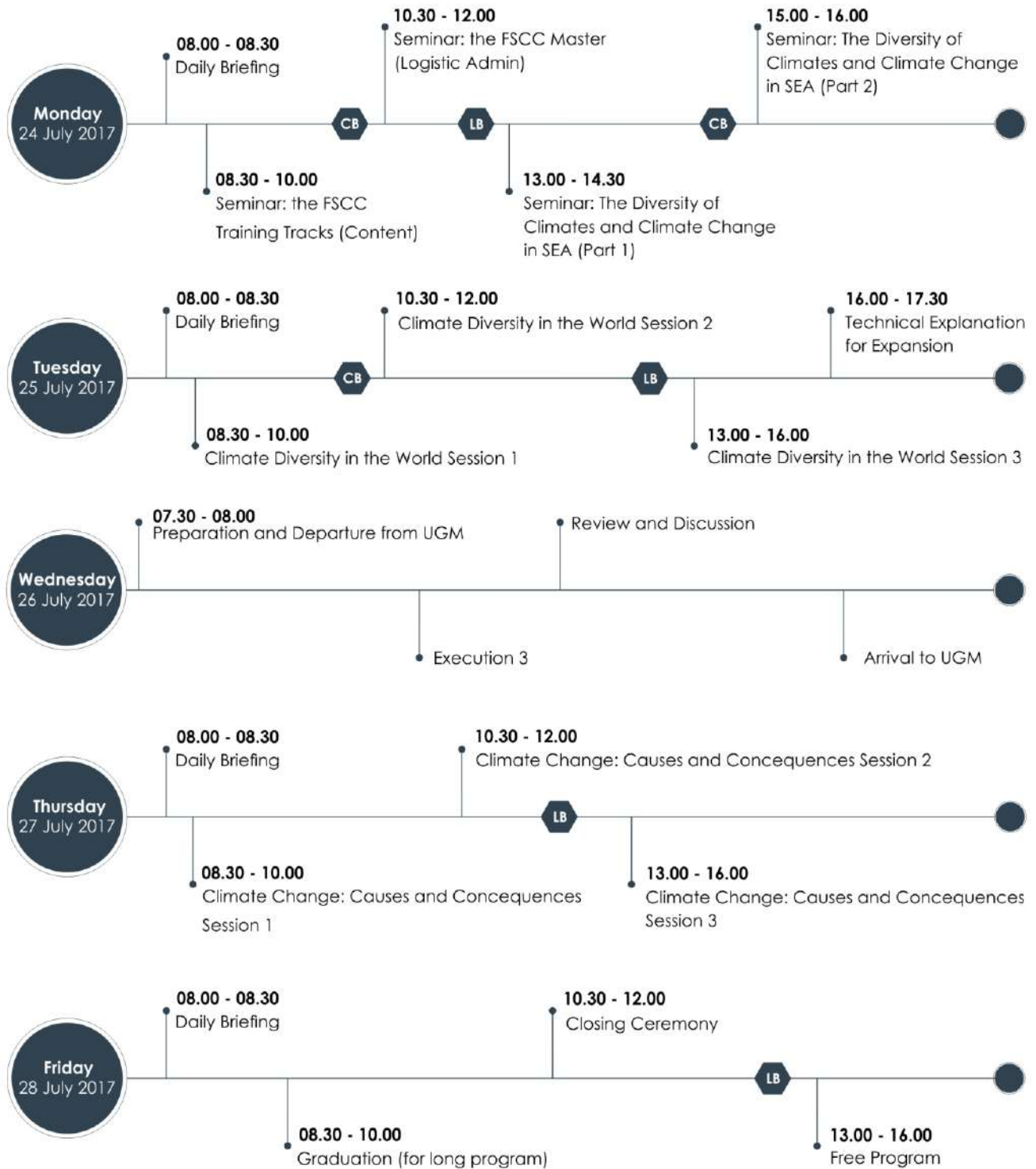
Reflection

- Within this program, participants are provided with an opportunity to present the climate conditions in one specific place within their country, as well as to identify the reasons behind it.

MS - FSCC PROGRAM

SCHEDULE

Coffee break **CB** Lunch break **LB**





DAY 15

July 24, 2017

1. Daily Briefing
2. Seminar: The FSCC Training Tracks (Content)

Introducing the different training tracks and further developing the FSCC team spirit.

3. Seminar: The FSCC Master (Logistic Admin)

Explaining the logistical and administrative details of being a FSCC student.

4. The Diversity of Climateder and Climate Changes in SEA (Part 1)

5. The Diversity of Climateder and Climate Changes in SEA (Part 2)

DAY 16

July 25, 2017

MS-FSCC Program



1. Daily Briefing
2. Seminar : Climate Diversity in The World Session 1

The participants were introduced to the mechanisms of the greenhouse effects, the sources of GHG especially in agriculture, the mechanisms of their production. They were put into groups working on specific sub topics: mechanism and impact of the deforestation, the methane production in flooded paddy fields, and the contribution of the different animal rearing systems to the climate change.

Seminar : Climate Diversity in The World



DAY 17

July 26, 2017

1. Preparation and Departure from UGM

2. Excursion 3

**3. Excursion in Merapi Museum –
Community based Disaster Management
in Volcano Area**

4. Short Route of Merapi Lava Tour

The tour started from Merapi Museum – *Makam Masal* – *Dusun Petung* – Mini Museum (*Sisa Hartaku*) – *Dusun Jambu (Batu Alien)* – *Bunker* – *Kali Kuning*.

**5. Excursion in *Lintas Merapi* Community
Radio**

6. Review and Discussion

7. Arrival to UGM



DAY 18

July 27, 2017

1. Daily Briefing

2. Climate Change : Causes and Consequences Session 1

This session comprised the principles of climate change modeling and the different models that exist at the global worldwide level and at the South-East Asian level.

3. Climate Change : Causes and Consequences Session 2

4. Climate Change : Causes and Consequences Session 3

5. Climate Change Mitigation :

The Reduction of The GHG Release and The C Sequestration in Agriculture and Animal Breeding

The final session included the technical (climate smart) solutions for mitigation of climate change, causes and consequences of climate change particularly of activities contributing to climate change.



1. Daily Briefing

2. Graduation (for Long Program)

DAY 19

July 28, 2017



Evaluation Report

Summary

The overall evaluation of the Summer School was very positive for both the general part (weeks 1&2) involving MSFSCC-students and additional participants from SE Asia and Europe, and for the part involving only MSFSCC students (week 3).

Regarding weeks 1&2, the students positively emphasised the opportunity to build friendships and international networks in a social and experiential learning setting. The participants stated that they could develop social, personal and professional competencies relevant for their future. The field stay was seen as an indispensable learning element.

The learning outcomes for weeks 1&2 were well to very well achieved; improvement could be necessary regarding theories and tools for facilitating change. For the future, it was

suggested to 1) recruit participants earlier and start e-learning activities accordingly; 2) to make the roles in the trainer team more transparent to students; and 3) to reduce the density of the program.

Regarding week 3, the participants appreciated the richness of knowledge provided, and acquired more technical competencies than expected. The learning outcomes were well achieved; improvement could be necessary in explaining the logistics and mechanisms of the MSFSCC program. For the future, it was suggested to 1) make the sessions more participatory and interactive and 2) to sharpen the focus. More than two thirds of the MSFSCC participants stated that they would definitely apply for an Erasmus+ mobility to Europe.

Evaluation mechanism

The evaluation mechanism separately assessed the performance of the Summer School in weeks 1&2 and week 3.

The evaluation strategy combined anonymous, written feedback using open and closed questions such as Likert-scales with oral group discussions (n=37). Both strategies were combined to gather information on:

- ◆ Expectations and their fulfilment
- ◆ Knowledge and skills acquired unexpectedly
- ◆ Learning outcome achievement
- ◆ Course structure and phases
- ◆ Recommendations for adaptation

We structure this report accordingly.

Evaluation Results



1. Expectations and Their Fulfilment

The participants saw their expectations regarding experiential and social learning more than fulfilled. Networking and making friends was seen as rewarding intercultural outcome, in addition to the opportunity to communicate with 'real' actors such as farmers and officials. The field stay and the application of a variety of skills was considered the most important learning element. The problem-based approach was seen as rich in learning on transition and food security, despite the frustrating

WEEKS 1&2

experience of complexity in systems thinking.

On a personal level, the participants underlined the importance of living with a family in the home stay setting. Also, the necessity to develop foreign language skills and the courage to present

and share in front of others was appreciated.

Some participants felt that the analysis of data would have required more skills and scientific rigour, again referring to the complexity of food systems and change. The wish for actionable knowledge and solutions was expressed, which is a frequent concern in problem-based learning approaches. Generally, the participants felt a lot of pressure and would have appreciated more time to digest and reflect on insights.

The MSFSCC participants appreciated the detailed knowledge provided on climate change scenarios during week 3. They found the lectures to be very rich in scientific knowledge on food security and climate change.

WEEK 3

Some participants had difficulties with the very technical approaches (modelling and formulas), and found that there was a lack of relating agriculture and land use to climate change issues. Also, the role of people in change and transition was considered as not addressed sufficiently, while the diversity of subjects made it difficult to integrate the provided knowledge. Generally, the students recommended more interactive, participative and group-based formats so that participants can learn from and with each other.

2. Knowledge and Skills Acquired Unexpectedly

WEEKS 1&2

Frequently mentioned knowledge and skills acquired unexpectedly included (1) social competencies, (2) applied professional competencies and (3) personal competencies.

Social competencies mentioned were working in teams over a longer period, adaptation to different cultures and personalities, particularly in a Muslim community and regarding gender issues. Professionally, many participants were inspired by characterizing complex systems using indicators, by soil research and in general by applying techniques learned in class. Personally, it was seen as important to learn to work under pressure with the need to improvise.

WEEK 3

The MSFSCC participants learned more than expected about scenario techniques, computing and statistics and the use of data.



3. Learning Outcome Achievement

WEEKS 1&2

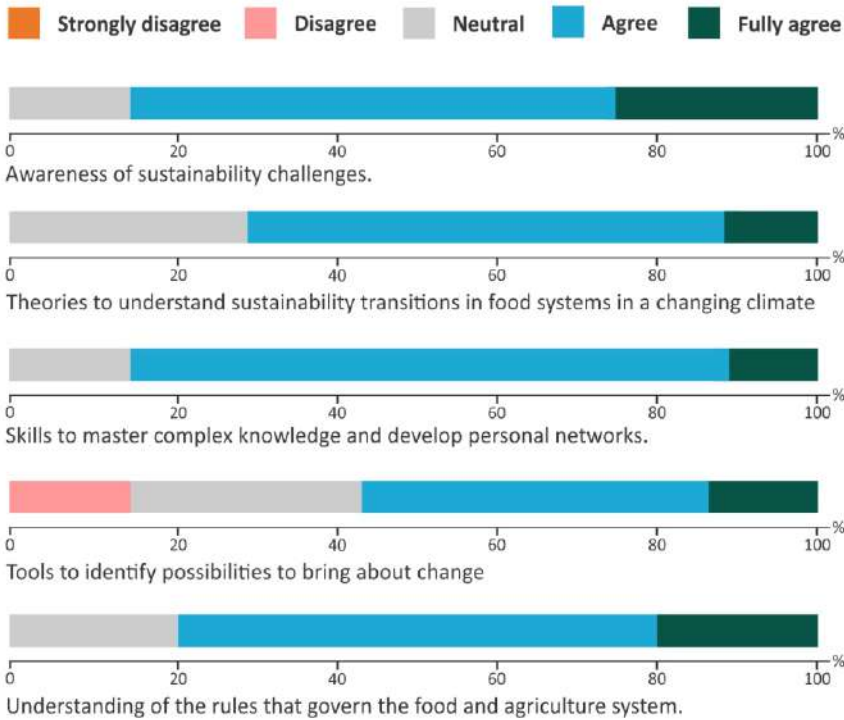


Fig. 1 achievement rating of learning outcomes.

AVERAGE RATING OF LEARNING OUTCOME ACHIEVEMENT

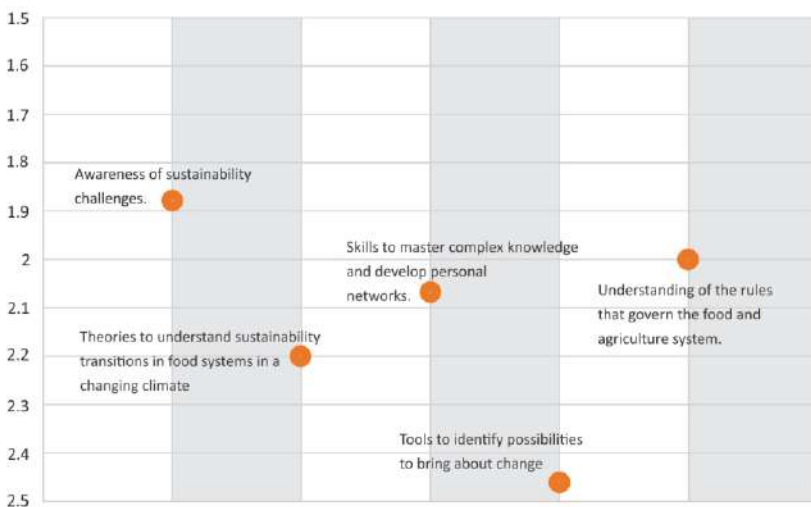


Fig. 2 achievement rating of learning outcomes.

Average over 1 = fully agree that achieved, ..., 5 = strongly disagree that achieved.



The achievement rating of the learning outcomes (Figs. 1 and 2) for weeks 1&2 shows that the Summer School did well or very well regarding all learning outcomes.

Weeks 1&2 clearly created awareness of sustainability challenges, developed skills to understand complexity and the food and agriculture system, and showed students how to establish personal networks. The students felt less confident regarding their understanding of pertinent theories and command of tools to bring about change.

WEEK 3

Week 3 shows a very balanced rating at a good achievement level. An important lesson is the relatively lowest ranking of learning outcome 4 – the 'Understanding of the training tracks and logistics of the MSFSCC program'.

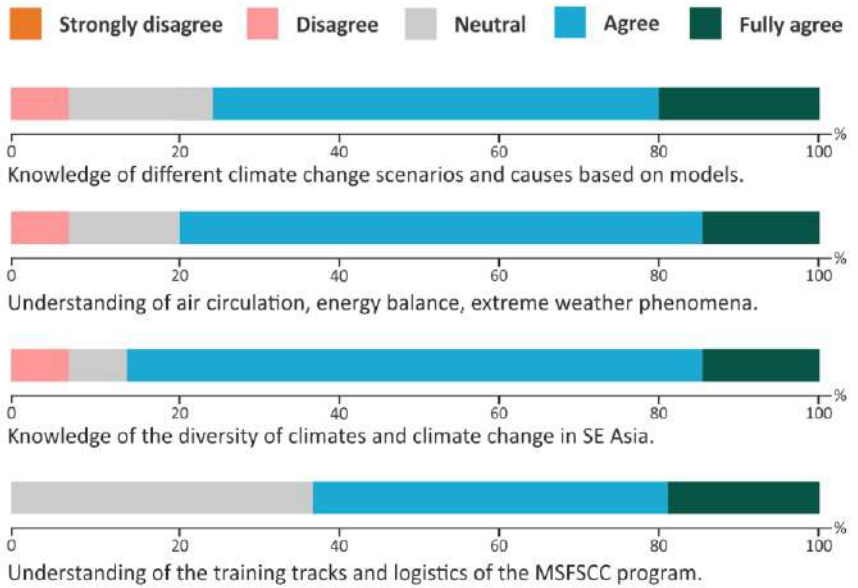


Fig. 3 achievement rating of learning outcomes.



AVERAGE RATING OF LEARNING OUTCOME ACHIEVEMENT

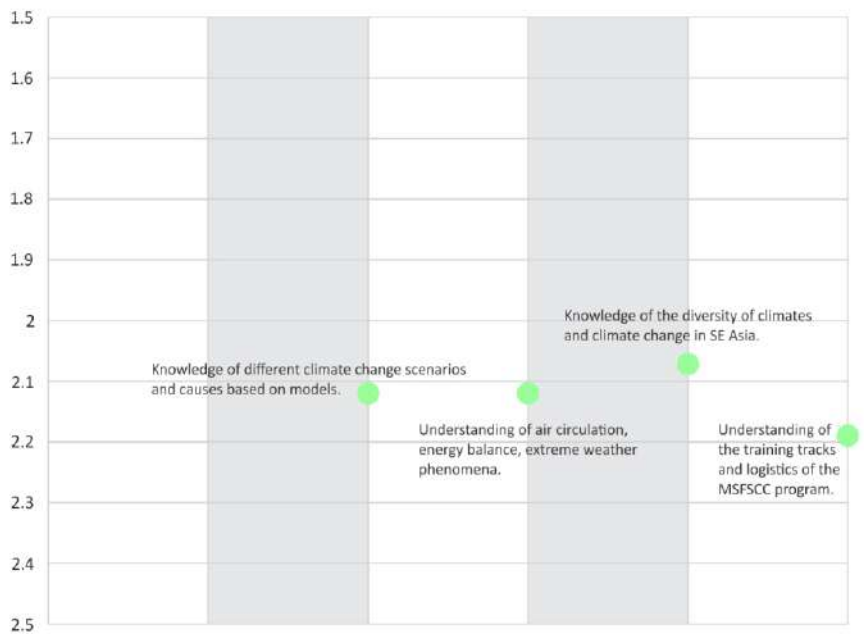


Fig. 4 achievement rating of learning outcomes.

Average over 1 = fully agree that achieved, ..., 5 = strongly disagree that achieved.

4. Course Structure And Phases

WEEKS 1&2

Weeks 1&2 clearly created awareness of sustainability challenges, developed skills to understand complexity and the food and agriculture system, and showed students how to establish personal networks. The students felt less confident regarding their understanding of pertinent theories and command of tools to bring about change.

The main message regarding weeks 1&2 was that the participants felt the schedule to be very tight, thus not leaving enough time for digesting the learning.

As shown in Figure 5, the student evaluation of the field stay was very positive, with more than 70% stating that it was a great benefit and very enriching. Less than 3% had rather visited a different place and all students considered a field stay necessary.

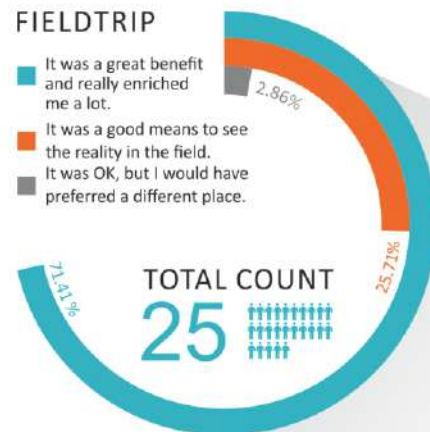


Fig. 5 Evaluation of the field trip as learning element

WEEK 3

The participants generally recommend a more participatory and engaging learning design. The second day of week 3 (Tuesday) and the session on carbon sequestration were not well received by the participants. Dr Perdinan of IPB was commended for his lecture and teaching style.

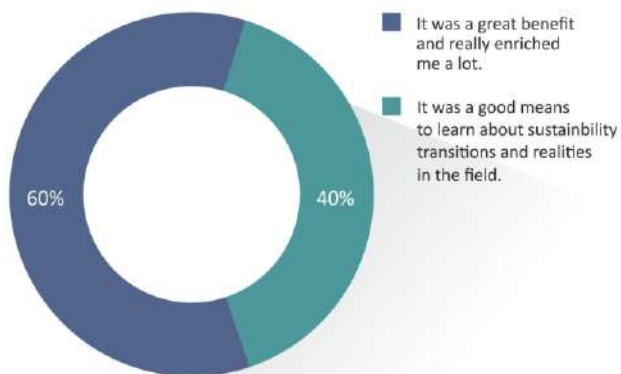


Fig. 6 Evaluation of weeks 1&2 after experiencing week 3

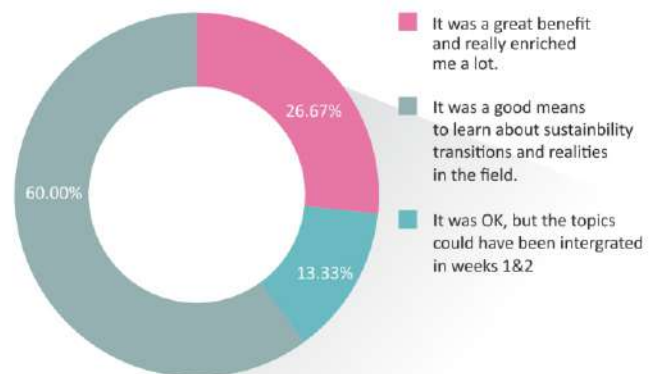


Fig. 7 Evaluation of week 3 for the overall experience of the Summer School

After week 3, the MSFSCC participants evaluated the overall importance of weeks 1&2 as compared to week 3. The results (Figs. 6 and 7) show that the weeks 1&2 were rated significantly more important than week 3 – however, the rating of week 3 was still strongly positive.

5. Recommendations for Adaptation and Outlook

WEEKS 1&2

In general, the participants recommended to start recruiting and e-learning much earlier to allow for more detailed and synchronized preparation. Regarding the implementation of the Summer School, the students would appreciate a clearer definition of roles among the trainer team so that decision making becomes more transparent, particularly when adaptation becomes necessary. Most importantly, the students would need more time to digest the lessons learned. After weeks

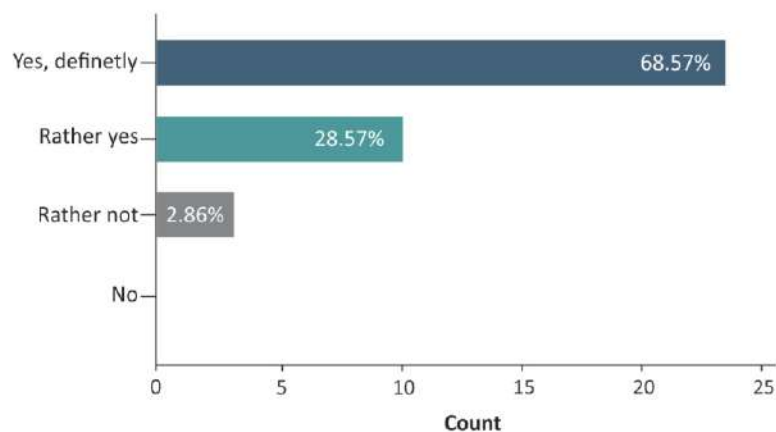


Fig. 10 Would you recommend the Summer School to other students?

1&2, all 37 participants were asked whether they would recommend the Summer School – more than 2/3 would definitely do so.

WEEK 3

For week 3, the students recommended to make sessions shorter and focus on fewer pertinent topics. Regarding the learning design, more interactive work individually and in groups was recommended. Learning materials should be provided for all inputs and earlier. 56.25% would definitely recommend week 3 of the Summer School to other students.

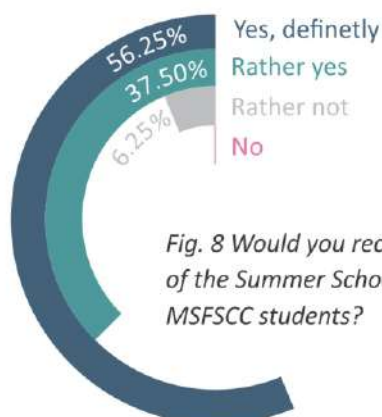


Fig. 8 Would you recommend week 3 of the Summer School to other MSFSCC students?

MS FSCC Mobility

Of the MSFSCC participants, a clear majority stated that they will definitely apply for a mobility opportunity to Europe within the MSFSCC program. (Fig. 9).



Fig. 9 Interest in applying for a mobility to Europe within MSFSCC

INSTRUCTORS

SUSTAINABILITY TRANSITIONS SUMMER SCHOOL 2017

Professionals from various institutions across the globe will assist and guide the participants throughout this Summer School. We are very glad to welcome instructors from University of Natural Resources and Life Sciences (BOKU), Agrinatura, Institut Pertanian Bogor, Universiti Putra Malaysia, Kasetsart University, University of the Philippines Los Banos, and Universitas Gadjah Mada.

A

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Saiful Maskan

Malaysia / UPM

Sandy Budi Wibowo

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Desy Wahyuning Tyas

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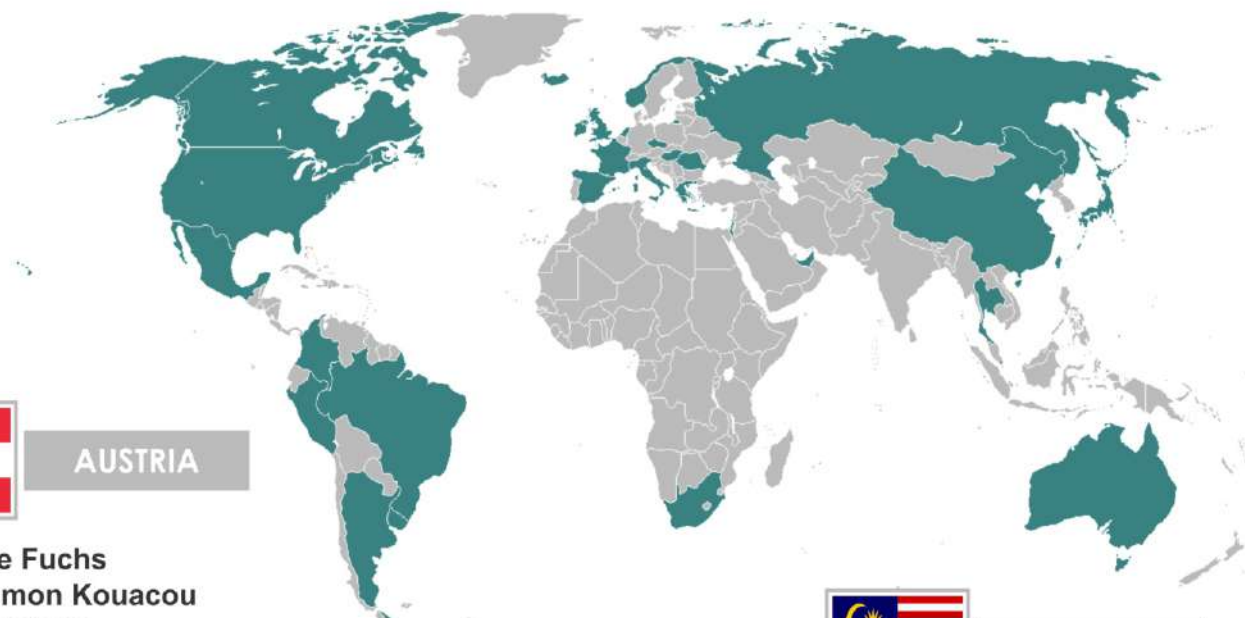
Rizki Maftukah



Students from universities around the world have enthusiastically signed up for the Summer School to join their peers in Indonesia. These participants come from many parts of the Asian and European regions, including from Austria, Cambodia, Czech Republic, Finland, France, Germany, Indonesia, Laos, Malaysia, Myanmar, Morocco, Spain, Philippines, and Thailand.

PARTICIPANT AND NATIONALITY

SUSTAINABILITY TRANSITIONS SUMMER SCHOOL 2017



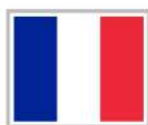
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Livia Klenkhart
Sebastian Jacob Vogler



FINLAND

Rami - Petteri Matias Apuli



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Lorraine Vaney



GERMANY

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Maria Gali Reniu



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THAILAND

Chonnipa Chittrakhani
Khongsuk Hutthaya
Mungmoom Panitnart
Nuttavant Meechart
Sutee Nootong



PROJECT REPORT

**SUSTAINABILITY TRANSITIONS SUMMER SCHOOL FOOD SECURITY AND CLIMATE CHANGE
INTEGRATED FORESTRY FARMING SYSTEM: A TRANSITION TO FOOD SECURITY IN A CHANGING CLIMATE?**

Yogyakarta, July 10 – 28, 2017