

GROUP 3
Sustainability for Agriculture in Japan-Indonesia

I Made Agus Dwi ginartha
 Citra Mayang Wardhika
 Wahyu Arif Sudarsono
 Sri Rebecca Sitorus
 Siti Fadhillah
 Sachnaz Oktarina
 Haruna Terada
 Ayumu Nishimura



OUTLINE

- ✓ Sustainability
- ✓ Field activities
 - the chemical soil content using Dr. Soil
 - Ibaraki University field visit
 - palatability
- ✓ The results of excursion : JICA, Tokyo Tama Seika, ICE
- ✓ Comparison between Japan and Indonesia

Winter Course, Ibaraki University, Japan 21-28 November 2012

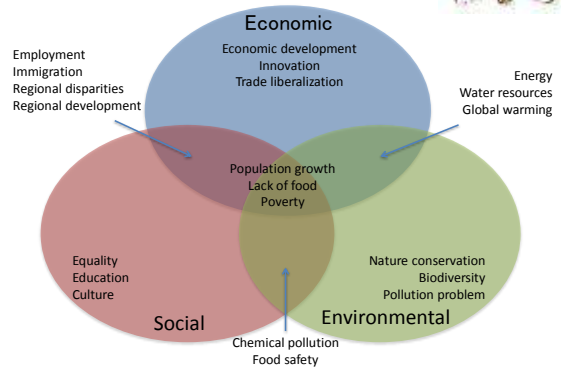
Sustainability

Sustainability is defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.

- Economic system
- Environmental system
- Social system

Winter Course, Ibaraki University, Japan 21-28 November 2012

Problems to realize sustainability



Field activities : Dr. Soil

- Dr. Soil to analyze soil content
- to determine the rate and kind of fertilizer which needed
- to determine the sustainability of soil → > 2% of soil organic C

Winter Course, Ibaraki University, Japan 21-28 November 2012

Samples

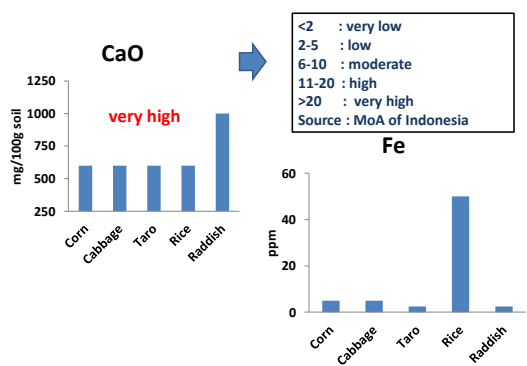
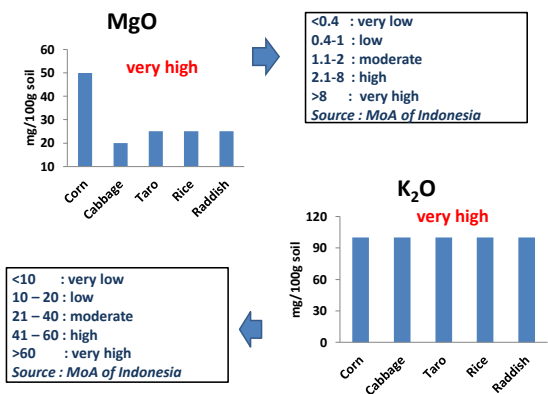
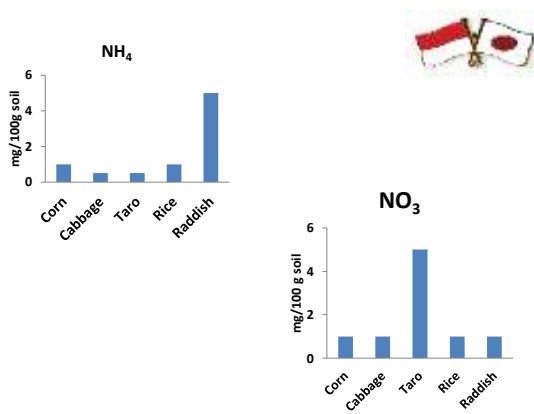
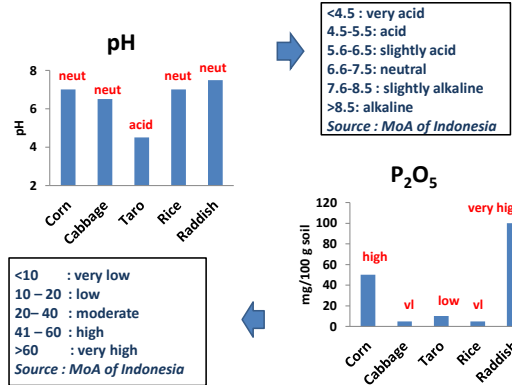


Soil analysis by using Dr. soil



Samples	pH	NH ₄ (mg/100g)	NO ₃ (mg/100g)	K ₂ O (mg/100g)	P ₂ O ₅ (mg/100g)	CaO (mg/100g)	MgO (mg/100g)	Fe (ppm)
Corn	7.0	1	1	100	50	600	50	5
Cabbage	6.5	<1	1	100	5	600	20	5
Taro	4.5	<1	5	100	10	600	25	<5
Paddy	7.0	1	1	100	5	600	25	50
Raddish	7.5	5	1	100	100	1000	25	<5

Winter Course, Ibaraki University, Japan 21-28 November 2012



The soil analysis need to be compared with the analysis which conducted in laboratory → more accurate

If the soil analysis which conducted with Dr. Soil is **TRUE**, so:

1. Soil in Taro plants need to be added lime to increase the pH
2. Soil in cabbage, taro, rice need to be added phosphor fertilizer
3. K₂O, CaO, MgO contents are sufficient

Winter Course, Ibaraki University, Japan 21-28 November 2012

Winter Course, Ibaraki University, Japan 21-28 November 2012

Field activities : Ibaraki University



STRAWBERRY CULTURE

→ Heat Shock Water Treatment

to enhance plant immunity, especially powdery mildew fungi

Applied once a week with hot water (50°C) for 20 seconds/plant and speed 50 cm/minutes.

Tool: Yuchemura



STRAWBERRY CULTURE

Advantages:

1. reduce labor and chemical
2. Heating → increase CO2 production, increase photosynthesis, then increase production
3. Applied in fall/winter



Winter Course, Ibaraki University, Japan 21-28 November 2012

SWEET SORGHUM CULTURE

1. to make biofuel, ONLY stem, no leaves and grain.
2. leaves used for animal feed/compost, while grain for seedling
3. sweet sorghum height depends on variety
4. in Indonesia, sorghum is developed as alternative food



Winter Course, Ibaraki University, Japan 21-28 November 2012

Nutrition contents of five staple food in Indonesia

(Sirappa 2003; BPS 2011; Kusumaningrum and Rahayu 2007)

Commodity	Nutrition content					Indonesian production (x1000 tons)
	Carbohydrate	Protein	Fat	Wayer	Ash	
	(%)					
Rice	79	7	0.7	9.8	0.15	65,385
Sorghum	73	11	3.3	11.2	0.3	13
Corn	72	9	4.5	2.7	0.39	12,3
Cassava	35	2	0.3	63	0.073	23,46
Sagoo	83.35	0.7	0.2	14.07	0.02	20.87

Winter Course, Ibaraki University, Japan 21-28 November 2012

SWEET SORGHUM CULTURE

Biofuel manufacturing process:

1. Stem juicing with machine 1-2 stems/20 seconds
2. Measuring sugar index with refractometer
3. Juice is fermented, heated, and splitted based on the boiling point (titik uap) → butanol, etanol, etc.



Rice Palatibility

Made based on perspective, will be different among countries

Japanese is prefer to choose high palatability (low amilose and protein), while Indonesian is prefer with low palatability (high amilose and protein)

Japanese more like sticky rice than Indonesian (depends on the region)



Winter Course, Ibaraki University, Japan 21-28 November 2012



RICE PALATABILITY

Palatability assesment of 5 rice varieties

Variety	Palatability	Amylose (%)	Protein (%)	Water (%)
Koshihikari	85	18.1	5.4	12.8
Nikomaru	78	18.8	6.5	14.1
Yumepirika	70	19.6	7.3	14.9
Calrose	72	19.3	7.3	13.2
Jasmine rice	61	20.4	7.7	11.7



Nasi Padang, West Sumatera



Nasi rames, Java



more sticky

Japanese rice



Winter Course, Ibaraki University, Japan 21-28 November 2012



JICA VISIT

(Japan International Cooperation Agency)



JICA Visit



- Not all countries have same and all resources that they need
- Resource is **important** but **isn't everything**
- Trade system in this world isn't always fair at all, but how we can achieve more fair world trade by
 - make **relationship** with other country
 - **Observe** and **optimize the resource** that they have (Natural and human resource) to plan the sytrategy that can be helpful the country in the world trading
 - **Hard work**

Winter Course, Ibaraki University, Japan 21-28 November 2012

TOKYO TAMA-SEIKA EXCURSION



Japan-Indonesia Vegetable Market



	Japan	Indonesia
1. Demand	High	High
2. Quality	High	Depend on market
3. Supply	Local and import	Local and import
4. Processing & packaging	Very good & high level of hygiene	Only few with good processing and packaging Hygiene????
5. Management (plan of demand, plantation, volume of yield etc)	Very good	Only few that have good management
6. Cold storage	Yes	Not all
7. Technology	High	Only few

Winter Course, Ibaraki University, Japan 21-28 November 2012

IBARAKI CHUO ENGEI (ICE) EXCURSION



Japan-Indonesia Farmer Cooperation



	Japan (ICE)	Indonesia (Gapoktan)
1. Member	102 farmers (21 – 86 y.o)	Various age
2. Product	Fruits, vegetables	Depend on local product
3. Benefit	Fixed : (high) price, amount, harvest time	Market, Credit, input system etc
4. Activities	<ol style="list-style-type: none"> 1. Farming contract : seller (farmer) → ICE → market 2. Processing, e.g : freezing processing 3. Training (> 20 years) : Indonesia trainee Output : System can be used in Indonesia → business partner 	<ol style="list-style-type: none"> 1. Help in selling product 2. Help in buying input and machine product (fertilizer, tractor, water management among farmer) 3. Routine meeting for problem discuss

Winter Course, Ibaraki University, Japan 21-28 November 2012

Japan-Indonesia Farmer Cooperation



	Japan (ICE)	Indonesia
5. Government support	Funding support Training (not regularly)	<ol style="list-style-type: none"> 1. Give information and help to solve the problem e.g disease attack, new technique for plantation 2. Connecting between farmer, university and research institute
6. Successor	Lack	Lack

Winter Course, Ibaraki University, Japan 21-28 November 2012

Japan & Indonesia Collaboration for Sustainable Agriculture



- MARCO (Monsoon Asia Agro-Environmental Research Consortium)
- Education : research and educational
- JICA (MoA, Universities), ICE
- etc

Winter Course, Ibaraki University, Japan 21-28 November 2012

Conclusion



- We should aware and put big effort to achieve the sustainability of agriculture : cooperation, research and technology, education
- Japan and Indonesia have similar challenge in food security such as climate change, increase of food demand, successor : population growth → Indonesia ↑, Japan ↓
- From this course we can get more knowledge about agriculture farming system in Japan (advance country) especially in farming management and processing system

Winter Course, Ibaraki University, Japan 21-28 November 2012

Suggestion



Indonesia:

- Government + University + Private Sector (Farmer & Agribusiness Company) should increase **cooperation** to develop Indonesian agriculture in order to establish the sustainability of agriculture
- Government & University should **collaborate** in information and technology transfer to farmer to help them improve their farming production
- Protection, guarantee for farmer (price, market, harvest season)

Winter Course, Ibaraki University, Japan 21-28 November 2012

Suggestion



Japan

- Japanese food self-sufficiency rate is decreasing. So it is necessary to establish a variety of import route

Japan-Indonesia

- Increase **cooperation** especially in agriculture (trade, technology, resources, etc)

Winter Course, Ibaraki University, Japan 21-28 November 2012

Terima kasih

