

## SUSTAINABLE FARMING

### GROUP B : “B 4 d BEST”

1. LIN
2. MARU
3. AKI
4. MEGA
5. DEWA
6. ROBI
7. ARDI
8. RITA
9. NIWAYAN
10. DIKA
11. AYUMI

## OUTLINE

- Introduction
- Visited Schedule
- Farming
- Water Quality
- Farmer's Market
- Conclusion

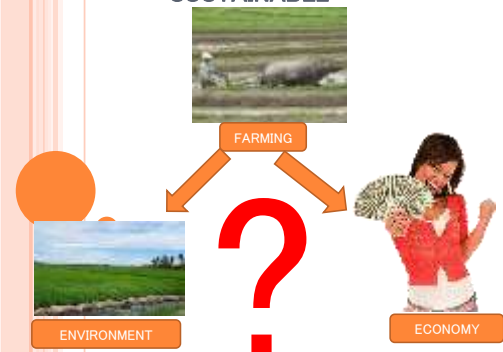
What is sustainable farming?  
What is needed?

### SUSTAINABLE DEFINITION??

It can continue permanently without destroying the environment, with maintaining the present conditions

## INTRODUCTION

### SUSTAINABLE



## VISITED SCHEDULE

- **FARMING LAND** (Organic Farming)
  1. Yokota Farm (Ryugasaki City)\*
  2. Abe Farm (Ushiku City)\*
- **WATER ENVIRONMENT**
  1. IKESC : Ibaraki Kasumigaura Environmental Science Centre. (Tuchiuira City)\*
  2. KFL : Kasumigaura Furiiai Land. (Namegata City)\*
- **FARMER'S MARKET**
  1. Sun-Flesh Hasu-no Sato (JA Market) \*\*  
Tuchiuira City
  2. ELF - Noukuku : Evidence of Leading Farmer \*\*  
Tsukuba City

\* Water Sampling

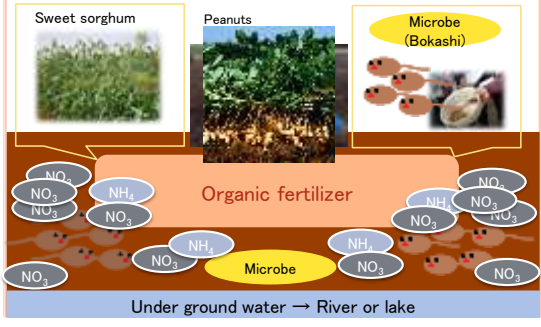
\*\* Interview with farmer's & owner

## FARM VISITING

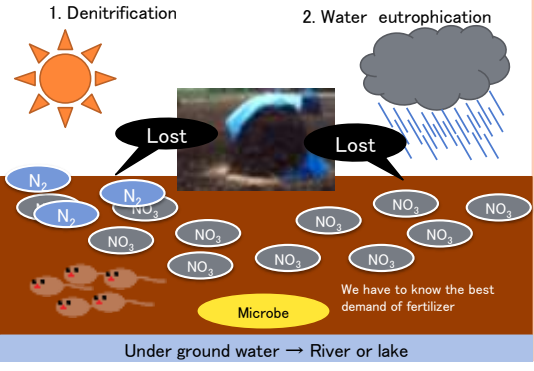
### THE DIFFERENT BETWEEN YOKOTA FARM AND ABE FARM

Parameter	Yokota Farm	Abe Farm
Farming Method (sampling place)	Organic	Organic
Commodity	Paddy	Vegetables (Peanut, Radish, etc.)
Yield	<b>Organic</b> : 480 ton/10 a <b>Semi Organic</b> : 520 ton/10 a	-
Fertilizing Method	using compost as fertilizer	Using bokashi and plant (sorghum) as fertilizer (Cover Crop)
Weed prevention method	Using soil cover to prevent weed	Manually (using tools )
data	$\text{NO}_3\text{-N}$ 0.5 $\text{mgL}^{-1}$	$\text{NO}_3\text{-N}$ >10 $\text{mgL}^{-1}$

### Why Abe farm soil has much NO<sub>3</sub>-N?



### What is caused by much NO<sub>3</sub>-N?



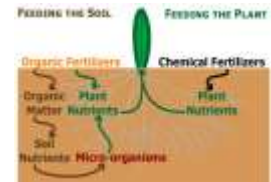
### FARMING METHODS



### ADVANTAGE Vs DISADVANTAGE

#### All Chemical Farming Method

- Advantage :**
1. High productivity
  2. Efficient for worker
  3. Lower product price
- Disadvantage :**
1. Lack other factors (mineral except N, K, and P) in the soil
  2. NO<sub>3</sub> and P will flow into ground water rapidly
  3. Low quality product for health



#### Organic Farming Method

- Advantage :**
1. Consist various factors (mineral such as C, Mg etc)
  2. Relatively good for environment
  3. Good for health
- Disadvantage :**
1. Need long time to fertilize
  2. Need big amount (not efficient for worker)
  3. Low Productivity

### PEOPLE RESPOND TO ORGANIC PRODUCT

#### ○ JAPAN

1. People have good awareness for healthy food
2. People can afford to pay more for organic product
3. Intensively technology increase the efficiency

#### ○ INDONESIA

1. Buying ability is still low
2. Farmer still focus on profit and quantity
3. Not efficient because lack of technology applied

So, mix Chemical and Organic is better???

where is the best point????

Still don't know the optimum, many factor can effect



### CONCLUSION AND SUGGESTIONS

#### Conclusion

Mix chemical and organic farming method is better but the best ratio cannot be decide yet because it effected by many factors

#### Suggestion

1. Doing precision farming → Before planting, check the mineral content of the soil and add only the lack good for environment and economy side
2. Find proper technology to increase efficient and decrease farming cost for better quality products

# WATER QUALITY

## WATER QUALITY STANDARD FOR LAKES (natural lakes that have 10 million m<sup>3</sup> of water or more)

Item No.	Water use	Standard value				
		Dissolved oxygen (mg/l)	Dissolved oxygen deficit (D) (mg/l)	Ammonia nitrogen (mg/l)	Chemical oxygen demand (COD) (mg/l)	Biological oxygen demand (BOD) (mg/l)
1	Water supply (drinking water)	6.0 (pH 6.5)	1.0 (mg/l)	0.1 (mg/l)	1.5 (mg/l)	0.2 (BOD <sub>5</sub> /mg)
2	Water supply (bathing, swimming, etc.)	6.0 (pH 6.5)	1.0 (mg/l)	0.1 (mg/l)	1.5 (mg/l)	0.2 (BOD <sub>5</sub> /mg)
3	Water supply (agricultural use, etc.)	6.0 (pH 6.5)	1.0 (mg/l)	0.1 (mg/l)	1.5 (mg/l)	0.2 (BOD <sub>5</sub> /mg)
4	Water supply (industrial use, etc.)	6.0 (pH 6.5)	1.0 (mg/l)	0.1 (mg/l)	1.5 (mg/l)	0.2 (BOD <sub>5</sub> /mg)
5	Ecological water (lake, etc.) and maintenance of fish resources	6.0 (pH 6.5)	1.0 (mg/l)	0.1 (mg/l)	1.5 (mg/l)	0.2 (BOD <sub>5</sub> /mg)

Note: 1. Consideration of the water quality standard for drinking water and other uses. 2. Water supply (drinking water) is the water supply standard for drinking water. 3. Water supply (bathing, swimming, etc.) is the water supply standard for bathing, swimming, etc. 4. Water supply (agricultural use, etc.) is the water supply standard for agricultural use, etc. 5. Water supply (industrial use, etc.) is the water supply standard for industrial use, etc. 6. Ecological water (lake, etc.) and maintenance of fish resources is the water quality standard for ecological water (lake, etc.) and maintenance of fish resources.

Source : Ministry of the Environment Government of Japan

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## WATER QUALITY OF KASUMIGAURA LAKE (Kamigeto and Park)

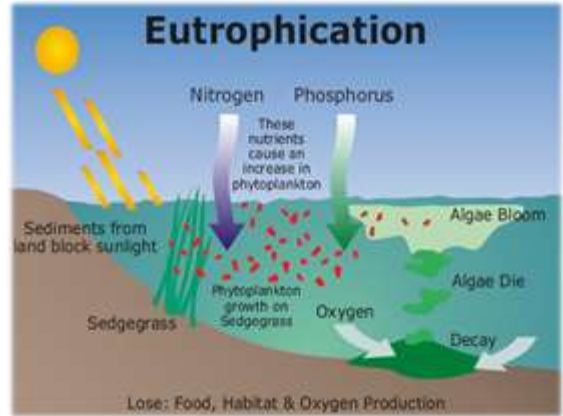
Parameters	Standard	I		II			
		Kamigeto (Under Bridge)		Park			
COD	≤ 8 mg/l (MEGJ)	6	6	5	6	6	6
NO <sub>3</sub> -N	≤ 10 mg/l (USEPA)	5	2	5	5	5	5
NH <sub>4</sub> -N	≤ 0.1 mg/l (USEPA)	0.2	0.2	0.2	0.2	0.5	0.2
PO <sub>4</sub> -P	≤ 0.1 mg/l (USEPA)	<0.1	0.1	0.1	<0.1	0.1	0.1
pH	6.5 ≤ pH ≤ 8.5 (MEGJ)	9.1		8.6			
EC (mS/m)		26.7		24.6			

## WATER QUALITY OF Yokota Farm and Abe Farm

Parameters	Standard	I		II	
		Yokota	Abe	Yokota	Abe
COD	≤ 5 mg/l (MEGJ)	>8	>8	>8	>8
NO <sub>3</sub> -N	≤ 10 mg/l (USEPA)	0.5	>10	>10	>10
NH <sub>4</sub> -N	≤ 0.1 mg/l (USEPA)	0.2	0.2	0.2	0.2
PO <sub>4</sub> -P	≤ 0.1 mg/l (USEPA)	0.1	0.1	0.1	0.1
PH	6.5 ≤ pH ≤ 8.5 (MEGJ)	7.5	7.1	7.1	7.1
EC (mS/m)		27.4	13.9	13.9	13.9

# EUTROPHICATION

### Sources of Cultural Eutrophication



### FARMER'S MARKET



### Japan Agriculture (JA)

```

    graph LR
      Farmer --> JA_Market[JA Market]
      Farmer --> Other_Market[Other Market]
      JA_Market --> Shop1[Shop]
      JA_Market --> Shop2[Shop]
      JA_Market --> Shop3[Shop]
      Other_Market --> Shop4[Shop]
      Other_Market --> Shop5[Shop]
      Other_Market --> Shop6[Shop]
      Shop1 --> Consumer1[Consumer]
      Shop2 --> Consumer2[Consumer]
      Shop3 --> Consumer3[Consumer]
      Shop4 --> Consumer4[Consumer]
      Shop5 --> Consumer5[Consumer]
      Shop6 --> Consumer6[Consumer]
    
```

Advantages	disadvantages
<ul style="list-style-type: none"> <li>- JA is very big market, so it is easy to ship market</li> <li>- JA have many service. (ex: bank, insurance)</li> <li>- JA use mobile technology</li> </ul>	<ul style="list-style-type: none"> <li>- It takes much time until reach home (reduce fresh)</li> <li>- Market price is easy to influenced by the market and much fee</li> <li>- Farmers does not see the face of consumer</li> <li>- We must use JA fertilizer and pesticide</li> </ul>

### Direct shop

Recently Style (Responsible for Farmer)  
Ex: ELF (Evidence of Leading Farmers)

```

    graph LR
      Farmer --> Online_shop[Online shop]
      Farmer --> Shop[Shop]
      Online_shop --> Consumers[Consumers]
      Shop --> Consumer[Consumer]
    
```

Advantages	disadvantages
<ul style="list-style-type: none"> <li>- Farmer get more income</li> <li>- Decide price</li> <li>- Connect shop directly, so not so much fee</li> <li>- Farmer see the consumer face directly</li> <li>- Reach consumer more fresh</li> <li>- It is possible to ship shop small quantity</li> </ul>	<ul style="list-style-type: none"> <li>- It is difficult to establish, because we must establish a few group</li> <li>- Farmer must gather consumer themselves</li> </ul>

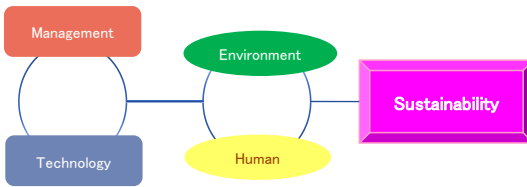
### Koperasi unit desa (KUD)

Advantages	disadvantages
<ul style="list-style-type: none"> <li>- Supporting by government</li> <li>- low-interest loans</li> <li>- processing and marketing of products</li> <li>- help provide the daily needs</li> </ul>	<ul style="list-style-type: none"> <li>- have not been able to compete</li> <li>- insufficient number of supervisors</li> <li>- easy to provide capital but less controlling</li> </ul>

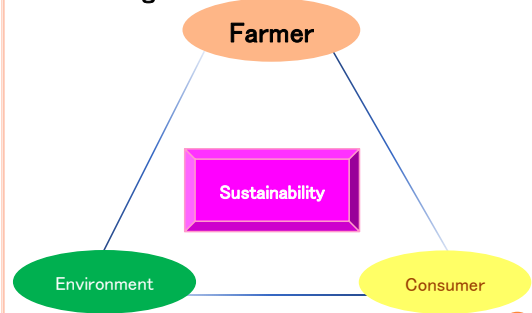
#### CONCLUSION FARMER MARKETS TO SUSTAINABLE AGRICULTURE

- Young farmers need to establish market, management oneself. Not only cultivate, but also manage.
- The farmer not only need knowledge about agriculture, but also management, news and information

#### All conclusion



#### For farming...



THANK YOU FOR YOUR ATTENTION!

