# SEMINAR ON FOOD SECURITY FOCUS ON

Water Management and Sustainable Agriculture

By Luhur Pradjarto

Assistant Director for Animal Husbandry

as

**ACEDAC SECRETARIAT** 

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#### **COUNTRY OVERVIEW**

The ASEAN Declaration states that the aims and purposes of the Association are to accelerate economic growth including agricultural sector, social progress and cultural development in the region, and to promote regional peace and stability through abiding respect for justice and the rule of law in the relationship among countries in the region and adherence to the principles of the United Nations Charter.

In line with geography in ASEAN Member States, that one of the main factors that contributed to the development of ASEAN was the geographical proximity of its member states. The region has great geographical variations, as it located between India and China. The ASEAN members range in physical size from the 1.9 million sq. km of Indonesia to the 710.3 sq. km of Singapore

# Asean Land Area

| ASEAN COUNTRY     | LAND AREA<br>(Km2) |  |
|-------------------|--------------------|--|
| Brunei Darussalam | 5,765              |  |
| Cambodia          | 181,040            |  |
| Indonesia         | 1.900,000          |  |
| Lao PDR           | 236,800            |  |
| Malaysia          | 329,847            |  |
| Myanmar           | 676,577            |  |
| Philippines       | 300,000            |  |
| Singapore         | 710.3              |  |
| Thailand          | 513,120            |  |
| Viet Nam          | 331,114            |  |

Sources: Food and agriculture profile, ASEAN, 2011

Related to climate, that in ASEAN countries in general is almost the same. Climate ranges within each individual country from tropical and humid along the coasts and inner plains to monsoon rains during the summer months. Usually, in a year there is the rainy season and dry season. Generally occurs during the rainy season from October to March and the dry season in April-September. However, in each of the ASEAN countries also have areas that are cold, hot with high humidity.

The members of ASEAN are rich in natural mineral resources. Natural resources found within the region include offshore oil and gas deposits, natural gas, water, fish, timber, coal, iron ore, tin, zinc, copper, lead, manganese, phosphate, gemstones and precious stones.

# **ASEAN POPULATION**

|                      |      | POPULATION | Pop. Growth | Rural    | Urban     |
|----------------------|------|------------|-------------|----------|-----------|
| ASEAN COUNTRY        | Year | (Million)  | (%)         | (Milion) | (Million) |
| Brunei<br>Darussalam | 2012 | 0.409      | 2.1         | NA       | NA        |
| Cambodia             | 2011 | 14.7       | 1.5         | 11.5     | 3.2       |
| Indonesia            | 2012 | 248.0      | 1.1         | NA       | NA        |
| Lao PDR              | 2011 | 6.3        | 2.3         | NA       | NA        |
| Malaysia             | 2012 | 29.3       | 1.7         | 8.1      | 21.2      |
| Myanmar              | 2010 | 59.8       | 0.8         | NA       | NA        |
| Philippines          | 2009 | 92.2       | 2.0         | NA       | NA        |
| Singapore            | 2009 | 4.8        | 1.8         | NA       | NA        |
| Thailand             | 2012 | 67.0       | 0.5         | 44.2     | 21.2      |
| Viet Nam             | 2010 | 86.2       | 1.2         | NA       | NA        |

Sources: Food and agriculture profile, ASEAN, 2012 combine with AFSIS data 2012

## POPULATION AND AGRICULTURAL POPULATION

| ASEAN COUNTRY | Year | POPULATION | Pop. Growth | Agri. Pop            | % of Agri. Pop. |
|---------------|------|------------|-------------|----------------------|-----------------|
|               |      | (Million)  | (%)         | (Million)            | to Pop          |
| Brunei        | 2012 | 0.409      | 2.1         | 0.00                 | 1.0             |
| Darussalam    |      |            |             |                      | No American     |
| Cambodia      | 2011 | 14.7       | 1.5         | 5.65                 | 38.1            |
| Indonesia     | 2012 | 248.0      | 1.1         | 10.078               | 4.2             |
| Lao PDR       | 2011 | 6,3        | 2.3         | (year 2004)*) 0.439  | 6.8             |
| Malaysia      | 2012 | 29.3       | 1.7         | 1.640                | 5.6             |
| Myanmar       | 2010 | 59.8       | 0.8         | (year 2004) *) 3.454 | 5.8             |
| Philippines   | 2009 | 92.2       | 2.0         | (year 2004) *) 3.003 | 3.2             |
| Singapore     | 2009 | 4.8        | 1.8         | N.                   | NA NA           |
| Thailand      | 2010 | 67.0       | 0.5         | 14.77                | 22.6            |
| Viet Nam      | 2010 | 86.2       | 1.2         | (year 2004) *) 5.419 | 6.3             |

Sources: AFSIS, 2012 , and \*) ASEAN-Japan Farmer's Partnership Project

## **ASEAN GDP AND AGRICULTURAL VALUE ADDED**

| ASEAN COUNTRY     | Year | GDP<br>(USD Billion) | Agriculture Value<br>Added<br>(USD Million) | % Agric. V.A to GDP |
|-------------------|------|----------------------|---|---------------------|
| Brunei Darussalam | 2011 | 16.36                | 50.800                                      | 0.31                |
| Cambodia          | 2011 | 12.83                | 2,011.00                                    | 15.6                |
| Indonesia         | 2011 | 846.80               | 124.597                                     | 14.70               |
| Lao PDR           | 2011 | 8.29                 | 950.390                                     | 11.46               |
| Malaysia          | 2011 | 287.90               | 17,165.00                                   | 5.96                |
| Myanmar           | 2011 | 51.92                | NA  | NA                  |
| Philippines       | 2011 | 224.80               | 29,681.00                                   | 13.20               |
| Singapore         | 2011 | 239.70               | NA  | NA                  |
| Thailand          | 2011 | 345.70               | 55,530.00                                   | 16.06               |
| Viet Nam          | 2011 | 123.60               | 26,595.00                                   | 21.51               |

Sources: World Bank, and AFSIS 2012,

#### **CURRENT SITUATION**

Food security should be linked closely with sustainable agricultural production. In agricultural production, water always plays the most important role, guaranteering whether there is a good or poor crop.

Water is essential element for agriculture because water is used by crops for photosynthesis, nutrition transport, transporation, and so on which in turn make crops produce biomass for human need.

In Asean Country, which lays in a tropical monsoon region, *rainfall is* the main water source for agriculture.

In irrigation management, it is necessary to consider the specific characteristics of water resources.

Water resource is a finite reources as the number of water in the world remain the same.

Water is also a vulnerable resources because it is affected by its surrounding including its users.

Water is required for many different purposes, functions and services, such as industry and domestic use. Holistic management, therefore, has to involve consideration of the demands placed on the resources and the threats to it.

Holistic management involves the management of natural systems as well as human activities which create the demands for water, determine land uses and generate water borne waste products.

Water is more complex life nowadays and in the future, irrigation management as part of water management is getting more challenging.

# WATER REQUIREMENT

|    |                   | Irrigation Agriculture | Industry and Domestic |
|----|-------------------|------------------------|-----------------------|
| No | ASEAN Country     | MCM/year               | MCM/year              |
| 1  | Brunei Darussalam | 8.00                   | 67.14                 |
| 2  | Cambodia          | NA                     | NA                    |
| 3  | Indonesia         | 141,00                 | 34,10                 |
| 4  | Lao PDR           | 50.0                   | NA                    |
| 5  | Malaysia          | 10,70                  | 4,80                  |
| 6  | Myanmar           | NA                     | NA                    |
| 7  | Philippine        | NA                     | NA                    |
| 8  | Singapore         | NA NA                  | NA                    |
| 9  | Thailand          | 48,17                  | 19,70                 |
| 10 | Viet Nam          | 74,03                  | 15,92                 |

Sources: AFSIS 2012, and NFP of ACEDAC Member MCM: Million Cubic Meter

The growth in food demand and need is also the result of the combined effects of world population.

The need for carbohydrate of the majority population in ASEAN are rice, almost the government in ASEAN Member States always improve several program for maximizing the productivity of rice.

To support food security and meet the nutritional adequacy of the community, the government also conducted programs to increase the production of meat, dairy, horticulture and fruit.

# RICE PRODUCTION IN ASEAN COUNTRIES

|            |      | Planted   | Harvested | Yield    | Production | Domestic         |
|------------|------|-----------|-----------|----------|------------|------------------|
| Country    | Ye   | Area      | Area      | (Ton/Ha) | (Mil. Ton) | Demand           |
|            | ar   | (Mil. Ha) | (Mil. Ha) |          |            | (Mil. Ton /year) |
| Brunei     | 2012 | 1.840     | 1.600     | 1.60     | 2.25       | 34.66            |
| Cambodia   | 2012 | 3.007     | 2.980     | 3.11     | 9.29       | 3.13             |
| Indonesia  | 2012 | 13.495    | 13.471    | 5.11     | 68.83      | 33.03            |
| Lao PDR    | 2012 | 0.945     | 0.945     | 3.94     | 3.72       | 2.09             |
| Malaysia   | 2012 | 0.692     | 0.610     | 4.51     | 2.75       | 2.55             |
| Myanmar    | 2012 | 7.592     | 7.566     | 3.83     | 29.00      | 19.80            |
| Philippina | 2011 | NA        | 4.536     | 3.67     | 16.64      | 12.40            |
| Singapore  | NA   | NA        | NA        | NA       | NA         | 0.27             |
| Thailand   | 2010 | 10.523    | 10.083    | 4.23     | 38.18      | 12.40            |
| Viet Nam   | 2012 | 7.745     | 7.745     | 5.60     | 43.40      | 30.38            |

#### PROBLEM ON WATER MANAGEMENT AND SUSTAINABLE AGRICULTURE

Population growth for ASEAN averaged 1.4 percent per year during the previous decades

To meet the need of food, agricultural sector should remain a concern in addition to industrial sector.

| ASEAN COUNTRY     | PLANTED AREA | IRRIGATED | NON IRRIGATED |
|-------------------|--------------|-----------|---------------|
|                   | (Mil. Ha)    | (Mil. Ha) | (Mil. Ha)     |
| Brunei Darussalam | 1.840        | 0.851     | 0.989         |
| Cambodia          | 3.907        | 0.270     | 3.637         |
| Indonesia         | 13.495       | 4.896     | 3.109         |
| Lao PDR           | 0.945        | NA        | NA            |
| Malaysia          | 0.692        | NA        | NA            |
| Myanmar           | 7.592        | 2.329     | 5.263         |
| Philippines       | NA           | 1.520     | NA            |
| Singapore         | NA           | NA        | NA            |
| Thailand          | 10.523       | 3.797     | 6.726         |
| Viet Nam          | 7.745        | 1.6       | NA            |

Sources: AFSIS, 2012

Agricultural development in ASEAN with the principle of **self-reliance** and continued sustainability should be realized over time, as a prerequisite for the sustainability of the existence of the nation in overcoming food scarcity which is now becoming increasingly apparent.

Reflecting the Summit Asia-Pacific Economic Cooperation (APEC) in Vladivostok, Russia, in 2011, we should improve the attention to the problem of food crisis.

The thema of food crisis resurfaced after the world population, is expected to rise to 9 billions by 2050 and has risen 7 billions in 2011.

# Agricultural Problem

- Degradation of land quality and quantity. From the quality side, currently the high consumption of anorganic fertilizer used to meet the human demand, degradation to the land is occurring.
  - 2. Facing at this time is **lack of reservoir** management. The construction of *reservoirs* is one of the most important practices for the development and management of water resources.
- 3. Related to technology. The main character of modern agriculture are productivity efficiency quality and continuity of supply that should always be continually improved and maintained. Agricultural products both commodity crops (horticulture), fisheries, plantations and farms have to face the world market which has been packed with high quality and has a certain standard. Of course, the high quality products are produced through a process that uses standard technology charge.

The problems that are faced in the supply of water, as well as for agricultural, industrial and consumer needs

#### Human resources

Generally, the farmers in ASEAN countries are still weak in accessing technological agriculture irrigation advances. This is as a result of the low level of knowledge of the water managers.

## • DAM is quite old.

Indonesia's infrastructure problem is closely related to the era of Dutch colonialism. Many "DAM" in Indonesia are legacy of Dutch colonialism. In some of ASEAN countries may also have the same problem, the DAM were built in the colonial era or 50s era. This is either seriously underdeveloped or completely absent. Shortly, these

irrigation infrastructures are in need of renovation, in order to function properly.

#### • Infrastructure Deterioration

Many of Infrastructure have been built, but after that, they are not properly maintained. For example, the walls are cracked and even have some broken line. So, some amount of water would loss through these process, and because of that, effective irrigation system could not be achieved.

## Climate changes

Climate changes is causing the seasonal shifts in precipitation. The rainy season has arrived in force in Indonesia especially in the eastern part with a heavy rainfall. Ten years ago, usually the rainy season appears from October to March and followed by dry season from April-September.

#### River Basin function has begun to diminish.

The function of river basin has begun to diminish. The conversion from agricultural to settlement uses have significant effect on the function of this River Basin.

#### KEY CHALLENGE

Suistainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs

Sustainable agriculture as a management and conservation of the natural resource base and the orientation of technological and institutional changes in order to ensure the achievement of human needs and satisfying the current and future generations. Such agricultural development conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable.

it is clear that water management and sustainable agriculture are the two things that can not be separated in meeting the basic needs of every community in a country.

In sustainable agriculture, the objectives that will be achieved is not only for short-term production targets, but also with more emphasis on the efforts to long-term sustainable production systems. Therefore, inovation for sustainable development in agriculture is totally needed in the effort to maximize the biological and ecological process in ecosystem.

Irrigation development and management issues will be the fulcrum for the government strategy in ASEAN member countries in facing the food crisis that will attack the world also followed by energy crisis and climate changes that are currently threatening the world.

Besides the challange of the rapid growth of population in managing water, sustainable agriculture development is also being faced with the extreem climate changes.

Agricultural cooperative and Water User Association (WUA) as an institution that acts directly to the farmer is becoming important nowadays.

There is no agricultural cooperative that specifically manage the business of agriculture in managing waters.

There are members of farmer groups that also enroll as a member of cooperative that manage the business activities of agricultural water.

The water user association (WUA), since the beginning, indeed has been handling the management of irrigation water for their agricultural needs. However, that dealt generally limited in quaternary and tertiary canal.

WUA has several members and they also regularly raise funds for water management purposes.

Implementation of the irrigation policy with approximation "between the optimistic-pessimistic" is a realistic option that can be done starting with the year it was built with the assumption and requirements that have been established.

Human issues become very important in the future management of irrigation



**HUMAN CAPITAL** 

There will be formed individual and organizational learning that will form a coordination between stakeholders efficiently and effectively.

Sustainable irrigation system management by involving communities within its capabilities are expected to be an effective solution to the existence of an irrigation system can be maintained well. Infrastructure development will provide greater benefits in the management of irrigation and of course will provide a great number of benefits to the farmers if it is built by the learners that are intellegent and honest as a character of the future irrigation managers.

Individual and organization learning

Operations and Maintenance of irrigation work will become much easier although there are many problems that must be overcomed.

they will become more innovative in doing research and finding a solution to problems and issues of irrigation and the strategic environment which in the future it will be more difficult

#### **EXPECTATION TO THE CB PROJECT**

To prepare the implementation of the ASEAN Economic Coummunity (AEC) in 2015 at the same time also to strengthen solidarity among ASEAN countries, the support from developed countries such as Japan is still important in order to build a sustainable agriculture and sustainable water.

It is not only the responsibility of the government to maintain the availability of water and food supply but also all stakeholders.



- Agricultural Cooperative
- 2. Farmer Groups
- 3. W U A

# Agricultural Cooperatives, Farmer Groups and WUA

| ASEAN COUNTRIES   | AGRIC.COOP | FARMER  | WUA                  |
|-------------------|------------|---------|----------------------|
|                   |            | GROUPS  |                      |
| Brunei Darussalam | 22         | NA      | NA                   |
| Cambodia          | 437        | 14,000  | 430                  |
| Indonesia         | 19,663     | 279,523 | 42,7 <mark>39</mark> |
| Lao PDR           | NA         | 3,176   | NA                   |
| Malaysia          | 500        | NA      | NA                   |
| Myanmar           | 4,337      | NA      | NA                   |
| Philippines       | 8,583      | 9,890   | NA                   |
| Singapore         | NA         | NA      | NA                   |
| Thailand          | 3,675      | 4,100   | 494 *)               |
| Viet Nam          | 9,085      | NA      | NA                   |
| TOTAL             | 46,302     | 300,799 | 43,663               |

Sources: The 19 ACEDAC Board Meeting, 2012.
\*) water user cooperative

- 1. Training and Practices
- 2. Benchmark
- 3. Dispatch of Expert
- 4. Exhibition
- 5. Information System

# Venue

1.ASEAN Countries2.Japan

## **Instructor:**

- 1.Host Country
- 2. Japenese Expert
- 3.ASEAN Expert

Strengthen the presence of agricultural cooperative and WUA, which is a farmer institution in managing water for irrigation, and also is expected can increase food production and improve sustainable agriculture, manage and maintain water resources to meet the needs of irrigation water



Business Network Among Agricultural Coop/FG/WUA

## BRUNEI DARUSSALAM





# CAMBODIA









## INDONESIA



Irrigation canal in ball







Paddy land in bali





# Lao PDR









# MALAYSIA





## **MYANMAR**





# **PHILIPPINES**





# **THAILAND**









# VIET NAM





Cam o'n Ball Arigato Thank Thank MENSING I Saum Arroum Anal Salamat Sa Inyo