

Agricultural Engineering Development to Promote Sustainable Agricultural Development in Indonesia

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Indonesian Agricultural Engineering Research and Development

Sustainable Agricultural Development

(Farm Bill, 1990)

An integrated system of plant and animal production practices having a site-specific application that will :

- Satisfy human food and fiber needs
- Enhance environmental quality and natural resources
- Make the most efficient use of farm resources
- Sustain the economic viability of farm operations
- Enhance the quality of society



General Figure of Indonesia

- Location : South East Asia
- Area : 1,904,443 km²
- Population : 242 million
- # Island : 17,508 islands
- GDP : US\$ 267.8 billion
- Agric. Contribution : 17%

High variation in socio-economic and ecosystem conditions



Ecological Aspects Related to Agricultural Development

- ❁ Declining of soil productivity
- ❁ Increasing of farm land pollutions
- ❁ Decreasing of water resources
- ❁ Increasing of environmental destruction
- ❁ The change of global and local climate



Problems Related to Specific Situations

- ✿ Agricultural land holding and conversion
- ✿ Agricultural infrastructures
- ✿ Agricultural institutions
- ✿ Financial/capital
- ✿ Human resource capability
- ✿ Information and technology
- ✿ Marketing of farm inputs and products

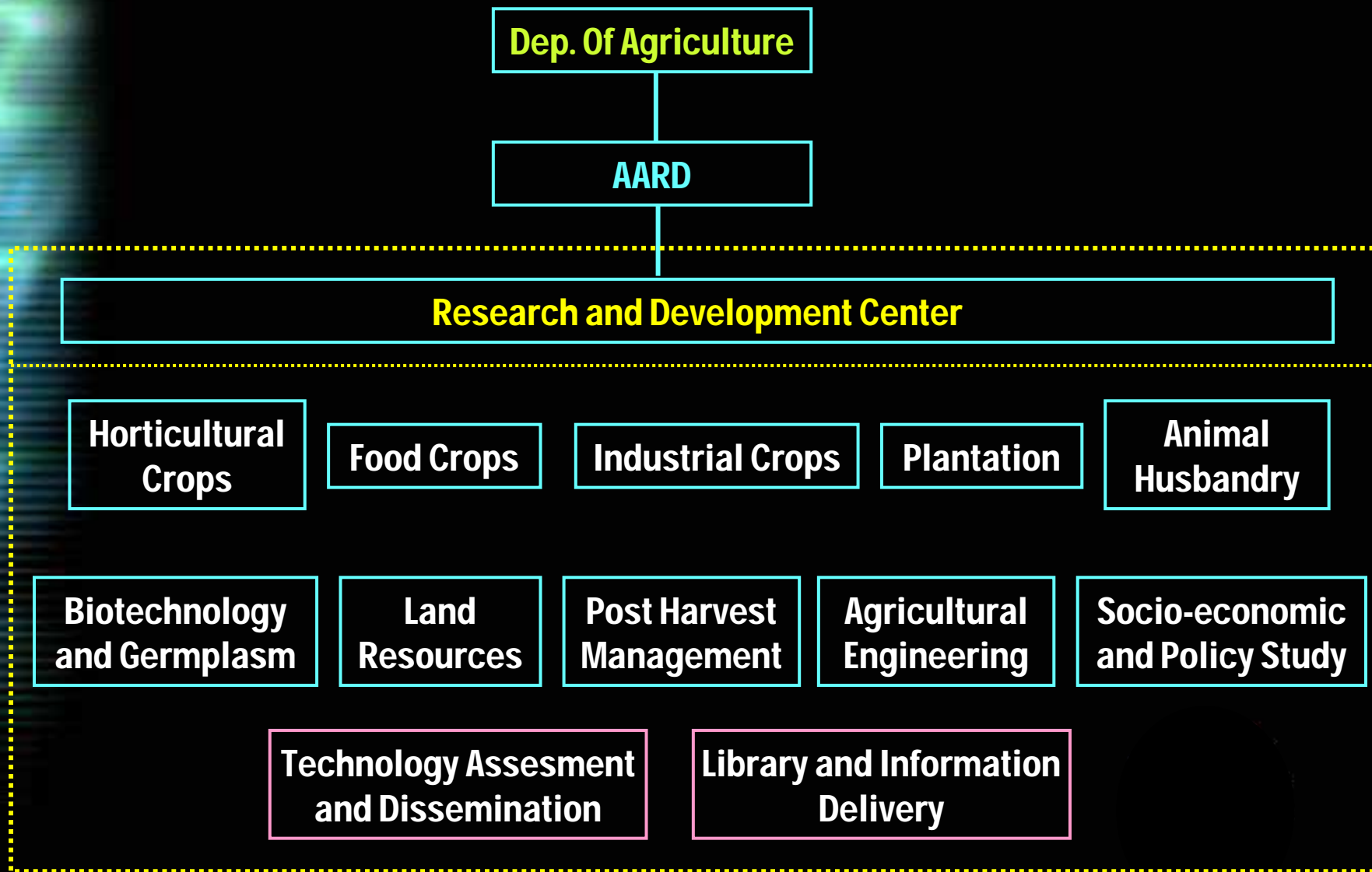


Policies toward Sustainable Agricultural Development

- Increase land productivity and its production sustainability
- Improve agricultural infrastructures and farmer's institution
- Promote integrated farming practices and renewable energy sources
- Improve innovation and dissemination system of technology
- Increase promotion and protection of agricultural commodities
- Reduce agricultural land conversion
- Improve coordination among related institutions



Indonesian Agency for Agricultural Research and Development



The Role of Agricultural Engineering in Sustaining Agricultural Development

- ✿ Improving of soil productivity and yield quality
- ✿ Increasing of production efficiency and added value
- ✿ Providing renewable energy sources
- ✿ Reducing of pollution effect to agricultural land
- ✿ Increasing of water availability and utilization efficiency



Technology Need from Agricultural Engineering R & D

Technology for improving soil productivity

- Soil tillage conservation techniques
- Agricultural wastes processing for organic fertilizer
- Organic fertilizer management



Technology Need from Agricultural Engineering R & D

Technology for reducing farm land pollution

- Agricultural waste management
- Water management system



Technology Need from Agricultural Engineering R & D

Technology for increasing water availability and utilization efficiency

- Many types of water pump
- Irrigation water management systems
- Low cost green house



Technology Need from Agricultural Engineering R & D

Technology for improving quality and added value

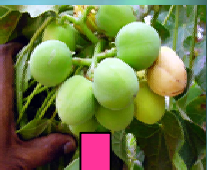
- Post harvest management → improve quality & yield
- Processing technology → added value & product diversification
- Storage and packaging → maintain quality & better price



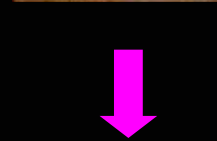
Technology Need from Agricultural Engineering R & D

Technology for renewable energy sources

- Processing of agricultural production and wastes
- Drying and storage with multi-sources of energy



Kandang sapi



PEMBUATAN PUPUK ORGANIK (dari lumpur sisa fermentasi)



Petromak berbahan bakar biogas

Kompur biogas



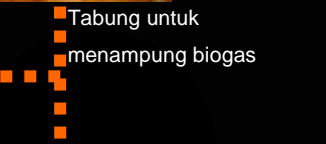
Generator listrik dengan penggerak mesin diesel (berbahan bakar minyak solar-biogas)



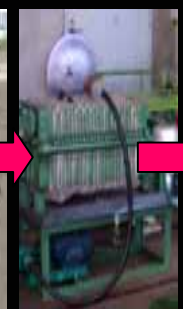
Pompa air



Mesin pencacahan Pakan ternak



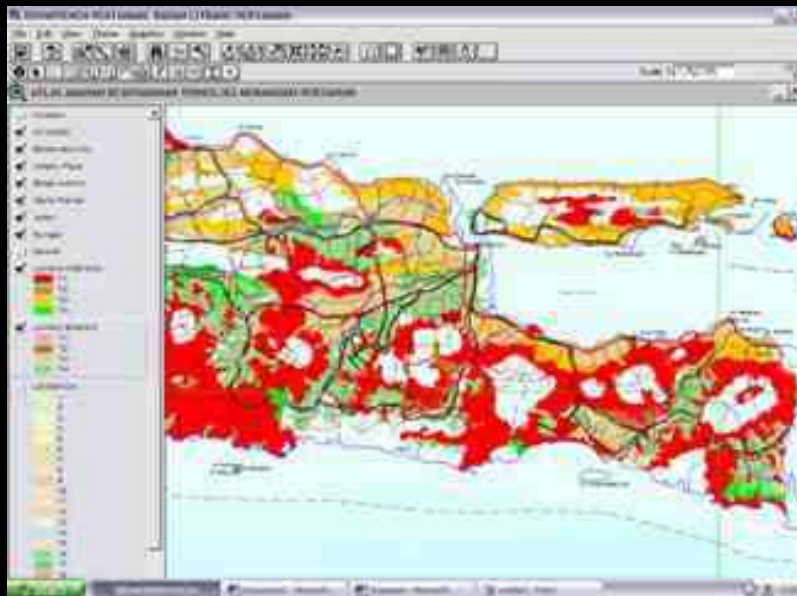
Tabung untuk menampung biogas



Acceleration of Agricultural Engineering Development

Development Approaches and Strategies

- ➔ Selective : technology selected based on local conditions
- ➔ Progressive : level of technology is gradually improved
- ➔ Partisipative : development implementation involves active participation of agribusiness society



Acceleration of Agricultural Engineering Development

Action Programs

- ➔ Increasing promotion of farm machinery utilization
- ➔ Facilitating of farm machinery ownership
- ➔ Promoting rental and leasing system of farm machineries
- ➔ Improvement of human resources capability
- ➔ Improvement of extension service capability
- ➔ Improvement of local farm machinery industries
- ➔ Improvement of Agric. Engineering R & D capabilities
- ➔ Improvement of agricultural infrastructures
- ➔ Improvement of testing and evaluation procedures
- ➔ Strengthening collaboration among related institutions



Thank You