



Indonesian Agency for Agricultural Research  
and Development  
Ministry of Agriculture



# Strategic Approach to the Improvement of Agricultural Productivity towards Food Security in Indonesia



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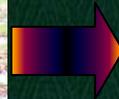


# Important Roles of Agriculture for Indonesia



✉ Agricultural is a prime mover of national & regional economic development

- ❖ Contribute to GDP's growth & export earning
- ❖ Provide food, fiber, energy & raw material for industry
- ❖ Create job opportunity & income for the people





# Important Role of Food Security for Indonesia

Food is not everything but without food is nothing

- ✉ Stability in the aspect of social, economic, politic and national security
- ✉ Quality of the people and sustainability of natural resources
- ✉ People's welfare and employment creation
- ✉ Life sustainability of people and the country
- ➡ Government of Indonesia must obtain and maintain national food security → Act No. 7/1996

# Projection of rice consumption in Indonesia, 2006-2020

Year	Population (million)	Consumption (kg/year/person)	Consumption (000 t)
2006	228.50	137.03	31,312
2007	231.45	135.67	31,402
2008	234.44	134.33	31,492
2009	237.46	133.00	31,582
2010	240.52	131.68	31,673
2011	243.63	130.38	31,764
2012	246.77	129.09	31,855
2013	249.95	127.81	31,947
2014	253.18	126.55	32,039
2015	256.44	125.29	32,131
2016	259.75	124.05	32,223
2017	263.10	122.82	32,315
2018	266.50	121.61	32,408
2019	269.93	120.40	32,501
2020	273.42	119.21	32,595

# Condition of food crop's production in Indonesia

Commodity	2003	2004	2005	2006	2007
Rice	52.138	54.089	54.151	54.455	57.157
Maize	10.886	11.225	12.524	11.610	13.288
Soybean	672	724	808	748	593
Peanut	786	838	836	838	789
Mungbean	-	310	321	316	323
Cassava	19.507	19.425	19.321	19.987	19.988
Sweet potatoes	1.991	1.902	1.857	1.854	1.887

Some of agricultural commodities are still imported

Cereals, tuber & fruit crops as alternatives food sources

In 2008, Indonesia is already self sufficient in rice production

# Main Problems for Enhancement of Food Security

- ✉ Increase of food production especially rice is less than that of requirement due to bio-physical constraints
- ➔ Land degradation, climate variability, pest and diseases enemy, and conversion of agricultural land
- ✉ Availability of food materials in the global market will become limited with high price
- ✉ Increase price of production inputs and energy
- ✉ Limited purchasing power of poor people
- ✉ Limited utilization of alternatives local food crops
- ✉ Competitive utilization of some food crop's production with bio-energy
- ✉ Lack of infrastructures → irrigation & post harvest



## Conversion plan of lowland based on Land Utilization Planning of District

Region	Lowland area (ha)			Utilization plan of lowland	
	Total	Non-irrigated	Irrigated	Converted	Maintained
Sumatera	2,036,690	414,780	1,621,910	710,230	911,680
Java and Bali	3,933,370	442,120	3,391,250	1,669,600	1,721,650
Kalimantan	1,253,130	375,200	877,930	58,360	819,570
Sulawesi	982,410	124,270	858,140	414,290	443,850
NT & Maluku	566,100	67,050	499,050	180,080	318,990
Papua	131,520	65,060	66,460	66,460	-
<b>Total</b>	<b>8,903,220</b>	<b>1,488,480</b>	<b>7,314,740</b>	<b>3,099,020</b>	<b>4,215,740</b>



In Indonesia, conversion of agricultural land 1-1.5% ~ 100.000 ha/year



# Challenges for Food Security and Sustainability

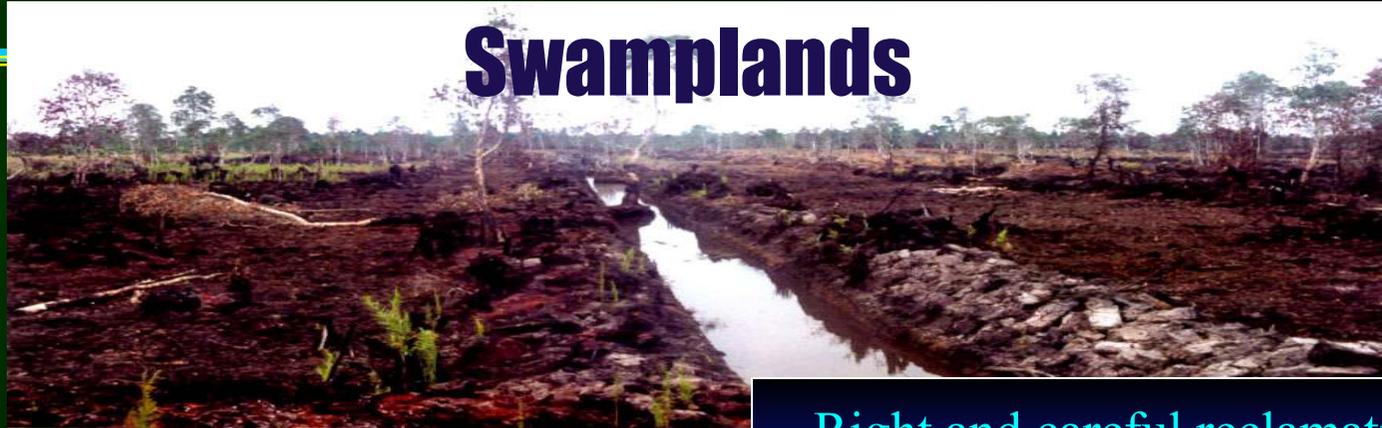
- ✉ Land gradation & high input price → development of low external input technology
- ✉ Water scarcity → development of on-farm water reservoir & water management saving technology
- ✉ Abundant local food crops → development of post harvest & simple food technology
- ✉ Available sub-optimal land resources → development of suitable land reclamation & management technology
- ✉ Abundant of agricultural wastes → development of processing technology for organic fertilizers & bio-energy





# Development Prospect of Swamplands

## Swamplands

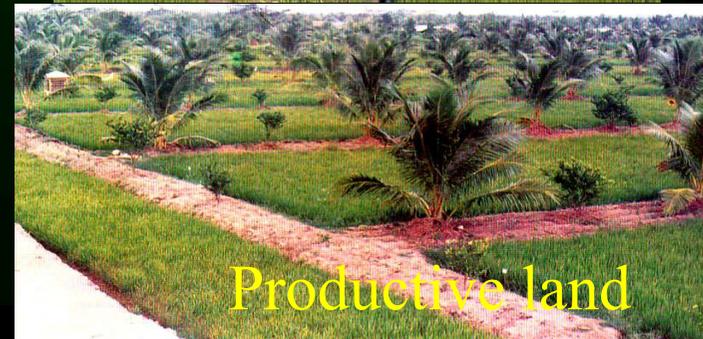


Wrong reclamation and management

Right and careful reclamation and management



Degraded land



Productive land



# Planted Crops & Cropping System on Swamplands

Food crops : rice, corn, soybean, mungbean, peanut, cassava, sweet potato

Horticultural crops : vegetable and fruit crops

Estate crops : Coconut, palm oil, rubber, coffee, cacao, pepper, ginger

Cropping systems : monoculture, inter-cropping, mix-cropping





# Impact of Climate Change on Agricultural Production

- ✉ Shift in planting season
- ✉ Increase flood & drought of agricultural land
  - o Degradation of land & water resources,
  - o Damage & reduce the capacity of infrastructure
  - o Reduce cropping area & production
  - o Trigger of pest outbreaks
  - o Decrease crop's productivity, quality & efficiency
  - o Cause forest and crops fire





# Impact of Climate Characteristic on Drought Area & Production Lost of Rice

Year	Area of drought (ha)		Climate characteristic
	Drought	Lost	
1991	868,0	192,3	El-Nino
1993	67,0	20,4	Normal
1994	544,4	161,1	El-Nino
1997	504,0	88,5	El-Nino





# Challenges of Climate Change for Agricultural Technology & Food Security

- ✉ Development of high yielding & low methane emitting crop varieties
- ✉ Development of soil & water management with low methane emission
- ✉ Development of crop varieties tolerant to drought
- ✉ Development of crop varieties tolerant to submergence
- ✉ Development of crop varieties tolerant to salinity
- ✉ Development of water harvesting technology
- ✉ Development of efficient water management technology



# Improvement of Agricultural Productivity



## Development Approach & Strategy

- ❖ Regional, ecosystem, integrated development approach of agriculture based on local resources capacity & sustainability
- ❖ Improve agricultural land conditions by promoting organic fertilization from agricultural wastes
- ❖ Optimum utilization of cultivated lands using appropriate land, water & crop management techniques
- Gradually develop & improve agricultural infrastructures especially for rice based-farming system areas
- Expansion of agricultural areas with very selective utilization & high consideration of agricultural, natural resources, ecological sustainability
- Agricultural development should be directed to integrated farming system

# Improvement of Agricultural Productivity



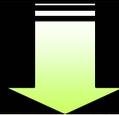
## Development of Agricultural Technology

- ❖ Response to the problems and user community needs
- ❖ Support utilization of local specific resources optimally
- ❖ Low external inputs sustainable agricultural technology
- ❖ More efficient use of production inputs, water and energy
- ❖ Improve agricultural land conditions and sustain natural resources with minimum agricultural wastes



# Rice Seedling Machine

Capacity : 100 tray/hour



# Grain Seeder



# Weeding Machine



# Water Pump



## On-farm Water Reservoir

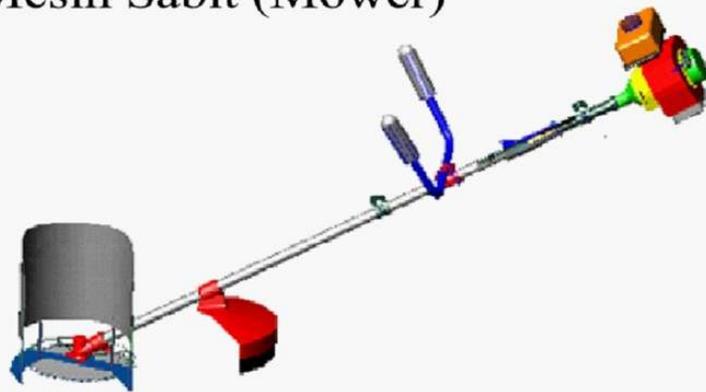


## Fertigation Unit

# Harvesting Machines



Mesin Sabit (Mower)



Modifikasi : (Hasil kerjasama BBP Mektan dengan PT Shang Yang Seri)



# Rice Husk Furnace



# Corn Cob Furnace



# Chopping Machines



Rice straw chopper  
Capacity : 1 ton/hour



Cassava chopper



Corn cob chopper  
Capacity : 1 ton/hour



# Machines for Processing *Jathropha curcas*



Mesin Pengupas

Capacity 200-300 kg/day, diesel 8.5 hp  
Rendement 27%.

Processing Machine



Stove



Filtering Machine

# Processing Units for Bio-diesel, Bio-ethanol, Bio-gas



# Closing Remarks



- As a prime mover of national and regional economic development, agriculture plays important and strategic role for Indonesia, therefore, Indonesian Government gives high priority in National Development Program.
- Strong commitment and good coordination among related stakeholders with better development approach, strategy, and technology are needed for improving production and maintaining natural resources



A sunset scene over a dirt road. The sun is low on the horizon, casting a golden glow. A large white arrow points to the right, overlaid on the road. The text 'Terima kasih' is written in a blue, 3D-style font across the middle of the image.

Terima kasih

Thank You