

# DEVELOPMENT OF SUSTAINABLE AGRICULTURAL MECHANIZATION IN INDONESIA



MINISTRY OF AGRICULTURE REPUBLIC OF INDONESIA  
JAKARTA - 2013

# VISIONS AND FOUR TARGETS

MINISTRY OF AGRICULTURE

REPUBLIC OF INDONESIA

## VISIONS MINISTRY OF AGRICULTURE RI :

-LEADING AGRO-INDUSTRY,  
BASED LOCAL, AND  
SUSTAINABLE

-FOOD INDEPENDENCE

-ADDED VALUE,  
COMPETITIVENESS AND  
EXPORT

-FARMERS WELFARE  
IMPROVEMENT

Self-sufficiency and Self-  
sufficiency Sustainable

Food Diversification

Increasing Added Value,  
Competitiveness,  
Downstream industries,  
Marketing and Export

Farmers welfare

2012

## Implementation of National Medium-Term Development Plan (RPJM) 2010-2014 :

*"Intended to consolidate the restructuring of Indonesia in all fields by emphasizing efforts to improve the quality of human resources, including the development of science and technology capabilities and strengthening the competitiveness of the economy".*

Theme

*added value, competitiveness, and partnerships*

Target Macro

- ✓ Increased Agricultural GDP
- ✓ Increased agricultural employment
- ✓ increased exchange rate farmers
- ✓ Increased strategic agricultural commodity export

# CONCEPT OF AGRICULTURAL DEVELOPMENT BASED ON AGRIBUSINESS

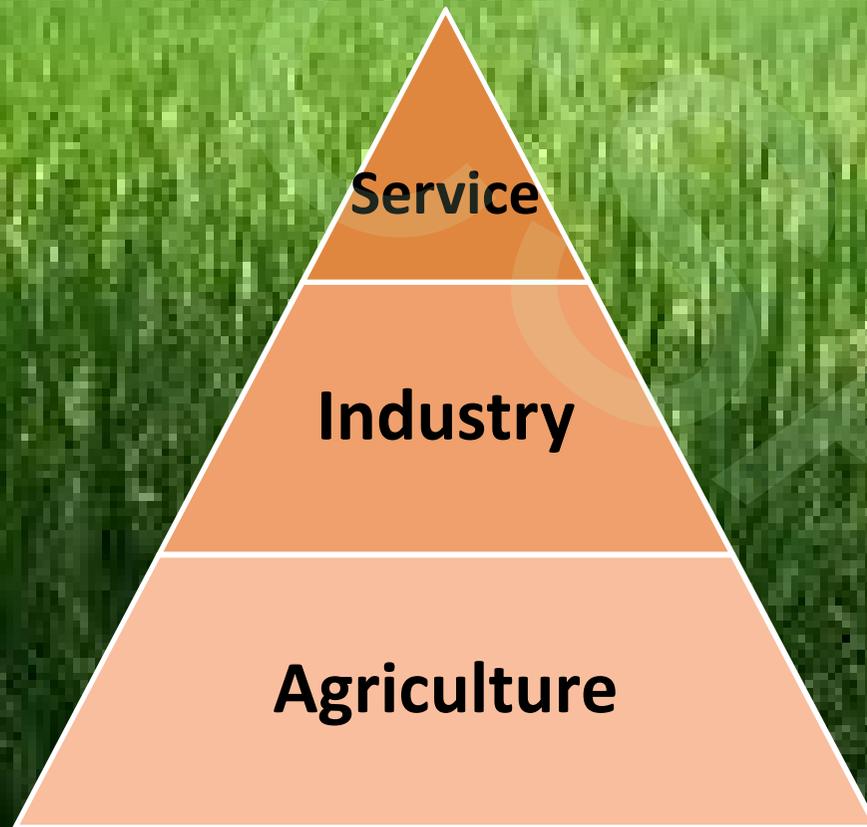
*“Building systems and agricultural business that have value-added, competitive, democracy, sustainable and decentralized”*



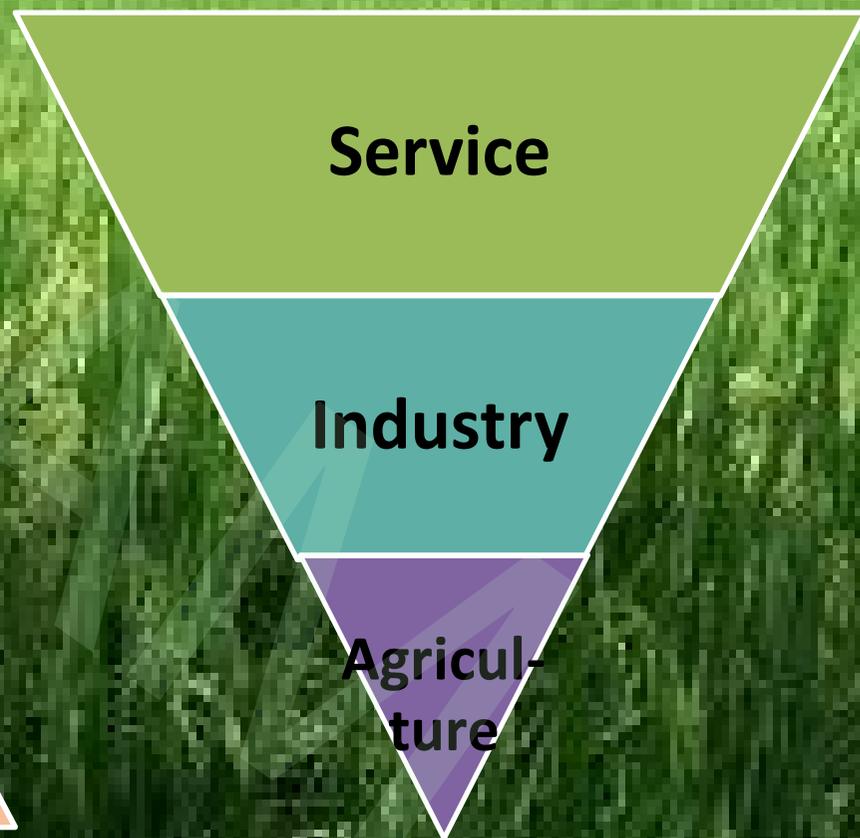
*“Development of Selective Agricultural Mechanization and Specific Locations”*

# TRANSFORMATION OF LIMITED REGION TO DEVELOPED REGIONS

**Limited Region  
/ Semi Developed Regions**



**Developing Regions  
/ Developed regions**



*with*  
**AGRICULTURAL  
MECHANIZATION**



**Efficiency**

- Shorter time
- Products more uniform
- High productivity, quality and competitiveness

**Effective**

- Losses reduced
- working fatigue reduced
- human exploitation reduced

**Cost**

- The minimum economic scale fulfilled
- Lower operating costs
- Increase the added value

# INDONESIA'S ECONOMIC INDICATORS

- “ Indonesia's economic growth : 5 – 6 % per year
- “ GDP in 2011 reached USD 7020 trillion with inflation rate : 3% - 7%
- “ GDP per capita in 2011 reached IDR 25.000.000 or about US \$ 2,800 (US \$ 1 = IDR 9.000)

# AGRICULTURAL LAND

- “ Area of agricultural land for food crop covered 24.6 million ha of paddy field where 76% is irrigated with an average cropping index (CI) reached 1.8 with cropping patterns: Rice - Rice – ‘Palawija’ (crops planted as 2d crop in dry season). Ownership paddy fields average 0.5 ha / person.
- “ Dry land (moor, gardens, fields and ‘huma’) area of 25.3 million hectares
- “ Land for annual crop area of 50.9 million hectares and plantation area of 16.7 million hectares.

# EMPLOYMENT AND GENDER

- “ In 2011, Indonesia's population of about 240 million people with a growth rate of 1.12 % per year.
- “ The labor force reached 112.8 million people and about 39% of them work in agriculture
- “ Female labor force participation rate : 39.38 % and nearly 40% of them coming from poor farmer. Female labor is almost half of male labor
- “ Most female workforce worked on planting and harvesting.

## Percentage of Farm Household Enterprises by Level of Education and Sex Year 2010

Level of Educational Attainment	Livestock		Horticulture		Rice & Crops	
	Female	Male	Female	Male	Female	Male
Level Elementary School	96.7	89.2	95.6	86.2	93.0	84.6
Higher level than Elementary School	3.3	10.8	4.4	13.8	7.0	15.4
Total	100	100	100	100	100	100

Source: Central Bureau of Statistics, 2000. Statistics and Gender Indicators

# Variability some farm machinery in Indonesia in 2010 (units)

Region	Hand tractor	Water pump	Power Thresher	Dryer	Rice milling
Sumatera	9.211	2.848	6.076	2.472	22.289
Jawa	71.127	80.683	16.566	1.108	60.635
Bali dan Nusa Tenggara	6.220	2.833	2.404	258	4.566
Kalimantan	4.067	1.367	5.415	666	7.155
Sulawesi	18.306	1.894	7.721	1.051	14.123
Maluku dan Papua	498	684	348	114	263
<b>Indonesia</b>	<b>109.429</b>	<b>90.310</b>	<b>38.530</b>	<b>5.699</b>	<b>109.031</b>

Sources: Calculated from data agricultural tool and machinery by region province and district in Indonesia (Central Bureau of Statistics, 2002) and reports from the region.

**Development of agricultural mechanization in Indonesia is still centered on crops commodity, mainly on commodity rice and focused on tractors, water pumps, mechanical threshers and rice mills.**

# USE OF AGRICULTURAL MACHINERY IN 2010

NO.	ACTIVITY	TRADISIONAL	MECHANIZA-TION	DESCRIPTION
1.	Tillage	62	38	hand tractors cappacity 50 ha / yr / unit
2.	Planting	100	0	still using traditional ( <del>tan</del> dur jajar legowoq drill)
3.	Weeding	100	0	still traditional (using hedgehog)
4.	Pest and Disease control	0	100	using hand sprayer dan power sprayer
5.	Irrigation	50	50	water pumps capacity 30 ha / yr / unit
6.	Harvest	100	0	still traditional (using a sickle)
7.	Threshing	79	21	power threshers Capacity 40 ha / yr / unit
8.	Drying	85-90	10-15	dryer capacity 60 ha / yr / unit
9.	Milling	0	100	rice milling capacity is more than 97% in 2002. Now estimated at over 100% (saturation) in some places.

# Agricultural machinery industry in Indonesia in 2010

No	Industrial Scale	Unit	Production Capacity (Units / year)	Level Technology
1	Industrial large-scale	3	955,550	Medium - High
2	medium-scale industries	30	125,000	Medium
3	Small scale industries	1063	15,000	Simple

Until 2010, there were 158 Indonesia National Standard (SNI) field of agricultural machinery. As many as 50 agricultural equipment and machinery has been awarded the User Product Certificate of SNI Mark (SPPT-SNI), and as many as 75 agricultural equipment and machinery has been awarded the Certificate of Conformity SNI.

# EKSPORT-IMPORT VALUE OF AGRICULTURAL MACHINERY IN 2005 - 2010

No.	Export/ Import	Agricultural Machinery Type	Year	
			2005	2010
1		<b>Pre-harvest Machine</b>		
	<b>Eksport</b>		<b>66 000</b>	<b>270 000</b>
	<b>Import</b>		<b>48 992 061</b>	<b>53 623 679</b>
2		<b>Post Harvest Machine</b>		
	<b>Eksport</b>		<b>20 000</b>	<b>100 000</b>
	<b>Import</b>		<b>454 027</b>	<b>68 104</b>
3		<b>Agricultural Product Processing Machinery</b>		
	<b>Eksport</b>		<b>734 000</b>	<b>100 000</b>
	<b>Import</b>		<b>25 974 989</b>	<b>37 014 359</b>
4		<b>implement and its equipment</b>		
	<b>Eksport</b>		<b>546 000</b>	<b>1 400 000</b>
	<b>Import</b>		<b>24 416 535</b>	<b>48 827 070</b>

# STRATEGY DEVELOPMENT OF SELECTIVELY AGRICULTURAL MECHANIZATION AND SPECIFIC LOCATION

## 1. DEVELOPED REGIONS

The region is possible to implement agricultural machinery because of the technical, economic and social aspects are feasible.

The purchasing power of farmers to purchase agricultural machinery is adequate

## 2. DEVELOPING REGIONS

This regions are feasible in technical aspect, economic as well as social aspects, but weak in terms of capital, so need low interest credit and easy. This area requires technical guidance and business management of agricultural machinery intensively

## 3. SEMI-DEVELOPED REGIONS

This regions are feasible in technical and social aspects but not economically feasible, so need a grant or subsidy from the Government and need a technical guidance and agricultural machinery business management intensively

## 4. LIMITED REGIONS

The region is constrained because of the technical, economic and social development is not feasible to implement agricultural machinery.

# SUPPLY CHAINS OF AGRICULTURAL MACHINERY

Agricultural machinery supply chain consisting of the provision and delivery systems

## 1. Agricultural machinery supply system

- "Employment contract (*consignment*)
- "Cooperation credit / capital from the supplier / manufacturer
- "Grants through the revolving fund
- "Loans from regional banks or financial institutions

## 2. Distribution system of agricultural machinery

- "Direct sales
- "Lease – purchase
- "Business management units
- "Field operations of the company / manufacturer

# **PHASES OF SELECTIVELY AGRICULTURAL MECHANIZATION DEVELOPMENT AND SPECIFIC LOCATION**

- 1. Appraisal**
- 2. Target group**
- 3. Procurement of agricultural machinery**
- 4. Increased human resource capacity**
- 5. Environment**
- 6. Investment**
- 7. Demonstration of agricultural machinery**
- 8. Testing and certification of agricultural machinery**
- 9. Distribution**
- 10. Quality control of agricultural machinery in circulation**

# ORGANIZATIONS AND INSTITUTIONS

1. **Government Institutions (Regional Technical Services Units in agricultural machinery testing and workshop as well as the Research and Development Agency).**
2. **Private institutions (*supporting system*)**
  - “ **Groups of farmers, Combination of farmer groups (Gapoktan) and Agricultural cooperatives**
  - “ **Service Effort of Agriculture Machine (UPJA)**
  - “ **Association of agricultural machinery entrepreneurs and dealership**
  - “ **Credit and financial institutions or banks**
  - “ **Insurance**
  - “ **Workshop for the treatment and maintenance of agricultural machinery**
  - “ **NGOs and Universities**

# ISSUES IN AGRICULTURAL MECHANIZATION DEVELOPMENT IN INDONESIA

- “ The availability and use of appropriate agricultural machinery is still limited
- “ Inadequate business UPJA scale
- “ Weak support of workshop activities and lack of spare parts
- “ Institutional agricultural machinery has not been steady
- “ Management of agricultural machinery has not been optimal, both technical and business management
- “ Purchasing power and capital are limited due to the exchange value of agricultural products declined steadily
- “ System of standardization, certification, and testing agricultural machinery is still weak
- “ Participation of farmers / private sector in the utilization and development of agricultural machinery is still low.

# Factors Inhibiting The Development of Agricultural Mechanization in Indonesia

## “ **Capital**

Generally, farmers have small land (0.5 hectares / person) and capital less so that they can not afford to buy agricultural machinery that cost relatively expensive.

## “ **Soil Conditions**

Topography of agricultural land in Indonesia mostly undulating and mountainous so it's difficult to operate farm machinery.

## “ **Labor**

Due to the availability of abundant labor, so the use of agricultural machinery will cause a lot of unemployment

## “ **Experts**

Experts or competent persons in the development of agricultural machinery (mechanization of agriculture) are still inadequate.

# CONCLUSIONS AND RECOMMENDATIONS

- “ **Agricultural mechanization development has a strategic position in the agricultural development that agribusiness oriented in transforming of traditional agriculture to modern agriculture.**
- “ **Agricultural mechanization development has contributed significantly in improving efficiency, productivity, quality, value added and competitiveness as well as environmentally friendly.**
- “ **Agricultural mechanization development is inseparable from the role of institutional support in adopting, learn, develop and manipulate agricultural machinery in accordance with the social and economic conditions of the region / area.**
- “ **Agricultural development with the concept of agri-business, competitive, sustainable, democracy and decentralized is a modern agricultural development that take advantage of local resources and technological innovation of agricultural machinery ongoing / sustainable is a must.**

**THANK YOU**

