



COUNTRY REPORT INDONESIA

ASTU UNADI
AGUNG PRABOWO

INDONESIAN CENTER FOR AGRICULTURAL ENGINEERING RESEARCH AND DEVELOPMENT
INDONESIAN AGENCY FOR AGRICULTURAL RESEARCH AND DEVELOPMENT
MINISTRY OF AGRICULTURE
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Badan Penelitian dan Pengembangan Pertanian
Kementerian Pertanian

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INTRODUCTION





Area : 5.193.250 km²

-Land : 1.919.440 km²

-Water : 3.273.810 km²

Island : 17.508

Population : 244.814.900

(2014)

Agricultural land : 70,2 million ha

- Paddy field : 7,9 million ha

- Dry Field : 14,6 million ha

- Plantation : 18,5 million ha

- Meadow/pastures: 2,4 million ha

- Yard : 5,4 million ha

- Ponds : 0,8 million ha

- Timber Plants : 9,3 million ha

- Sub optimal lands: 11,3 million ha

MAJOR AGRICULTURAL PRODUCTS (2014)

- The rainy season : October to April
- The dry season : April to October
- Land holding : 0,3 - 0,5 ha/farmer

No.	Commodity	Harvested Area (ha)	Productivity (Ton/ha)	Production (Ton)
1	Paddy	13.569.941	5,15	69.870.950
2	Corn	3.786.376	4,89	18.548.872
3	Soybean	601.237	1.48	892.602
4	Ground nut	501.142	1,32	664.003
5	Green beans	180.055	1,17	210.819
6	Cassava	1.149.208	22,99	26.421.770
7	Sweet potato	156.862	15,07	2.363.568



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PRIME MOVER



Tractor products in Indonesia consists of several types:

- Large size hand tractors (>15 HP)
- Small size hand tractors (\leq 15 HP)
- Mini tractors (\leq 25 HP)
- Four-wheel drive tractors (> 25 HP)



The population of 2-wheel tractors :

- Java : 52 thousand units
- South Sulawesi : 18.9 thousand units
- Jakarta : 11 units



The population of 4-wheel tractor :

- Sumatera : 1989 units
- North Sumatra : 759 units



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STATUS OF MACHINERY USAGE



MECHANIZATION USED IN CROP PRODUCTION (PRE-HARVEST)

LAND PREPARATION

- Traditional (Animal drawn)
- Hand tractor 6.5 HP - 12 HP.

PLANTING

- Traditional (manual by hand)
- Transplanter (3,5 HP – 5,5 HP)

WEEDING

- Traditional (hand weeder)
- Power weeder (2 HP)

PEST & DISEASE CONTROL

- Hand sprayer, power sprayer, mist-blower, fogger, duster

IRRIGATION

- Open channel (gravitation, pumps)
- Micro irrigation (drip, sprinkler)
- Gun Sprayer, Big-gun sprayer



LAND PREPARATION



PLANTING



PEST CONTROL



WEEDING



IRRIGATION



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MECHANIZATION USED IN HARVEST AND POST-HARVEST

HARVESTING

- Traditional (sickle)
- Reaper, Combine Harvester

THRESHING

- Traditional (hand beating)
- Pedal and Power Thresher

DRYING

- Sun drying (drying floor)
- Mechanical dryer (bed & con)

MILLING

- Rice Milling Unit



HARVESTING



THRESHING



MILLING



DRYING



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STATUS OF MACHINERY MANUFACTURING AND OR MACHINE ACQUISITION



- Large and medium-sized machinery industry and trade is characterized by manufacture, importation component/ spare part and assemble of four-wheel tractors, combine harvester, transplanter, engines and sophisticated equipment
- The local manufacture produce of power tillers, power weeder, water pumps, threshers, chopper, shredder, and dryers based on demand.
- While small-scale farm machinery company is only able to produce simple tools, such as tillage implements, thresher, dryer and other farm equipment.
- 30% to 70% cost of agricultural machine is attributed to the cost of the prime mover and other imported parts.
- Although small engine has been locally manufactured, some spare part special components are imported



The medium-scale agricultural machinery manufacturers :

- Agricultural Tractors: 14 companies
- Irrigation Pumps: 18 companies
- Power Sprayer: 3 companies
- Thresher: 16 companies
- Rice Milling Unit: 11 companies
- Polisher: 5 companies
- Husker: 3 companies



Some Indonesia agricultural machinery companies have manufactured various models and type of machinery locally marketed and export:

1. PT. Yanmar Agricultural Machinery Manufacturing Indonesia: 4-wheel tractor, power tiller, mini tiller, rice milling equipment, and others.
2. PT Kubota Indonesia: Diesel engine, single cylinder, generator, power tiller, ridding tiller, water pump, rice milling unit (RMU), and others.
3. PT. Agrindo: 4-wheel tractor, power reaper, RMU, dryer, grain separator, huller, rice polisher, paddy cleaner, diesel engines, electric motor and electricity generator power tiller, water pump, etc..
4. CV. Karya Hidup Sentosa: Single cylinder diesel engines, 2 wheel tractor, and distribution of a wide range of tillage implements, power thresher, RMU, rice polisher, harvesting equipment, water pumps, and others.
5. PT. Traktor Nusantara: This company assembling and marketing four wheel tractor Massey Ferguson.
6. PT. ALTRAK 1978: distribution of four-wheel tractor with New Holland brand.
7. PT. Bina Pertiwi: distributor of Kubota tractors brand four-wheel manufacturer from Japan.
8. PT. Satrindo : marketing the trademark four-wheel tractor John Deere



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STATUS OF INSTITUTIONAL SUPPORT



YEAR	INSTITUTION
1953	Mechanization Institute was originally founded under the name of Agricultural People's Bureau (Jawatan Pertanian Rakyat): Training centers and workshops in the field of agricultural mechanization
1957	MEKATANI: Mechanization services and training
1963	Research Institute of Labor and Agriculture Equipment. To conduct a small-scale farm mechanization research
1975	Sub-Directorate of Agricultural Mechanization: Training, extension & testing of agricultural mechanization
1983	Sub Directorate for Development of Agricultural Machinery: Training, extension & testing of agricultural mechanization
23 Juni 1986	JICA (Japan) granted to construct buildings for the Indonesian government to be used as a Center for Development of Agricultural Engineering and Technology (CDAET).)
1991	Center for Development and Agricultural Machinery (CDAM) by Decree of the Minister of Agriculture No. 75 / Kpts / OT.210 / 2/9.
2002	Indonesian Center for Agricultural Engineering Research and Development (ICAERD) by Decree of the Minister of Agriculture No. 403 / Kpts / OT.210 / 6/2002.

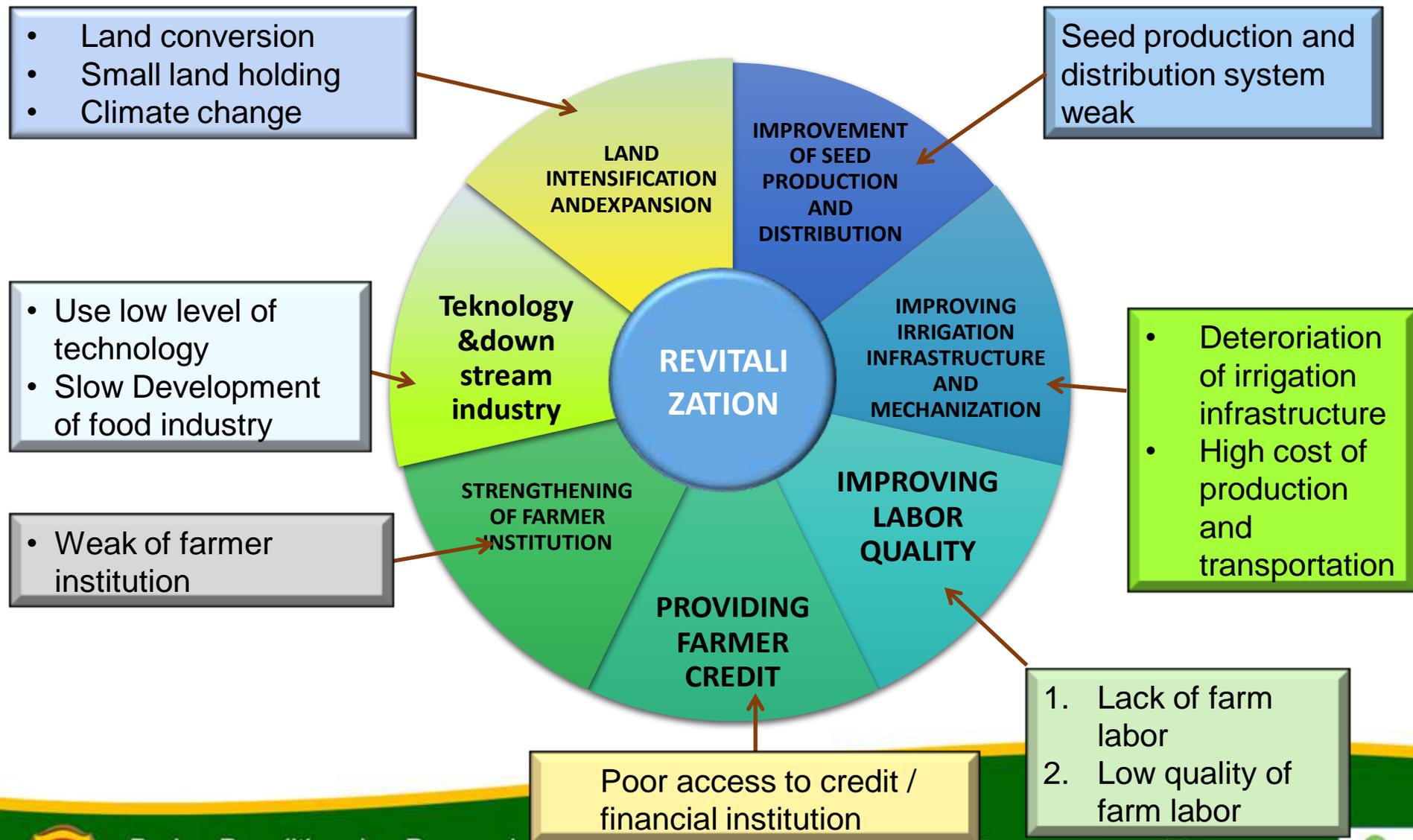


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STATUS OF FARM INFRASTRUCTURE



SPECIFIC PROBLEMS AND CHALLENGES



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STATUS OF MACHINERY TESTING CENTER



The capacity building of Testing Laboratory of ICAERD

No.	Testing Laboratory	Capacity
1	Testing Laboratory for 4 Wheeled and 2 Wheeled Tractors	Max 100 kW
2	Testing Laboratory for Irrigation Centrifugal Pumps	Max 250 mm discharge pipe
3	Outdoor Testing Laboratory for grain post-harvest machinery	Var.
4	Testing Facilities for sprinkler irrigation and hand sprayer	Var.



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Agricultural Machinery that have been tested from 2010 to 2014

NO	AGRICULTURAL MACHINERY	YEAR				
		2010	2011	2012	2013	2014
1	Two Wheel Tractor	21	10	13	11	28
2	Four Wheel Tractor	4	4	5	11	5
3	Pump	13	12	20	13	8
4	Seeder / Transplanter	2	2	2	2	2
5	Corn Sheller	1	1	1	1	-
6	Power Thresher	3	-	1	2	2
7	Harvester	1	-	4	4	2
8	Dryer	3	-	3	-	-
10	Hand Spryer	-	-	2	-	-
11	Power Wedeer	1	-	-	-	-
12	Organic fertilizer crusher (APPO)	7	-	-	3	2
13	Coffe Processing	4	-	6	1	-
14	Cashew Peeler	1	-	-	-	-
15	Biomass Chooper	1	-	-	6	2
16	Tobacco Chopper	1	-	-	-	-
19	Mini Tiller/ Cultivator	-	-	-	4	4
20	Paddy Processing (RMU, Polisher, Paddy Separator, Vibration Sifter)	1	-	-	8	4
	TOTAL	64	29	57	66	59



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POLICY MATTERS



AGRICULTURAL ENGINEERING POLICY TOWARD

1. Increase productivity and efficiency of resource in agricultural production systems
2. Improve quality, and value-added products and waste
3. Develop of new renewable energy sources in agriculture
4. Increase FARMERS WELFARE



AGRICULTURAL MACHINERY TESTING INSTITUTION

- **Government concern to guarantee quality of agricultural machinery for local and import machinery**
- **Testing institution was established in 1972**
- **1986: CDAET (now ICAERD) was established: Design, developed and test of agricultural machinery (ISO 17025 in 2003 for Agricultural machinery testing)**
- **2004: Indonesian institute for testing for certification of agricultural machinery**



RECOMMENDATIONS AND WAYS TO PROMOTE AND ADDRESS CHALLENGES FOR AGRICULTURAL MECHANIZATION DEVELOPMENT

Testing and evaluation is one important aspect in the development of agricultural machinery :

- Protect the consumers need (farmers and other users) through quality control for standardization, which refers to the Indonesian National Standard of the testing procedures, test methods and minimum technical requirements for certification
- Guarantee quality agricultural machinery used by the farmers/other users to meet the requirement of global trade
- Strengthen research and development agricultural machinery more systematic and leads to what the national needs
- Strengthen the growth of local agricultural machinery industry through developing and adopting National Standard of Agricultural Machinery (SNI) used for technical barrier to trade

Through testing and evaluation, research and development technically can be carried out systematically



- In order to fulfill the implementation of the decree, testing institutions/laboratory of agricultural machinery should seriously be able to improve their competency to guarantee the quality of testing results and gain mutual recognition through the National and International accreditation process.
- Indonesian Center of Agricultural Engineering Research and Development (ICAERD) as National Center for agricultural Machinery development, since 1987 has started to establish and develop National Agricultural Machinery Testing Laboratory as National Testing Center.
- Through gradual improvement of testing Machinery, since October 2003 Testing Laboratory of ICAERD has been recognized as competent testing laboratory through accreditation based on ISO/IEC 17025: 1999.
- National Standard of Agricultural Machinery which has been developed for the references in conducting testing and evaluation of agricultural machinery are includes Test Codes-Procedures-Methods, and Minimum Technical Performance Requirement of Agricultural Machinery.
- Currently, those standards are available and used for almost food crops and horticultures machinery.





THANK YOU

