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# Status of Agricultural Mechanization and Testing in Vietnam

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The purpose of this report is to introduce the current status of agriculture mechanization and recent rural developments in Vietnam. Vietnam is an agricultural country with a population of 90 million people, of which 47.4% reside in the country side and are employed in agriculture. Agriculture products account for 22% of GDP, while the annual average growth of agriculture is 4%. The agricultural output is composed of livestock, cultivation, and services. Specifically, the livestock sector occupies 27%, cultivation takes 71% and services get 2% of the share.<sup>1</sup>

## 1. Land area

The country covers a total land area of 32 million hectares, of which 22% of the total land area is cultivable area. Paddy field areas account for 85% of arable land.

Land Area by Land Classification:

Land use	Area (Ha)
Agriculture land	9,345,400
Forestry land covered by trees	11,575,400
Homestead land	443,200
Specially used land	1,532,800
Unused land and river, spring, mountain	10,027,300
Whole country	32,924,100

(Source: Statistical Yearbook 2011)

<sup>1</sup> Statistic of Ministry Agriculture 2011: <http://wdi.worldbank.org/table/3.2>

On average, Vietnamese farmers have only a very small area to plant rice in the Red River Delta area which is an average of 2,000 m<sup>2</sup> household, while for the Mekong Delta, it is 14,000 m<sup>2</sup>.

## 2. Land and agriculture

The planted area of paddy in 2011 was 7,484,600 ha which were for food crops. Rice areas are focused in the Red River Delta (1,202.5 thousand ha) and Mekong River Delta (3,781 thousand ha). The food capacity of paddy reaches to 39 million tons per year.

Planted Area of Main Perennial Crops:

<i>Unit: Thous. ha</i>	2005	2008	2009	2010	2011
<i>Fruit crops</i>	767,4	775,5	774,0	779,7	780,7
<i>Of which:</i>					
<i>Grape</i>	1,9	1,2	1,2	0,9	0,8
<i>Mango</i>	80,1	86,4	87,6	87,5	86,3
<i>Orange, mandarin</i>	85,6	80,1	77,4	75,3	70,3
<i>Longan</i>	115,1	95,6	90,7	88,4	87,6
<i>Litchi, rambutan</i>	115,9	108,6	103,4	101,7	99,7
<i>Cashew nut</i>	348,1	406,7	391,4	379,3	360,3
<i>Rubber</i>	482,7	631,5	677,7	748,7	834,2
<i>Coffee</i>	497,4	530,9	538,5	554,8	570,9
<i>Tea</i>	122,5	125,6	127,1	129,9	126,3
<i>Pepper</i>	49,1	50,0	50,6	51,3	55,4

(Source: Statistic of Ministry Agriculture 2011)

## 3. Irrigation

Irrigation water for agricultural production includes water supply and drainage. Currently, the level of mechanization reaches about 50% (50% of the area is irrigated by machine and the remaining 50% is irrigated by gravity flow and hand pump).

## 4. Agricultural mechanization

Currently, Vietnam is witnessing rapid increase of agricultural mechanization. The total number of tractors in 2013 increased by 1.4 times, and the number of harvesters increased by 4.3 times in comparison to 2006. The rate of mechanization for land preparation is 80% of the total area of arable land. On average, the power input per cultivated hectare reached up to 1.6 horsepower (HP) and for rice 2.2 HP/hectare. The rate of rice land preparation mechanization, rice threshing and combination of harvester in the whole country are 95%, 50% and 50% respectively. The total number of dryers decreased by 8%, however drying



capacity increased by 20% because small dryers (1-4 tons/ batch) have been gradually replaced by large productive dryers (10-30 tons/ batch).

Presently, there are more than 500,000 tractors and power tillers, with existing capacities of 6.5 million horsepower (HP). Moreover, there are about 900,000 agricultural machines of all kinds such as ploughs, hoe rotary, cultivator and cage wheels. In addition, there are 1,500 units of harvesters, 600,237 units of threshers with existing capacities of 471,661 ton/hour, and 1,340,080 units of water pumping machines with existing capacities 57,094,439 m<sup>3</sup>/h. About 53% of tractors have the capacity of less than 12 horse powers (HP), 35% have 12 to 35 HP and 12% have the capacity of more than 35 HP. Currently, the size of tractors is increasing. Tractors are mainly used for mechanized land preparation for crop production such as rice, corn and sugarcane.

In recent years, the number of machinery used for agricultural purposes increased rapidly. For example, during 2014, the number of tractors increased by 1.6 times compared to 2006, while the number of harvesters increased by 25.6 times. Increased mechanization was mainly concentrated in the Mekong River delta area that accounts for 75% of the country's agricultural production. Also, sprayers and plant protection machines increased up to 5.8 times and water pumps used in agricultural production increased by 1.2 times.

Although the rate of mechanization in agriculture remains limited, Vietnam has gained a lot of experience in the mechanization of rice production. The quality of small machinery, used for rice production is generally good, specifically for spreader harvesters, threshers, and dryers. Vietnamese machinery for rice production are used locally and exported internationally.

## 5. Testing of machinery

Vietnam has national standards for inspecting and testing of machines used in the agricultural sector. The government has policies to support the use of machines in agricultural mechanization. This has contributed to the rapid increase in the use of agricultural machinery.

Nonetheless, the application of testing standards is still not compulsory. The standardization system consists of National Standard TCVN and standards at a fundamental level. The TCVN is issued by the Ministry of Science and Technology. Products certified as suitable to TCVN are issued by the General Department for Standards and Quality immediately after the Ministry of Science and Technology. Other Certification Centers do not issue certificate of conformity for agricultural machines. Fundamental standards are set up and released by each establishment. The establishments also perform testing and announce whether their products pass the fundamental standards. Generally, the application of standards is still very limited and applied only to a limited number of machines.

## 6. Challenges and way forward

The Vietnamese government has recently implemented new policies to support agricultural mechanization by introducing programs such as "Build New Rural". This program aims to build new infrastructures, expand rural and field roads. Farmers can now easily borrow money from the bank to invest in agriculture machinery. There are numerous kinds of

machinery and tractors built by Vietnamese manufacturers, with less than 30 HP that can be easily used by smallholders.

In the next phases, the government will focus on motorizing the whole process of producing and processing rice, maize, sugarcane, and peanuts.

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CSAM, Centre for Sustainable Agricultural Mechanization, is a regional institution of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), based in Beijing, China. CSAM is built upon the Regional Network for Agricultural Machinery (RNAM) and the United Nations Asian and Pacific Centre for Agricultural Engineering and Machinery (UNAPCAEM), and started operations in 2004. CSAM serves the 62 members and associate members of UNESCAP.

The vision of CSAM is to achieve production gains, improved rural livelihood and poverty alleviation through sustainable agricultural mechanization for a more resilient, inclusive and sustainable Asia and the Pacific.

CSAM's objectives are to enhance technical cooperation among the members and associate members of UNESCAP as well as other interested member States of the United Nations, through extensive exchange of information and sharing of knowledge, and promotion of research and development and agro-business development in the area of sustainable agricultural mechanization and technology transfer for the attainment of the internationally agreed development goals including the Millennium Development Goals in the Asia-Pacific region.

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