



MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
Vietnam Institute of Agricultural Engineering and Post Harvest Technology

HUMAN RESOURCE DEVELOPMENT FOR SUSTAINABLE AGRICULTURAL MECHANIZATION IN VIETNAM

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I. Overview of human resource development work in the field of agricultural mechanization

1. Current number and employment status of agricultural mechanization workforce

- **Vietnam currently has no overall survey of the number of employees serving agricultural mechanization. However, the status of qualified Mechanized Vietnam is very low compared to areas where the work force agricultural mechanics and asynchronous missing.**
- **According to the General Statistics Office in 2014, there are 18.2 million workers have been trained in total 52.7 million people are working, there are only 3.3 million people have diplomas and certificates issued by the educational institutions in the country and abroad. People aged 15 and older are not technical training: 81.8 %; vocational training 4.9%; Long - term vocational training): 3.7%; College: 2.1%; Graduate and above : 7.6%.**
- **There are 6.4 million people work in the fields of agriculture, forestry and fishing; plant and machine operators and assemblers: 3.9 million people.**

As reported by the Department of Agri - Forestry Processing for Products and Salt Production-fisheries, Ministry of Agriculture and Rural Development, the engine management system of agricultural electricity from the central to local levels has not been paid sufficient attention; capacity of staff from the central to grassroots levels are insufficient in and weak.

Currently, monitoring and reporting on the use of machinery and agricultural equipment in provinces of Vietnam are done by Departments of Agriculture and Rural Development or Agricultural Extension Centers of the provinces. However, most of them work part-time and do not have good experiences on agricultural mechanical engineering.

Among the agricultural mechanical engineers who have been trained previously, there are few people working in the field as professionals.

Survey results in 34 Extension Centers of the provinces having largest rice-growing areas of National Institute of Agricultural Planning and Projection, Ministry of Agriculture and Rural Development) showed:

- **At 10 extension centers of Red River Delta provinces and 10 extension centers of Central coastal provinces and Central Highlands: no agricultural mechanical engineers or mechanical engineers.**
- **At Departments of Agriculture and Rural Development of the Northern mountainous provinces: very small number of agricultural engineers and Departments of the Interior of the provinces: also no civil service recruitment criteria for their Agricultural Engineering sector.**
- **Survey results in Extension Centers of 13 Mekong Delta provinces showed: human resource professional qualifications in the field of agricultural mechanization are very limited: only 1 Center has engineers in agricultural Mechanics, 5 Centers have agricultural engineers and the other 7 Centers have no staff having agricultural Engineering degrees. This results in difficulties for the implementation of technical advances in mechanization of agricultural production in the localities.**

Table 1. The status of human resource engineer at the Agriculture and Fisheries Extension Center of the 13 provinces in the Mekong Delta (4/2012)

N_0	Agriculture and Fisheries Extension Center	Agricultural Mechanical Engineer	Mechanical Engineer	Graduation year
1	An Giang province	01	0	1986
2	Long An province	0	01	2006
3	Tien Giang province	0	01	2001
4	Kien Giang province	0	02	2007
5	Vinh Long province	0	01	2004
6	Tra Vinh province	0	01	2004
7	Can Tho province	0	0	
8	Dong Thap province	0	0	
9	Soc Trang province	0	0	
10	Bac Lieu province	0	0	
11	Hau Giang province	0	0	
12	Ca Mau province	0	0	
13	Ben Tre province	0	0	
	Total	01	06	

Table 2. Survey data manpower level manufacturing facilities combine harvester Mekong Delta

Province	N ₀	Facility Name	Number of employees	Qualifications are trained in mechanical engineering					
				University	College	Intermediate	Worker	Vocational certificates	Self-training
Long An province	1	Nhật Thành	50	0	0	10	0	0	40
	2	Chín Nghĩa	15	1	0	0	0	0	14
	3	Hiệp Hùng	19	0	0	14	0	0	5
Tien Giang province	4	Tư Sang	57	2	0	4	9	0	42
Dong Thap province	5	Phan Tấn	80	1	0	0	3	0	76
	6	Vạn Phúc	25	0	0	3	0	0	22
	7	Út Máy Cày	30	0	0	0	0	0	30
Can Tho province	8	Hoàng Thắng	30	3	0	3	6	0	18
	9	Năm Sanh	20	0	0	0	0	0	20
	10	Tâm Phúc	55	0	0	0	5	0	50
An giang province	11	Hai Tính	9	0	0	0	0	0	9
	12	Tư Hồng	10	0	0	0	0	0	10
	13	Dũng số 5	20	0	0	0	0	0	20
	14	Cơ Khí An Giang	275	28	4	20	223	0	0
Kien Giang province	15	Đức Ngươn	15	0	0	0	1	0	14
		Tổng	710	35	4	54	247	0	370

2. Credentialing/licensing/regulations of agricultural engineers, agricultural machinery operators and technicians

Previously the country had five Universities training undergraduate and postgraduate agricultural mechanics. Those are Vietnam National University of Agriculture, Nong Lam University - Ho Chi Minh City, Can Tho University, Hue University, Thai Nguyen University. However, only Vietnam National University of Agriculture and Nong Lam University have Faculty of Mechanics to train Agricultural Engineering.

Faculty of Agricultural Engineering from Can Tho University since 1999 could not have any student studying Agricultural Engineering; Thai Nguyen University: no student studying agricultural engineering since 2007.

Colleges and vocational schools under Ministry of Agriculture and Rural Development are tasked with training and certifying technicians, and certifying machinery operation. In 2014, universities' enrollment quota allocated for fields of agriculture construction, fisheries, agriculture, forestry and fisheries processing was 43.630 people, in which the primary vocational training under 3 months accounted for 54%, vocational 34% and vocational in colleges 12 %.

Now only some vocational colleges (Vocational College of Agricultural Machinery, College of Electrical Engineering of Phu Tho Province, etc) have training of agricultural engineering, rural electrification with the number of trainees is about 300 persons/year.

There are also training centers of some Universities and Institute of Mechanical Engineering who carry training (use and operation of equipment in agriculture) vocational qualifications for students.

3. Agencies/institutions involved in agricultural mechanization human Resource development and their current programs/projects

- Vocational training:

- + Vocational schools under the Ministry of Agriculture and Rural Development;
- + Vocational schools under the Ministry of Labour-Invalids and Social Affairs;
- + Training centers of Universities and Institute
- + Some other mechanical vocational schools.

- About agricultural engineer and mechanical master training:

- + Vietnam National University of Agriculture
- + Nong Lam University - Ho Chi Minh City

- Training of agricultural engineering Ph.D:

- + Vietnam National University of Agricultural
- + Nong Lam University - Ho Chi Minh City
- + Vietnam Institute of Agricultural Engineering and Post Harvest Technology (Ministry of Agriculture and Rural Development)
- + Research Institute of Agricultural Machinery (Ministry of Industry and Trade)

- Management of human resources:

+ Ministry of Education and Training

+ Ministry of Agriculture and Rural Development

+ Ministry of Industry and Trade

+ Ministry of Science and Technology

+ General Department of Vocational Training, Ministry of Labour-Invalids and Social Affairs

Program / project development of human resources of the Ministries:

- + Scheme Training and retraining of civil servants and employees of the Agriculture and Rural Development for the 2013-2015 period and orientations towards 2020;**
- + Scheme improving the quality of human resources in the Agriculture and Rural Development 2015-2020 period;**
- + Strategy for labor and human resource development in agriculture and rural industrialization period , modernization 1999-2020;**
- + Scheme development of human resources and technological sciences 2011-2020;**
- + Scheme Training and retraining of human resources in science and technology in the country and abroad with the state budget in 2015.**

II. Strategies, policies, and national programmes/initiatives of human resource development of agricultural mechanization

- Decision No. 121/2007/QĐ-TTg dated 27/07/2007 of the Prime Minister approving the planning of the network of universities, colleges, 2006-2020 specify: structural adjustment of student number trained in lines to 2020: Basic sciences 9%; Pedagogy 12%; Technology-Technical 35%; **Agriculture-Forestry- Fishing 9%**; Health 6%; Economy-Law 20% and others 9%. However, there have not been oriented human development set, thus human requirements for many sectors are not met.

- Decree No. 02/ 2010/ND-CP dated 08/01/2010 of the extension regulation policies supporting production lines, processing, storage, consumption in agriculture, forestry, salt production, fishery, irrigation, agricultural mechanical engineering, rural industries. **To implement this policy, those who carry rural services will be mechanical supported by training, raising education level, providing information, in which one of them is to conduct study tours to demonstrations of machine agricultural equipments, agro-processing processes, etc ...**

- Decision No. 579/QD-TTg dated 19/04/2011 of the Prime Minister on approving workforce development strategy for the period 2011-2020 which focused on building scientific and technological manpower, improving vocational training for rural labor, labor intensive in farming areas, regional economic restructuring. It is also to enhance training, retraining and improving professional skills, and teaching skills for teachers of vocational training schools, vocational training centers, etc...

- Decision No. 186/2002/QD-TTg dated 26/12/2002 of the Prime Minister approved the "Strategy for development of Vietnam's mechanical engineering industry till 2010 and vision to 2020", in which the mechanical engineering service for agriculture - forestry - fishery and processing industry is one of the priority sectors.

- Decree No. 45/2012/ND-CP dated 21/5/2012 on industrial promotion policy provisions supporting individual units engaged in rural industry development and application of cleaner production.

- Economic development strategy for 2011-2020 set by social Congress XI National Communist Party of Vietnam (2012) defined through one of three strategic breakthrough is "Rapid Development human resources, especially high-quality human resources.

- Resolution No. 46/NQ-CP dated 29/03/2013 issued by the Government action program to implement Resolution No. 20-NQ/TW dated 11/01/2012 of the 6th Congress, the Executive Committee XI Party Central Committee determined "formulate mechanisms and policies to develop human resources, use and promote staff Science and technology"

- Decision No. 880/QD-TTg dated 09/6/2014 of the Prime Minister: The master plan for development of the industry of Vietnam till 2020 with a vision to 2030. One of the plans is to build a number of specialized and key mechanical products to meet the basic needs of the economy, such as movers, mechanics for agriculture, forestry and fisheries. A number of measures are also raised to implement the plan as measures of capital, market, science and technology, developing solutions for human resources.

III. The need assessment of human resource development of agricultural mechanization in Vietnam

In mechanization of agriculture, there are two important factors influencing the production process: the use of human resources and equipment and technical status of farming.

According to data of some agricultural machinery enterprises, the rate of agricultural machines produced in Vietnam including both manufacturing and assembling is only about 30-40% of the market. Establishments of manufacturing agricultural machinery of Vietnam are mainly at local level, and small, and it is one of the reason of design engineering and manufacturing technology are limited. Spare-parts have not been standardized and quality is low. Consequently, it increases the cost of maintenance, repairs and reduces competitiveness.

System and after-sales services are mostly done by cooperatives and private holders, accounting for about 80% of the total services. According to statistics of Ministry of Industry and Trade, there are 1,267 establishments for sale and after sale services of agricultural machinery in the country, and over 18,000 who specialize in business; 1,218 establishments with 14,146 people specialized in repair, maintenance, and warranty of machines and agricultural equipment.

However, qualified human resources for conducting mechanization for agricultural production such as machine using, machine building and agricultural extension servicing are limited. The majority have not been trained from schools specializing in agricultural mechanization. To initially deal with that, there should be training on motorization for related objects.

Vietnam agriculture will not be integrated and has higher added value if no restructuring while promoting agricultural mechanization. Therefore, focus on improving capabilities and quality of agricultural mechanization services is critical mission.

IV. Challenges and constraints that human resource development for agricultural mechanization is facing in Vietnam

The mechanics in general and engineering for agriculture and rural development in particular is a less attractive sector (low wages, work hard, study hard, etc...). Agricultural production today with the economic restructuring and rapid industrialization is facing labor shortages. The solution is mechanization. To develop agricultural engineering industry, firstly needs to focus on training engineers, but in the meanwhile, the mentioned universities have stopped training (Can Tho University, Hue University, Thai Nguyen University) or are very difficult and unstable on getting enrolment on this subject (Vietnam National University of Agricultural and Nong Lam University - Ho Chi Minh City).

Number of trainings is low compared to the requirements of industrialization and modernization of rural agriculture, not to mention there is very small percentages (only 3-5%) of students after graduation returned to the countryside to serve agricultural production.

Table 3: Summary of college students studying agriculture mechanics 2006-2015 of the Nong Lam University

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Students	37	27	24	17	9	0	67	138	144	91

Table 4: Summary of college students studying agriculture mechanics 2006-2015 of the Vietnam National University of Agriculture

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Students	160	206	51	115	100	96	114	150	176	135

There are many causes of the current situation that very few students enrolled in Agricultural Engineering, but one of the important causes is that study is hard while working career is not attractive. According to Ministry of Education and Training, in 2010 the number of students in engineering sector was accounted for 31.09% and technologies in agriculture, forestry and fisheries was accounted for 8.69%.

About postgraduate education (Masters and Doctor): Input supplies are limited in quantity and quality, due to the nature of the research with specific characteristics requiring large cost, research carried in limited service facilities, etc...

From 2006 to 2015, only more than 200 master's of Agricultural Engineering have been trained by universities. The number of agricultural mechanical Doctor trained is also very small, just over 20 people. On the other hand, it is a common situation that staff of universities and research institutes, after being sent for further training abroad, when comeback they do not work in the field of agricultural mechanization any more.

V. Solutions and suggestions for human resource development for sustainable agricultural mechanization

1. Need to do good work for getting more enrollments on vocational training of agricultural mechanical engineering

For tertiary education institutions: innovate the human resources training enrollment: enrollment training must be based on the needs of society. Strengthening the link between school/training institutions and enterprises. Training institutions and employers should pay attention to the needs of each organization to collaborate, and support each other in developing training and manpower supplying.

Plan, manage and open educational sector now need to study to match actual demands and development orientation of national human resources. Failure to adjust and balance the supply-demand growing manpower, will affect badly on the development of economic-social life, firstly on sector development including agriculture one.

2. Need to develop a comprehensive policy on training for agricultural mechanical engineering

Providing and rationalizing scholarships from the budget through general regulators, and from various sources at the national macro level are essential. There should be more appropriate policies to attract students for mechanical engineering sectors like for pedagogy.

The state should establish the system of research centers and technical service of agricultural mechanization in the agricultural production areas as key Mekong Delta, Southeast, Central Highlands, Red River Delta... just to meet the requirements of industrialization, just a workplace for engineers and those working in mechanical talents, technical services and passion creation.

Need to reset the training level IV category in the system of national training programs for agricultural mechanical engineering.

Agricultural mechanization is indispensable in the process of industrialization and modernization of agriculture and rural areas. One of the key factors for successful agricultural mechanization is the quality of human resources in agricultural mechanization.



**THANK YOU
FOR YOUR ATTENTION**