



SURVEY REPORT

RATES PROJECT

**EVALUATION OF CURRENT AGRICULTURAL
EXTENSION SYSTEM IN VIETNAM**

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SUMMARY

Vietnam's agricultural extension system (NAES) was formed in 1993, and has undergone several organizational structural changes. The national agricultural extension system is essential in transferring scientific and technological advances to farmers. However, recent operations have shown that agricultural extension activities conducted by the state agricultural extension system are facing many difficulties. Meanwhile, the socialization of agrarian extension activities is ineffective in replacing the national agricultural extension system.

The results from RATES's project survey in 2023 revealed that the agricultural extension system at the commune level is no longer effective in reality, leading to the cancellation of commune-level AE units in almost all provinces. Many agricultural extension centers have been merged into agricultural service providers operating under the model of revenue-generating public service units with state ownership, carrying out agricultural extension activities under transfer contracts combining regular functions.

However, The operation under the new model met several disadvantages. In fact, after restructuring the whole system, the agricultural extension system was broken from the province to the commune. Provincial agricultural extension units can no longer maintain connection with district-level agricultural extension centers, and commune extension officers are no longer under the personnel management of the agricultural extension system. They worked part-time and lacked professional capacity. Furthermore, AE units lack experience in trade and markets, making them unstable when taking AE activities under commercial contracts.

The backward thinking in implementing activities, slow innovation, and weak competition capacity worsen the situation of AE system, especially at district and commune levels. Furthermore, the abolition of the grassroots agricultural extension system restricts monitoring and guiding farmers to apply new technical advances. In the context of rapid change, the lack of linkage in the state agricultural extension system units also creates problems for the country's seed, input market, and pest management.

The process of implementing agricultural extension activities of the system is also negatively affected because district and provincial agricultural extension agents often do not understand the actual situation in communes, villages, and hamlets. Activities concurrently taking on the role of grassroots agricultural extension by commune officials, village heads, and street group leaders are also limited due to work pressure as well as the suitability of expertise. The AE activities include selecting sites to build demonstration models, organizing field workshops and field visits, and promoting the spread of new techniques in agriculture, therefore being restricted.

The survey results of farming households from RATES also showed that the agricultural extension model implemented by international organizations has many advantages. However, it depends heavily on the project implementation time, so the effectiveness in the long run is very limited. According to the rice reduction emission practice case in Can Tho, the adoption level of agriculture techniques in the projects is not maintained stably and synchronously, and agricultural extension officers of international organizations are often very strict in ensuring the requirements of transferred technology.



Meanwhile, the transfer activities of agricultural enterprises and other organizations are mainly to advertise their products and services, so being able to apply them synchronously on a large scale is very limited. Farmers sometimes cannot distinguish between the effectiveness of the varieties/products of the transfer models these units implement.

Currently, the community agricultural extension team model is being initially built and is expected to be a new agricultural extension mechanism that encourages farmers to apply techniques and ensures continuous implementation supervision among members. However, they are ineffective due to insufficient connection with local state agricultural extension organizations and resource support to operate effectively. Community extension groups operate as interest groups without links, making it impossible for the government to manage them, thereby missing out on necessary information to support them.

Faced with the above situation, the RATES research team proposed a combined agricultural extension model, similar to the model implemented by international organizations but with a close connection between farmer groups and the model participation in supporting state agricultural extension. The model is planned to be deployed in 2024 and 2025 under the framework of the project to test the effectiveness and spread of plant protection technology transfer on rice, orange, and dragon fruit in Binh Thuan, Hoa Binh provinces Can Tho.



1. Introduction

1.1. Background

Agricultural extension activities in Vietnam are long-standing activities associated with wet rice civilization. Historical stories and legends about King Hung tell that the King taught people to plant rice and mulberry trees and the "Tich Dien" Festival (the King went to the fields to plow in the spring to encourage the people to start a new production year) became the traditional of Vietnam's agriculture. Establishing the "Agricultural Extension Mission" under the Tran Dynasty and the "Agricultural Promotion Edict" issued by King Quang Trung was the pre-foundation for Vietnam's agricultural extension system. After 1945, the Government and President Ho Chi Minh also paid attention to directing and promulgating many agricultural extension policies to encourage agricultural innovation. Encourage the development of agricultural production and improve farmers' lives.

However, the milestone that marked the birth of Vietnam's agricultural extension as a complete system began in 1993 under Decree No. 13. Subsequent periods from 1993 to 2022 saw changes in the system in terms of changes in functions, tasks, and operating methods under the regulation of the Vietnamese government and the Ministry of Agriculture and Rural Development.

Compared to other countries in the region, agricultural extension tasks are mainly carried out by national agricultural extension agencies, while private agricultural extension activities, although carried out, do not have the nature of a complete system. However, in recent years, agricultural extension activities deployed to grassroots levels have faced many difficulties regarding implementation, effectiveness, and pervasiveness. The scale of many agricultural extension organizations has shrunk and converted to other operating models. The current decentralization from central, provincial, district, and commune-level also has many problems that make agricultural extension organizations operate ineffectively, causing waste of resources and people.

In addition, socialized agricultural extension activities are also continuously developing and competing strongly with the state agricultural extension system, but also have many potential risks, especially for farmers due to communal agricultural extension organizations. The association pursues many different goals, among which the goals of maximizing profits and promoting products change the nature of agricultural extension activities. In order to find and overcome the limitations of the current agricultural extension system in Vietnam, research on the current state of the agricultural extension system, propose solutions, and build a pilot agricultural extension model based on the limitations of agricultural extension systems is necessary. The weaknesses of current agricultural extension models are essential to promoting and improving the effectiveness of agricultural extension in Vietnam. The project results are an essential scientific basis for policy-makers to adjust agricultural extension policies appropriately and effectively expand the agricultural extension model built into the project.

1.2. Objectives

- Overview agricultural extension system (AES) in Vietnam, characteristics and history of development



- Evaluation of situation and difficulties of AES through interviewing farmers and extension staffs in study sites

2. Methodology

2.1. Secondary data collection method

- Agricultural extension-related policies of the national agricultural extension centers, the Ministry of Agriculture, and other relevant legal documents and supporting policies;

- Reports and statistics of agricultural extension centers in Hoa Binh, Binh Thuan, Soc Trang provinces on the implementation and Evaluation of agricultural extension activities in agricultural production areas;

- Documents on natural, socio-economic conditions of the study sites.

2.2. Primary data collection method

- Building the survey form: The survey form is built with 03 samples, including:

+ 01 survey form for the staff of the National Center for Agricultural Extension

+ 01 survey form for officials at provincial agricultural extension centres and district agricultural extension stations

+ 01 samples for farmers at the study sites participating in agrarian extension activities from various sources. The information includes:

- General Information

+ information on participation in agricultural extension activities in the locality, topics of involvement, frequency of participation, and support received when participating in agricultural extension activities.

+ Evaluation of agrarian extension activities organized locally through different channels and subjects of technology transfer to farmers

+ Farmers' actual need for extension, preferred type, desired model, and expected implementation steps

+ Some difficulties in accessing farming techniques in extension and farmers' suggestions

- Interview: Subjects and interview locations will be randomly selected at representative research sites, selected from orange growing areas to be transferred technology in Cao Phong; Dragon fruit growing area in Ham Thuan Nam district and rice growing area in O Mon district, besides their are some agricultural production areas in Hai Duong, Soc Trang, Ha Nam

The number of questionnaires collected included:

+ 60 staffs from the agricultural extension system at all levels (central, provincial, district, grassroots)



+ 300 farmer

Interview method: Face-to-face interview using a printed questionnaire. The interview process was carried out as follows: The researcher contacted the locality to obtain a list of surveyed households. The researcher randomly selects the farmers from the list and conducts the survey until the required number of samples is collected.

c. Methods of synthesizing and analyzing information

- Descriptive statistical method: This method is used to describe the socio-economic conditions of the study area through data on area, output, size of farmers, applied techniques, and participating training classes... The data collected from field surveys and questionnaires will be processed statistically with the support of specialized software to calculate the average percentage of agricultural indicators, etc., to the local;

- Comparative analysis method: The comparative analysis method is used to compare different cases and agricultural extension models applied at the study sites. Comparative results clarify the level of difference, the ability of farmers to absorb, and the rate of successful application of technical advances in the field through different extension approaches for farmers. From there, find a suitable method, change the current traditional agricultural extension method,

- Using the SWOT analysis method to analyze the general situation of the study area and, at the same time, evaluate the strengths, weaknesses, opportunities, and challenges in agricultural extension activities at all levels. The combination of (i) Strengths (S) are favorable factors and internal resources that contribute to promoting agricultural extension activities; (ii) Weaknesses (W) are unfavorable factors, unfavorable internal conditions that limit the development of agricultural extension and fruit; (iii) Opportunities (O) are external factors that can positively affect agricultural extension activities; (iv) Challenges (T) are external factors that can create negative, unexpected results that negatively affect agricultural extension activities.

The analysis results are the basis for proposing strategies and solutions to develop agricultural extension activities in the future. Based on SWOT matrix analysis, to devise appropriate strategies based on a combination of strengths and challenges (adaptive strategy: ST), strengths and opportunities (offensive strategy: SO), weaknesses and opportunities (adjustment strategy: WO), and weaknesses and challenges (defensive strategy: WT).

3. Results of assessment of the current state of the Agricultural extension system in Vietnam

3.1. Results of collecting secondary information about the current agricultural extension system in Vietnam

3.1.1. State agricultural extension system

Period 1993- 2005:

On March 2, 1993, the Government issued Decree No. 13/CP on agricultural extension work. Accordingly, the state agricultural extension organization system was officially established.



- At the Central level: The Ministry of Agriculture and Food Industry established the Department of Agricultural Extension. In the Ministries of Forestry and Fisheries, forestry and fishery extension tasks are assigned to the appropriate Departments.

- Locally: establish an agricultural extension center under the Department of Agriculture, Forestry and Fisheries. The Center organizes agricultural extension stations in each region or commune cluster.

- Regarding the number of agricultural extension officers: the national agricultural extension organization system had only a few hundred people at the beginning of its establishment. With the attention of the Government, ministries, branches, and Party committees at all levels of local authorities, the agricultural extension system has been rapidly developed nationwide. According to local reports, by 2004, the total number of agricultural extension officers at all levels was 10,654 people, including 58 people at the central level, 1,446 people at the provincial level, 1,716 people at the district level, and 1,716 people at the commune level, 7,434 people, and 3,918 agricultural extension clubs with 176,300 members voluntarily established by farmers under the guidance of state agricultural extension.

The agricultural extension worked in this period aims to eliminate hunger, reduce poverty, and ensure national food security. Agricultural extension focuses on supporting the economic development of farming households with extension programs that apply high-yield plant and animal breeds with short growth periods to transform production structure, increase crops, increase productivity and output, improve living standards, and ensure social security.

Period 2005 - 2010:

Agricultural extension work is carried out at this stage according to Decree No. 56/2005/ND-CP dated April 26, 2005 of the Government on Agricultural and Fishery Extension (replacing Decree 13/CP).

Regarding the organizational system: At this time, the Ministry of Agriculture and Food Industry merged with the Ministry of Forestry to become the Ministry of Agriculture and Rural Development. Therefore, there are only two systems left: agricultural extension and fishery extension:

- At the central level: The Ministry of Agriculture and Rural Development established the National Agricultural Extension Center and the Ministry of Fisheries established the National Fisheries Extension Center as public service units serving state management of agricultural extension. , fishery extension.

- Locally:

+ Provincial level: there is an Agricultural Extension Center under the Department of Agriculture and Rural Development a Fisheries Extension Center under the Department of Fisheries.

+ District level: has Agricultural Extension Station and Fishery Extension Station.

+ Commune level: each commune, ward, and town has at least 01 employee working on agricultural and fishery extension.



+ Villages, hamlets, phum, and socs have agricultural and fishery extension collaborators.

- Regarding the number of agricultural extension officers: during this period, localities continued to pay attention to developing the agricultural and fishery extension organization system at all levels, especially at the grassroots level. According to local reports, by 2010, the total number of agricultural extension officers at all levels nationwide was 33,708 people (of which 85 people at the central level, 2,108 people at the provincial level, 3,768 people at the district level, and 3,768 people at the district level). The commune-level is 9,301 people, and the village level is 18,446 people).

- Regarding activity content:

This period started when Vietnam's agriculture gradually integrated into the international economy. The technical advances, high-quality seeds and modern farming technologies were gradually applied to production.

Agricultural extension activities in this period focused on the goal of transforming production structure to increase the value per unit of land area used. By promoting the conversion of plant varieties livestock, changing seasons, and applying advanced intensive farming techniques, we have promoted the movement to build fields with income of 50 million VND/hectare, even hundreds of millions. VND/ha/year is widely developed nationwide.

Period 2010 - 2018:

Agricultural extension work is carried out at this stage according to Decree No. 02/2010/ND-CP dated January 8, 2010, of the Government on Agricultural Extension (replacing Decree 56/2005/ND-CP).

Regarding the organizational system: At this time, the Ministry of Fisheries was merged into the Ministry of Agriculture and Rural Development. Therefore, the agricultural extension system has unified a focal point from the central to grassroots level:

- At the central level: The National Agricultural Extension Center is a public service unit under the Ministry of Agriculture and Rural Development, with the functions and tasks of being the focal point for implementing central agricultural extension tasks according to the Ministry of Agriculture and Rural Development. assigned by the Ministry.

- Locally:

+ At the provincial level (province, centrally run city) there is an agricultural extension center that is a public service unit;

+ At the district level (districts, towns, and cities with agricultural production at the provincial level), there is an agricultural extension station that is a public service unit;

+ At the commune level (commune, ward, town with agricultural production) there are agricultural extension staff with a number of at least 02 agricultural extension staff in communes in difficult areas and at least 01 agricultural extension staff for remaining communes. again;

+ In the village (hamlet, village, level, phum, soc) are agricultural extension

collaborators and agricultural extension clubs.

- Regarding the number of agricultural extension officers: according to local reports, by 2015, the total number of agricultural extension officers at all levels nationwide was 36,812 people (of which 92 people at the central level, 2,114 people at the provincial level), people, district level is 4,347 people, and commune level is 8,880 people, village level is 21,379 people) and about 3,000 agricultural extension clubs with hundreds of thousands of farmers in regions throughout the country.

- Regarding activity content:

In this period, Vietnamese agriculture deeply integrated internationally, participating in global agricultural supply chains. Agricultural extension focuses on transferring technical advances and management solutions to improve product productivity, quality, and competitiveness.

The content of agricultural extension activities has gradually shifted to developing commodity production, applying intensive farming techniques and modern technology to increase food quality, hygiene, and safety by focusing on training and improving food safety. It also focuses on improving farmers' farm management skills and market knowledge to save production costs, lower product prices, increase the competitiveness of Vietnamese agricultural products in the international market, and increase income for farmers. Agricultural extension programs in this period prefer the application of good agricultural practices (GAP) in agricultural, forestry, and fishery production. The AES also emphasizes applying rice farming techniques according to "3 reductions, three increases", "1 right five reductions," synchronous mechanization, and high-tech agriculture, linking the agricultural value chain from production to consumption. The other intensive farming model has been widely deployed and achieved positive results.

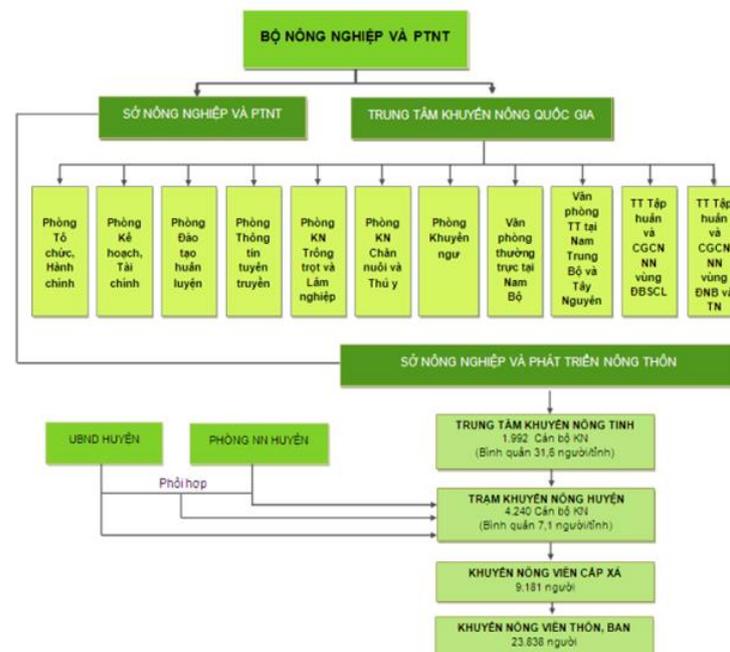


Diagram 1. Organizational structure of Vietnam's agricultural extension system in the period 2010-2018



Period 2018 - 2022:

During this period, Vietnam's agricultural extension system was built based on the previous period (2010-2018), but steps have been taken to reform and streamline the system. Agricultural extension work is carried out according to Decree No. 83/2018/ND-CP dated May 24, 2018 of the Government on Agricultural Extension (replacing Decree 02/2010/ND-CP). Regarding the organizational system: Decree No. 83/2018/ND-CP does not provide detailed regulations on the state agricultural extension organization system (like previous Decrees). At the same time, implement Resolution No. 19-NQ/TW dated October 25, 2017 of the 12th Central Executive Committee on continuing to innovate the organization and management system to improve unit quality and operational efficiency. From 2018 up to now, localities have reviewed and rearranged the agricultural and rural development organizational system at all levels (including the agricultural extension system), creating changes and disturbances in the agricultural system.

Accordingly, the commune agricultural extension staff have decreased significantly. Almost all provinces no longer have commune agricultural extension staff. There are only a few remain. In addition, commune-level agricultural extension agencies in many localities have also been streamlined, with only a limited number of agricultural officers in charge of agricultural extension work. Many districts and provinces have completely abandoned the agricultural extension system at the commune and sub-commune levels, leaving agricultural extension at all levels. During this period, the functions, tasks, and organizational structure of agricultural extension levels are as follows:

a. National Agricultural Extension Center

Regarding functions and tasks: based on Decision No. 3869/QĐ-BNN-TCCB dated September 9, 2014 of the Ministry of Agriculture and Rural Development, the National Agricultural Extension Center is a public service unit directly under the Ministry of Agriculture and Rural Development, has the function of serving the Ministry's state management of agricultural extension and organizing the implementation of agricultural extension activities on training, education, propaganda, application, and transfer technology, international cooperation, consulting, and agricultural extension services nationwide.

The Center's organizational structure includes a board of Directors, 07 specialized departments, 02 permanent regional offices (headquarters in Ho Chi Minh City and Buon Me Thuot City - Dak Lak), 01 Technology Transfer and Training Center (headquarters in Soc Trang). Staffing: The Center was assigned 88 staff members (of which 56 staff members receive salaries from the state budget and 32 staff members take care of their own salaries). Personnel: The Center currently has 85 officials and workers, including qualifications: Associate Professor: 01; Ph.D.: 10; Master's degree: 35. The rest are engineer and bachelor's degrees.

b. Local agricultural extension

In 2017, the 12th Party Central Committee issued Resolution No. 19-NQ/TW dated October 25, 2017 on continuing to innovate the organization and management system, improving unit quality, operational efficiency, and public service organization at the local level. According to local reports, the current situation of the local agricultural extension



organization system is as follows:

b1. Provincial agricultural extension organizations:

- 14 provinces and cities have arranged public service units (AE units) to consolidate and merge units to reduce focal points following Resolution 19-NQ/TW (provinces include Cao Bang, Dien Bien, Thai Nguyen, Lang Son, Vinh Phuc, Thai Binh, Binh Thuan, Kon Tum, Dak Lak, Lam Dong, Binh Phuoc, Tien Giang, Can Tho, Dong Thap).

The arrangement model is as follows: consolidation and merger of the Provincial Agricultural Extension Center with units such as the Department of Crop Production - Plant Protection, Department of Animal Husbandry - Veterinary Medicine, Center for Plant Breeds, Livestock, Aquaculture, Fisheries Center, Clean Water and Sanitation Center, Vocational Training and Development Center, Inspection Center, Project Management Board, etc. This arrangement and consolidation led to changes and adjustments in provincial-level agricultural extension organizations' names, functions, tasks, and organizational structure.

- There have been 19 provinces and cities changing names, adjusting functions and tasks, and streamlining the apparatus following Resolution 19-NQ/TW (provinces include Tuyen Quang, Bac Can, Lao Cai, Hoa Binh, Quang Ninh, Bac Giang, Bac Ninh, Ha Nam, Nghe An, Quang Binh, Da Nang, Quang Ngai, Binh Dinh, Dak Nong, Dong Nai, Ba Ria Vung Tau, Long An, Vinh Long, Hau Giang).

Additional functions, tasks, and fields of activity for the Provincial Agricultural Extension Center include agricultural services, high-tech agricultural development, irrigation project management, trade promotion, market information, seed production, and business.

- 02 provinces have dissolved the Provincial Agricultural Extension Center: Lai Chau (agricultural extension tasks assigned to the Quality Management Department) and Binh Duong (agricultural extension tasks assigned to the Crop Production - Plant Protection Department), implemented by the Department of Livestock and Veterinary Medicine).

- There are 02 provinces (Ninh Thuan, Ben Tre) are developing a project to arrange and consolidate the local agricultural extension organization system to submit to the Provincial People's Committee.

- The remaining provinces are still maintaining the Provincial Agricultural Extension Centers model with the main functions and tasks of agricultural extension and agricultural technology transfer.

The total number of existing provincial-level agricultural extension officers is 1,571 people.

b2. District-level agricultural extension organizations:

At the district level, there are currently the following types of district-level agricultural extension organizations:

- District Agricultural Extension Station model under the Provincial Agricultural



Extension Center: currently maintained in operation in 18 provinces and cities with a total of 165 Agricultural Extension Stations, the number of staff is 838 people.

- District Agricultural Extension Station model under the District People's Committee: currently maintained in operation in 06 provinces and cities with a total of 62 Agricultural Extension Stations, the number of staff is 325 people.

- District-level Agricultural Service Center model (merging Agricultural Extension Stations, Plant Protection Stations, and Veterinary Stations): 36 provinces and cities have merged stations to establish Service Centers following Resolution 19-NQ/TW. The newly established district-level Agricultural Service Centers have the functions and tasks of providing public services in agriculture (including agricultural extension, cultivation-plant protection, animal husbandry - and veterinary medicine).

- There are 02 provinces with different models: Lam Dong Province (merging Agricultural Extension Stations, Plant Protection Stations, and Veterinary Stations to establish district-level Agricultural Centers since 2003) and Ha Tinh Province (merging other provinces). Agricultural Extension Station, Plant Protection Station, Veterinary Station to establish the Center for Scientific and Technical Application and Plant and Animal Protection since 2012). The name is different, but the functions, tasks, and operating model are similar to the district-level Agricultural Service Center.

- Da Nang is the only city that does not have a district-level agricultural extension organization.

b3. Commune-level of agricultural extension:

In arranging the local agricultural extension organization system according to Resolution 19-NQ/TW, the commune-level of agricultural extension network has had a significant change.

- Commune-level agricultural extension workers: 36 provinces and cities are still maintaining a network of commune-level agricultural extension workers with a total of 6,464 people. Of these, only 16 provinces and cities have agricultural extension officers operating in a specialized form (Lao Cai, Hoa Binh, Yen Bai, Phu Tho, Lang Son, Ha Nam, Thanh Hoa, Quang Tri, Dak Lak, Lam, Can Tho, Hau Giang, Soc Trang, An Giang, Kien Giang, Ca Mau); The rest operate part-time. The regime for commune agricultural extension staff is quite low; on average, they receive an allowance coefficient of 1.0 (1,490,000 VND/person/month).

- Rural and village extension collaborators: there are very few provinces maintaining these collaborators (08 provinces are Ha Giang, Tuyen Quang, Lao Cai, Lai Chau, Yen Bai, Ha Tinh, Quang Tri, Dak Lak). Common forms are concurrent heads and deputy heads of villages and hamlets or concurrent farmers' and women's associations. They are limited operations.

The commune-level agricultural extension staff work relatively smoothly for provinces that maintain the agricultural extension organization system according to Decree 02/2010/ND-CP. They support effective connectivity and are extended arms to transfer technical advances into production.

For provinces that have merged Stations to establish district-level Agricultural



Service Centers, the provinces have handed over commune-level agricultural extension officers to the district-level Agricultural Service Center to manage and maintain operations. However, maintaining a team of commune-level agricultural extension officers meets a lot of challenges due to difficulties in coordination mechanisms and funding for the regime.

3.1.2. The private sector carries out agricultural extension

In fact, unlike other countries, the development and mobilization of resources for agricultural extension activities originating from businesses, private organizations, and NGOs are not entirely independent activities. According to the Principles of agricultural extension activities stipulated explicitly in Article 4 of Decree 83/2018/ND-CP, agricultural extension activities must originate from the needs of production, market, and agricultural development orientation of the government. Agricultural extension activities must be democratic, public, supervised by the community, and managed by the State. Technical advances and transferred technologies must be recognized or approved by competent authorities. At the same time, agricultural extension activities must be closely linked between management agencies, scientific research establishments, businesses, and farmers. In addition, the state encourages the socialization of agricultural extension activities and diversification of agricultural extension services to mobilize resources from domestic and foreign organizations and individuals to participate in agricultural extension activities. Thus, the Vietnamese government's policy on agricultural extension stipulates that although agricultural extension activities are democratic, they must be subject to community supervision and state management, and the implementation can occur smoothly, reasonably, and per the proposed direction.

The state also encourages agricultural extension socialization activities (private agricultural extension and other organizations). The private sector is understood in terms of individuals, NGOs, production groups, and farmers' associations. According to Decree 83/2018/ND-CP, socio-political organizations, economic organizations, social organizations, professional organizations, associations, professional associations, and domestic and foreign organizations, when participating in Agricultural extension activities, must meet the following conditions:

- 1- Established according to the provisions of law; have a direct business or participate in supporting agricultural extension activities;
- 2- Having sufficient ability in human resources, finance, and technical progress for agricultural extension activities;
- 3- Directly or in association with other organizations and individuals in sponsoring and supporting agricultural extension activities;
- 4- Transferred plant and animal varieties must have their technical progress recognized; Transferred agricultural supplies must be licensed for production, business, use, and circulation according to the provisions of the law.

Domestic and foreign individuals participating in agricultural extension activities in the territory of Vietnam must meet the following conditions: Have civil act capacity according to the law; Meet conditions 2,3,4 of Decree 83. Organizations and individuals participating in agricultural extension activities may honor, promote, and introduce



products owned by the organization or individual when carrying out agricultural extension activities with appropriate content according to the law. At the same time, be guided by the state management agency in charge of agricultural extension and create favorable conditions when participating in the activities. They can also enjoy preferential policies according to the provisions of the law. In addition, agricultural extension activities are encouraged to be implemented through contracts. The content and form of the contract shall comply with current law, which stipulates provisions on liability for compensation for damages (if any) except in cases of force majeure.

In addition, the responsibilities of non-state agricultural extension organizations (private individuals, international projects, other organizations) require compliance with the following regulations:

a) Seeds Plants, livestock, supplies, machinery, and agricultural equipment transferred must be recognized for their technical progress or be allowed to produce, trade, use, and circulate according to the provisions of law;

b) When transferring technical and technological advances, there must be specific instructions on the features and effects of technical and technological advances;

c) Be responsible before the law and compensate for damage caused by the transfer and application of technical and technological advances (except in cases of force majeure);

d) Other organizations and individuals participating in agricultural extension activities must report to the state management agency in charge of agricultural extension in the area, which specifically informs the content of the activities, time, location, and subjects, receiving sponsorship, support, and subjects receiving the transfer of technical advances (if any). Organizations and individuals, when transferring technical advances, must have specific instructions on the features and effects of technical advances. Responsible for compensating for any damage caused by the transfer and application of technical advances.

In addition, state management agencies in charge of agricultural extension must also be responsible for managing and monitoring private agricultural extension activities, including a) Within 05 working days from the date of receiving the report, The state management agency in charge of agricultural extension is responsible for checking the completeness and validity according to regulations; In case of invalidity or inconsistency with local policies, needs and conditions, a document must be sent to the organization or individual stating the reason; b) Proactively inspect and supervise agricultural extension activities, technology transfer in agriculture by organizations and individuals in the area.

Organizations and individuals in the private sector and foreign organizations carrying out agricultural extension activities in Vietnam include the private sector (enterprises and cooperatives), non-governmental organizations, and associations. Collaborators and production teams with similar interests. In there:

a. Agricultural extension from businesses, agribusiness corporations, and individuals according to farmers' needs

Domestic businesses, companies, corporations, and individuals engaged in technology transfer activities, organizing training to improve capacity for farmers: Most



agricultural production and business enterprises have material production areas. They deploy technical training sessions, transfer technology to farmers to get the products from farmers and ensure the standard of products or their purpose, processing for example.

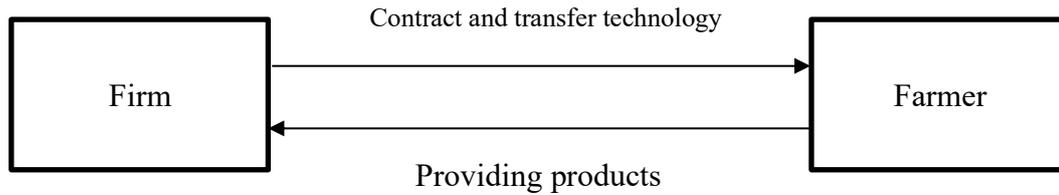
In addition, farmers who have needs for specific crops, plant protection issues, or intention of investing in new technology by themselves can hire companies, research organizations, or individuals with the function and ability to take on the role of agricultural extension to guide and transfer the technical advances that farmers require directly. However, these activities are limited in scope and for subjects with specific needs or farmers in the enterprise's raw material areas. Most other small-scale farming households (typical of farming households in Vietnam) receive little benefit from these agricultural extension activities.

Table 1 Organizations providing agricultural extension services/activities at private and non-governmental levels

Sector	Organizations	Major activities
Private	Enterprises trading in materials, plant varieties, fertilizers, pesticides, etc.	- Agricultural extension activities within the scope of activities and raw material areas
	Large corporations are operating in the field of agriculture domestically and internationally. Independent agricultural extension consultants	- Specific plants and animals serving the business's goals - Irregular and commercial in nature

Large corporations such as Vinamilk, TH, Ba Vi Dairy Joint Stock Company, Loc Troi Group... also have their own research, scientific and technological advances transfer, and agricultural extension activities. Large international corporations investing in the agricultural sector in Vietnam, such as Nestles and Orion, also have raw material areas and they deploy agricultural extension activities, transferring seeds and techniques to have input products according to the requirements. However, foreign investment enterprises in the agricultural sector are still quite limited. However, it has also created a solid foothold for itself.

In addition, in 2021, the country will have 1,640 newly established and re-operated enterprises in the agricultural sector, bringing the total number to over 14,400. The force of agricultural enterprises is growing stronger and more dedicated to investing in agriculture and rural areas, becoming the core of the agricultural value chain. In addition to the investment and development of small and medium-sized enterprises, a number of large corporations and businesses continue to promote investment in agriculture, especially high-tech agriculture, such as Nafoods, TH, and Dabaco. Vietnam, Masan, Lavifood, Doveco, East Sea Trade and Investment... Most businesses have their own agricultural extension activities to serve their production and business purposes.



b. Agricultural extension activities from international organizations

In addition to the bloc of production and business enterprises in the agricultural sector with their own agricultural extension activities, international organizations, especially non-governmental and intergovernmental organizations related to the agricultural sector, Agriculture, rural development, hunger eradication, poverty reduction, and gender equality all organize agricultural extension activities through rural development funding projects, capacity building for the poor, farmers, livelihoods, and ensure sustainable livelihoods...in many different ways. Some of the popular activities include:

- Organize training activities, train farmers on agricultural techniques, and apply new farming techniques and breeds for direct production. Some organizations that have experience, resources, experts, and techniques in agriculture, such as KRC, KOPIA, and FAO, send agricultural experts to train farmers in Vietnam in the framework of their projects so that farmers can grasp the techniques they have researched and developed, suitable for Vietnam's conditions. Usually, They uses all funding from international organizations and foreign governments

Table 2 Organizations providing agricultural extension services/activities at private and non-governmental levels

Sector	Organizations	Major activities
NGO	International organizations implement projects to develop agriculture, rural development, hunger eradication, and poverty reduction, considering production development in Vietnam.	<p>Agricultural extension activities within the framework of approved projects, usually focusing on vulnerable communities, women, the poor or responding to climate change</p> <p>Agricultural extension using direct methods (sending experts to train farmers)</p> <p>Agricultural extension by coordinating with Vietnamese transfer units (techniques, breeds, instructors are from Vietnam, training programs are designed according to the orientation of international organizations)</p>

- Organize training activities to train farmers on agricultural techniques and apply new farming techniques and breeds through coordination with an agent of agricultural extension, research, and transfer functions in Vietnam. These organizations, through association with a domestic transfer unit, will carry out activities in the project area to improve capacity, stabilize livelihoods, and move towards achieving the goals. At this time, the selected plant varieties and farming techniques can be from these international organizations or techniques from research institutes or transfer units that they find suitable



for agricultural extension instructors. This model is currently more popular than direct agricultural extension activities from international organizations

c. Community agricultural extension team model

Cooperative groups: A type of cooperative group (or interest group) in agriculture and rural areas was born and increasingly developed strongly and diversely, a simple type of cooperative economy. These are professional groups and associations formed based on voluntary participation of members or self-exclusion from the group, democratic management, and mutual benefit. The purpose is to collaborate, exchange experiences, and help each other in production and consumption activities, maximizing each member's profit. This type of cooperative group has no charter or legal status, and binding relationships are built based on emotions, customs, and community traditions and have no legal nature.

Besides cooperative groups of similar interests, community agricultural extension groups are also being promoted in many localities with the support of the national agricultural extension system. The main task of the community agricultural extension team is to transfer technology, market consulting support, and value chain linkage. According to the National Agricultural Extension Center (2022), the Central Highlands provinces have established 8 community agricultural extension groups with 42 members. At the same time, 39 community agricultural extension groups were established to serve the coffee raw material area project with 178 members. The ongoing community agricultural extension groups have promoted their role with various activities. Specifically, agricultural extension groups have supported and advised farmers and cooperatives on agricultural extension and science and technology transfer; Supported and advised farmer households and commune cooperatives on market development and production links along the value chain; and consulted and guided digital transformation in agricultural production.

Table 3 The farmer organization taking the AE activities

Sector	Organizations	Major activities
Producer Organization	Participating members unanimously established farmer groups and associations with similar interests and fields. Agricultural cooperatives involve farmers Community agricultural extension groups	Agricultural extension activities are informal, often through the exchange of experiences between members through daily work and exchanges. Becoming more popular

However, from another aspect, a survey in Hoa Binh province in the first months of 2023 showed that although some progress has been achieved in implementing agricultural extension work, local agricultural extension teams face many difficulties. In directing and managing activities, members still have limited knowledge about the functions and tasks of community agricultural extension groups, especially knowledge about market development, cooperative management, value chain linkage, quality management, traceability, and digital transformation in agricultural production... Equipment and experience working expenses for the team to perform the tasks are still lacking. There is no clear hierarchy guiding the establishment of community agricultural extension groups.



3.2. Results of investigation and Evaluation of the current agricultural extension system

3.2.1. Operational situation of the Agricultural Extension system in 2021 - 2022

In addition to the regular activities of the agricultural extension system, in 2022, the national agricultural extension system carried out many activities in 06 main areas, including:

i) Build and connect the system

- Guide localities to continue to innovate the organization and management system to improve quality and operational efficiency in the spirit of Resolution No. 19-NQ/TW dated October 25, 2017 of the Central Executive Committee, Session XII

- Coordinate with the School of Agriculture and Rural Development Management Officers I to develop a program of training materials according to the standards of professional titles of agricultural extension officers according to Circular No. 18/2020/TT-BNNPTNT; Organized 10 training classes for 720 agricultural extension officers in provinces and cities

- Organized 37 training classes for more than 1,000 agricultural extension officers and cooperative officers on agricultural economic thinking, production reorganization, production linkage along the value chain, safe production, and management of Agricultural cooperatives

ii) Agricultural extension serves to restructure the industry towards increasing added value and sustainable development

- Coordinate with localities to organize 12 agricultural extension events (Forums, meetings, discussions, etc.) with over 1,500 farmers from 54 provinces/cities attending to promote the development of crops and livestock, application of science and technology, improving quality and added value, promoting regional and local advantages, adapting to climate change.

- Coordinate with the mass media system to communicate event content; Introducing new technologies and effective plant and animal varieties; Good practices of good farmers across the country with over 350 news, articles, reports, and discussions

- Focused and key training to serve the restructuring of agriculture associated with new rural construction. In 2022, organized 86 training courses for 2,600 farmers and 15 study tour groups for 450 farmers on crop restructuring, production linkages, and new technical advances for key commodity producers. High technology, food safety and hygiene knowledge, GAP, and production processes according to different standards were also deployed. Farmers can create products according to market requirements, giving priority to advantageous product groups. export service

- Organize and implement agricultural extension projects, build demonstration models on farming, livestock, and aquaculture in the direction of increasing added value and sustainable development: the target audience is key products. national resources, key provincial products, local specialty products; Transferring technical advances and new technologies to improve productivity, quality, added value, and sustainable development



iii) Agricultural extension associated with building new rural areas and developing OCOP products

- Building the "Agricultural Extension Market" page on the Vietnam Agricultural Extension website to introduce hundreds of products from the agricultural extension model, specialty, and local OCOP products. At the same time, open the "Building new rural areas" section with hundreds of news articles reflecting agricultural extension activities participating in building new rural areas nationwide.

- Organizing an OCOP technology, equipment, and products exhibition at the AGRITECHNICA Live 2022 event with 25 booths to introduce OCOP products from the Mekong Delta with nearly 5,000 domestic and international visitors.

- Coordinate with mass media agencies to propagate hundreds of news articles and reports promoting the construction of new rural areas and developing OCOP products in localities.

- In 2022, organize 37 training classes for 1,100 students; organize 10 study tour groups for 300 students to improve students' knowledge about the market and marketing of agricultural products; Make plans to organize farm and cooperative production management, focusing on locally strong crops and livestock. Share knowledge about branding for OCOP products.

- Deploy agricultural extension models and projects with priority in new rural communes, integrating technical transfer with quality certification, traceability, origin, branding, OCOP certification to create jobs, increase income, and improve life

iv) Agricultural extension contributes to green economic development, organic agriculture, circular agriculture, smart agriculture, reducing greenhouse gas emissions and digital transformation

- In 2022, the National Agriculture Center has coordinated with localities to organize 14 agricultural extension events with topics on smart agriculture, organic agriculture, circular agriculture, and digital transformation.

- Digital transformation in agricultural extension activities has also been actively implemented, especially in the context of the COVID-19 epidemic. More than 30% of agricultural extension events have been organized online and in-person. Forum and workshop documents are all digitized, contributing to accelerating digital transformation in agricultural extension activities and enhancing the spread of communication.

- In 2022, organize 65 training classes for 2,000 students 15 study tour groups for 450 students to foster, improve knowledge, and share experiences on the agricultural circular economy, organic agricultural production, mechanics, smart agriculture, agricultural business, traceability, issuance of production area codes, use of production software, sales software, etc.

- Build transfer models to encourage the transfer of technical and technological advances in organic agriculture, circular agriculture, smart agriculture, and high-tech agriculture into production

v) Agricultural extension promotes production links along the value chain,



reorganizes production, and improves farmers' production capacity and level.

In 2022, organize 25 training classes for 1,000 AE staff, 10 study tour groups for 300 AE staff to improve AE staff's knowledge and skills about linking production along the value chain, organizing exhibition to ensure quality standards, food safety and hygiene, production and consumption.

Implement activities to support farmers in reorganizing production according to the model of cooperative groups, cooperatives, and agricultural extension clubs and connect with businesses to sell products to farmers.

vi) Developing community agricultural extension

To consolidate and improve the operational efficiency of the grassroots agricultural extension staff, based on the orientation of the Ministry's leaders, the National Agricultural Extension Center has developed and submitted to the Ministry for approval the Pilot Project "Improving the effectiveness of agricultural extension activities through strengthening community agricultural extension groups" (Decision No. 1094/QĐ-BNN-KN dated March 25, 2022, of the Minister of Agriculture and Rural Development). The initial results achieved are as follows:

- Established 126 community agricultural extension teams in 13 provinces with 857 agricultural extension staff.

- In addition to the 13 provinces participating in the Pilot Project, currently across the country, there are 12 more provinces that have established community agricultural extension groups (Lang Son, Bac Giang, Hai Phong, Thai Nguyen, Hanoi, Binh Dinh, Binh Dinh). Phuoc, Quang Nam, Ninh Thuan, Vinh Long, Hau Giang, Can Tho).

3.2.2. Organizational and policy issues for the current system's operations

3.2.2.1. Issues on mechanisms and policies for agricultural extension activities

Results of interviews with agricultural extension officers from agricultural extension service centers in three provinces of Hoa Binh, Can Tho, and Binh Thuan: Main difficulties arising from implementing Resolution 19-NQ/TW in Binh Thuan, Can Tho and Hoa Binh show that the operating mechanism and organizational apparatus of the current agricultural extension system are facing the following problems:

(i) The situation of a "broken agricultural extension system."

The Provincial Agricultural Extension Center cannot direct or connect with district-level agricultural extension organizations. There is no focal agency to manage and provide professional guidance to maintain a team of grassroots agricultural extension officers. Therefore, the management and implementation of agricultural extension activities face many difficulties and obstacles, reducing the effectiveness of agricultural extension activities and wasting human resources in the agricultural extension system. According to the report of the National Agricultural Extension Center 2022, up to now, 07 provinces and cities have dissolved the grassroots agricultural extension network (Lai Chau, Bac Giang, Da Nang, Khanh Hoa, Dak Nong, Ho Chi Minh City Minh, Tien Giang).

Survey results in all three provinces of Hoa Binh, Binh Thuan, and Can Tho show that the national and provincial agricultural extension centers deploy agricultural extension



activities directly to farmers without going through the agencies. District agricultural extension centers are only invited to attend demonstration models and new technical evaluation sessions (1-2 people). Therefore, district-level agricultural extension staff do not have the necessary information to report to the District and Provincial People's Committees. Meanwhile, every year, these tasks must be compiled at the district level to report to the provincial level and the national agricultural extension center.

Many central-level agricultural extension activities are implemented in the form of extension projects, in which the agricultural service centers are only informed or have limited involvement, making it difficult for them to grasp the technical issues of the projects. After the projects end, due to a lack of resources to sustain training, field visits, and advisory services, many techniques are gradually no longer applied. In practice, we often have to organize refresher training courses to ensure that farmers consistently maintain accurate implementation of the transferred techniques.

Nguyễn Văn Kiên – Vice Director Agricultural center service – Binh Thuan Province

Table 4 The evaluation of the system linkage of AE staff at Hoa Binh, Binh Thuan, Can Tho

Content	Quantity (N=60)	Rate (%)
District agricultural extension agencies are involved in planning general agricultural extension plans for the provincial level	0	0,00
District agricultural extension agencies are involved in building agricultural extension models developed at the central and provincial levels	3	5,00
District agricultural extension agencies are informed about model building and implementation of agricultural extension projects at central and provincial levels.	55	91,67
District agricultural extension agencies were invited to participate in evaluating the effectiveness of the model	60	100,00
District agricultural extension agencies are consulted on adjusting the model to suit the locality	4	6,67

(ii) Issues on human resource management for agricultural extension:

In some localities, such as Hoa Binh, vertical human management is not applied, so district-level agricultural extension organizations cannot mobilize and use people for local agricultural extension activities. Specifically, the current survey results in Hoa Binh province show that provincial and district agricultural extension service centers are not allowed to manage those in charge of grassroots agricultural extension directly. The authority to mobilize and use human resources for grassroots agricultural extension activities and to collect information on the application of varieties and farming techniques belongs to the People's Committees of the communes. When district-level agricultural extension centers want to implement agricultural extension activities such as building demonstration models, organizing field conferences, and organizing tours in communes, they must have a written request for approval from the People's Committees of the communes. Coordinate with the commune's agricultural extension officer to deploy.



Due to lack of human management, district agricultural extension staff do not have monthly meetings to update the status of agricultural extension activities and agricultural development with grassroots agricultural extension staff, which creates serious problems in organizing the investigation, detection, estimation, and forecasting of harmful organisms on crops and animal diseases and guiding and promoting the application of new varieties and farming techniques in production. In addition, the professional management of grassroots agricultural extension in some localities, such as Hoa Binh is assigned to the Department of Agriculture and Rural Development for implementation. District Agricultural Extension Centers are only responsible for coordinating and providing professional and technical guidance when grassroots agricultural extension staff request them, so the centers face many difficulties in grasping the production situation and agricultural extension work.

Table 5 Evaluation of AE staff on the human management mechanism

Content	Quantity (N=60)	Rate (%)
The district agricultural extension center is managed by grassroots agricultural extension staff	0	0,00
The agricultural extension center must request permission from the commune-level People's Committee to coordinate with grassroots agricultural extension staff	54	90,00
District centers lack people with enough expertise to carry out work in communes	60	100,00

(iii) Issues of human resource quality and job performance.

Implementing Circular No. 18/2020/TT-BNNPTNT: in the process of arranging and consolidating the system of agricultural extension organizations at all levels, provinces and cities are facing difficulties and confusion in arranging positions and titles according to Circular No. 18/2020/TT-BNNPTNT regulating codes, professional title standards and salary rankings for specialized agricultural extension officers.

Table 6 Evaluation of AE staff on the position carre and capacity of AE staff at commune level

Content	Quantity (N=60)	Rate (%)
The salary for the position of AE staff is too low (rate 1.0)	56	93,33
The university degree requirement for the position of AE employee with a salary coefficient of 1.0 is inappropriate	57	95,00
The AE staffs are part-time commune civil servants and still complete their tasks well	57	95,00
AE staff are commune civil servants with sufficient expertise to carry out agricultural extension work	44	73,33

Regarding the effectiveness of commune-level AE, it is necessary to have human resources with sufficient capabilities. However, because many localities have abandoned



the grassroots agricultural extension network, this task is concurrently performed by commune-level civil servants in charge of agriculture and many other jobs. Some localities have the title of grassroots agricultural extension officer, requiring a university degree or higher to be recruited, but pay salaries with a coefficient of 1 (50 USD/month), so these positions cannot be recruited. That means the civil servants in charge of agriculture from the Commune People's Committee must work concurrently. The concurrent work mentioned above is ineffective due to inappropriate time and professional qualifications.

(iv) Training and capacity building for agricultural extension officers in localities:

Capacity-building programs for agricultural extension officers are organized continuously yearly with two main contents (1) Soft skills, teaching methods, methods of contact with farmers, listening skills... and (2) New farming techniques. However, the survey results show that the agricultural extension skills and methods trained for agricultural extension officers at provincial, district and lower levels have not changed much in recent years. In some new fields, such as digital transformation, organic agriculture, high-tech agriculture, and automation in agriculture, training sessions only have 1-2 leaders invited to participate. Very limited specialized staff are dispatched.

Table 7 Evaluation on the capacity building of AE staffs

Content	Quantity (N=60)	Rate (%)
Agricultural extension teaching content is continuously renewed	32	53,33
All agricultural extension officers at district and commune levels are fully trained and absorbed	47	78,33
The regime for staff participating in training is fully guaranteed	29	48,33
The officers sent for training have transfer areas appropriate to the topics of the training classes	31	51,67

(v) Capital sources for operations

Survey results show that operating capital at the district level and below is limited compared with National Agricultural Extension Center, which has capital from projects of the Ministry of Agriculture and regular expenditures. District agricultural extension centers currently have 3 main sources of capital:

- Funding from the rural vocational training program: The rural vocational training program is built annually with items according to regulations that are difficult to use for unplanned agricultural extension activities. This capital source can only be used for rural vocational training programs at colleges, vocational secondary schools, or continuing education centers where agricultural extension officers become lecturers and work under contract. In essence, this source of capital is not controlled by the centers but by the educational centers as the governing bodies.



“In 2021, the orange area of Cao Phong district has an epidemic of orange stink bugs. Communes proposed training classes to prevent orange stink bugs, but the center cannot use the vocational training program funds to immediately train them/ Because training for farmers but must be submitted to the District People's Committee for a license to use, causing a waste of time because of having to wait for the approval process.”

Phan Sum An – Vice-Director, Agricultural Extension Service Center – Cao Phong, Hoa Binh

- Funding from the rural vocational training program: This capital source currently serves agricultural extension activities related to scientific research, inspection tasks, and testing of new varieties and techniques that can be applied. Funding for localities is provided for this capital source, but it only accounts for about 20% of the total operating costs of district-level agricultural service centers.

Table 8 Evaluation of AE staff on the financial resources

Content	Quantity (N=60)	Rate (%)
The total annual budget allocated is sufficient for all activities	25	41,67
Funding sources are used flexibly	12	20,00
Financial regulations according to the budget law are suitable for service activities	0	0,00
All unexpected activities have adequate capital allocated for implementation	6	10,00
Regulations on public service units to help develop agricultural extension units	28	46,67
Norms for public services for agricultural extension are still low	58	96,67

- Funds from district economic development: some localities also have funds for highland ethnic groups, but these are quite limited. To use this capital, provincial and district centers must develop project proposals and submit them to the scientific council. After being accepted by the scientific council, it will move to financial appraisal at the Department of Finance/Finance and Planning Department. After the financial plan is approved, the project will be submitted to the competent authorities for consideration (Provincial People's Committee and District People's Committee). The People's Committee will then submit it to the People's Council for a final decision on whether it can be implemented or not. This process is very long and time-consuming. When unexpected situations arise, it is difficult to adjust. Disbursement and funding procedures must also be carried out in the order of using the budget, so many units have to advance capital to carry out the process. Only then will the funding be received later.

- Survey results of local agricultural extension units also show that Resolution 19/TW implementation aims to let district-level agricultural extension units autonomously seek technology transfer contracts with outside parties. However, implementing these



services is very difficult in many localities with underdeveloped economic conditions and a high rate of purely agricultural poor households. Meanwhile, in Binh Thuan (famous for dragon fruit), technology transfer and training contracts have become more popular and create a source of revenue for the centers.

For district-level agricultural extension centers in provinces with less development (especially the northern provinces), the survey in Hoa Binh shows that the center's services depend on many orders from local and public services, including plant protection services for rice, crops, and livestock. Every year, district agricultural departments will sign contracts with district agricultural extension service centers to implement these annual tasks. However, another difficulty that arises is that this public service norm is actually lower than the norm for providing services to outside parties because state management agencies can only spend according to the norms set by the government.

“The original purpose of establishing the center was to develop in this direction, but in reality, farmers in the area have low income and there are no large agricultural enterprises, so the center does not have service contracts. Which technology to transfer? The Center currently only has a service contract with the district Department of Agriculture to deploy plant protection for 1,000 hectares of rice.”

Phan Sum An – Vice-Director, Agricultural Extension Service Center – Cao Phong, Hoa Binh

In addition, operating centers still have to follow the financial mechanism of the unit using the state budget, even the external service funding, which is not related to the state budget. Procedures and documents on financial use and rules for using funds must comply with budget law with complex requirements, long implementation procedures, and going through many levels of approval, causing significant difficulties for applications.

3.2.2.2. Issues about agricultural extension transfer methods, perspectives from interviews the “1 must 5 reduction” models of rice cultivation technology transfer in Can Tho

Current state agricultural extension units still apply traditional agricultural extension methods. In essence, they are still contact methods through i) training, ii) building demonstration models, iii) on-site seminars, iv) tours and v) mass communication, lack of creativity and flexibility leads to limited transfer results. Meanwhile, models transferred through international projects are more effective due to changes in agricultural extension methods, with farmers at the center. This method helps farmers work in groups and have technical support from experts organizing the project.

Case study in Can Tho with two models of rice cultivation technology transfer to reduce greenhouse gas emissions "1 right, 5 reductions" Regarding the transfer process, compare the 1P5G technical transfer process through two transfer models between state agricultural extension systems and international projects, it is easy to see that both models use group contact methods through: i) training, ii) building demonstration models, iii) field conference, iv) sightseeing, and v) mass media. However, there is a difference between the two transfer forms under state agricultural extension and project-based agricultural extension.



a. Transfer method

Approach method

The difference in advanced technology transfer methods through the traditional agricultural extension system always considers rice farmers as people who do not know technology and need to be "taught" new techniques. State agricultural extension uses a top-down approach to transfer rice cultivation techniques to reduce greenhouse gas emissions. The assessment of the actual state of rice cultivation techniques and the needs of farmers has not been systematically implemented. Most information is collected through quarterly reports from the district's Agriculture Department.

Meanwhile, the transfer model through international projects applies a bottom-up approach. Before planning the transfer, a survey of the current situation must be conducted at the farmer household level, based on the survey results, to get farmers' needs and participation, which serve as the basic foundation for transfer planning.

Table 9. Comparison of approaches of two transfer models

	NAES	Private
Approach method	The plan is made from the provincial level down to the district and commune levels for implementation → top-down approach.	The transfer plan is based on the actual needs of farmers and the local farming schedule → bottom-up approach.
	Farmers are non-technical people and need to be taught advanced techniques	Farmers are the focus of the design in terms of content and delivery methods
	Assess farmers' needs by understanding the general reporting situation from district/commune agricultural departments.	Agricultural extension officers support farmers in understanding the principles of new techniques and working with farmers to apply them in practice in the fields.

Develop and implement a transfer plan.

Regarding transfer planning and implementation of transfer plans, because there are no community organizations and development activities and division of groups to manage production like in the project-based transfer model in Can Tho , it is not feasible to plan to monitor and evaluate the spread and accuracy of farmers' self-application of transferred techniques. In addition, the state agricultural extension system also did not announce the implementation of the training class in advance. Usually, only 3-4 days in advance are notified through coordination with commune authorities and village and hamlet heads. The transfer implementation process is carried out according to a plan directed from above and in coordination with a few selected households, without coordination with the local farmer collective.

The table below shows that only 4% of respondents were surveyed before organizing the transfer, and 5% were involved in planning the transfer. These are the people chosen as the model construction site or the households who are the village or hamlet heads, and they are allowed to participate in discussions to keep in touch with the people, ensure the training process, and transfer information to the community.

Table 10. Farmer's assessment of transition planning of AE



Content	NAES (%)	Private (%)
Have a plan and be informed in advance	35,0	100,0
There was a survey of farming households before organizing the transfer	5,0	65,0
Planning involves the participation of farmers and project staff	5,0	85,0
Participate in linking and forming production teams to plan for your team	0,0	100,0
The process of planning and implementing the transfer plan is agreed upon among members and farming households	0,0	95,0
Have a plan to support assessment of people's adoption of new technology	0,0	90,0

Meanwhile, in the project transfer model, each transfer area is organized into 5 production groups, with criteria of geographical conditions (households living close together) and sharing the same irrigation/drainage canal. The group transfer and training plan will be implemented in class and through production groups when established. Each farmer group will elect a leader and deputy leader to lead the production group in implementing crop schedules and crop management and leading group members to access, learn and practice rice cultivation techniques to reduce greenhouse gases.

The process of implementing the transfer plan mainly takes place in groups after being trained by project staff. These technical activities are held right at a farmer's home, often convenient for farmers to participate and visit the fields. Meetings are divided into topics appropriate to the growth cycle of rice

b. Agricultural activities

Accordingly, the personal contact method is transferred through the international project through direct agricultural extension activities through production groups and farmer households encountering difficulties in receiving new techniques. Both models transfer the process of transferring rice cultivation techniques to reduce greenhouse gases through a series of similar activities, but there are differences in the method of organization and implementation, which are analyzed through each transfer activity as follows.

Training

Although the steps in the transfer process between the two transfer channels are similar, field results show differences between implementation methods. The diagram below describes implementing training in two different transfer channels at two research sites.

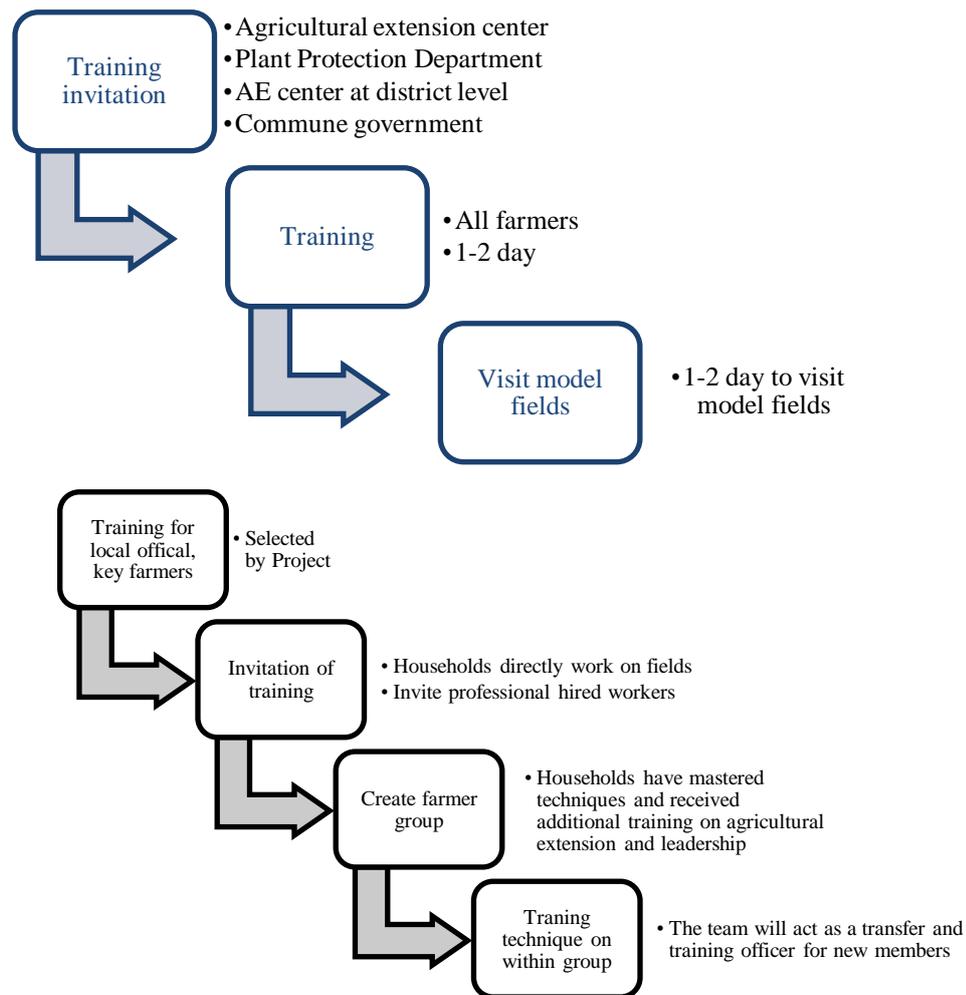


Figure 2 Process of organizing technical training for farming households according to state and project agricultural extension transfer channels

For the transfer channel through state agricultural extension, participants are all rice-producing households, in which participating farmers have two main characteristics: 1/ those who are invited by the commune/cooperative to choose to participate. New technical training classes are usually conducted by household heads who are literate enough to take notes. 2/ Participants do not necessarily have to participate fully in all training sessions. There is no requirement for household heads to attend training sessions continuously.

Meanwhile, the difference between the project-based transfer model is that it focuses on the transferee. So preparation is very important. The transfer sequence includes:

- i. Train local officials and core farmers to become resource officers.
- ii. Classroom training for farmers directly cultivating rice; Even invite professionally hired workers because they directly participate in rice cultivation and pesticide spraying.
- iii. Technical training through groups: Use group leaders and good farmers to participate in transferring to the community and organize 6-7 sessions for each group/crop. Resource officers are often leaders of production groups who have mastered techniques



and have received additional training in leadership and problem-solving skills. They have a leadership role and coordinate with farmers in production groups to organize community events to transfer new techniques to all farmers in each group.

Thus, in the project-based transfer model, the training process helps form groups, and these groups continue to provide technical training to the community and new members through group meetings and guidance.

Build a demonstration model.

Table 9. Comparison of demonstration model design between two models

	Government AE	International Project
Design and build demonstration models	<p>Select 1 farmer's field following the standard 1P5G technical outline and 1 field representing old practices as a control field. In many demonstration models, the same householder divided their field into 2 areas and practiced demonstrating both the 1P5G process and the traditional farming process (control).</p> <p>The demonstration field of this model does not measure the amount of irrigation water/ha/crop. At the same time, there is no organization to measure gas emissions in the fields.</p> <p>⇒ The practical representativeness, scientific rigor, and probability are not high.</p>	<p>Based on the results of investigating the current situation before receiving the transfer, 03 representative farming households with farming practices using many inputs were randomly selected on a voluntary basis to participate in control farming. 03 farming households that use few materials and have needs and interests in applying new techniques were randomly selected on a voluntary basis to participate in the 1P5G technology transfer model.</p> <p>All demonstration fields measure the amount of irrigation water/hectare/crop and measure greenhouse gas emissions according to irrigation and fertilization cycles.</p> <p>⇒ Representativeness, randomness and demonstration model results are calculated on the basis of "3 iterations," ensuring rigor and high scientific probability.</p>

Building a demonstration model is one of the forms of group agricultural extension that brings "seeing and hearing" results and serves as a basis for recording agronomic data and farming results of transferred techniques. However, the ways to build a demonstration model, organize monitoring and evaluation of results, and select households to implement the demonstration model are developed and implemented differently by the state agricultural extension system and international projects. This has a great impact on the results and effectiveness of each different transfer channel.

The survey results in the table above show that the state agricultural extension model has a relatively low percentage of people evaluating aspects of the demonstration model. Only 70% think the model and theory are appropriate, while Only 5% said they had specific measurements of the demonstration model. The people who carried out the model did not represent the region and were mainly intentionally selected from agricultural extension agencies. Meanwhile, the rating of the demonstration model is

positive. All households are representative of rice production and are chosen randomly voluntarily to build the model.

Table 10 Evaluation of farmer on comparing demonstration model

Content	Quantity (n=300)	Rate (%)
Eye-catching performance model	200	66,7
Demonstration and theoretical models are arranged appropriately	210	70,0
There are specific measurements at the demonstration model	15	5,0
The person implementing the model is representative in the region	30	10,0
Select households to implement the model purposefully from the agricultural extension agency	260	86,7

Field seminars

Regarding the organization of evaluation of crop performance results (activity vii), both traditional transfer models and international projects are carried out regularly for every crop. In the traditional transfer model, farmers in the area are invited to "visit" the demonstration field and then listen to the results of an evaluation report comparing the two demonstration models between conventionally cultivated fields and cultivated fields.

Table 10. Compare the on-filed seminar are organized between two transfer models

Seminar	Government AE	International Project
Activity 1: Organize evaluation of demonstration model results	The transfer officer took agronomic indicators from a model field, applying the technique compared to a field following conventional practices (control), from which it was used as a basis for writing an evaluation report.	Transfer officers and farmers jointly participated in collecting agronomic indicators in 6 fields (3 replicates) in the model fields, applying techniques compared to fields following conventional practices (control).
Activity 2: Evaluate the effectiveness of farmers' application	No monitoring of targets and results in fields where farmers apply techniques themselves	Summary of production efficiency from production groups and monitoring of agronomic indicators, economic efficiency, environmental performance and farm log books of households participating in implementing the demonstration model to evaluate the situation and production efficiency when applying transfer techniques and giving feedback to the community through crop reviews and team/group meetings



In the transfer model through international projects, production team leaders, farmers, and local authorities go to the field, harvest test samples, calculate random yield estimates in farmers' fields, and apply the techniques themselves. 1P5G technique was transferred and compared with control fields. Farmers are also guided on how to calculate estimated yield and actual yield, compare agronomic indicators of rice, and calculate costs, profits, and losses. During the crop review, the farmers themselves will present the results of farming and accounting from their family fields to local authorities and other farmers in the area.

Data from interviews also shows that the state agricultural extension model does not have a model evaluation with people's participation as well as monitoring of targets and application results in fields that people apply themselves at the end of training. This is a fundamental, strategic difference to ensure that farmers trust and voluntarily apply correctly and fully the recommendations of the transferred techniques to bring maximum efficiency and co-benefits.

Table 11 Evaluation of farmers on On-field seminar

Content	Quantity N=(300)	Rate (%)
Evaluate the model with farmer participation	0	0,0
Rate more than 1 time	9	3,0
Continue to monitor indicators after the model is demonstrated	15	5,0
Summarize actual production efficiency into specific documents	300	100,0
Monitor targets and results in self-applied fields	0	0,0

Organize a visit field tour.

Organizing farmers to visit demonstration field models is implemented by both models transferred through the state agricultural extension system and international projects. The difference is that the traditional model only organizes field visits for farmers during the training session and one last time before the field workshop. In the model transferred through international projects, in addition to 6 demonstration models (3 following the 1P5G process 3 control), almost every production group has prototype fields for farmers in the group to participate in. 5-6 times/crop before meeting with the production team to decide on water management, nutrition and disease management. Visiting model fields and actual fields being cultivated regularly throughout the season helps farmers make the right decisions and feel secure in following the process.

Survey results through questionnaires show that the rate of participants visiting each other among households applying the technology is almost non-existent. The state agricultural extension model only organizes visits to the demonstration model 1-2 times before and after the end of the season. At the same time, the rate of people exchanging experiences with each other when participating in field visits is low (60%)

Table 12 Evaluation of farmer on Visit field

Content	Government AE		International Project	
	Quantity (n=50)	Rate (%)	Quantity (n=50)	Rate (%)
Organize mutual visits between applicable households	42	84	4	8
Organize evaluation meetings based on prototype fields	45	90	12	24
Organize regular tours throughout the season	39	78	17	34
Organize tours more than 1-2 times before and at the end of the season	40	80	0	0
Organize farmers to exchange during the tour	50	100	30	60

(Note: Only account farmers willingness to answer this question)

Propagate

Propaganda to promote the application of new rice cultivation techniques is organized very strongly and loudly by the traditional transfer model through many forms of propaganda such as posters, official activities through field seminars, good farmer contests, building official propaganda content through educational programs on television and radio stations of the province and at all levels. In the transfer model through international projects, propaganda is promoted in-depth and becomes more practical with the community and farmer households by integrating propaganda content of reduced emission rice cultivation techniques.

Farmers will bring their farm diary notebooks to these meetings. They will receive support after visiting the fields and discussing the plan and amount of fertilizer for the upcoming fertilization and water pumping period together. Group leaders and transfer officers can grasp the implementation situation of new techniques and support households that still apply the wrong techniques and overuse necessary data inputs. This is also the premise for agricultural extension activities through groups and individuals to be implemented reasonably and well-founded. At the same time, through surveys of households in the area receiving the transfer, when farmers believe and understand the new technology, they are the most active propagandists in spreading the technology to their neighbors, customers, and friends through meetings such as going to church, going to weddings and other appropriate occasions.

In terms of propaganda effectiveness based on geographical distance, it is clear that the agricultural extension system has organized systematic and widespread propaganda campaigns across the entire district and even the entire province, while the propagation of new techniques by international projects only focuses on the communes/cooperatives receiving the transfer.

3.2.2.3. Issues of Agricultural Research and Development for the Agricultural Experience System

Unlike many other countries, the scientific and technical research and development



system in agriculture is, in some ways, relatively independent of the central agricultural extension system. A characteristic of Vietnam's science and technology research and development system is that units also carry out agricultural extension activities and technology transfer to farmers, but they are generally transitory, not permanent, tasks. Agricultural extension activities are associated with research activities, testing of new breeds, new technological processes from topics and projects through funding sources from the government, and socialization or sponsorship from foreign organizations.

According to VAAS survey results (2022), the agricultural field currently has 55 large organizations that research plant varieties and agricultural techniques. Of which, the number of research institutes is 60%, with 33 units; Universities 20% with 11 units and private companies with 11 units (accounting for 20%). In addition to these 55 units, other units and individuals are participating in agricultural research and development, but this is not the main function, and it has a long history of operation.

Table R&D organizations in agriculture, Vietnam

	Type	Total	rate (%)
1	Research Institutions	33	60,00
2	Higher Education	11	20,00
3	Private companies	11	20,00
	Total	55	100,00

Research institutes in the field of agriculture in Vietnam currently include: Vietnam Academy of Agricultural Sciences (VAAS); Center for Technology Development and Agricultural Extension (CETDAE) ; Field Crops Research Institute (FCRI); Fruit and Vegetable Research Institute (FAVRI); Institute of Agricultural Environment (IAE); Agricultural Genetics Institute (AGI); Agricultural Science Institute for Southern Coastal Central of Vietnam (ASISOV); Agricultural Science; Institute of Agricultural Science for South Vietnam (IAS); Maize Research Institute (MRI); Nha Ho Cotton Research and Agricultural Development Institute (CRDI); Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI); Plant Protection Research Institute (PPRI); Plant Resources Center (PRC); Soil and Fertilizer Researcher Institute (SFRI); Southern Horticultural Research Institute (SOFRI); Sugarcane Research Institute (SRI); Vietnam Sericulture Research Center (VietSeri); Western Highlands Agro-Forestry Scientific and Technical Institute (WASI); Forest Inventory and Planning Institute (FIPI); National Institute for Agricultural Planning and Projection (NIAPP); National Institute of Animal Science (NIAS); National Institute of Veterinary Research (NIVR); Research Institute for Marine Fisheries (RIMF); Research Institute for Oil and Oil Plants; Research Institute of Aquaculture No. 1 (RIA-I); Research Institute of Aquaculture No. 2 (RIA-II); Research Institute of Aquaculture No. 3 (RIA-III); Rubber Research Institute of Vietnam (RRIV); Vietnam Academy for Water Resources (VAWR); Vietnam Institute of Agricultural Engineering and Post-Harvest Technology (VIAEP); Vietnamese Academy of Forest Sciences (VAFS)

Universities and businesses specializing in agricultural research include: Binh Dien

Fertilizer Joint Stock Company; Loc Troi Group; Minh Phu Seafood Corporation; Nghe An Seed Joint Stock Company; Southern Seed Corporation (SSC); Thai Binh Seed Company; The PAN Group; Viet - Uc Company Limited; Vietnam National Seed Joint Stock Company (VINASEED); Vietnam Northern Food Corporation I; Vietnam Northern Food Corporation II.

The agricultural R&D system is closely related to the agricultural extension system. Basically, technical advances and new varieties, after being researched, will be transferred and disseminated to society through the agricultural extension system. In some cases, these advances can also be transmitted to farmers through agricultural extension activities of small-scale and infrequent research facilities. In this case, the state agricultural extension system's role is to bridge the connection between scientists and farmers, transmitting and spreading research results through agricultural extension projects. The model of research, development, transfer, and reception of scientific and technological advances in agriculture in Vietnam is described as follows:

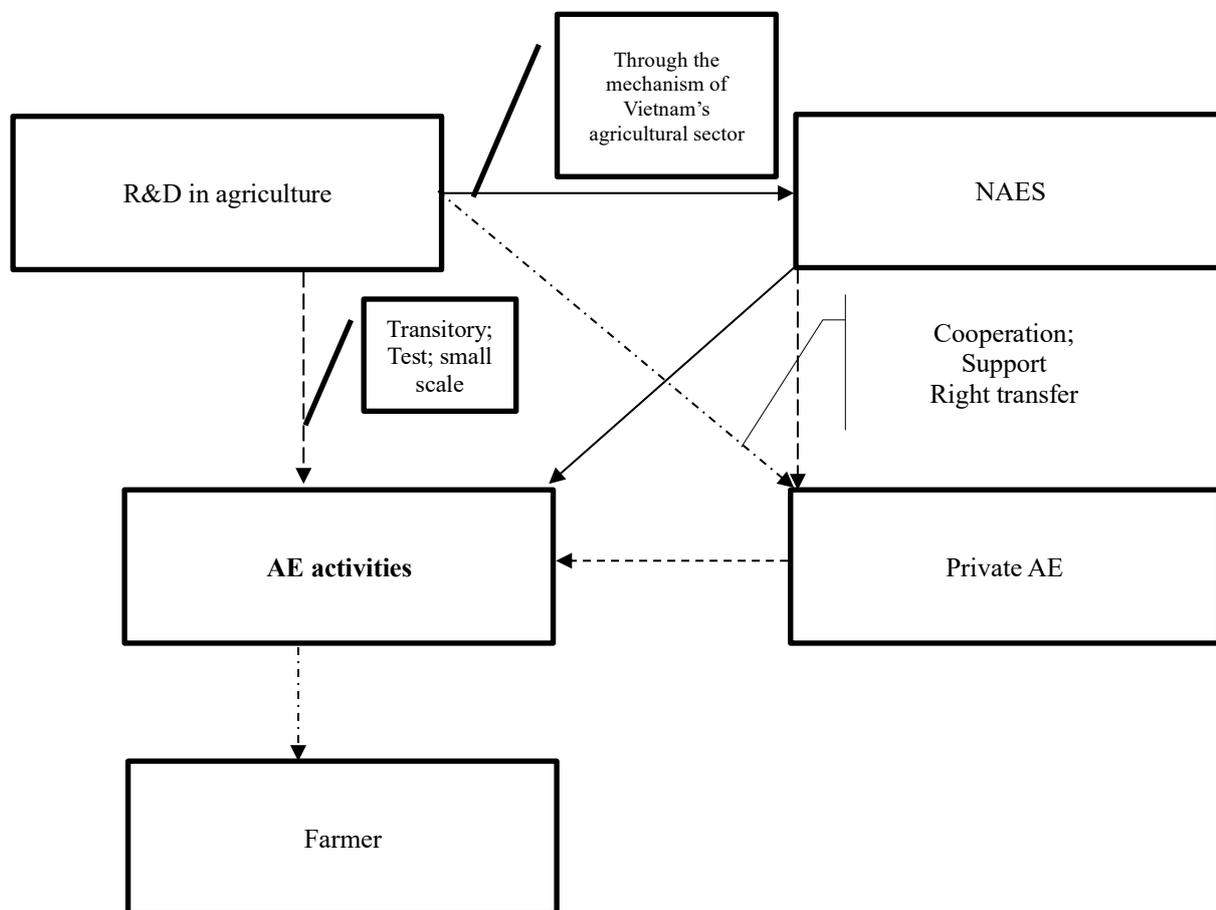


Diagram 2 the correlation between development research and transfer of scientific and technical advances and agricultural extension in Vietnam

Research and development units (including academic institutes, universities, and companies), through the research process, produce results of new scientific and technical advances that will be evaluated by the government (MARD). After MARD approves, These units can transfer new technical advances to small-scale farmers in research locations in the project area. Organizations and individuals, such as agricultural businesses and

international organizations, can build projects in Vietnam through cooperation, support, or copyright purchasing mechanisms. They will use their technical advances to train and teach farmers.

Meanwhile, research results will be transferred through the agricultural sector linkage mechanism for the state agricultural extension system, and the agricultural extension center will transfer technical advances such as seeds and farming techniques. Nationally, lower-level state agricultural extension units link with research units or directly use and build agricultural extension projects to transfer techniques to farmers on a regional or national scale.

New varieties formed from scientific research and development results for scientific and technical advances must go through certain steps to be disseminated to farmers. Accordingly, to transfer research results, technical advances and technology must be recognized or approved by competent authorities. The recognition process consists of 04 steps implemented according to Circular No. 04/2018/TT-BNNPTNT dated May 3, 2018 of MARD stipulating criteria, order, and procedures for recognition of technical advances in agriculture. Particularly for new varieties, recognition procedures are carried out following the law on cultivation and legal documents under the law. Only after scientific and technical advances and new varieties have been recognized can they be used for agricultural extension activities.

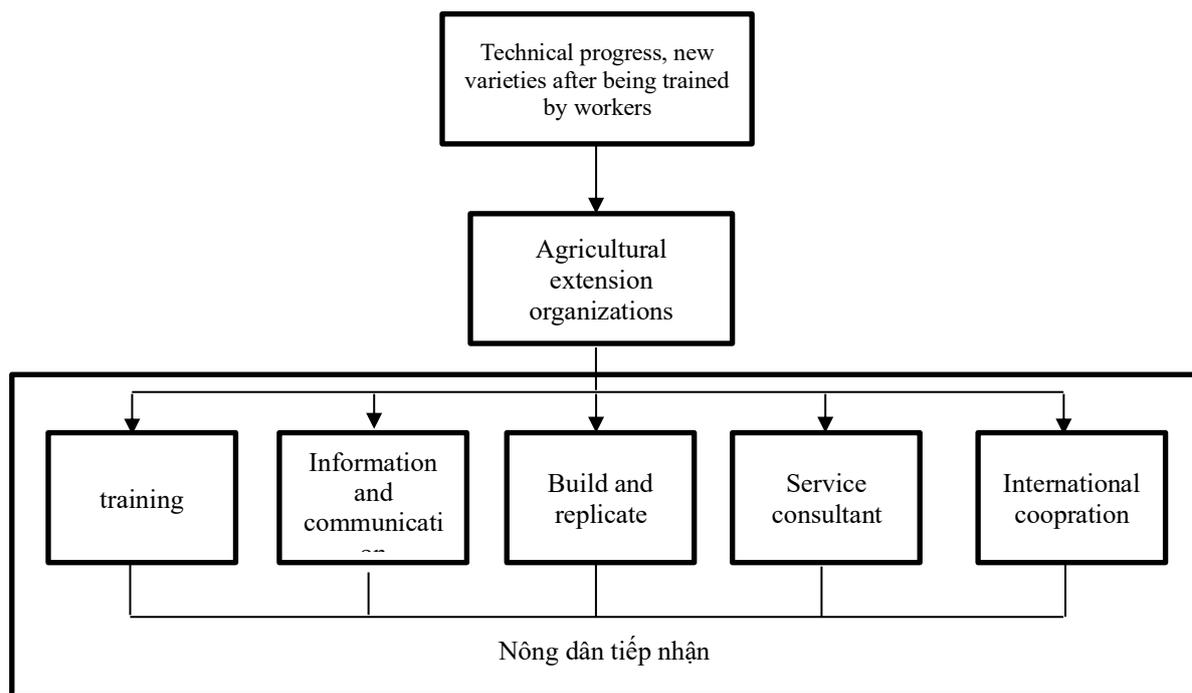


Diagram 3 How achievement of R&D results are disseminated to farmers

Thus, it can be seen that Vietnam's current agricultural extension system only uses scientific and technological research results for transfer without contributing to researching technology for agriculture. This is one of the major shortcomings of the whole system when Agricultural Extension is the unit closest to the producers and needs to contribute for that process.

Agricultural extension officers clearly understand what real problems occur in the



fields, and why these technical advances are popular with many farmers, while other techniques are not. Therefore, the participation of agricultural extension in perfecting scientific research results is an important premise for easier application of new advances and higher application rates.

4. Conclusion

According to RATES's 2023 survey, commune-level agricultural extension (AE) units have become largely ineffective and have been dissolved in most provinces. Many provincial AE centers were merged into agricultural service providers operating as revenue-generating public service units under state ownership. These centers are now tasked with conducting AE activities through transfer contracts alongside their regular functions. Despite these reforms, the transition has introduced several disadvantages. The restructuring process disrupted the hierarchical linkage from the provincial to the commune level. Provincial AE agencies are no longer directly connected with district AE centers, and commune-level officers now work part-time under local authorities rather than the AE system. Their limited professional skills and weak coordination severely reduce the system's effectiveness.

Moreover, these AE units lack experience in market-oriented operations, making it difficult for them to sustain AE activities under commercial contracts. The persistence of outdated management approaches, slow adaptation to innovation, and weak competitiveness further exacerbate the challenges, especially at district and commune levels. The elimination of the grassroots AE network has also limited the monitoring and guidance of farmers in adopting new technologies, leading to inefficiencies in input markets, seed distribution, and pest management.

The disconnection between provincial and district AE officers and local farmers has negatively affected the implementation of AE activities. Without a strong presence at the commune level, AE agents struggle to understand local conditions, reducing the effectiveness of demonstration models, field training, and the dissemination of technical innovations. Commune officials or village leaders who temporarily assume AE roles face work overload and often lack the technical expertise required.

The RATES survey also found that agricultural extension models operated by international organizations exhibit several advantages, such as modern approaches and strong technical discipline. However, their impact is often short-lived and dependent on project duration. For instance, the emission reduction rice project in Can Tho demonstrated that technology adoption rates declined after project completion. Similarly, AE initiatives led by private enterprises often focus on promoting their products rather than ensuring sustainable and large-scale application. As a result, farmers find it difficult to assess the real benefits of these models.

In response to these systemic weaknesses, a new **community-based agricultural extension team model** has been piloted. This model aims to promote peer learning, encourage farmers to adopt new techniques, and maintain continuous supervision within groups. However, due to weak institutional linkages with state AE organizations and inadequate resources, these teams remain ineffective and fragmented.