DEVELOPMENT OF FARM ECONOMY IN NGHE AN PROVINCE

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Abstract. Nghe An is the largest province area in Viet Nam with many favorable conditions for developing farm economy. Researching on the farm economy in Nghe An is approached in the direction of sustainable development theory and from the farm owners. Based on principle of sustainable development to survey 150 farms, which were selected by two criteria group: distribution such as mountains, midland, coast plain and types of farms such as cultivation, animal husbandry, forestry, aquaculture. The content was collected focus on: land use, labor, product value, average farm income and land use efficiency,... Based on the results analyzed, there are some problems in Nghe An farms development: the scale of farms are small, quality product is not high, difficulties in product consumption, there is not link between farms, environmental protection issues are not paid attention,... This is not meet the need of sustainable development. Some solutions are proposed, such as: expanding farm scale, creating the close links between farm owners and enterprises, applying the scientific advances in production, building the waste treatment facilities and developing specialized products by region advantage, etc.

Keywords: Farm economy, sustainable development, Nghe An province, Viet Nam.

1. Introduction

Agricultural economists and other development specialists generally agree that investing in agriculture is an effective strategy for reducing poverty, inequality and hunger, especially in countries where the sector employs a large share of the population (FAO, 2012; World Bank, 2007). Many people emphasize the importance of “smallholder farming” or “family farming”, with claims often made that smallholders or family farms are responsible for a large share of the world’s food production (e.g., Fairtrade International, 2013) or that a large share of the food consumed in Africa and Asia is produced by smallholders in those regions (HLPE, 2013; IFAD & UNEP, 2013). The terms smallholder and family farm are often used interchangeably or in combination. The FAO, as part of its strategic planning for the International Year of Family Farming in 2014, defined family farming as “a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family labor, including both women’s and men’s. The family and the farm are linked, co-evolve and combine economic, environmental, social and cultural functions” (FAO, 2013a, p. 2).

Received March 7, 2018. Accepted July 15, 2018.
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The United Nations' (UN) 2014 International Year of Family Farming provided an opportunity to reflect on the status of family-based agriculture throughout the world in relation to food security, socio-ecological sustainability, and equitable economic development. However, the diversity within this global sector in terms of farm characteristics and position within the global food system creates significant challenges for systematic policy design and development aimed at maximizing global food and nutrition security, secure livelihoods, environmental sustainability, and socioeconomic development (FAO, 2014a; Smith & Haddad, 2015). Recent policy debates at the international and regional levels have seen a shift in how smallholders and family farmers are viewed: from being a part of the hunger problem, to now being central to its solution (HLPE, 2013; McIntyre, Herren, Wakhungu, & Watson, 2009; Silva, 2014). Within the global food system, the contribution of family farmers to food security and local and regional development is surprisingly poorly documented. [FAO’s SOFA report (2014a)] estimated, based on an analysis of just 30 countries using the 2000 round of agricultural census data, that there are approximately 500 million family farmers in the world who produce 80% of the world’s food, thus highlighting the need for more accurate accounting and relevant policy analyses. An initial challenge within any review of family farming is that the term itself is not a clearly defined statistical entity at the global or often even national level.

A relatively small scale of agricultural operations has often been used as a proxy for family farm ownership. Many organizations, such as the World Bank in its Rural Development Strategy (World Bank, 2003), use landholding size to identify smallholder farmers—the most common being under 2 hectares (Conway, 2011; Salami, Kamara, & Brixiova; 2010; World Bank, 2003). Both the FAO and the HLPE are clear that the family and smallholder sector cannot be defined solely based on the size of landholdings. The size of an economically viable family farm holding varies by region, production strategy, level of market integration, family structure, access to inputs, technology, and infrastructure, and off-farm labor opportunities.

In Vietnam, farm economy is the household economy with commodity products sold to the market, reaching the size of land area and the value of goods according to criteria: for cultivate farms and fishery farms, the farm size must reach 2.1 ha or more and the value of products must be 700 million VND/year; For livestock farms, the value of products must reach 1 billion VND/year; Forest farms scale from 31 ha and value of products from 500 million/year (Viet Nam Ministry of Agriculture and Rural Development, 2011). Many studies on farm economics have assessed the current status of farm development and proposed solutions for sustainable farm development (Nguyen Dinh Huong, 2000). Analyze farm development process in Quang Binh province in different geographic features and propose solutions for sustainable development (Pham Hong Chuong, 2007); Research on farms in Bac Giang province has identified existing problems, threatening the sustainable development of Bac Giang farms, and suggest solutions to promote the North's farm economy. Giang developed in the direction of commodity production (Pham Van Khoi, 2011).

In this paper, the farm economy in Nghe An is examined in a sustainable and ecologically-friendly manner to clarify the current status of farm economy in Nghe An. The number of constraints and challenges, thus suggesting solutions to develop farms in the direction of sustainability.

2. Content
2.1. Materials and methods
2.1. Materials
Both survey data and statistical data was used to carry out research contents. The survey data was conducted by PRA in 4 districts (Quy Chau, Quy Hop, Nam Dan, Quynh Luu). The farm statistics data was collected from the collection of statistical data from government agencies in Nghe An, such as: Nghe An Department of Agriculture and Rural Development, Bureau of Statistics, Agriculture Divisions of Quy Chau, Quy Hop, Nam Dan and Quynh Luu Districts.

2.1.2. Methods

*Participatory Rural Appraisal (PRA)*

Participatory Rural Appraisal (PRA) method is consider as the main method, which is a qualitative approach to study human action in their production, attempting to make interpret, phenomena in terms of meanings people bring them. The qualitative data was collected through structured interview items, focus groups, and participant observation. A total of 150 farm owners participated in the PRA together interviews group, where the respondents distributed from mountains district (Quy Chau district, Quy Hop district) to midland district (Nam Dan) and coast plain district (Quynh Luu). The type of farms is the criterion to be considered when selecting area for survey that include cultivation, animal husbandry, forestry, aquaculture. Interviews were used to study, focusing on land uses, labors, investment, product value, average farm income, land use efficiency, protected environment in the farms.

| Table 1. Number of farms distributed by districts and by type of farms |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| **TT**                         | **Quy Chau district** | **Quy Hop district** | **Nam Dan district** | **Quynh Luu district** |
| 1 Cultivate farms              | 1                | 46               | 1                | 1                |
| 2 Animal husbandry farms       | 1                | 0                | 29               | 19               |
| 3 Forestry farms               | 7                | 0                | 0                | 2                |
| 4 Aquaculture farms            | 0                | 0                | 0                | 35               |
| 5 Compound farms               | 5                | 0                | 0                | 3                |
| *Total*                        | 14               | 46               | 30               | 60               |

*Analytical data method*

This study used concurrent design of mixed methods research to collect both qualitative and quantitative simultaneously in a single data collection phase from farmers. In addition, the collection of statistical data from government agencies (published in Vietnam) has also been conducted. Both of these data sources are analyzed, calculated, and aggregated to provide the judgment and assessment in this study. Futhermore, the results of assessment was consulted by experts in the field of agricultural production, such as: the situation of input sources, output of farms, linkages between farm owners and localities in Nghe An province

2.2. Results

2.2.1. Potential for farm development in Nghe An

Nghe An is located at the center of the North Central Region, with geographical coordinates from 18° 35' to 20° North latitude and 103° 50' to 105° 40' East longitude, borders Thanh Hoa province in the north, Ha Tinh province in the south, Lao People's Democratic Republic. The area of natural land is 16,490.85 km², accounting for 5.1% of the country's natural area and 3.063
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million population, accounting for 3.4% of the national population (2016). This position makes Nghe An play an important role in socio-economic exchanges in North and South, building and developing marine economy, expanding international cooperation and exchanging goods with ASEAN countries through cross the border. This will promote Nghe An agriculture to develop in the direction of commodity production as well as the formation of large scale farms. This location also regulates the tropical monsoon climate of Nghe An with the temperature is from 23-24°C, the average annual rainfall ranges from 1,200 to 2,000 mm/year, total heat is 3500°C - 4,000°C.

The differentiation of terrain and climate make them is divided into different subregions, creating a variety of distribution and types of production on the farm. Nghe An terrain has two main areas: the mountainous - midland (1) and the coastal plain (2). The first (1) is about 13,749.2 km², accounting for 83.4% of the province, is a complex terrain, mainly medium and high mountains with feralit soil, which is good drainage but poor water retention, with thick layers, favorable for the development of forestry farms and industrial crops such as coffee, rubber, tea, pepper and the basis for the agro-forestry processing industry. This region is suitable for develop the forestry farms, long-term industrial crops such as coffee, rubber, tea, pepper... as well as short-term industrial crops such as beans, peanuts and medicinal plants, leaves... The second (2) is about 2,741.5 km², accounting for 16.6% of the province's area. The land in the area is mainly alluvial soil, sandy soil, along the coast with muddy areas, swampy mudflats and mudflats. This soils are the areas to form food farms, annual industrial crops, and vegetable crops. Plain terrain is favorable for the development of types of short-term industrial plantations and aquaculture.

Due to the diversity of terrain, the abundance of sub-zones and climates of Nghe An province has created a great diversity of crop structure, thus forming different types of farms with the advantages of agriculture, forestry and fisheries. Although there are many advantages and good natural conditions, Nghe An province also has a major obstacle to the development of farm, such as: rainfall, floods, erosion of farmland, storms, cold winters, summer with hot dry droughts, severe water shortages, forest fires, tropical diseases, poor infrastructure, especially road transport networks in the midland and mountainous districts.

The area of land uses has increased, of which the fastest increase is the area of agricultural land. Over the past 16 years, it has increased 1.4 times and accounted for 75.8% of the total area land, due to the expansion of industrial plantations and forest. The unused is quite high, mainly hilly land, occupying 16.4% of the total area of natural land, which is capable of growing short-term industrial plants (peanut, sesame), long-term industrial crops (coffee, tea) and fruit trees (pineapple, oranges) over 50,000 hectares. In 2016, the annual crop land area is 194,905.7 hectares, accounting for 11.8%; Perennial land is 81141.4 hectares, accounting for 4.9% of total natural land area. In addition, the area of forested land occupies the largest share of forest land, in 2016, is 963691 hectares, accounting for 58.4% of the total natural land area, is the largest production forest land area, accounting for 29.9% of the total area of natural land. Rich forest resources are a favorable condition for Nghe An to develop forestry farms with agro-forestry developing. Futhermore, with long coastline (82 km) and many creeks, Nghe An has 3,500 hectares of brackish water capable of developing aquaculture farms.

2.2.2. Survey results of farm development in Nghe An province period 2011 - 2016

a. The increasing the number of farms

The number of farms in Nghe An has increased rapidly over time. In 2011, the number of farms in Nghe An is 159 farms, by 2016 increased to 464 farms. Livestock farms and Complex farms are dominant. In 2016, livestock farms accounted for 56.5% of total farms, complex farms accounted for 15.5%. Number of forestry farms and aquaculture farms are at least.
Table 2. Number and structure of farms in Nghe An province in 2011 and 2016

<table>
<thead>
<tr>
<th>Types of farms</th>
<th>Number (farm)</th>
<th>Structure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>159</td>
<td>464</td>
</tr>
<tr>
<td>1. Cultivate farms</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>2. Livestock farms</td>
<td>87</td>
<td>262</td>
</tr>
<tr>
<td>3. Forestry farms</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>4. Aquaculture farms</td>
<td>29</td>
<td>47</td>
</tr>
<tr>
<td>5. Complex farm</td>
<td>15</td>
<td>72</td>
</tr>
</tbody>
</table>

b. The size and land uses in the farms

Compared with the size of households, the scale of production of farms is much larger. In 2016, on average, each farm uses 7.2 hectares of land, of which household size in Nghe An is about 1.2 hectares/household. Forestry farms have the largest land use scale. Forest farms are mainly located in mountainous districts with an average area of 55 hectares used by each farm. The main crops of the forest farm are acacia, some fruit trees and cattle and buffalo,...

Table 3. Average size of land use per farm in Nghe An province

<table>
<thead>
<tr>
<th>Type of farms</th>
<th>Average size of land use per farm (ha/farm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>7.2</td>
</tr>
<tr>
<td>1. Cultivate farms</td>
<td>7.1</td>
</tr>
<tr>
<td>2. Livestock farms</td>
<td>3.4</td>
</tr>
<tr>
<td>3. Forestry farms</td>
<td>55.0</td>
</tr>
<tr>
<td>4. Aquaculture farms</td>
<td>4.7</td>
</tr>
<tr>
<td>5. Complex farms</td>
<td>11.0</td>
</tr>
</tbody>
</table>

Complex farms have an average land use scale of 11 hectares per farm. Complex farms have a large scale of land use as they are forest land. The main crops and livestock of the complex farms are acacia, fruit trees, cattle, pigs, etc.

The cultivate farms have an average land use scale of 7.1 ha. Through a survey of farms in Quy Hop, Nam Dan and Quynh Luu districts, all 49 farms were planted with perennial trees, mainly fruit trees (oranges, guava, apples, lemons ...), The coffee plantation is not much. Aquaculture farms have an average size of 4.7 hectares per farm, mainly shrimp farms of coastal communes in Quynh Luu district.

Livestock farms have the smallest land use scale, as farms are mainly pigs and chickens concentrated in two delta and coastal districts. The average number of pigs on farms is from 120 to 150 pigs. Beef farms are not much, accounting for only 12.2% of all farms surveyed.
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The forest land of 150 surveyed farms accounted for 55.4% of the total land area of farms, followed by perennial land for 15.0% and aquaculture land for 14.7%. Forest farms, complex farms and livestock farms also account for a large proportion of perennial land that they combine with cattle and forestry.

Table 4. Land structure of farms in 2016

<table>
<thead>
<tr>
<th>Land used</th>
<th>Cultivate farms</th>
<th>Livestock farms</th>
<th>Forestry farms</th>
<th>Aquaculture farms</th>
<th>Complex farms</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Land for planting annual crops</td>
<td>23.2</td>
<td>21.1</td>
<td>1.9</td>
<td>1.0</td>
<td>15.7</td>
<td>10.3</td>
</tr>
<tr>
<td>2. Land for perennial crops</td>
<td>74.4</td>
<td>8.2</td>
<td>-</td>
<td>0.8</td>
<td>10.3</td>
<td>15.0</td>
</tr>
<tr>
<td>3. Forest land</td>
<td>2.4</td>
<td>41.8</td>
<td>98.1</td>
<td>-</td>
<td>54.4</td>
<td>55.4</td>
</tr>
<tr>
<td>3. Aquaculture area</td>
<td>-</td>
<td>16.0</td>
<td>-</td>
<td>98.2</td>
<td>11.1</td>
<td>14.7</td>
</tr>
<tr>
<td>4. Land for another purpose</td>
<td>-</td>
<td>12.9</td>
<td>-</td>
<td>-</td>
<td>3.4</td>
<td>4.6</td>
</tr>
<tr>
<td>Total area</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**c. Ownership of land on the farm**

The land of the farm is mainly granted by the government. Allocated land is accounts for 62.4% of the total land area of surveyed farms in 2016 while land for rent occupies only 7.5%. In all types of farms, the total area of forest land is the land allocated. The farm has 54.7% of the land allocated, 17.5% of the leased area, and the remainder is another source. Aquaculture farms have the largest share of land rents, accounting for 59.7%. Thus, most of the land area of the farms is the land allocated, the proportion of land transferred, land tender is very little. The area of land rent is not much, due to the short duration of land lease, so the farm owners do not dare invest capital to build infrastructure, technical facilities for production.

**d. Labor of farms**

Farms mainly use family labor. Regular labor of each farm an average of 4 people. The number of farms employing workers regularly accounts for 48.2% of the total number of farms surveyed. Among the types of farms, the most frequent use of labor was on aquaculture, with 5.7 laborers on average, followed by 4.8 laborers per farm. In addition, farms employ seasonal workers, mainly for some jobs such as land preparation, harvesting, transportation, etc. The forestry farm hires the most seasonal labor, followed by the farm crop. Most of the farms employ local seasonal workers, creating jobs for thousands of workers in the area.

In general, the labor of the farms is not very high, the number of laborers with university and college degrees is very low, mainly unskilled laborers. Through surveys, 62% of the farm owners only attained 12/12 education level, without vocational training. Production skills are mainly self-taught, in part through extension centers. Employees are those who work in the farm mainly as general workers, mainly by experience and farm managers who work through the job.

**e. Investment of farms**

In 2016, the average investment per farm is about 2 billion, in which the investment capital for aquaculture farms is highest, the average farm is about 6 billion, followed by the breeding
farm about 3 billion/farm, 2.5 billion farm/farm. Farms in mountainous districts have lower capital investment than plain farms.

The investment capital of the farms is mainly invested in the construction of production and business facilities (accounting for 52.8% of the total investment capital of the farm), the total value of machinery and equipment, production tools occupying about 22.5%. The current cash balance of farms accounts for a very low 5.7% of total capital. Thus, most of the capital of the farm is invested in assets for production and business.

The investment capital of the farms is mainly own capital, accounting for 82.2% of the total capital of the farm, the loan capital accounted for only 17.8%. Bank loans of farms are very small, accounting for only 6.3% of total farm capital, due to the short time of borrowing and the low loan amount. Farm owners mainly borrow from relatives. Some farms are supported by funds from rural development programs and projects.

Farmers want to expand production, but have difficulty borrowing business capital. The main reason is short loan period (usually about 1 year) and difficult access to preferential loans. On the other hand, the loan amount is not much (about 50 million), should expand production difficulties.

f. Application of science and technology of the farm

Throughout the survey, farm owners in Nghe An province mostly finished high school and the proportion of farmers with professional qualifications was very low. Therefore, the application of scientific and technological advances in the production of farms is difficult. With the exception of fruit farms, aquaculture farms and some large scale pig farms, most of the technology is low, most farm owners self-study and apply technology into production by experience. Technical sources for use in production are mainly self-taught farm owners and partly from extension agencies. Of the 150 surveyed farm owners, up to 52% self taught technical techniques in cultivation, husbandry, aquaculture, irrigation, pest and disease control, agro-forestry and fishery processing and only 38%, 4% from the extension agency; Environmental protection techniques are 56% and 16%, respectively. Some large farms have applied new production technologies with high efficiency, such as orange farms and aquaculture farms, such as irrigation systems, covered the soil with nylon to prevent soil erosion and keep the orange tree moist. Thus, some farms produce their own delicious, high-yielding varieties of orange for local farms. The aquaculture farms have also applied the plastic coatings against cold shells for shrimp to be cultured in the winter, reducing the seasonality of shrimp farming.

g. Input market of farms

Most of the input materials of farms are mainly purchased from service households and self-farmers. For perennial varieties, farm owners purchased from service households, or from plant breeding centers (67.3%), partly self-made; Annual crop varieties are mainly contracts with enterprises (86.4%); aquatic products supplied from contracts with enterprises (34.6%) and traders (42.1%); cattle and poultry are mainly supplied by traders (43.5%), and farm owners themselves breed.

For fertilizer materials, pesticides purchased from farms mainly from service households (88.5%), the quantity bought from cooperatives was very low. For livestock feed, aqua feed, the supply of farms is mainly from traders, followed by the service business households. Some livestock farms and aquaculture farms have contracted with the companies to provide feed. Contracts with enterprises on input sources will be more stable, farms can advance cattle feed, mobilize capital of enterprises. However, only large farms are contracted to enterprising businesses, while small scale farms mainly buy inputs from traders or service businesses.

h. Income of the farm in Nghe An

The average revenue per farm is from 2.0 to 2.2 million per year, with an average annual cost
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900 thousand - 1.3 million VND. Each year of each farm about 800 million VND.

Table 5. Total income and expenditure of farm in 2016

<table>
<thead>
<tr>
<th></th>
<th>Cultivate farms</th>
<th>Livestock farms</th>
<th>Forestry farms</th>
<th>Aquaculture farms</th>
<th>Complex farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total revenue</td>
<td>1859</td>
<td>2235</td>
<td>1909</td>
<td>2834</td>
<td>1646</td>
</tr>
<tr>
<td>2. Cost</td>
<td>809</td>
<td>1342</td>
<td>1265</td>
<td>1886</td>
<td>1023</td>
</tr>
<tr>
<td>3. Profits</td>
<td>1050</td>
<td>893</td>
<td>644</td>
<td>948</td>
<td>623</td>
</tr>
</tbody>
</table>

In the types of farm, aquaculture farms have the highest turnover, but the cost of production is high, so profit is not higher than other types of farms. In crop farms, orange growers are most effective because of their high productivity and stable price, large market demand. Farm products are commodity products, is sold on the market, is accounted for 97.3% of the total value of farm products and services. In order to adapt to market demand, most farm owners diversify their products, generating a lot of revenue. The complex farms animal husbandry, aquaculture farms in the production process, so the income of the farms is diversified and utilizes all the ingredients in the production process. Farms also have income from cultivation, aquaculture and other production and business activities. Aquaculture farms also have other sources of income from cultivation and livestock production. However, the quantity products of the farms are not large and the specialization is not high.

Cultivate farms have higher incomes than the main types of survey farms. In 2016, each orange ha has an average income of about 1 billion VND. These are farms that have applied high-yielding technology. According to a farm owner, orange trees can yield 3 quintals per crop. The technique of growing orange by the farm owners is mainly self-study and experiment to see high efficiency, especially the technique of nylon coat anti-erosion feces and moisturizing orange trees.

Moreover, the income of regular labor of the average farm is from 3 million to 3.5 million VND/month. Compared with farm households, the income of farm labor is much higher. However, the number of regular labors in farms is not large, mainly seasonal workers. Land use efficiency of farms has increased rapidly. In 2016, the average production value of the farm is about 200 million VND/ha, which is four times higher than in 2010. Farms with the highest production value, on average 350 million VND/ha, next to the aquaculture farm is 231 million VND/ha, the forestry farm has the lowest production value, about 13 million VND/ha.

i. Consuming products of farms

Output products of the farms are mainly sold to traders and sold at local markets, such as products of fruits, cattle and aquatic products. Among the products of the farm, fruit and aquaculture products are most easily consumed, all products are still the annual purchase price, not stable, low local price, not linked to the business.

k. Environmental problem in the farm

According to survey results, most of farmers do not attention the importance of environmental protection during production and business. Farmers are primarily interested in the volume of produce, resulting in great sales. Some farmers are aware of this issue but due to limited capital, so they have no investment in environmental protection. However, cultivating farms and forest farms are good for greening bare land, bare hills, preventing soil erosion in midland and mountainous areas. Many farm models bring economic and environmental benefits quite high in the hills, such as family model of Mr. Le Van Oanh, Hoa Hai village, Chau Hanh
commune, Quy Chau district. Acacia hybrid acacia plantation (a root-rooted species in Quy Chau) under the glacial canopy has increased the coverage on hilly land and increased income for households. Thus, if the combination of the two plants, the turnover will be nearly double compared with the acacia plantation only, in addition to prevent soil erosion when the glue has not closed canopy. The cow raising model combined with reforestation is also highly effective in Quy Chau and Quy Hop district. On the other hand, due to inadequate use of fertilizers in agricultural practices, low fertilizer efficiency, over 50% of protein, 50% of potassium, and 80% of phosphorus directly or indirectly pollute the environment in Nghe An. Among the types of farms, the most polluting farms are livestock farms. Medium scale farms with biogas digester to treat wastes are environmentally responsible. Many pig farms near residential areas, breeding facilities lack planning, measures of waste disposal almost no. This source of waste contains many organic compounds, viruses, germs, eggs, worms, etc., which affect the soil, water and air environment, affecting public health. In Nam Dan district, the majority of animal husbandry farms that combine pig farming with ducks and fish are polluting the environment as waste from unprocessed pigs discharges directly into fish ponds. In addition, it is still a phenomenon that some livestock farms discharged waste directly into the environment causing the smell to seriously pollute the surrounding environment.

2.3. The results and some problems of farms economy in Nghe An

2.3.1. Contribution of farm economy to the economic development of Nghe An province

Farm development has exploited the potential advantages of the local; to exploit the area of waste land, bare land, bare hills ... to put into production; improving the efficiency of land use; creation of concentrated production areas with large volume of goods, promoting the process of restructuring plants and animals. This also facilitates agricultural and rural industrialization, applies scientific and technical advances, and brings mechanization into production. From there, improve product quality and competitiveness in the domestic and international markets, increase income for farmers and create jobs for tens of thousands of local workers. Developed farms play a role in promoting the economy of the mountainous midland area of Nghe An province, minimizing regional disparities in the process of socio-economic development. On the other hand, farm economy developed in hilly areas also contributes to environmental protection, greening bare land and bare hills, minimizing flash floods and floods.

In addition, farm economy contributes to innovate awareness of market economy and production and business models in agriculture and rural areas, facilitating farmers access to market economy faster. Many farm owners have had experience in economic and business management, and the willingness to grow rich in market mechanisms. It will promote the economy of the mountainous midland of Nghe An province (due to the advantages of land), contribute to alleviating poverty in mountainous areas, minimizing regional disparities in socio-economic development. Futhermore, in hilly areas, it also has contributed to the greening of barren hills, reducing flash floods, swamp floods, soil protection, erosion control, increasing land cover on the sloping land.

2.3.2. Some limitations, challenges of farm economy

Farms in Nghe An are mainly spontaneous, not in accordance with local and regional development plans. The quality of commodity products of the farms is not high, mainly in the raw form with low economic value. Most of the farm owners have not yet grasped the market demand so the production is still passive and low efficiency.

On the other hand, the average size of a farm is low, so the application of advanced science and technology is very difficult, limiting the ability to specialize, as well as the production of large quantities of products, highly competitive. Production efficiency of farms is not high, due to
small scale production, small product quality, low product quality, low value of goods and services. One of the biggest difficulties that farm owners face is the market for the product. The problem of market access, as well as the production of products that meet the requirements of the market almost few farms do, so the consumption of products is often precarious, affecting production.

Furthermore, production level of workers and farm owners is low. There are very few college-educated and university-level laborers, who are not trained or have few elementary or intermediate levels; The interest in technical investment, technology for cultivation and livestock is limited. Farmers who produce business on experience capital are available or self-educated through other models rather than through training.

Otherwise, farmer linkages are almost nonexistent. Farms mainly exchange experience of production, as well as livestock and plants, but also in production and consumption of products is very little. Many farm owners also want to cooperate in production, but lack of management experience should cooperate unsuccessfully, at times conflicting in the sharing of interests and business direction. Some of the farms are located in the raw material area associated with the company in the sale of products, through contracts for the supply of seeds, fertilizers and consumption of outputs. The majority of farms are not linked to the business of consuming the output. Farmers find themselves where to consume products, have verbal agreements, or telephone deals with traders to sell products, without contracts, so the consumption of the product is uncertain. very much on the market price.

In addition, the quality assurance of food safety and hygiene for agricultural products has not been paid much attention. In addition, orange farms have registered trademarks and ensure food hygiene and safety, while most products of the farms are not interested in food hygiene and safety. Currently, only input materials of aquaculture farms are inspected on food hygiene and safety and the products have not been tested for quality, hygiene and food safety. Outbreaks, especially bird flu, blue ear disease, grass buds disease in sugarcane, yellow leaf in orange, ... but the disease prevention for the farm is difficult because of the level of Workers are still low, facilities are limited.

On the other hand, most of the farms have not invested in environmental protection due to high environmental costs, while the initial investment of the farmers is not much, mainly invested in production. Pig and poultry farms have invested in waste treatment systems, but the costs are high. Therefore, many large livestock farms can not solve the environmental problem with biogas tanks, but need to build a modern waste treatment system to ensure environmental sustainability.

2.4. Solutions for sustainable development of farm economy in Nghe An province

Based on the results of the survey, analysis and expert consultation, some solutions for sustainable development of farm economy in Nghe An province was proposed.

Firstly, the government need to expand area scale. Scale up existing farms. The government should guide the unit price of land lease and transfer to accumulate land in a flexible way. Implement the accumulation of land to develop large-scale farms, facilitate the application of technical advances, science and technology into production at farms. Many farm owners have a need to scale up area (54.3% of the 150 farm owners surveyed want to expand area). Cultivate farms have the greatest need to expand are (75.7%), followed by livestock farms (66.2%). There are many reasons causing difficulties to the farm owners when they expand area scale, in which the most difficult is the lack of invested capital, difficult to sell products and not buy or rent more land. In addition, farm owners lack the knowledge and experience of farm management, lack of techniques in production, and supportive policies of the locality are not synchronized to promote the economy.
Secondly, farmers should apply advanced scientific and technical advances to farm production to produce high volume, high quality products to meet market requirements. Enhance technical training and skills for farm owners and farm workers. Organize preliminary and annual review of farm economy, organize dialogue between farm owners with scientists, managers, traders, .... to exchange experience, find solutions. The solution to the difficulties. Every year, there are plans for training and fostering of farm owners on techniques of cultivation, husbandry, exploitation, harvesting, processing and post-harvest preservation.

Thirdly, strengthening the market information and trade promotion to timely provide the farmer with the price of agricultural products and market demand, such as: open agricultural product fair to introduce and promote high quality agricultural products, competitive advantage of the province, organize study tours to experience domestic and foreign production, promotion encouraging farms to build brand name products of high quality and prestige in the market. Moreover, farm economy should be closely linked to develop the value chain. Farmers need to link together, forming cooperative or cooperative groups that provide inputs and outputs for farms. Cooperatives will directly sign contracts with businesses. The enterprise will organize the purchasing, processing, and marketing of farm products. This creates a large volume of products, good quality and stable consumption. Combining the development of agricultural services, especially veterinary services, to avoid the loss of livestock due to disease. Investment in wastewater treatment systems in farms, avoiding environmental pollution. To invest in the development of infrastructure and technical facilities in mountainous districts in order to promote the development of forestry farms. Development of this type of farm will bring high environmental efficiency, suitable for mountainous terrain, ensuring the sustainable development of agriculture.

In order to develop a sustainable farm economy, environmental protection needs to be paid attention. For small and medium sized farms, the treatment of biogas waste is the method of achieving high efficiency. However, it is necessary to build a biogas tunnel system in accordance with the standards and have the management and strict control of the Government to ensure maximum safety of the livestock environment; large scale farms need to invest in modern waste treatment systems that are appropriate to the scale of animal production.

Likewise, developing a separate policy, specific criteria for ensuring the environment in the production and business of farms to control and deal with farms that violate the environment; Conducting an assessment of the current state of the environment in livestock farming areas, aquaculture farms and agricultural product processing establishments to have specific measures to protect the environment in the areas most likely to cause environmental pollution. Also, organize training courses on food hygiene and safety for farm owners so that farm owners can be productive. In addition, it is important to encourage farm owners to register their brands for food safety and hygiene to raise environmental awareness among farm owners.

3. Conclusion

The farm economy has contributed greatly to the transformation of agricultural and rural economic structure in Nghe An, promoting agricultural development towards commodity production, creating a dramatic change in thinking, methods of working for farmers when our economy is integrating into the world economy.

However, there are still many difficulties in the process of developing the farm economy: the scale of small farms, product quality is not high, difficulties in product consumption, environmental protection issues are not paid attention, ...

In order for the farm economy to develop sustainably, Nghe An province needs to synchronously implement solutions in terms of science and technology, human resources,
technical facilities, capital sources, markets,... For scientific and technical solutions and human resource development. High technology and labor will be the driving force for Nghe An's farm economy to develop highly and sustainably.

REFERENCES


