



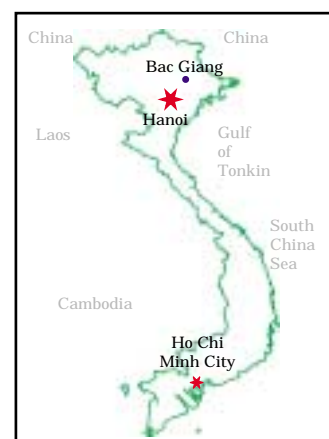
Tinh Loc and Kha Ly Ha Villages, Bac Giang Province

GENERAL INFORMATION

Tinh Loc and Kha Ly Ha were two villages that were selected for the initial Green Productivity Demonstration Program (GPDP) during 1998 and 1999. The Green Productivity (GP) program was extended in these villages during 2000 and 2001 under the GP Development Assistance program.

These predominantly agricultural villages are located within Bac Giang province. Both the villages are located in mountainous areas, about 60 km north of Hanoi.

Some characteristics of each village are as follows:



Tinh Loc Village, Nghia Trung Commune, Viet Yen District

Total amount of land: 169.93 ha.
Cultivated land: 96.44 ha., including <ul style="list-style-type: none"> ○ Vegetable plantation land: 75 ha., and ○ Lowlands used for rice cultivation: 21.44 ha.
Population: 1375 people within 301 households.
Average income: 2,300,000 VND/person/year.
Main production activities
Agriculture: 66% of the total income
Breeding livestock: 16.8 % of the total income
Breeding fish: 2% (1998 data) of the total income
Other: 5.2% (construction, trading, service, etc.) of the total income

Kha Ly Ha Village, Quang Minh Commune, Viet Yen District

<p>Total amount of land: 72 ha.</p> <p>Cultivated land: 61 ha., including</p> <ul style="list-style-type: none"> ○ Vegetable plantation land: 30 ha., and ○ Lowlands used for rice cultivation: 31 ha.
<p>Population: 1450 people within 330 households.</p>
<p>Average income: 2,074,000 VND/person/year (1997 data).</p>
<p>Main production activities</p> <p>Agriculture: 80% of the total income (85% of the population is involved in agricultural activities.)</p> <p>Other: 20% from various services</p>

MAIN ISSUES

- Wells, ponds, and lakes are often the main sources of water. However, these sources were often polluted and their use by villagers created many health problems.
- Sewage and manure disposal practices were inappropriate causing local air and water pollution.
- Methods for domestic solid waste disposal were contributing to air and water pollution. Waste was not collected and treated, and instead was either burned or deposited in gardens.
- Daily activities such as cooking and burning solid waste caused air pollution.
- The application of chemical pesticides and fertilizers was inappropriate and resulted in an increase in environmental degradation through water and soil pollution.
- Agriculture productivity was low, mainly due to inappropriate cultivation methods and external factors such as insect and rat infestation.
- Agricultural production is important to the economic condition of rural areas. This is also the main activity within both Kha Ly Ha and Tinh Loc villages. However, agriculture requires manual labor for limited time periods. During certain stages of the agricultural season, there is little work available. Hence, farmers in many villages seek a by-trade to subsidize their income. Both, Kha Ly Ha and Tinh Loc villages lacked a by-trade. Thus, it was important to establish a secondary income for farmers.

GP OPTIONS

- (1) Install groundwater pump systems for supplying potable water.
- (2) Apply biogas technology for treating sewage.
- (3) Form solid waste collection teams for managing and treating domestic waste.
- (4) Construct energy efficient stoves. These stoves reduce the amount of energy used, minimize air pollution, and improve the health of villagers.



- (5) Apply Korean natural farming technology to rice growing to reduce the reliance on chemicals. This method using locally produced natural ingredients enables farmers themselves to prepare fertilizer mixtures.
- (6) Apply integrated pest management (IPM) to reduce chemical use during agriculture production.
- (7) Use effective microorganisms (EMs) in agriculture production to reduce reliance on chemicals, and in landfills to reduce odor problems and aid in decomposition.
- (8) Distribute semicircular-shaped rat traps to the villagers. This will aid in reducing damage to vegetable crops caused by rats.
- (9) Introduce mushroom cultivation techniques. Cultivating mushrooms will provide a secondary income as well as make use of agricultural waste like straw from rice production.

IMPLEMENTATION AND RESULTS



Installing a Biogas Chamber



Energy-efficient Stoves

- Two groundwater pump systems were installed in the two villages. These systems pump groundwater to the surface and filter the water to remove iron.
- Twenty biogas chambers were constructed within the two villages. The total volume of the chambers is 100 m³. Animal waste, once dissolved, can also be used as fertilizer for vegetable cultivation. This will reduce air pollution and waste generation.
- One domestic waste collection team was formed in each village. The collection teams now dispose of solid waste into a landfill established as part of this program. Each household contributes money for the maintenance of the landfill and the collection teams.
- One hundred and fifty energy-efficient stoves were constructed within the two villages. Due to a reduction in their energy consumption, each household containing 4-6 people saves approximately \$US10/year.

The energy-efficient stoves have the following advantages:

- Save time needed for cooking and also energy by 20-30%.
- Reduce air pollution.
- Lower the ambient air temperature by 5-7°C, which is significant particularly in the summer months.
- Minimize the risk of fires occurring within households.
- Reduce smoke and dust and thereby improve the health of the villagers, particularly the women, children, and the elderly who spend more time inside the home.

- Seven hundred liters of EMs were supplied to the two villages. The EMs are used for rice cultivation and for treating solid waste. EMs are a catalyst for the decomposition of solid waste and reduce the odor from the landfills.
- Teams responsible for eradicating rats were formed in both the villages. By using the semicircular rat traps, teams in Kha Ly Ha village caught 10,000 rats within two months. These rats are suitable for pig food.
- Thirty tons of waste straw from agriculture were used for growing mushrooms. Therefore, this method utilized waste and generated a secondary income as earlier the straw was disposed of by burning. Mushroom growing increased the income of the villagers since they earn approximately \$US90 for each ton of mushrooms.
- The villagers are now aware of the need to protect their environment. GP methodology has become an environmental preservation technique for both the villages. It is now applied to any new production activity.
- The villagers established regulations for environmental protection and the maintenance of GP activities in their villages.



Mushroom Cultivation

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After one year of the project implementation, the environmental awareness of the people in the village has increased. Environmental conditions in rural areas are better. The Green Productivity project has created a positive effect on people's awareness. This is the result of a combination between productivity and the environment.
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Mr. Binh, GP Team Leader of Kha Ly Ha,
Bac Giang province