"Strengthening Capacities to Enhance Coordinated and Integrated Disaster Risk Reduction Actions and Adaptation to Climate Change in Agriculture in the Northern Mountain Regions of Viet Nam"

Ministry of Agriculture and Rural Development

Northern Mountainous Agriculture and Forestry Institute

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Improving Agricultural Production Systems
in northern mountain regions of Vietnam

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1. Introduction

Vietnam's economy is largely based on agriculture, over 70% of its population rely on the agriculture production for food source and income. Nonetheless, the country is also highly exposed to recurring natural hazards, especially in the northern mountainous regions. In recent years, disasters occurred in this region with increasingly unprecedented severity and scale, causing damages to large crop areas and serious losses in term of human lives, properties and the environment.

Almost 40% out of the region's total limited agricultural land area of 6,821,781 ha is sloppy, scattered and detached. Only 524,600 has out of the total rice lands of 1.400.000 ha are flat (including valley fields and irrigated terraces), of which a large part is one-crop-season, meaning they can be cultivated only once a year. Recently, in order to increase food crop production, significant attempts have been made for improving cropping patterns and increasing the double cropping land area. Nevertheless, due to irrigation water shortage during the long dry and cold seasons, about 36% (equaling to 190,000 ha) out of the total 524,600 ha of irrigated rice lands remains single cropped, and are left to fallow in the winter-spring season.

In this context, and through the project UNJP/VIE/037/UNJ "Strengthening Capacities to Enhance Coordinated and Integrated Disaster Risk Reduction Actions and Adaptation to Climate Change in Agriculture in the Northern Mountain Regions of Viet Nam", FAO provides technical support to the Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI) to improve agricultural production systems on slope lands in the northern regions to improve farmers' income

One of the specific objectives of this project includes the development of appropriate grazing and fodder grass production systems for drought flat lands (currently one-crop-season rice lands) and slopping lands towards advanced husbandry, cattle raising and natural resources protection in the Lao Cai and Yen Bai provinces.

Development of grazing and fodder grasses for cattle raising is considered to be a feasible and fruitful option. Results obtained from demonstrations proved that two grass species in particular have shown optimal adaptability for dry flat and slope lands, predominant in both provinces, the VA-06 and the Guatemala species have demonstrated optimal results also as far as suitable cultivation techniques for the local natural and socio-economic conditions, and wide acceptance among farmers. Their growth for cattle raising not only increases household income, but also contributes to forest, land and water resources protection by reducing the pressure on the exploitation of these resources for food crop production.

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2. Implementation of the technology

2.1. Test some grass species in order to identify 1-3 species appropriate for the target areas

The first step included the test of varietal grass species established in the Ngài Chồ commune (Lào Cai province), characterized by sloping lands and in the Phù Nham commune (Yên Bái province) where the flat lands have recurrent drought problems (currently one-crop-season rice lands)

Preliminary results from the test on 7 varietal grasses expressed different growth strength and yields. The survival rates of 5 from 7 species were high and similar for both sites in Lao Cai and Yen Bai, over 80%.

The yields of the first harvest are in the table below (t/ha):

	Species	In Lao Cai	In Yen Bai
1	*Brachiaria decumbens*	22,17	24
2	*Brachiaria ruziziensis*	11,25	31
3	*Panicum maximum* TD 58	23,72	25,65
4	*Brachiaria brizantha*	21,55	19,66
5	Guatemala	34,58	33,67
6	*Setaria splendida*	22,76	29
7	VA-06	66,25	85,45

The most promising species, VA-06 and Guatemala continue to be monitored to guarantee their good adaptability and high yield in time, helping to meet local needs for grass production to promote intensive cattle raising.

In Lao Cai, the demonstration was established on slopping uplands, where both grass species were well established and showed good growth. Famers could already harvest twice with the average yield of 3.0-3.5 tones per hectare per harvest for VA-06, while the yields averaged 2.7-3.0 tones per hectare per harvest for Guatemala grass.

In Yen Bai, demonstrations took place in flat lands with drought problems and very poor soil quality, so grasses did not perform as in Lao Cai. However, grasses were also harvested 2 times and yields were estimated in 250-270 tones per hectare per year for VA-06 and 160-180 tones per hectare per year for Guatemala.

2.2. Test different cultivation, harvest and postharvest techniques in order to define the most appropriate for each target species

Different cultivation techniques for VA-06 and Guatemala were tested in both provinces in order to find the most suitable ones according to local conditions.

Fertilization regimes for tested grasses[1]

	At planting time	After each harvest
VA-06	- 10- 15 tons of organic fertilizers, - 150 - 200 kg kali sulphate, - 60 - 100 potassium sulphate, - 400 - 500 kg Urea.	- 25 - 30 kg NPK
Guatemala	- 10- 15 tons of organic fertilizers,	- 30 - 35 kg NPK.

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1 Amounts apply for 1ha of land, but this may vary according to soil quality

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2.3. Training of local staff and farmers in relevant techniques

A 4-day training session was organized in Lao Cai for 30 farmers belonging to the H'Mong ethnic group (trainings for Yen Bai are foreseen). The subjects of training modules included:

- Planting of grasses (class lesson and field practice)

- Plant management and harvest (class lesson and field practice)

- Processing of grasses and feeding cattle (class lesson and field practice)

2.4. Implementation of 2 demonstration models of environmentally sound grass production

Demonstrations models were established in the Nùng Khấu Nhin commune (Lào Cai province) and in the Phù Nham commune (Yên Bái province).

In Lao Cai, the implementation of grasses was highly appreciated, especially because in that province the raising of cows and buffaloes has considerably increased, and farmers call for support to grow grasses, as benefits in the short and medium terms were visible to them from the project's activities. In Yen Bai, although there is less need for grass (as not many farmers are raising cows and buffaloes), local authorities understand the need for this, as trends of cattle production show a considerable increase.

2.5. Organization of field visits for farmers, local staff and officers to evaluate the tests and models

Workshops for stakeholders allow discussion and exchange of ideas towards the scaling up and replication of the models in the region.