

Supporting the policy implementation for

**SUSTAINABLE CASSAVA DEVELOPMENT THROUGH INTENSIVE CULTIVATION
OF COMMUNITY - BASED CASSAVA CULTIVATING MODEL**

in Binh Dinh province





PROJECT TITLE

Supporting the policy implementation for sustainable cassava development through intensive cultivation of community - based cassava cultivating model, on possibly degraded land, due to cultivation conditions and the impact of climate change (drought, soil degradation) in Binh Dinh province.

PROJECT NUMBER

VNM/SGP/OP5/Y4/STAR/2014/05

IMPLEMENTING AGENCY

Binh Dinh Gardening Extension Association

DURATION

30 months (01/2015-6/2017)

01 | PROJECT RATIONALE

In Viet Nam, cassava is one of the four main cash crops – rice, maize, sweet potato and cassava. Previously, cassava was a self-consumption crop, which was cultivated in the small scale by swidden practice of ethnic minorities in mountainous and midland areas, the government had no planning and development policy. At the beginning of the 21st century, when cassava became a commodity crop, mostly for export and raw material for ethanol production, the area of cassava plantation had been rapidly growing, and became out of



control in many localities. The cassava plantation area increases fast but the cultivation method remains “extensive and monoculture farming” or even in several mountainous places the “shifting cultivation” resulted in degradation and no more cultivable areas, particularly in steep hills, many forested areas including the protection forest lost due to deforestation for cassava production.

Climate change makes drought and water shortage more severe and local farmers in Phu Cat and Tay Son districts, Binh Dinh province in the South Centre coast of Vietnam have shifted from water - demanding crops into other crops, including cassava and peanuts, especially in the areas with the difficult irrigation. For the areas converted to cassava, soil degradation is likely extremely high especially in extensive cassava instead of intensive cultivation due to lack of funds and proper technique.

SGP project in 2008 in Phu Cat district, Binh Dinh province successfully tested the community-based sustainable and effective cassava production on the basis of intensive and intercropping (cassava and peanut) cultivation. Based on that success, the provincial government has issued a policy to support the cassava sustainable development in Binh Dinh province.

However the farmers are not yet able to fully exploit the available advantages such as the use of manure from livestock, and agricultural residues, the peanut stems and leaves to improve soil, reduce a part of investment costs, as well as the use of intensive techniques to improve productivity and quality of crops or to maintain soil fertility.

The local farmers need capital support as well as capacity development through appropriate policy and mechanism, the economic efficiency would be very high, contributing to sustainable livelihood, adaptation to drought and land degradation,



which becomes more and more harshly, threatening the lives of people in the cassava farming areas who already have very low income and are vulnerable to the adverse effects of weather and natural disasters.

02 | PROJECT OBJECTIVE

Supporting the policy implementation for sustainable cassava development in two communes of Cat Hiep (Phu Cat district) and Binh Tan (Tay Son district), Binh Dinh province through the application of technical and management solutions in production planning/support of capital, input materials and product consumption.

03 | PROJECT LOCATION

Cat Hiep commune, Phu Cat district and Binh Tan commune, Tay Son district are semi-mountainous communes, suitable for the growth and development of many terrestrial crops such as cassava, bean, perennial and fruit trees. However, the land is relatively poor in nutrition.

This region frequently suffers storms and floods in the rainy season, causing damages to production and infrastructure; in the dry season, water shortage causes local droughts, heavily affecting the production and people's life. The people in the project area are poor, with few paddy fields, their living mainly depends on terrestrial and perennial crops. The farmers' income is mainly from agriculture. The poverty rate of Cat Hiep and Binh Tan communes is 16.2% and 11.3% respectively (2014)

04 | PROJECT IMPLEMENTATION

SGP project supported the cassava sustainable development in two districts of Binh Dinh province in early 2015. SGP project introduced four climate smart agriculture techniques including:

- Intercropping of cassava with peanut and cassava with black bean on hilly terrain along contour lines, and application of economical, spray irrigation technique by pipes with holes;
- Basal fertilizing for peanut and cassava with organic compost from coir;
- Fertilizing organic compost from coir by the top dressing method to increase yields and cassava starch content;
- Planting cassava double stems in the model of peanut-cassava intercropping on the hills.

The project also provided technical training including FFS, series of exchange for farmers to discuss and share the knowledge and experience. A revolving fund has been established and operated to provide financial support to local farmers at beginning of the crop and return after harvesting. Memorandum was also signed with local enterprise to provide fertilizer (mùn dừa) before crop and pay after harvesting. Local government contributed 20% in cash co-financing while and participating households contributed 30% in-kind of the project total budget.

05 | RESULTS AND SCALING UP



The project demonstration has been conducted in 35.5 hectares with the participation of 59 households. During 2015-2017, farmers participating in project have replicated the model by themselves to 1,360 hectares with 2,720 turn/households participated.

By 2017, the successful peanut-cassava intercropping model has been spreading 2,200 ha in Phu Cat district. The yield and profitability of the crops are shown in Table 1 below. The productivities were increased by nearly 12%.

After two years of this intercropping model on hilly and sandy soil, soil quality has been improved most of the nutrients parameters increased and the hilly soil was improved more than the sandy soil.

The hilly soil turns from sour into less sour (Binh Tan commune), the sandy soil changes from less sour to neutral (Cat Hiep commune), especially the easily soluble phosphate. In addition, soil quality was improved in term of soil texture, increasing humus content from poor to the medium level.

Crop	Productivity	Net profit	Increased percentage compared to the control sample	Increased percentage compared to the plan	Rate of return in the model	Rate of profit outside the model
	tonne/ha	VND million/ha	%	%	Time	Time
Cassava	27.14		10.4	8.6		
Peanut	3.77		10.5	37		
Peanut + Cassava		71.2	20.9	317	1.59	1.28
Black bean + Cassava		18.5	75.2 (cassava monoculture)	23.2	0.5	

Table 1: Productivity and net profit of crops in the intercropping model and monoculture

The peanut and cassava intercropping model has contributed to increasing the land cover by 50-80% over a period of 3-3.5 months. Normally, peanuts are damaged by many kinds of pests, but when cassava is intercropped with peanut, pests significantly reduced, and due to reasonable care the pests and diseases were limited thereby reducing pesticides compared to cultivation outside the model. In addition, watering for cassava was less because if crop rotation for peanut and cassava applied, it would be necessary to water the cassava in drought months (May-July), if there is insufficient water for cassava, it would die.

After harvesting peanut, its stems and leaves are used for composting and processing into food for cows. There are 4-6 tonnes of manure from cow fattening, this is the main fertilizer to re-fertilize the soil in the next crops. The peanut stems and leaves are also used to cover cassava roots to maintain soil moisture and return organic matters to soil. In general, after two years of the project implementation, the peanut and cassava intercropping models on sandy and hilly soils have produced the best effectiveness. The black bean and cassava intercropping model can be applied in the winter-spring crop for the water shortage areas and having less intensive investment or for hilly soil.

06 | PROJECT IMPACT

- **Environmental impacts:**

Soil degradation prevention and control: the project has used proper combination of lime, organic fertilizer from coir, manure, and inorganic fertilizer which result in increased humus content in the soil. Thanks to the application of integrated cultivation methods and incorporating grass bands, the washout and erosion were limited; proper fertilizer application has increased the humus quantity and effectiveness of manure use. Use intercropped crop residues to cover the soil or to feed cattle (to have more manure) and hence improve the nutrition parameter, water and air for the land, and ensure the sustainable production. Cassava can be planted in any kind of land, but if it is extensively cultivated, the soil is degraded rapidly (especially on sloping area and sandy soils). Thanks to intercropping peanut with cassava these problems have been fixed.

Reduction of carbon emissions: cassava and peanut intercropping or/and cassava and black bean intercropping techniques increase carbon stocks per unit of cultivated area.

Adaptation to climate change and ensuring sustainable livelihoods: The South Central Coast is vulnerable to drought and flooding due to climate change, so the peanut and cassava intercropping method is a measure to adaptation and ensure the local people's sustainable livelihoods.



- **Environmental impacts:**

Capacity building for the community and women through training courses and farmer field schools (FFS). The majority of participants in the model, in the training courses and FFS were poor, near-poor households, and poor women consisted of 41%. Farmers have

access to new technical advances, community projects, and loans, production planning for crops, spending plans, product marketing, market information, and production of safe agricultural products (VietGap).

Employment: The project also created jobs for farmers in the two communes involved in the project through planting and processing of cassava starch and peanut. The total labor-days in the project was 194,465, creating jobs for 748 rural laborers, with a labor-day value of USD 20-25/day.

Poverty reduction, livelihood improvement: Integrate the project development with poverty reduction and livelihoods creation programs for farmers. Getting more income, people have purchased means of production such as plows, pumps, pesticide sprayers, construction of relatively modern irrigation systems, etc. At the same time, it would be good to focus on intensive farming on the current cultivated area, develop valuable fruit trees, and develop forest plantation, increase livestock and poultry to increase fertilizer sources, and increase food and foodstuff for the society. Many households now have enough money for their children to go to colleges and universities, which was quite difficult in the past.

- ***Economic impacts:***

According to the data in Table 1 above, intercropping of cassava and peanuts got higher yields than cassava monoculture and peanut monoculture by 10.4% and 10.5%, respectively. The intercropping of peanut and cassava is the most effective, following by the black beans and cassava intercropping model, and the cassava monoculture is the least effective.

07 | SUSTAINABILITY

The local farmers now are aware of the need for sustainable and effective cassava cultivation and want to change their behavior. They had chances to directly discuss technical process, exchange ideas and experience, form a key farmers' group to facilitate the technology transfer and model implementation. Local farmers were trained on teamwork skills, they were more pro-active and able to spread the known technical advances in the form of training of trainers, and become the masters of technology.



- **Revolving Fund:** The project has successfully run a revolving fund (25% of project budget) (revolving two times (one cycle/year), about 70 households) solved the capital demand for production. The fund will be continue revolving to help the local farmers to boost production.
- **Market:** The market for cassava is very large, in eight provinces from Da Nang to Binh Thuan, each province has at least one cassava starch processing plant for exportation (only in Binh Dinh province, there are three plants in operation, Quang Ngai and Phu Yen have two plants/provinces), one ethanol plant in Dung Quat - Quang Ngai (under the Vietnam Oil and Gas Corporation) processing biodiesel. Peanut is an export product. To date, the prices of cassava and peanut have been stable and have brought about high economic efficiency; simple application techniques, high net profits, low adverse impacts on the environment, low investment level, ect.; all these characteristics are suitable for poor farmer households to replicate the models.
- **Supports of the local authorities and other stakeholders:** The province has issued the policies for the cassava sustainable development in Binh Dinh province and provided co financing for this project. Project technical documents have been adopted and disseminated through the agro-extension channel. In addition, the Binh Dinh cassava starch processing company for exportation is reviewing and supplementing a planning of raw material areas, adopting policies to encourage cassava plantation in the different crops, use new cassava varieties and has signed business contracts with cassava growers.

08 | REPLICABILITY

The provincial sustainable cassava development policy has come to effect and being implemented by localities in the province; the province has set targets to develop sustainable cassava development models by the districts in the annual agricultural extension plans.

In 2015-2017, the replication area of the peanut and cassava intercropping model is 2,200 ha. Moreover, the local government policy is to encourage intensive farming, not expansion of cassava area. The project intensive solutions are easily accepted by the local people for replication and scale up. Through piloting result in two communes, two districts, the project have been proven its social, economic and environmental impact and replicable to other communes and districts of Binh Dinh Province as well as other provinces with similar conditions in the South Central Coast.

09 | EXPERIENCES AND LESSONS LEARNT

The community trust and consensus are critical factors the project successful implementation and replication. Raising awareness and capacity development for the community are also very important factors. Once the community was engaged, consulted. Their opinions are heard and respected, then they will seriously implement the project activities, and they help each other overcome difficulties.

The strong link among four parties (farmers, local authorities, scientists and enterprises) is the driving force behind the projects success.

Cofinancing in cash of the local government was allocated to the project reflecting the provincial support and determination in the implementation of the cassava sustainable development policy.

The project concept and design suitable with the urgent requirements of the localities, and the selection of appropriate pilot areas contributed to the project successful implementation and great possibility of the replication. The close coordination of local technical staff with Farmer's Association chairpersons, village heads, village Women's Union chairpersons and key farmers helps the project smooth implementation and project high efficiency.

The success of the technical solutions applied in the project will be documented as lessons learned and shared with other projects in the field of land degradation prevention and control, or more suitable with projects in the field of climate smart agriculture, a field newly proposed in GEF 6 with the aims of both ensuring sustainable agriculture and climate change adaptation and mitigation.





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