

GLOBAL ENVIRONMENT FACILITY
SMALL GRANT PROGRAM IN VIETNAM
(UNDP – GEF CBA)

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Community-Based Adaptation Project (CBA)

Project title and number: Developing a community model in applying technologies to reduce vulnerabilities and to increase adaptive capacity in addressing drought and salt water intrusion issues in agro development at Ky Nam Commune, Ky Anh District, Ha Tinh Province (CBA/VN/SPA/08/002).

Name of proposing organisation: Ha Tinh Union of Science and Technology Associations

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Expected starting date: 1.10.2009

Expected ending date: 30.4.2012

Project budget:

Total project cost: 1.629.000.000 VND

Amount requested from CBA: 897,000,000 VND

Contributions from other sources: 732,000,000 VND

CBA Approval

Proposing organisation

Nguyen Thi Kim Anh

GEF SGP Coordinator

Nguyễn Xuân Thiều

PROPOSAL SUMMARY

1. Background information

1. Project title:

Developing a community model in applying technologies to reduce vulnerabilities and to increase adaptive capacity in addressing drought and salt water intrusion issues in agro development at Ky Nam Commune, Ky Anh District, Ha Tinh Province (CBA/VN/SPA/08/002).

2. Name of country: Vietnam

3. Project site:

Ky Nam Commune, Ky Anh District, Ha Tinh Province.

4. Proponent:

- Union of Science and Technology Associations of Ha Tinh province (NGO)
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- Proponent contact person: Ms Bui Thi Minh

Project objective

General objective: To contribute to reducing vulnerability and strengthening adaptive adaptability to droughts and salt water intrusion on agro development at Ky Nam commune, Ky Anh district, Ha Tinh province through application of advanced technology and scientific knowledge about varieties, methods of general cultivation, collection of rainwater for household use and sustainable land use methods.

Specific objectives

Objective 1. To promote the awareness and understanding of the local government authorities and the community on the impacts of climate change on every socio-economic activities and local living environment.

Objective 2. To build 2 models for applying scientific-technological advances so as to limit damages caused by droughts and salt water intrusion with 3 main solutions: i/ a shift to drought-resistant plants and species for households, with special emphasis on local varieties native to the region, ii/ collection and storage of rainwater for household; and iii/ protection of forest

Model 1: for the residents of low-lying seaside areas (problems to deal with are that of drought and salt water intrusion)

Model 2: for the residents of highlands near the foot of the mountains (problem to deal with is that of droughts)

Objective 3:

Distill lessons and experiences of the model, analyze and recommend to the local community.

5. Authorized Representative:

- Mr Nguyễn Xuân Thiều, Vice Chairman

6. Cooperating Organizations:

- People's Committee of Ky Nam commune
- People's Committee and relevant agencies of Ky Anh District
- Union of Science and Technology of Associations of Ky Anh district

7. Start-up Date: 1/10/2009

8. Project Period: 30 months, Oct 2009 – Apr 2012

9. Total Project Cost:

Total project cost: 1.629.000.000 VND

10. Amount requested: 897,000,000 VND

11. Brief Project Description

The project “Developing a community model in applying technologies to reduce vulnerabilities and to increase adaptive capacity in addressing drought and salt water intrusion issues in agro development at Ky Nam commune, Ky Anh district, Ha Tinh province” has the general objective to contribute to minimizing vulnerability and improving adaptability in order to reduce the impacts from droughts and salt water intrusion in agro development at Ky Nam Commune, Ky Anh District, Ha Tinh Province through application of advanced technology and scientific knowledge about varieties, methods of general cultivation, harvesting of rainwater for household and industry use and sustainable land use methods. The four specific objectives are i/To promote the awareness and understanding of the local government authorities and local people on the impacts of climate change on every socio-economic activities and local living environment. ii/To build a twin model for applying scientific-technological advances so as to limit damages caused by droughts and salt water intrusion; iii/: Draw lessons and experiences of the model, analyze and recommend to the local community. The project is implemented at two villages: Minh Quy (area near the foot of the mountains) and Minh Hue (a low-lying area near the sea) of Ky Nam commune, Ky Anh district is a district north of Ngang Pass, with a relatively high large gradient, main livelihood of the people is forest-agriculture. In particular, Ky Nam is considered one of the poorest communes of the district with proportion of poor households being 52.5%, despite high potential for ecotourism. The implementation of the project is consistent with the legitimate aspirations of the community and the objectives of socio-economic development of the People's Committee of Ky Anh district.

Main activities of the project include i/develop and implement an awareness-raising programme on the threats of climate change through community-level communication activities, ii/Design and implement 2 models for applying scientific-technological advances so as to limit damages caused by droughts and salt water intrusion with 3 main solutions: a shift to drought-resistant plants and species for households, with special emphasis on local varieties native to the region, harvesting and storage of surface water and rainwater for household and industry uses, communicate the measures to protect forests Establish rainwater-harvesting model at household level to address shortage of water supply for domestic and production use, iii/ Monitor and distil lessons learnt from the models, propagate the methods and expand to other localities

Tentative technological solutions: i/ a shift to drought-resistant plants and species for households, with special emphasis on local varieties native to the region, design and effectively manage drought-resistant plant diversity in the households ii/ construct tanks within in the household scale to collect rainwater for household use iii/ Propagate methods to conserve forests based the community

Project outcome : Training information and documents, warning propaganda about the impacts of climate change and introduce adaptive solutions, advanced technology constructed and propagated, 10- 12 training classes, education seminars organized for 500 participants, 2 conversion models to adapt to droughts and salt water intrusion are designed and tested, small tanks to collect and store rainwater for household use and the model for the shift in agricultural activities (projected 40-50 household beneficiaries). Famer groups of interest are founded and initiate activities, protective forests are better conserved.

1.0 RATIONALE

1.1 Ecosystem / community context

1.1.1 Community context

Ky Nam commune of Ky Anh district, Ha Tinh province is situated to the north of Ngang pass with coordinates between 17⁰57' and about 17⁰58' N, 106⁰30' to 106⁰32' E. Ky Nam commune is to the south of Ky Anh district, 25km from the district center of Co An, adjoining Ky Phuong commune to the north and the sea to the east. To the south and west is Quang Trach district (Quang Binh province). Among the famous relics and landscapes are Ngang Pass and the famous gate of Hoanh Son quan, 5 km to the north of Ngang Pass, crossed by National Highway No 1A close to Dao cape (also called Con Pass), an attractive tourist site with quite a few seafood specialties.

Topography: Ky Nam commune is located in a narrow valley of Hoanh Son range (a ramification of northern Truong Son range eating out into the East Sea) with a great declivity running from the mountain slopes to the seashore. All the three sides: north, west, and south are shielded by Dao Mountain at an average height of 300m above sea level, resulting in a distinct local climate.

The total natural area of the commune is 1842 ha, in which forest land occupies 771ha (productive forest: 112ha); farmland consisting of only 32ha of cultivation land, about 45ha of garden land for planting groundnut and other crops, and 100 ha of shrimp breeding area managed by Ha Noi-based Viet Anh Company.

The total population of the commune (2008 census) is 2192 (population growth rate in 2008: 2.3%) of 553 households, in which females make up 57%. The working group consists of 915 persons, accounting for 41.7 % of the population. The Kinh make up 100% of the commune's inhabitants.

Administrative structure: The 6 hamlets are also 6 residential hubs scattering in the commune. The commune center is located in the land of Minh Thanh hamlet. The distinct residential areas have been formed in terms of terrain: *the area by the mountain foot and in the mountain* (adjoining Hoanh Son mountain foot, from Con Pass to the cape of Ngang Pass adjoining the sea) consisting of the hamlets of Minh Tien, Minh Tan and Minh Qui with a population of 1113; *the coastal area* consisting of the hamlets of Minh Duc, Minh Thanh, and Minh Hue with a population of 1079. In this *coastal area*, the source of daily-use water is from rainwater in the rainy season and water from dug wells during the dry season. Due to recent droughts aggravated by the scorching sun, dug wells with a depth of 7-8m have run dry and the inhabitants have had to drill deep wells down to 18-25m in depth for water. Thanks to the "clean water program", there have now been more than 40 bored wells in low-lying areas of the commune. In the meanwhile, in the areas *by the mountain foot and in the mountain* as wells could not be made by boring into the rocky soil, there have been plenty of water during the rainy season, but in the dry season when the dug wells have run dry, there has been a serious shortage of daily-use water. The inhabitants in these areas have had to ask for water from people in low-lying areas.

The average income of the commune's inhabitants is about VND 3.0 million /capita/year (approx 168 USD). The commune's economy as well as living depends mainly on agricultural activities. Agricultural production aims chiefly at self-support, with planting rice and gardening with natural water as the main cultivation mode. The total cattle herd in 2007 was 872 heads and that of poultry was 6800 heads. Owing to the great declivity and narrow catchment, water storage in the soil proves to be poor. Ke Bo dam is the only water storage facility in the whole commune, serving agricultural production. Before 2004, this dam could supply adequate water to the commune's production all year round, but presently there is almost no water left in the dry season. In 2007, the total productivity of food of Ky Nam commune was 249 tons, with agro-forestry-fisheries accounting for 56.9%; industry-small crafts and construction 11.56%; trade – services 31.45%. In the area *round the mountain foot and in the mountain*, agricultural production prevails. In *the coastal area*, as Minh Duc is a hamlet located right at the seafont, the inhabitants' main occupations depend much on exploitation and aquaculture. Although the hamlets of Minh Thanh and Minh Tien are located to the east of National Highway No. 1A close to the coastal plains, the inhabitants' occupations are quite diverse: services, agricultural production and forestry. Another remarkable point is that as there is only 32ha of paddy fields in the commune, a great majority of the working population must make their way to industrial parks in Southern Vietnam seeking for jobs, much affecting agricultural production in Ky Nam commune. Every year, around 500 working people of the commune have to travel to the South to hire themselves out for a living and send money back home. Auxiliary occupations do not develop much in the commune, with 16 motorbike servicing households, and 5 households going out fishing with basket-boats along the river and seashore. Fourteen persons in the commune went abroad on labor export contracts.

1.1.2. Ecosystem context

Ky Nam commune in particular and Ha Tinh in general has relatively abundant and diverse natural vegetation. Ky Nam sub-region alone affected by extreme climate and varied topography, witnesses a distinct development of natural vegetation in comparison with other localities.

The upland area (bordering Hoanh Son mountain foot, stretching from Con Pass to Ngang Pass bordering the sea): forest resources are of tropical evergreen forest ecosystem with general features of diverse and abundant fauna and flora, with a number of precious and rare species of wood trees such as ironwood, red mahogany, dôi ????. However, these are unevenly distributed and badly destroyed in the 1980s of the previous century. At present, natural forests are now basically restored, but their quality has been degraded. The people have also planted forests on the areas assigned to them. Over 1000 ha of forest land is being returned by the Agricultural and Forest Products Joint-Stock Company to the People's Committee of Ky Nam commune for handing over to the public. Local household gardens are fairly large (300-1000m²) but in the present dry season, except for a number of fruit trees like bananas and custard apples, are left almost uncultivated due to droughts.

The structure of planted trees and raised animals is as follows: Short-term industrial trees such as groundnuts, beans and peas, sesame; Food and crop plants consisting of wet paddy, potatoes, cassava, Oriental basil...; fruit trees comprising longan, guava, tough custard apples,...; husbandry of cattle and poultry,... The inhabitants are now concentrating much on planting forests and other auxiliary crops. However, they are facing with such difficulties as a shortage of water for irrigation and daily use during the sunny months, while the crop productivity is quite low, there are not enough jobs for the public, and the high rate of poor families of approximately 60%. The measure of developing this locality in the near future is still focusing on developing household and forest gardens and improving the plant cultivars and the cattle breeds. Water sources must be accessible through the rainwater storage system or small currents running out of the streams in Hoanh Son range. In the remote future, once garden production has been stable, diverse, and highly productive, each household may supply eco-tourist services to the customers at the resort.

In the coastal areas of Ky Nam commune, there are mangroves abounding in seawater and brackish shrimp, crabs, and fishes. The planted crops consist of local rice, potatoes, bananas, casuarinas trees... yet at low productivity. The most pressing problem in the locality: the water and land are seriously salinized, there is a shortage of fresh water, suitable seedlings for production are lacking, and there are not many jobs for every person, resulting in lots of poor families.

In a setting where forest resources become more and more exhausted and the waters are too deep despite their proximity, the inhabitants – lacking in exploitation means – have been forced to seek jobs in other localities. Hence, agricultural production and garden crops have been unable to develop, failing to become the main source of the public's income. A shortage of principal managerial staff, a lack of care for plants and animals leading to the destruction by pests and insects and to poor reproduction and development, hence low productivity, all led to a decrease in production efficiency, impoverishing the households. It is due to these reasons that the rate of hunger and poverty in Ky Nam reached 52.5% -- the highest rate of the kind in the province.

1.2 Climate context

Characterized a special topographical terrain, located in a narrow valley with high declivity stretching from the side of Hoành Sơn mountain range to the sea, blocked by mountains to the North, West and South of the northern foot of Ngang Pass and adjoined by the sea to the East, the climate in Kỳ Nam has developed a micro-climatic regime featured by many types of harsh natural disasters: droughts, heavy rains, storms, floods and salinity intrusion... As there is no meteorological station in Kỳ Nam, we can make use meteorological data obtained at Kỳ An meteorological station, 25 km to the north of Kỳ Nam to describe the climatic characteristics of the project area.

1. Air temperatures:

- Mean temperatures through several years: 24.0°C
- Absolute lowest temperature: 6.9°C (December 14, 1975)
- Absolute highest temperature: 40.4°C (June 16, 1977)
- Mean temperatures in January through several years: 17.5°C (month with lowest mean temperature)
- Mean temperatures in July through several years: 29.8°C (month with highest mean temperature)

During high winter (December - February), there often appear many spells of north-easterly monsoons accompanied by prolonged hot and dry weather and cold frost. Especially in recent years, various spells of intense and harmful cold did not take place along a usual routine but protracted until even February, much lowering the temperatures down, sometimes below 7°C. Harmful cold accompanied with mist killed grass in grazing pastures – which had formerly been a rare phenomenon – causing much damage to local cultivation and husbandry.

Between April and August, the dry and hot south-westerly winds (normally called “*Lao winds*”) frequent the area with speeds up to the 6th and 7th on the Beaufort scale (11-17 m/s). In recent decades there frequently appeared prolonged hot and sunny spells with air temperatures reaching over 40°C. Formerly, the highest temperatures recorded in Kỵ Nam were normally 37-39°C, but these have now reached 40-41°C, even 42-43 °C in certain years. The temperatures of the ground surface during these periods were recorded at 69-70°C.

2. Droughts, rains and storms:

In recent years, the weather conditions have followed a more irregular pattern. The number of rains tend to drop but the quantity of rainfall get more and more intense. The mean annual rainfall varies between 2,600-3,000 mm, concentrating mainly in the three months of September, October and November. The rains can be divided into 3 periods, as shown in the annual rain process recorded at Kỵ Anh meteo-station.

- Between January and April: In January alone, the mean rainfall over several years reaches 130 mm, and only 72-87 mm in other months. In those years when dry and hot westerly winds appeared early – maybe in February – winter-spring droughts would take place.

- Between May and July, the mean monthly rainfall over several years reached 127 – 141 mm. There were days with heavy rains, at times reaching over 300mm/day. Yet, these were also periods when hot and fry westerly winds dominated, sometimes lasting 3-4 days, at times up to 10-15 days, with temperatures increasing quickly over 35°C and sometimes 40°C, the humidity falling below 55%, evaporation raising suddenly at a monthly total reaching 140-227 mm –which was greater than the total monthly rainfall (127 – 141 mm) – resulting in withering vegetation and dried-up ponds. Periodic

minimum rains or heavy rains could only help in reducing part of the drought intensity during the summer-autumn period – the typical drought period in the area. Summer-autumn droughts together with winter-spring droughts as stated above have introduced typical years of drought, such as the drought that lasted 4 consecutive years in 1991-1994 or the droughts in 1996, 1998..... Especially during the 2008 drought between April 14 and August 15 in Kỳ Nam, there was not a single rain. Many families dug down to 12 m for water in vain, while a previous digging of only 4 m could yield water.

- Between August and December, the mean monthly rainfall over several years reached 200 – 800 mm; especially during the period of September-November, most likely prone to rain, storm and whirlwinds, there were days with heavy rains of more than 400 mm of rainfall/days, and at times reaching up to 519mm/day(October 14, 1984). In each of the past 3 years, this locality found itself within storm eyes with wind speeds of 12 on Beaufort scale (over 32.7 m/s), causing great losses to agricultural production and aquaculture.

As shown earlier, due to being located in a special terrain, Kỳ Nam is affected by many kinds of alternated natural disasters, typically droughts, salinity intrusion, heavy rains, storms and floods causing multiple damage to the local economy, social affairs and living. Some of the consequences from the mentioned disasters can be described as follows:

* *Droughts and salinity intrusion:* To the side unaffected by the wind, the “fohn” effect brought about by south-westerly winds passing over Trường Sơn range has generated spells of prolonged hot and dry westerly winds with high temperatures and low humidity, increasing the harshness of the fast-developing droughts in Kỳ Nam and strongly affecting the eco-system in the area, the most remarkable phenomenon of which the prompt drying-out of daily-use water in high areas close to the mountains and shortage of daily-use water in lower coastal areas, due to the deep intrusion of saltwater into inland fields and residential areas. Seawater has been advancing very close to the rows of casuarinas trees that had been planted 20-30 m from the coastline, enabling salinity intruding deep into the mainland. While the droughts once lasted only 2-3 months, the duration has been presently up to 4-5 months, and even since 2004, the drought spells in Kỳ Nam have amounted to 6 months (from March until August). Former two-crop paddy fields can now only serve one crop with low productivity or with rice unable to be in ear. Data from communal authorities show that with an area of 32ha of winter-spring crop, the productivity could only reach 3,000kg/ha on the average, with a mere productivity of 96 tons, i.e. 73.2% with a drop of 35.2 tons compared with the 2006 crop. Prolonged droughts have also caused serious damages to orchard economy.

- The productivity of vegetables and secondary crops dropped by 20 – 30%;
- Fruit trees died off and shed their fruits, with a 50% decrease of the output and with low product quality.
- Grazing fields were scorched, resulting in a 1/3 decrease of livestock from the total herd.
- 2007: 1,000 m² of paddy field yielded 250 kg; 2008: the figure fell below 200 kg.
- 2007: 1,000 m² of groundnut yielded 70kg; 2008: the figure fell below 50 kg.

- 2007: 1,000 m² of cassava yielded 400 kg; 2008: the figure fell below 400 kg.
- Some of the crop cultivars have degraded such as custard apple and taro.

Droughts and land degradation have driven have seriously degraded the forest eco-system. Kỳ Nam once possessed a diverse resource of tropical forests abundant in fauna and flora. A number of precious wood trees such as *E. forfii*, *P. cochinchinensis*, *Delonix regia*, ... are unevenly distributed and were seriously destroyed in the 1980s. At present, natural forests have been basically restored, yet at a low quality due to arid and barren soil.

* *Heavy rains, land erosion and degradation:*

On the leeward side blown by the south-easterly winds from the sea in the rainy period, especially during the 3 months from September to November, Kỳ Nam has had to suffer from highly intense rains with rainfalls up to 500 mm/days. This high amount of concentrated rainfall together with high declivities in Kỳ Nam's terrain has resulted in strong erosion and washout. The land, already barren from droughts, has been washed out by big floods, leading to serious degradation. The trees and crops in the families' gardens and orchards have shown no signs of yields, such as the custard apple. This fruit formerly grew well in local soil and yielded good harvest, but in recent years the trees only blossomed without fruits, or yielded bad fruits dried up due to barren soil, shortage of nutrients, and droughts. In the meantime, strong green banana trees withered down the top when the dry season came.

Storms, floods, and heavy rains have caused quite serious damage to agricultural production and aquaculture, and decreased the quality of anti-salinity dykes. The area of salinized soil has been gradually increasing with each passing year, and so far nearly 10 ha of land has been salinized and desertified. The water in wells for daily use in lower areas has been salinized into brackish water, and the inhabitants have had to fetch water for their daily use in higher areas.

These disasters – droughts, heavy rains, flood storms, salinity intrusion and land degradation – have given rise to many kinds of diseases, and aggravated poverty and hunger among many households in the area, forcing many to leave their homeland for a living in many other localities.

1.3 Impact context

On the basis of the 21st-century scenario of the climate in Northern Central Vietnam, preliminary remarks could be made on some future changes in temperatures and rain as follows:

- *From Table 1 in Annex 1* we can notice, corresponding to all the scenarios of high, medium and low emissions, through the decades of the 21st century, the temperatures increase compared with 1990, at least in the last 5 decades. Most remarkably, during December-May, the temperatures rise very clearly, up to 4.12 – 4.19°C (high emission scenario), 2.75 – 2.81°C (medium emission scenario) and 2.12 – 2.27°C (low emission scenario) in the last decade of the century.

- *Rainfall (Table 2 in Annex 1)*, corresponding to all the emission scenarios through the decades of the 21st century, the amounts of rainfall during December-May drop compared with 1990, especially during December-February, to 11.8% (high emission scenario), 7.9% (medium emission scenario) and 5.8% (low emission scenario). Conversely, during June- November, the amounts of rainfall increase, especially during September-November, up to 18.8% (high emission scenario), 12.7% (medium emission scenario) and 9.3% (low emission scenario) in the last decade of the century.

From the above analysis, it is possible to put forward warnings that droughts and rainstorms causing soil erosion and landslides are all likely to increase in intensity and harshness.

- *Droughts and salinity intrusion*: In the future, at least in the last 5 decades of the 21st century, even in the medium emission scenario, the temperatures during March- May still rise by 1.81 – 2.81°C, showing the increased operation of hot and dry westerly winds leading to low air humidity and high rate evaporation, while rainfall drops by 1.3 - 2%. Natural droughts will take place in a harsher way and the drastic shortage of water will be more serious. Droughts combined with rising sea level will cause more serious intrusion of salinity into inner fields, and the shortage of water for daily use and production will be more threatening, and the area of land desertified by salinity will increase.
- *Heavy rains, soil erosion*: In all the emission scenarios, both temperatures and rainfall increase during June-November, especially during the last 5 decades of the 21st century. Even in the medium emission scenario, the rainfall during September-November – i.e. the period with the highest rainfall in Kỳ Nam most usually from the direct influence of storms and tropical depressions – increases between 8.4 and 12%, showing the possible increase of heavy rainstorms and more complex soil erosion and landslides.

Collected data on climate development as described and community consultancy have led to warnings that natural disasters in Kỳ Nam based on the climate scenario for Northern Central Vietnam in the 21st century as mentioned are much likely to take place.

During community consultancy, all elders with production experience all named Kỳ Nam “fire pan” owing to the presence of “Lao winds” and scorching sun. The temperature in Kỳ Nam would be over 40 °C while it is only 36-37°C in other areas, and the cold month of February would be immediately followed by hot and dry “Lao winds”. Before 2004 there seldom were droughts, rains were regular, and rice was produced from 2 crops/year with a productivity of 160-180 kg/1000m²; and now the droughts would last 5-7 months and the air temperatures are high, permitting only one winter-spring crop with low productivity: 50-80 kg/1000m². The cultivation and yields of plants, vegetables and secondary crops are now much less limited. Poor growth of grass presents much difficulty in breeding goat and cattle. Before 1990, there still was a clear-cut distinction among the 4 seasons (spring, summer, autumn, winter), and now the weather fails to reflect any distinct season. Formerly, there was not any shortage of water until March, but now the area has already run dry as early as January or February, and droughts render the winter-spring crop a fishy business. Water for daily use, once more than sufficient, has now got rare; groundwater becomes exhausted, and one can only reach well-water at a depth of at least 20 m. Contrary to common beliefs, dryness and droughts are not in fact a result of the loss of forests, as formerly water still abounded while there was only grass in the area, and water should be abundant now when trees have been planted all around. Kẽ BỔ reservoir

with a capacity of 1 million m³ has run dry since 2003. Formerly, the crop would begun when autumn started, but now rain is much anticipated when autumn begins, “Lao winds” still dominate until August, and most sweet potatoes are infested by weevil or form no bulbs due to the heat and drought. The scorching sun prolongs in such a way that during groundnut harvests, the ploughshares may be broken at times and moths barely survive. Droughts in Kỳ Anh are of the same trends as those in Northern Central Vietnam, but prove to be harsher due to the topographical terrain.

1.4 Project approach

The issue that needs to be addressed is that shortage of water supply and salinisation will be greatly exacerbated in the face of climate change at the project site, which would consequently affect agriculture production and people’s lives.

The project approach is to develop adaptive capacity of the community to mitigate these adverse effects through:

1. Enhancing knowledge and awareness about the importance of and the adaptive capacity of the community to climate change;
2. Testing and demonstrating technologies to strengthen the preservation and sustainable use of land, water and biodiversity resources in order to mitigate adverse effects of droughts and salinisation on agricultural production and people’s life.

In the development and implementation of the project models, the project will pay attention to the followings:

- Strengthening technical capacity of local people in agriculture production to build local adaptive capacity and ecosystems to cope better with the increasing droughts and salinisation as an impact of climate change
- Restructuring species composition of plantation, crops, farming techniques so as to adapt to droughts and salinisation. Pay attention to conservation and sustainable use of local plant resources, traditional knowledge of local community and people, and application of technologies in sustainable land management. Immediate and long-term impacts of climate change will be fully take into account in the design and implementation of the project models. The project models will be good experiments for suitable climate change adaptation models for the commune. The project aims to increase the efficiency in land use, income generation, job creation and food security and poverty for the local people.

A model for restructuring species composition of plantations in the household garden at Kỳ Nam so as to conserve and promote the use of local plant species and increase productivity/efficiency of use of land to reduce climate change associated risks (drought) in the project upland area

Rationale: Kỳ Nam has a big ares of household gardens (45 ha) which provide key income to the local farmers (very limited rice area)

Solution:

-development of a commune plan for using local plant resources aiming to (1) preventing land degradation in household gardens (2) providing direction for the commune in the development of household gardens (3) promote the effective use of barren land (4) applying technologies in selection

and producing seedlings, integrated pest management, rotation/inter-cropping (5) land use suitable to local ecosystem and local plant resources

Expected result:

- local plant species conserved and used through the on-farm conservation
- technical capacity of local people in conservation and sustainable use of local plant species enhanced
- 10-15 ha, 30-45 households benefited from the project, income increased by 15%

A model for restructuring rice varieties and crops in the degraded rice planting land at Ky Nam so as to reduce climate change associated risks (drought and salinisation) in the project coastal area

Rationale:

Testing some drought and salinity tolerant rice varieties and change rice crop to peanut, sesame and sweet potatoes

Solution: Test 3 rotating models at small scale so as to define the most suitable rotation model to apply widely in the commune: spring-crop rice, summer-autumn crop drought and salinity resistant rice; spring crop rice and autumn-winter crop drought resistant peanut tree; spring crop rice and summer autumn sweet potato; Khang Dan variety development and get the drought-resistant crops in experiment.

Expected results: 12 ha of rice paddies are developed as models for suitable drought-resistant varieties and rotating scheme. 1-2 drought-resistant peanut and 1-2 drought-resistant sweet potato crops are applied.

Build a rainwater storage tank to supply water for domestic use at Ky Nam Commune.

Rationale: Application of this technology will enable households to better manage their water reservoirs and save more water. The volume of water will be calculated as follows:

- Calculations:

Each person uses 60 litres of water/day by national standard (according to the National Strategies on domestic water supply by 2015). Calculations are needed for each 4-person household during the 6 months of the dry season:

- Thus each household will need: 60 litres x 4 persons x 6 months x 30 days = 43,200 litre = 43.2 m³.
- As a result, a water tank with volume 50m³ can be built for each household.

However, it should be noted that the 60 litre volume is the standard for a person's all domestic activities (eating, drinking, washing, cleaning and drainage). If the project is not able to afford such investment as described above, it is possible to reduce the volume of the water tanks by 50% or 25 m³, i.e. supply water for eating and drinking purpose only.

Adequate technology to be applied is to build a cement water tank. The tanks will be submerged or semi-submerged depending on the soil condition at the household.

Due to large precipitation (around 2,000mm), only house roofs need to be used as a catchment to harvest rainwater.

Expected results: The participating households will have sufficient water for domestic use during the dry season, and even sufficient water for garden watering if they can take advantage of the tank provided wisely. 30 households will be benefited from the project in this activity and have enough water to use in the dry season.

2.0 COMMUNITY OWNERSHIP

The project pays special attention to community ownership and participation in the project development, implementation, and monitoring and evaluation. During the project development, the local communities were consulted through community meetings and interviews on the issues of their concern and their understanding on climate change issues. This was very helpful as there is a lack of scientific information on climate change in the project area. The local communities were also encouraged to propose solutions to their problems and issues. Traditional knowledge of the local communities was discussed and used for project design.

In order to ensure full involvement and strong participation of the local communities during project implementation, and monitoring and evaluation, the project will pay attention to the followings.

- Full information on the project objectives, outcomes and outputs are made available through community meetings.
- Community have the opportunities to join in all project activities.
- Selection of participating households are made at the community meetings.
- Commitments participating in the project will be signed between the project management team and participating households.
- Traditional knowledge of the local communities is collected and used for project activities.
- Participatory methods are used in project monitoring and evaluation.

In order to promote project sustainability, the project will focus on the capacity building component for the local authorities and community. The commune plan on local plant resources provides a management plan toll for the commune authority. The results of the project models will be assessed and documented for wide distribution. Lessons learned will be drawn so as to further experiment on models on climate change adaptation. The project will cooperate with local relevant agencies in project model building and share information and experience to promote the replication of the models where and when appropriate. Based on the project experience and lessons learned, the project will put recommendations on policy issues to the local authorities so as to promote projects and activities in the area of climate change adaptation.

3.0 PROPONENT DESCRIPTION

3.1 Organization's background and capacity

General organization information:

- Union of Science and Technology Associations of Ha Tinh province (HUSTA)
- Mailing address: 103A Phan Dinh Phung, Ha Tinh Township, Ha Tinh province
- Email: hustaht@gmail.com, Tel: 039 3855786, Fax: 039 3857534
- Website: www.lienket4nha.vn

HUSTA is a socio-political organization, a rank of academia and science and technology expert team of Ha Tinh. There are currently 28 member science and technology associations: 11 member associations are science and technology associations at district level, 17 members. HUSTA has more than 10,000 staff members as a whole. The executive committee includes 8 officers: among which there is one Master of Economics, one Master of Sociology, one Master of Forestry, four university graduates and one polytechnic officer.

HUSTA Ha Tinh has been implementing the following projects: Project “Biodiversity conservation at the mountain ranges North Truong Son” within 3 communes Son Tay, Son Kim and Son Hong – Huong Son District - Ha Tinh Province”, sponsored by Denmark Government (completed); Project “Community-based prevention of land desertification and land improvement of the coastal sandy area” at Thach Dinh commune – Thach Ha district, Ha Tinh, funded by GEF SGP (completed); project “Conservation and development of the two medicinal plants Moc hoa trang and Xic dong nam at Phuc Trach commune – Huong district – Ha Tinh province”, funded by NTFP Project phase 2 (completed); project “Sustainable development on the degraded coastal sandy areas at Thach Van and Thach Dinh communes – Thach Ha district, Ha Tinh province”, funded by GEF SGP (on-going Jan 2007 – Dec 2009). Project “ Raising awareness and development community regulations to protect the coast of Thach Hai commune – Thach Ha district – Ha Tinh province, funded by SIDA (August 2007 – May 2008).

Primary financial source:

Operation of HUSTA Ha Tinh is financed by the provincial government, the central VUSTA, some national and international organizations and contributions from member associations via programmes and projects financed by DANIDA, GEF-SGP, ICCO, TEW, People ‘s Committee of Ha Tinh...with annual operation budget approximately 1 billion VND

Banking information – bank’s name and bank transfer information

- Account name: Union for Science and Technology Association of Ha Tinh
- Account holder: Mr Ngo Van Hong
- Account No. 020.100.0198.331, Vietcombank – Ha Tinh Branch, Phan Dinh Phung Street, Ha Tinh Township.

4.0 PROJECT DESCRIPTION

4.1. Objective, Outcomes, Planned Outputs:

General Objective: To reduce climate change vulnerabilities and enhance local capacity to address climate-driven drought and salt-water intrusion issues through applying technologies in agro production and sustainable use of agro biodiversity, land and water resources in Ky Nam Commune, Ky Anh District, Ha Tinh Province

Objective 1: Enhancing local adaptive capacity and awareness of community in climate change and its harmful effects on social-economic activities and environment at the local.

Outcome 1.2: Increasing the awareness and knowledge of related-partners about the impacts of climate change and adaptation measures

Output 1.1.1:

A project introduction leaflet (300 copies), 6 billboards of project model will be built and diffused to enhance awareness about impacts of climate change.

Output 1.1.2:

3 dialogue workshops on climate change and adaptation method organized for 150 people, targeting local commune and village leaders and local people of Ky Nam commune.

Output 1.1.3:

The content on impact of climate change and adaptation measures will be incorporated in the activities of mass organizations in Ky Nam commune.

Objective 2: Built two successful model applied agricultural technology to limit the harmful effects of drought and salt-water intrusion

Model 1: for communities living in the costal area (addressing drought and salinisation issues)

Model 2: for communities living in the upland area (addressing drought issues)

Outcome 2.1. Local capacity in management of agro biodiversity enhanced.

Output 2.1.1: a commune management plan of plant resources developed and approved, and used for agro forestry development

Output 2.1.2: Designs of the two models developed and approved for model building. Criteria for assessing these designs are as below.

- Comply with the result of the survey on plant resources and the commune management plan of the commune
- Ensuring that the selection of local plants/crops and cultivation methods contribute to:
- Conserve and promote the use of local plants and prevent land degradation
- Take into account immediate and long term impact of climate change associated issues of droughts and salt water intrusion
- Experiment so as to draw lessons learned
- Ensure food security, poverty alleviation and increase income by 15-20%
- Meet the local expectation and comply with local economic development
- Be feasible and replicable

Outcome 2.2.

Built two successful model applied agricultural technology to limit the harmful effects of drought and salt-water intrusion

Output 2.2.1:

Model in household gardens

- Plant to be selected include forestry plants, fruit trees, herbs, fodder plants, land-covered plants (based on the result of the survey on local plant resources)
- 30-45 participating households, 10-15ha land

Output 2.2.2:

Model in rice planting land (30-45 participating households, 10,000-15,000m² rice planting land):

- Restoring the rice variety of
- Testing 3 rotating formulas so as to select the most suitable in local conditions:
 - Spring – summer and summer – autumn drought and salt resistant rice varieties.
 - Spring – summer rice and autumn – winter drought resistant peanut
 - Spring – summer rice and summer – autumn balata.
- Autumn – winter peanut: 0.5ha* 2 years = 1ha.
- Spring – summer rice: Khang dan : 1ha*2 years* 1 vụ* 3 formulas = 6ha
- Summer – autumn drought resistant rice: CH2, CH20...0.2 ha*1 crop*2years= 0.4ha
- Sweet potatoes: 1ha*1 vụ*2 years= 2ha

Outcome 2.3

Model of rainwater harvesting successfully established.

Output 2.3.1

15 households assisted by the project in building their water-collecting and storing tanks with a capacity of about 25m³, sufficient for their daily activities during the dry season.

Output 2.3.2

2 training workshops organized for 100 participants on the following:

- Building the technical ability of operating the model of collecting, storing, and using water in an economical and efficient manner;
- Impacts of climate change on water resources and adaptation measures;

Outcome 2.4

Local capacity in preventing land degradation and minimising drought impact enhanced.

Output 2.4.1

8 training workshops organized for 400 participants on the following:

- Cultivation methods of drought and salinity resilient varieties and collecting, storing, and using water in an economical and efficient manner;
- Impacts of climate change on water and land resources and adaptation measures;

Output 2.4.2

- A farmer’s group of interest in climate change adaptation measures in agro production (using land and water sustainably) established with the participation of 10 – 15 households in the model to provide technical assistance and share experience in applying adaptation measures
- workshops and community meetings organized for model evaluation and experience sharing

Objective 3. Monitor and distil lessons learnt from the models, share the project results and make recommendations to the local government.

Outcome 3.1

Project technical documents on the project models compiled, approved and disseminated

Output 3.1.1

Technical documents on the project models compiled and disseminated.

Output 3.1.2

Reports on recommendations on policy issues in management of local plant resource, restructuring in agricultural production to strengthen local adaptive capacity in addressing droughts and salt water intrusion developed and approved.

4.4 Timetable (see Annex 2)

4.5 Risks and Barriers

Risk description	Estimated likelihood (degree)	Measures to overcome
Natural disasters (storms, droughts, flooding, ...)	medium	Pay attention to project workplanning Provide community with weather information and early warnings for prevention and preparedness
Technical issues, pests and diseases	Medium	Project experts and field workers conducting periodic site visits for technical assistance Training provides technical measures in addressing technical issues
Lack of active participation of	Medium	- Distributing information on the project in a

community and local farmers. Conflicts among local farmers due to the limited number of participating households		transparent way - Paying attention to local knowledge and traditions - paying attention to awareness raising on the project objectives and issues of climate change - Using participatory approaches in all project activities: Community making decision on selection of participating households. Using revolving loan programme
Local authorities are unacceptable to project recommendations on related issues	Medium	Recruitment of good experts and ensuring involvement and participation of local authorities in project key activities. Integrating project activities with relevant programmes/projects managed by local authorities. Frequently sharing and informing on the project activities and results.
Lack of strong cooperation between the project management team and expert group	Low	Design a subcontract which clearly identifies each part responsibilities and duties. Conduct regular meeting to review the implementation of the contract.
Delay in grant disbursement	low	Comply with CBA principles in project management and workplanning, budgeting and reporting

4.6 Monitoring and Evaluation Plan

Vulnerability Reduction Assessment Reporting Form	
Indicator 1	8,25
Indicator 2	5,60
Indicator 3	7,50
Indicator 4	7,85

Indicator 5	6,50
Indicator 6	7,20
Indicator 7	7
VRA Score	7,20

The Vulnerability Reduction Assessment (VRA) will be measured at the planning stage of the project, at the mid-point, and at the end of project. Given that the VRA is qualitative and is based on the community perceptions, the first VRA was conducted to establish a baseline during the Project planning phase. A second VRA will be done at mid project after all the project activities to build the model has been completed. A final VRA will be done at the end of the project to assess the overall impact of the project on the community adaptive capacity.

The VRA questions that will be used are as follows:-

1. Rate the impact of droughts, salinisation and land degradation on your livelihood
2. Rate your ability to cope with the negative impacts of droughts, salinisation and land degradation
3. Rate the impact on your livelihood if droughts, salinisation and land degradation doubles
4. Rate how effectively you would be able to cope with the doubling of droughts, salinisation and land degradation
5. Rate how effective you think this project will be in reducing your risks from increasing droughts, salinisation and land degradation.
6. Rate your confidence that the project will continue to reduce droughts, salinisation and land degradation risks after the project ends.
7. Rate your own ability to cope with increasing droughts, salinisation and land degradation and other climate changes after this project ends.

GLOBAL ENVIRONMENTAL BENEFITS (GEB):

The Impact Assessment System (IAS) indicator will be measured at the end of the project using the following components:

- (1) The number of hectares of land protected from degradation due to droughts and salinisation
- (2) The number of innovations developed/applied under the project
- (3) The number of policy recommendations proposed in disaster, land and ago biodiversity management

The targets for the above are as follows:

- (1) 15-17 hectares will be sustainable managed by the project
- (2) The project will apply 3 technologies (namely, drought and salinity resistant varieties cultivation, rainwater harvesting, conservation of local plant resources)

- (3) Three to four recommendation on policies in disaster, land and ago biodiversity management will be proposed to local authorities

UNDP ADAPTATION INDICATORS:

The project will contribute to the UNDP adaptation indicators adopted by the Viet Nam CBA country programme strategy, namely:

1. The number of measures that address the additional risks posed by climate change deployed as part of sustainable resource management activities;
2. Percentage of area concern in which climate change risk management activities, in the context of sustainable resource management are implemented; and
3. Number of local and national level policy recommendations proposed as a result of lessons from CBA projects

The targets for the UNDP Adaptation indicators are outlined below:

- (1) Three measures will be deployed as part of the activities for sustainable farming in the project area.
- (2) 30% percent of project area will be engaged in climate-resilient farming activities.
- (3) Three to four policy recommendations proposed as a result of lessons from the project.

4.7 Project Management

4.7.1 Management Structures

Ha Tinh Union of Science & Technology Associations receives CBA grant and is responsible for managing CBA resources to implement the project to achieve the objectives, outcomes and planned outputs described in the project document.

In order to manage the project, Ha Tinh Union of Science & Technology Associations form a management team, consisting of 6 members who are representatives of Ha Tinh Union of Science & Technology Associations and representatives of local governments, including Ky Anh District and Ky Nam Commune. The Project Management Team adopt a transparent and democratic approach in managing the project. Each member will be assigned to help the project management team leader in project implementation, monitoring and evaluation. Decision on the project issues will be made at the meetings of project management team. There will be monthly meeting and the team leader will convene ad hoc meetings in case needed.

The Project Management Team will be responsible for the followings.

- Develop project workplans and budgets
- Organize activities according to the approved workplans and budgets
- Monitor, evaluate, report on the project progress and use of resources for CBA and co-financers

- Draft and sign the contract with subcontractors with the expert group and providers
- Manage the project resources and raise other financial contribution
- Provide oversight to the sub-contractors and process payment
- Revise the project based on the results of project monitoring and evaluation
- Establish relations with local authorities and relating organizations to make good use of the supports and mobilize grant for the project.

The project's sub-contracts

The project will have 2 sub-contracts with (1) the provider of materials and equipments for model building; and (2) the expert group who will provide technical assistance to the project.

The Project Management Team will sign the sub-contracts with the company/individuals in Ha Tinh in supplying equipments and materials for the project activity on model building.

Another sub-contract is for technical assistance to the project activities. A group of technical experts who have expertise in the area of climate change, agroforestry and water resources will be recruited for the project implementation. The group of experts will be responsible for the followings.

- Developing project communications and training materials and conducting training workshops as trainers.
- Working as resource persons for project workshops.
- Conducting surveys/assessments/research.
- Providing technical assistance in the project model design and implementation. Provide technical assistance to the participating households during the operation of the models, collecting data and information for project monitoring and evaluation.
- Compiling technical documents and writing the technical reports.

4.7.2 Relationship and Responsibilities of Proponent and Project Partners

The project key partners include the local authorities, including the People's Committee of Ky Anh District and its relevant agencies, and of Ky Nam Commune, and the Ky Anh Union of Science and Technology Associations. The project will establish a working relationship with these partners to seek support and assistance in project implementation. Representatives from the People's Committee of Ky Anh District and of Ky Nam Commune will serve as members of the project management team. They have the responsibilities to provide the project with the information so as to ensure the project to be in line with local policies and action plans. They also assist the project team leader in making the link with the local government programmes and project of similar objectives such as the agro forestry extension and disaster programmes. They also help in seeking co-financing from local authorities and mobilize in-kind contribution from local relevant agencies for the understaking of project activities.

