

**PROMOTION OF INDIGENOUS KNOWLEDGE BASED
CLIMATE CHANGE RESILIENT AND ORGANIC FARMING
PRACTICES IN THE NORTHERN MOUNTAINOUS REGION OF
VIETNAM**

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ABOUT ADC

- ▶ Local Research and Development NGO
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- ▶ Tel/fax: 02803 851822
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- ▶ Established in 1991
- ▶ Working areas:
 - Livelihood and food security
 - Natural resource management
 - Climate change adaptation
 - Rights and voices for the poor and women



❖ Networking and partnership

- ▶ Chair of NorthNet- a network of 10 local NGOs working in the Northern mountainous region
- ▶ Core member of VNGO-FLEG T network (Forest law enforcement, governance and trade)
- ▶ Member of climate change working group (CCWG), ethnic minority working group (EMWG), and ALiSEA

ABOUT ADC

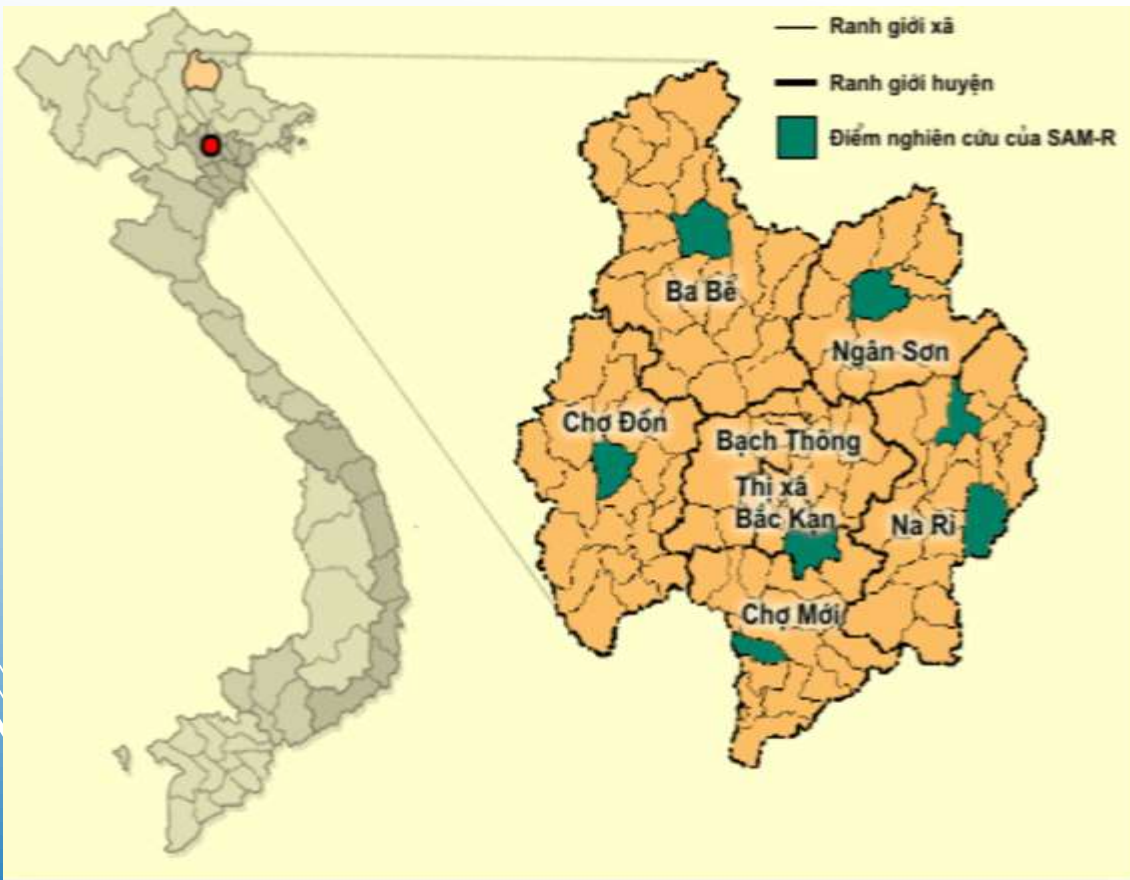
▶ ADC implemented more than **50 projects** related to ethnic minority (EM) people and agro-ecological transition

- Research
- Training
- Technology transfer



ALISEA PROJECT:

- ▶ **Title: Promotion of indigenous knowledge based climate change resilient and organic farming practices in the northern mountainous region of Vietnam**
- ▶ **Located in Cho Moi district, Back Kan Province**



PROJECT OBJECTIVES

- ▶ Enhance awareness, understanding, and the knowledge of indigenous based climate change resilient livelihoods and sustainable farming practices for local communities, and civil society organizations (NorthNet), local government staffs
- ▶ Promote the application of sustainable farming practices in the NorthNet's member organisations working provinces (Bac Kan, Yen Bai, Ha Giang, Phu Tho, Cao Bang and Hoa Binh...)

PROJECT ACTIVITIES



1. Consolidating the indigenous knowledge based climate change resilient and organic farming practices
2. Documenting farming practices for sharing (guideline, reports, handbook)
3. Organizing a sharing experience study tour for key farmers, CSOs, local government officials
4. Training workshop on scaling up the IK based agroecological practices
5. Supporting NorthNet members, local governments to scale up the practices
6. Writing final report (2 short “agroecological transition stories” & a brief narrative & financial report)

WHAT HAS BEEN ACHIEVED?

1. Completed the consolidation of models of the indigenous knowledge based climate change resilient and organic farming practices
2. Documentation: Handbook: Promoting indigenous knowledge and good agriculture practices in climate change adaptation; Micro-organic fertilizer composting techniques; sustainable banana cultivation techniques
3. A training workshop on scaling up the IK based agroecological practices and a sharing experience study tour for key farmers, CSOs, local government officials are organized
4. Supporting NorthNet members, local governments to scale up the practices has been implemented
5. Writing draft reports (2 short “agroecological transition stories” & a brief narrative & financial report)

WHAT HAS BEEN ACHIEVED?

Documentation: Handbook and technical guideline

PROMOTING INDIGENOUS KNOWLEDGE AND GOOD AGRICULTURAL PRACTICES IN CLIMATE CHANGE ADAPTATION

ADC, care, Australian Aid, ALISEA

MICRO-ORGANIC FERTILIZER COMPOSTING TECHNIQUES

ADC, care, Australian Aid, ALISEA

BENEFITS OF MICRO-ORGANIC FERTILIZER

- Using crop and forest byproducts, livestock waste to make compost. Reducing environmental pollution caused by untreated animal waste, smoke and dust from straw burning after harvesting.
- Using composted fertilizers with micro-ferment for catalysis to increase the beneficial microorganisms in the soil, promote the decomposition of organic matter and increase the humus content to make the soil porous.
- Limiting and eliminating some germs in livestock waste and crop residues. The products from crops fertilized by micro-organic fertilizer are clean, qualitative and safe for human health.

MICROBIAL PREPARATIONS

Microbial preparations contain one or more useful microorganisms, which are well selected. These microorganisms are capable of high activity and have no potential to harm plants and humans. These microorganisms can rapidly decompose organic matters supplying humus and nutrients to the soil.

STAGES OF IMPLEMENTATION

- 1. Location**
 - Selecting location
 - Preparing materials and tools
 - Composting steps
 - Checking and turning the compost pile
 - Collecting finished products
- 2. Materials**
 - Manure: 300-400kg/700kg composting materials
 - Materials for composting: agricultural byproducts, green manure plants, mushroom residue, sawdust, banana trunk
 - Microbial preparations: EMIC, Sankin, Trichoderma
 - Usage: use 2 Microbiological product packages/ 1 ton of composting materials
 - Canvas sheet for covering: use a 8-10m² canvas sheet for a ton of composting materials
- 3. Implementation steps**
 - Step 1:** Chop the waste into sections of 4 to 5 cm in length.
 - Step 2:** Mix 1-2 microbial preparation packages with 60-75 liters of water (divided into 4 parts).
 - Step 3:** Spread the materials into round pile of 3-4 feet wide, 1-1.5 centimeters high (1/4 the amount of waste).
 - Step 4:** Spread 1/4 of manure/buffalo dung on the material.
 - Step 5:** Use 1/4 of the amount of water mixed with probiotics, stable cleaning water and irrigate until reaching 60-70% moisture, continue with stepping on the heap.
 - Step 6:** Continue to spread the second layer up to 1-1.5 spans, and then continue the same steps as for the first layer.
 - Step 7:** When finished (about 4 layers), cover by the canvas and stomp up with surrounding soil or rocks to avoid the wind turning over the canvas sheet.
 - Step 8:** Dig a small drainage ditch around the composting area to avoid water run into the pile too much, killing microorganisms.
- 4. Checking and turning the compost pile**
 - Regularly monitor the temperature, humidity in the heap. Because after 3 to 5 days of composting the heap temperature will increase 40-50°C, therefore, every 15-20 days we should turn the heap 1 time (turning the heap from top to bottom, from inside to outside evenly). In the turning process, add water to reach the right humidity, if the compost is too dry.
- 5. Collecting end-products and using**
 - After 50-60 days, if the compost pile has cooled, became porous, no smell of manure, it can be used to fertilize the crops. It should be used immediately after 50-60 days of composting. Covering the canvas sheet to keep moisture and avoid stagnant water, if have not used yet.

SUSTAINABLE BANANA CULTIVATION TECHNIQUES

ADC, care, Australian Aid, ALISEA

- 1. PLANTING SEASON**
 - Spring season: planting in April- May
 - Fall season: planting in August- October
- 2. LAND PREPARATION**
 - Clean up the vegetation to limit pests and diseases
 - Planting hole size: 40 x 40 x 40cm (length x width x depth) to avoid the emergence of root on the ground
 - Digging holes depending on the soil type: dig small hole if the soil is rich type, dig big hole if the soil is poor type
 - Planting distance:
 - Space between rows: 3m
 - Space between the plants: 2.5m
 - Land slope: <math>< 40^\circ</math>
- 3. SUCKERS PREPARATION**
 - Select suckers without pests and diseases from disease-free mother plants
 - Suckers: Select seven suckers having around 4-5 leaves
 - Cut the top of the suckers to 40-50cm tall
 - Tissue culture plants: having 5-6 leaves
- 4. PLANTING**
 - Treat the bulb by dipping it in lime solution in 3-5 minutes
 - Place the sucker in the middle of the hole, cover the soil around the bulb (5cm)
- 5. CARE AND HARVESTING**
 - Fertilizer application

NEWLY PLANTED BANANA	PERENNIAL PLANTED BANANA
- Basal fertilizing: 350g of bio-organic fertilizer + 0.4kg phosphate/haole	- 3.5kg of micro-organic fertilizer + 0.6kg of bio-organic fertilizer
- First dressing after planting: 2-3 months	- Phosphate + 0.2kg of Nitrogen + 0.25kg of Potassium
- 5.2 kg of Nitrogen + 0.25 kg of Potassium for each tree	- Dissolve into 2 liter/1 year from March to April and from August to October.
 - Water: The amount should be compared with micro-organic fertilizer to increase its efficiency
 - De-suckling should be done early, keep only 2 suckers at different age of about 2-3 months
 - Remove the bisexual flowers
 - Remove weeds and old leaves 2-3 times a year
 - Harvesting when the banana reached maturity after 3.5-4 months (bananas must round the edge, the banana core is lemon yellow)
 - To harvest in the desired month, keeping the shoots 15 months from the time the shoots appear until the harvest of the chamber
- 6. INTERCROPPING**
 - In the first and second year, banana plants should be intercropped with legumes or with herbal plants such as ginger, Arisa strobilata, *Centrosema pectinatum*, etc. to increase soil cover, improve soil fertility, and soil moisture.
 - Intercropping principle: plant species non-plant each other without affecting main plants to ensure the sustainable development.

SOME TYPES OF PESTS AND DISEASES AND PREVENTIVE MEASURES

- 1. PANAMA**
 - It is caused by *Fusarium oxysporum*.
 - Symptoms: Color of leaves turns into yellow from edge to center, stems are easy to break, then the plant is dried from the top to the root and the disease will spread to other plants in the growing area.
 - Prevention: dig out the dumps having diseased-infected plants and burn them, then sprinkle the powdered lime on the stumps to treat and prevent the transmission of the disease (nematodes).
- 2. LEAF SPOT DISEASE**
 - It is caused by *Cercospora musae*.
 - Symptoms: Traces of the disease often run along the leaf edges, the gray spots are in straight lines parallel to the leaf veins.
 - Prevention: Regular clean up plantation, remove old and dry leaves. Apply more potassium.
- 3. BANANA BUNCHY TOP**
 - It is caused by Bunchy Top Virus.
 - Symptoms: Leaves of diseased banana plant are smaller, straight and tightly folded, short stems and dark green and striped nervures appear on the leaves.
 - Prevention: dig out the dumps having diseased-infected plants and burn them, then sprinkle the powdered lime on the stumps to treat and prevent the transmission of the disease (bug), do not use the suckers from the infected plantation.
- 4. ERIONOTA THRIX/ BANANA SKIPPER**
 - Characteristics: The mature banana skipper is brown in color, has 5-6 cm wide wings, 3 yellow spots in front wings; the young banana skipper eats leaf epidermis and then turn into tube cocoon.
 - Prevention: Use the net to catch adult banana skipper; plant with right density; Use biological insecticide made from neem and peach leaves.
 - Formula for making biological insecticide from neem and peach leaves:
 - Materials: chinaberry leaves, peach leaves, water, urine, EM products, soaking tools (bucket, pot with lid)
 - Mixing method: Take 8 kg of chinaberry leaves + 4 kg peach leaves cut into small pieces (for small) and soak in 12 liters of water. After 24 hours, pour 3 liters of urine into the mixture and soak for 7 days. After 7 days, decant and filter to take the liquid solution and use for spraying.
- 5. COSMOPOLITES SCHENKUS/ BANANA WEEVIL**
 - Characteristics: the banana Weevil damage both rhizome and pseudostem; the young banana Weevil hides in the rotten and old leaf sheath, the mature banana Weevil lays eggs in the banana root.
 - Prevention: Remove all rotten leaf sheaths and petioles, remain right density of the banana plantation; Use biological insecticides from neem and peach leaves or trap chili, garlic, or use traps to catch and kill the adult banana Weevil using sweet and sour baits.
 - Formula for making moth trap using sweet and sour bait: 4 portions of black sugar + 4 portions of vinegar + 1 portion of alcohol + 1 portion of water + 3% pesticide Paden.
 - Note: Only use chemical pesticides when the disease has reached epidemic proportions.

AGRICULTURE AND FORESTRY RESEARCH & DEVELOPMENT CENTER FOR MOUNTAINOUS REGION (ADC) | SUSTAINABLE BANANA CULTIVATION TECHNIQUES

The Stories of Change

Inspiring People Potential - Brightening the Future

A NEW DIRECTION FOR CLIMATE CHANGE ADAPTATION AND SUSTAINABLE DEVELOPMENT OF ETHNIC MINORITIES

Mai Lap and Thanh Van, two communes of Cho Moi district, Bac Kan province, have been suffering severe damages due to the impact of climate change. Many fields were abandoned to three crop seasons due to the lack of irrigation water, and upland areas were not capable of ensuring sufficient water for farming. The life was already hard for people living this area and now have become even harder due to the effects of climate change. In this context, the Agriculture and Forestry Research & Development Center for Mountainous Region (ADC), Thai Nguyen University of Agriculture and Forestry in collaboration with the local authorities of two communes, has conducted a study to find out the response measures to help stabilize local people's lives. And one of these measures, that can effectively solve water shortages, is the decision in restructuring crop production, shifting from planting maize to banana. This is a new direction for agriculture to better adapt to climate change and sustain life, which is laid out before us.



The banana plantation model in Thanh Van and Mai Lap communes, Cho Moi district, Bac Kan province.

THE STORY OF MRS. TONG THI VAN

At the highland commune, road transportation and farming conditions are extremely difficult. Therefore, to escape from hunger and poverty is not an easy matter. However, with determination and the spirit of learning, Mrs. Van has learned and enriched on that harsh land.

Mrs. Tong Thi Van, a 43-year-old Tay ethnic woman, living in Na Ray village, Thanh Van commune, Cho Moi district, Bac Kan province, shared openly about the process of overcoming various obstacles and difficulties, enriching her family's life, and developing economic status from climate change adaptation models in agricultural production on a piece of her family's arid homeland.

She was born into a poor farming family with many children in Na Ray village, Thanh Van commune, Cho Moi district, Bac Kan province. Having no conditions for schooling, after finishing secondary school, she had to drop out of school and stay home to toil and toil for helping her parents. At the age of 22, she got married and gave birth to three children. In 2009, unfortunately, her husband passed away after suffering a serious disease, leaving his wife and their children. Since that day, her family life was very difficult, strenuous, having only a makeshift house and 3 ha of land planting corn and cassava on steep hills. Total income of her family from farming, raising livestock was only about 7-10 million VND/year, subsequently, her families are still haunted by extreme hardships and poverty.

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The Stories of Change

Inspiring People Potential - Brightening the Future

A STORY OF A DAO WOMAN IN BAC KAN PROVINCE

Mrs. Tran Thi Kim Phuong and her family, as well as other families in Khuoi Dac village, Mai Lap commune, Cho Moi district, Bac Kan province, are Dao people who emigrated from other provinces (Lang Son and Cao Bang province) and immigrated to the place twenty years ago. Being born and bred in Cao Bang province, until Mrs. Phuong at her twenties, she married a man from Gia Lai who was a soldier garrisoned in her living area at the time. The couple later moved to his hometown in Gia Lai. Unfortunately, Mrs. Phuong's husband passed away in a traffic accident. She was forced to marry her husband's younger brother according to the customs in Gia Lai. On rejecting to follow such customs, she ran away from her husband's family in a stormy night to move to Khuoi Dac village, Mai Lap commune in 2000, accompanied by her two little children and one more to be born (her husband's family members have not yet known where she has moved to so far).



At initial time, Mrs. Phuong's family encountered lots of difficulties in the settlement and economic activities since they had no residential land and also farmland. She built a temporary shack on the cattle grazing area as it was a public and unused land and farthest from the residential area. She then took her mother from Cao Bang to live with her so that they could take care of each other. At the beginning, the villagers did not allow her to do any cultivation and farming activities in that land for the reason that the land belonged to their ancestors. Gradually, the villagers felt pity and sympathy for Mrs. Phuong's situation. She and her family have changed 3,000m² of waste land into maize cultivated area. This maize cultivation area brought her family the major income for a long time because they did not have any land suitable for wet rice cultivation. With a limited income source for a household of five members, and her three children were at schooling age, her mother was over 80 years old and could no longer work, she had to run about to other communes, districts or even to other provinces. Yet her family got stuck in the poverty trap.

According to the Sedentarization program in 2006-2007 period, her family was granted with land to build house and with the land use right certificate (Red Book) by the communal People's Committee. The land used to be the public grazing area surrounding her house was

planned and allocated to local people and her family was also allocated with more than 10 ha forest land. From 2010 to 2011, thanks to the support of project conducted by ADC, her family was granted the Red Book for the 10 ha forest land area.

Since the official issuance of land use right certificate, her family has concentrated on cultivation and production activities. She joined technical trainings for nursery garden, afforestation and she has planted more than 2 ha of *Manglietia conifera* Dandy. Until now the *Manglietia conifera* Dandy area is in preparation for harvest, promising to bring the significant income of around 100 to 200 million VND. Besides, she also joined some research and training courses on the role of indigenous knowledge (IK) and the impact of climate change on her life and the community. She understands the difficulties and challenges caused by climate change that she and her community are facing and will face in the area, especially to households having no flatter field land like her household. She is a pioneer in the protection of land in her community. In order to sustainably cultivate on sloping land, she applied the technique that

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WHAT HAS BEEN ACHIEVED?

A sharing experience study tour:



30 people (key farmers, CSOs, local government officials) were shared and learnt experiences in the field from local commune on models Banana intercrop with medicinal plant in sloping land; Micro-organism composting process; Green bean cultivation

WHAT HAS BEEN ACHIEVED?

A training workshop on scaling up the IK based agroecological practices :



- 25 participants from NorthNet network and local government were **enhanced their and understanding of IK based climate change resilient livelihoods and sustainable farming.**

WHAT HAS BEEN ACHIEVED?



A training workshop on scaling up the IK based agroecological practices :

- **Some case studies were shared and discussed to scale up:**
 - Banana intercrop with medicinal plant in sloping land
 - Green bean cultivation in inefficient rice land in spring season
 - Agroforestry model intercrop soybean, corn, and forest tree
 - Bee keeping model
- **Some organizations have plan to scale up the agriculture models using IK to adapt climate change**

WHAT HAS BEEN THE PROJECT ACHIEVED?

Supporting NorthNet members, local governments to scale up the practices



- **ADC has been supported Bac Kan CSC, DECEN, CCD, local people in Back Kan province to scale up the models of IK based climate change resilient livelihood and agriculture organic farming practices**

CHALLENGES

- **Limited in time (9 months) to support scaling up the model of IK based climate change resilient livelihood and agriculture organic farming practices**
- **Limited in budget to document more stories and practices**
- **The use of new varieties and chemical fertiliser supported by local authorities**

Long term strategy

- 1) ADC will participate in the workshops to disseminate using IK on climate change adaptation and good agriculture practices
- 2) ADC will find other resources to continue supporting farmer on using IK on climate change and good agriculture practices

HOW DO THIS INITIATIVE CONTRIBUTE TO THE AGRO-ECOLOGICAL TRANSITION AND KNOWLEDGE SHARING



- Supported the application of more sustainable farming practices for at least 200 households in Bac Kan province.
- The indigenous farming practices has been scaled up to other provinces
- The involvement of government officials will facilitate the adoption of these practices in the future.

THANK YOU VERY MUCH!