

PROMOTION OF INDIGENOUS KNOWLEDGE BASED CLIMATE CHANGE RESILIENT AND ORGANIC FARMING PRACTICES IN VIETNAM

Ho Ngoc Son, PhD

Deputy Director

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WHY CLIMATE CHANGE, INDIGENOUS KNOWLEDGE, AND AGROECOLOGY?

- ▶ Agroecology has been developed from traditional knowledge, accumulated from peasant farmers, to which it has been added the scientific knowledge
- ▶ On-farm innovations have seen farmers adapting to climate change through the use of food crop residues such as rice and maize husks to increase soil fertility.
- ▶ Farmers who practice agro-ecology draw upon their understanding of local ecologies and biodiversity in their cultivation methods
- ▶ By adapting smart agriculture, the mountain communities in Vietnam are drawing upon several traditional farming principles in modern day context



Promotion of indigenous knowledge based climate change resilient and organic farming practices in the northern mountainous region of Vietnam

- ▶ 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...)
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



PROJECT RESULTS

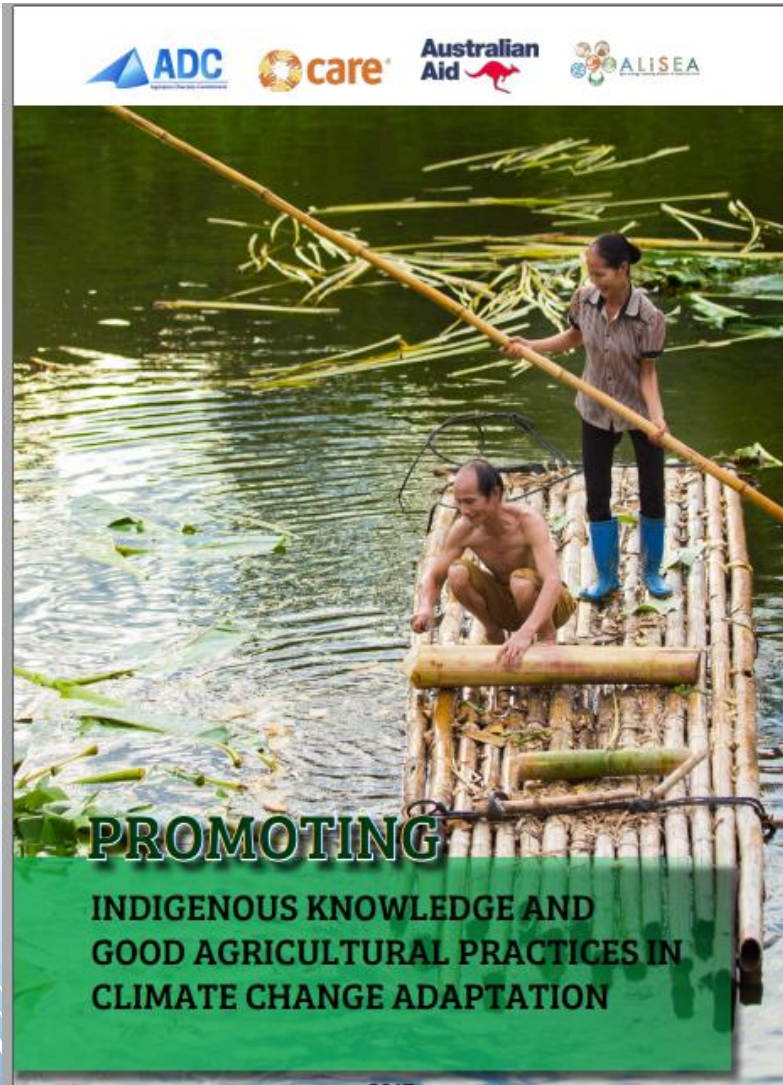


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USING LOCAL CROPS AND TRADITIONAL FARMING PRACTICES

- ▶ Many local crops identified as drought tolerant
- ▶ Suitable for use in different land use systems
- ▶ Training for local communities to make compost
- ▶ Water management practices: soil cover using rice straw, maize stems
- ▶ Contribute to increased crop productivity and reduced production cost in drought years





**PROMOTING
INDIGENOUS KNOWLEDGE AND
GOOD AGRICULTURAL PRACTICES IN
CLIMATE CHANGE ADAPTATION**

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MICRO-ORGANIC FERTILIZER COMPOSTING TECHNIQUES

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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 stove 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

Selecting location
Preparing materials and tools
Composting steps
Checking and turning the compost pile
Collecting finished products

1. Location

The composting area for 1 ton of raw material is around 3-4 m². The composting area should be even and flat, dry, having drain to avoid water flows into the compost pile. The compost pile can be made directly in the field, hill, stock, or the unused stable to use the roof.

2. Materials

Manure: 100-400kg/700kg composting materials
Materials for composting: agricultural byproducts, green manure plants, mushroom residue, sawdust, banana trunk

Microbial preparations: EMIC, Sumbi, 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 centermeters high. (1/4 the amount of waste).
- Step 4:** Spread 1/4 of manure/buffalo dung on the materials.
- Step 5:** Use 1/4 of the amount of water mixed with probiotics, stable cleaning water and irrigate until reaching 60-70% moisture, combine 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 check up with surrounding soil or rods 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 weekly). 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, become 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

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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 cm (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: $\leq 40^\circ$

3. SUCKERS PREPARATION

- Select suckers without pests and diseases from disease-free mother plants
- Suckers: Select second 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. CARING AND HARVESTING

Fertilizer application

NEWLY PLANTED BANANA	PERENNIAL PLANTED BANANA
<ul style="list-style-type: none"> Soil fertilizing: 3-5kg of bio-organic fertilizer + 0.4kg phosphorus/hole First dressing after planting: 2-3 months, 5.2 kg of Nitrogen + 0.2kg of Phosphorus Divide into 2 times/ year from March to April and from August to October. 	<ul style="list-style-type: none"> The total amount of fertilizer/dump/year: 3.5kg of micro-organic fertilizer + 0.4kg of Phosphate + 0.2kg of Nitrogen Divide into 2 times/ year from March to April and from August to October.

Note: Fertilizer 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 16 months from the time the shoots appear until the harvest of the chamber.

INTERCROPPING

- In the first and second year, banana plants should be intercropped with legumes or with herbal plants such as ginger, Ardisia alba, Syntherisma pentastachyum, etc. to increase soil cover improve, soil fertility, and soil moisture.
- Intercropping principle: plant species complement each other without affecting main plants to ensure the sustainable development.

SOME TYPES OF PESTS AND DISEASES AND PREVENTIVE MEASURES

- 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 clumps 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).
- 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.
- 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 clumps 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.
- EBRONOTA 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 nest.
 - 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)
 - Making 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.
- COSMOPOLITES SORDIDUS/ BANANA WEEVIL**
 - Characteristics: the banana weevil damage both rhizome and pseudostem; the young banana weevil hides in the rotten and old leave 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 from 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 + 1% pesticide Padan.
 - 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

Sharing experience and learning



30 people (key farmers, CSOs, local government officials) shared experiences and learnt in the field

A training workshop on scaling up the IK based CC practices



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

Supporting NorthNet members/NGOs, local governments to scale up the practices



- **ADC supported local NGOs, local people in Back Kan province to scale up the models of IK based climate change resilient livelihood and organic farming practices**

AGROECOLOGY AS A SOLUTION TO CLIMATE CHANGE

- ▶ Indigenous knowledge is part of agroecological practices
- ▶ Agroecology deals with both mitigation and adaptation
- ▶ Climate change demands a form of agriculture that is resilient; a system of food production that support local knowledge transfer and on farm experimentation through building adaptive capacity of farmers
- ▶ Organic production systems are low emission and more resilient than industrial systems in terms of withstanding environmental shocks and stresses



CAPACITY BUILDING FOR PEASANT FARMERS TO ADOPT AGROECOLOGY



THANK YOU VERY MUCH!

Ho Ngoc Son, PhD

Deputy Director

son.ho@adc.org.vn; hongocson@tuaf.edu.vn