

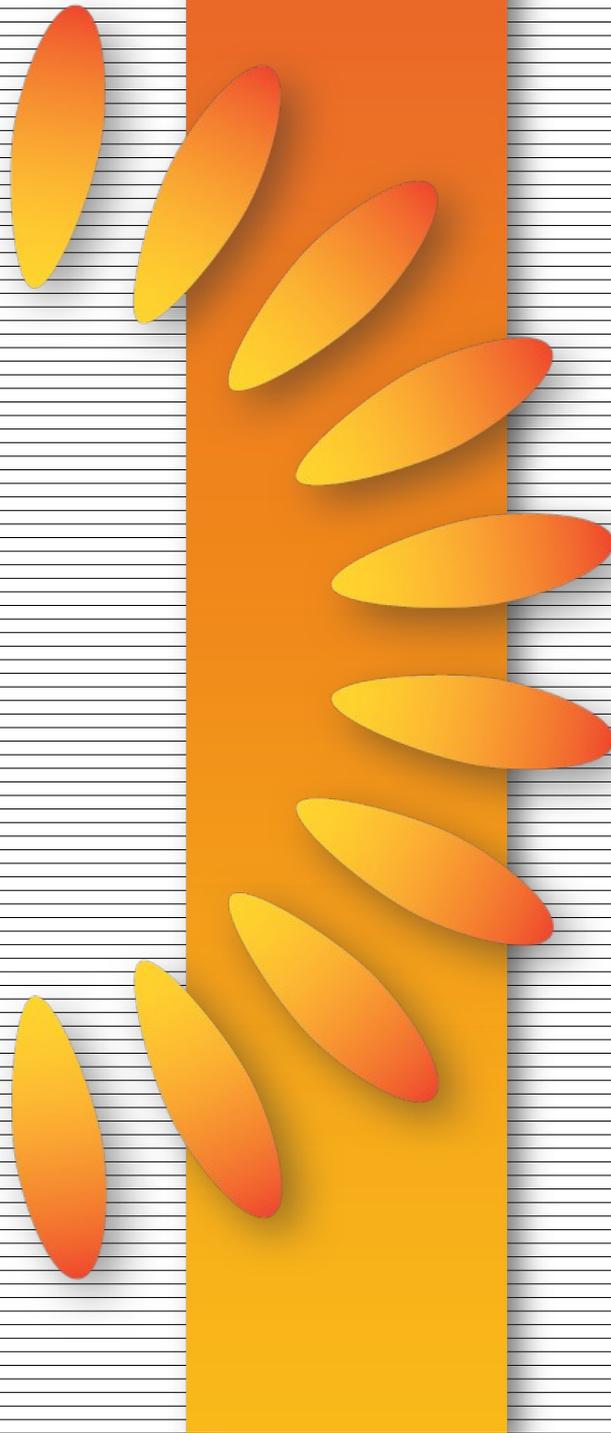
*CDWAI*

*Community  
Development  
Workers  
Association Inc.*

*Pangaspup  
Community, Lower  
Nebilyer LLG, with  
Dove Foundation,  
New Zealand*

*"Ecological  
Agriculture and  
Adaptation to  
Climate Change  
Workshop"*

*September  
2024*



*CDWAI  
PO Box 1032,  
Goroka EHP  
Papua New Guinea*

Funded by:	Dove Trust International- New Zealand
Implementing Agent:	Community Development Workers Association Inc– PNG
Beneficiaries:	Pungaspup village, Lower Nebilyer, Mt Hagen, WHP.

- 1) Venue: Pungaspup Village,
- 2) No. of Participants: 24 Adults & 9 Children
- 3) LLG/ Ward: Nebilyer Rural LLG, Ward 37
- 4) District: Tambul-Nebilyer
- 5) Province: Western Highlands Province, PNG.
- 6) Facilitators: David Kulimbao & Anna Kulimbao.
- 7) Date of Training: 01-04 September 2024

## INTRODUCTION

*Workshops are conducted with different groups of participants, mainly with the same topics and sessions. Of course, the main crops and people's experiences in each location are different so the discussions and points of interest change making each workshop unique, a stand-alone, as will be seen from the participants' course evaluation comments.*

David Kulimbao welcomed participants and opened the training with a word of Prayer.

David introduced the facilitators and named the CDWAI team members in PNG and Overseas.

He described CDWAI's vision and that the team the purpose and reasons of CDWAI inviting the people of Pangaspup to join in this workshop. He informed the trainees that the training will focus on 2 areas:

- Ecological Agriculture and  Adaptation to Climate Change.

The Workshop took 3 1/2 days:

Nebilyer is a rural sub-district in the Western Highlands Province of Papua New Guinea, located just outside Mt Hagen. It lies in the highlands region, known for its cool climate, fertile volcanic soil, and strong subsistence farming life style. Most people in Nebliyer live in villages and depend on agriculture for food and income.

The main crops grown in Nebliyer are; potatoes, taro, yam, corn, beans, cabbage, broccoli, pumpkin, banana and carrot. Potatoes and cabbage are the main cash crops sold at the roadside and in Mount Hagen Market.

Day 1 was about Food Security and Land Management

Day 2 was about what produces or makes Topsoil

Day 3 was about how to solve pest problems naturally

Day 4 was a half day Demonstration

## Day 1 – Discussion of Food Security and Land Management

All sessions are seminars or two-way communication in which facilitators ask questions and participants respond. The first question asked by the team was;

“What kind of foods do they grow in the Nebilyer?”

In response participants named all the food crops and cash crops they grew in the Nebilyer. Listed below are the names of the crops they grow.

Kaukau, local yams, vegetables (kumu), cassava (tapiok), bananas, pineapples, corn, beans and taro.

### Food Security

DK explained to the participants what food security is.

Food security refers to planning your gardens so that you manage to have food all year round.

Having food security is a condition in which people have access to sufficient, safe and nutritious food all the time. When you look after your food crops properly you'll always have enough food, a surplus to sell and also healthy seeds for future crops.

We asked the participants, “What problems do you face in your gardens?”

- a) When there are hot sunny days for a very long time?
- b) When it's raining day after day continually?

The feeds backs or responses from the participants are listed below;

Our garden crops yield poorly

We lose cash crop income

When it's dry all our food crops wilt and can die

Many types of pests eat our crops

We run out of seeds so there is a shortfall in our planting

### Land management

Our question was: “Do you know how to care for the land?”

Kiame James replied, “No; we don't know”

Anna Kulimbao explained to them what land management is.

She explained to them the importance of land management because it refers to how we look after our land to sustain it for future use. We can take action to reduce the effects of climate change. We can avoid land degradation from gardening for too long because population growth means land is short.

She spoke about ways to take care of the land and how people spoil land.

Dig your drains across the hill not down the slope

Block downhill drains with trash to slow down the water running fast

Heavy rain washes away topsoil when you keep putting your pigs on old gardens or land you are clearing for a new garden

Dig holes in the drains so that when rain is carrying away the soil the holes will trap the soil from being carried away

Plant trees and grasses. Their roots hold the soil together

Cover crops like cowpeas and forage peanuts protect soil when main crops are not growing

Cover the garden beds with green leaves when you plant. This is called mulching

Nowadays in dry season fires are dangerous, take care to keep them inside new garden areas.

## Day 2 – Discussion of Land Degradation and ways to make New Topsoil

DK asked the people about the layers in the soil of their land. The rich black layer underneath leaves and sticks is the topsoil. It is the most important soil layer for good yields of food.

David and Anna displayed the different local legumes that give organic material and nitrogen to the ground which makes more topsoil. Deep topsoil grows good crops.



### Land degradation

People cause their land to degrade by planting in the same garden over and over again for too many years instead of resting it by letting bush grow. Or they garden on very steep ground without mixing different plants to cover the soil like ginger, soya bean or tupaita between pineapples. Rain washes away the topsoil from pineapples planted on steep slopes. That is an example of an unsustainable farming practice that will degrade land quality and reduce productivity.

Growing the same crop repeatedly on the same land will lead to nutrient depletion in the soil. This practice, called intensive monoculture, makes the soil more susceptible to pests and diseases. Then people start to use expensive pesticides which will also kill the insects that help us by feeding on pests.

Population growth describes the increase in number of people living in a district or province cause by births exceeding deaths or people moving into the area. As population grows people start to find they are short of land for gardens because more land is needed for:

- Housing, settlements, health centres and schools

- Gardening for family and market food production

- Farmers may overuse the land to produce more food

The best way to stop land degradation by rebuilding fertility is to plant trees, to reafforest your land so that the trees can bring up nutrients from deep soil layers then their leaves become compost or fertilizer.

To escape from the problem of too many people, a population so large that land is short and spoiled by overuse and bad management, what can we do?

In WHP, in Enga, in EHP, in the Highlands, in PNG we need to talk more about family planning.

### How Topsoil is formed

We talked about topsoil explaining that it is formed by the natural processes of living organisms. Some of the main ways this happens are:

- Bacteria and fungi decompose dead plants and fallen leaves rotting it all down to compost
- We can't see bacteria but we can smell them at work
- We can see fungal threads in soil & fallen logs
- Bacteria and fungi are called micro-organisms because they are so small
- Dead animals too decay to soil organic matter by the bacteria and maggots (fly larvae) that eat the bodies
- Earthworms and insects mix soil and organic matter. That aerates the soil for plant roots to grow
- We can heap up leaves and plants we cut down to make compost for adding to garden beds
- Mulching, covering garden beds with leaves like Wild Sunflower and Crotonia, also builds topsoil
- By breaking down bodies, plants and leaves micro-organisms release nutrients into the soil

We encouraged them to plant legumes like beans, cowpea, tephrosia, stylo, clovers and desmodium their garden as they are very important for adding nitrogen to the soil. By covering and protecting the topsoil they can also help with erosion control, give shade for crops and feed to pigs, poultry or cattle.

These are all the ways you can use to improve your topsoil, without buying fertiliser. The family will eat healthy food and you can add to household income.

### Seed storage and testing

Anna explained how to store seed or young seedlings in safe conditions so that they remain healthy and viable before planting.



- ✓ Label seeds with their name and date of storage
- ✓ Seeds should be stored in a cool, dry and well – ventilated place
- ✓ Keep seeds in airtight containers or bags to protect them from moisture and pests
- ✓ That is how to protect them from direct sunlight, strong wind, pests and diseases.

To show the participants how to do a seed test Anna told them to bring their own seeds on the next day. A lot of their seed was infested with insects or fungus because they were not dried properly. They were still damp when stored.

She showed them how to test the seeds to tell whether they were already dry or still too fresh and moist to store. She put the seeds in a bottle and left it in the sun for 30 minutes. After that time if you see moisture droplets in the container, it means the seed is still moist not dried enough so you have to dry them out more.

### Day 3—Solving pest problems in your garden.

David asked the participants, "What do you do to kill the pests in your gardens?"

Darkmar one of the PNG Bible Church participants replied; "Taking ashes from the fire I throw them on to the leaves of my pumpkins. Nothing else apart from that".

**Did the ashes kill the looper caterpillar pests?**

Did DK ask this question? If he did write in Darkmar's (or Dakmar) answer?

Then Anna told them some others ways to kill insect pests.

- Spray soapy water on the infested plants
- Write DK's explanation of how to use tephrosia, crotolaria or tobacco leaves!
- Plant chillies, ginger, and marigolds between the plants in the garden beds
- Use sunflower leaves, Write DK's explanation for this!
- Spray salt mixed with water or spread fire ash Write DK's explanation for this!
- Feed the soil with compost and mulch, organic fertilizer and green manure



A Marigold Plant

What is organic fertiliser or green manure? Do participants really know these words?  
Ask DK to explain how to make compost with leaves from legumes and other plants

## Food preservation

David and Anna showed the participants some ways of preserving food to prevent damage like rotting, mould or spoilage by moth larvae.



Using local and African yams they showed them how to store yam flour for long periods, months or years. They also demonstrated making cassava flour by grating, squeezing out the liquid within the cassava, then drying it in the sun till it becomes powder.

Check that the flour is dry in the same way that you check whether seeds or fully dried! Then you can store it in jars or plastic containers.

## Day 4— session

### 4 Demonstration Day

On the last day of the workshop, David, Anna and Pastor James demonstrated some practices or techniques discussed over the last 3 days of training.;

#### Animal Manure

The first demonstration they did was about the worth of animal manure. They filled a bucket with pig manure from James Ambone's backyard. [They explained to the participants how important the manure it is because of all the nutrients that the pigs ate that have passed through their intestines. That is why manure can improve your soil, adding to the fertility of the gardens for the next few crops.](#) Not only pig manure but chicken manure, goat manure, cow manure and horse manure as well altho' pig, chicken (poultry) and cow manure are best.

#### Mulching

Mulching is the process of covering the soil surface of a garden bed with plant leaves and stems to protect the soil from sun and heavy rain and rotting down to improve the soil. Anna emphasised from her own garden experience at home in Goroka that during hot, dry periods she uses fallen tree leaves as mulch to cover the plants to keep moisture (water) in the soil. The leaves also slow down the rain, holding it from washing away so stopping erosion.

They showed how keeping the kaukau mounds wet with mulch can also prevent kaukau weevils infesting the tubers. Doing this in your garden will protect and feed the soil to keep it healthy.



Wild sunflower leaves make an excellent mulch or green manure.

### Drainage

In Pastor James and Kiame's backyard garden they demonstrated digging drains across the slope to slow down the flow of water after rain. Fast moving water cuts away the soil so that it quickly washes away. You can have one drain at the edge of the garden flowing downward at an angle. Put stones in that drain to slow the water down and trap soil at the bottom edge of the garden.



The Pangaspup participants are digging this drain on the contour across the slope of the garden. They will also put trash in the drain to slow down water flow.

## Legumes

David and Anna demonstrated to the participants planting legumes along the edges of garden beds and also planting seedlings of trees that they would like to use or enjoy but they are missing.

Here is a crotalaria bush. Like all legumes, also yar & mari mari trees, they add nitrogen to soil.



After the demonstration we closed our workshop at 12 noon due to the death of a local.

The people were very happy. They gave several gifts to the CDWAI team. There was one big banana bunch, K10 for the PMV fare to Hagen, from the women, and K80 contribution as a whole

In this last photograph we see that this pig, tethered in the same place day after day, week after week, has uncovered and turned over the soil while eating grubs, worms and the small roots of the coffee trees. Of course that damages the trees so that they bear a poor crop of small cherry. When there is heavy rain soil will be washed away. Eventually the roots of the coffee trees will sit above the ground! [Is this the pig's fault or the person who owns it?](#)

