CENTER FOR MICROENTERPRISE DEVELOPMENT

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Sustainable Climate-smart Agricultural Transformation

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THE WISE FARMER

Center For Microenteprise Development Ltd./GTE

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Written by
Center for Microenteprise Development

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This book is created by Center for Microenterprise Development Ltd/Gte. Center for Microenterprise Development Ltd/Gte is a company incorporated as a company limited by guarantee with its head office located in Gombe, Gombe State. Center for Microenterprise Development Ltd/Gte (CMD) has been delivering innovative services including digital extension, farm monitoring services, and value chain financing to farmers with the objective of increasing productivity, resilience and incomes of farmers.

Propcom+ is UK Aid's climate-resilient and agricultural market development programme aimed at supporting economic growth for smallholder farmers and small and medium enterprises in conflict and climate-affected regions in Nigeria. Propcom+ and CMD are collaborating to build the resilience and income of smallholder farmers through provision of climate-smart agricultural practices and digital extension services using satellite. Pest and disease monitoring is one of the services we offer under the digital extension advisory services.

Published by WiMo Publications

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Chapter 1

The Rain is Coming

The dry season had lasted long. The sun was hot, the wind dry, and the sky gave no sign of rain. Everyone in the village was waiting for the clouds to return, waiting to plant. The weather was harsh, dry and hot! Farmers are getting ready for the new planting season but the rains were yet to come.

Baba Dogo stood at the front of his gate, holding his hoe. He was 58 years old and had been farming since he was a boy. He had seen good and bad years. He knew one thing well; planting must be done at the right time. If you plant too early, the ground will be too dry. If you plant too late, the rain might stop before your crops are ready.

In past years, many farmers could predict when the rains would come! But recently, the rains did not follow the patterns that farmers were familiar with. Now the rains could come several weeks or even months after they are expected to come! Additionally, the rains could come and then there could be dry spells for weeks which are difficult for farmers to predict!

Baba Dogo's 19-year-old son, Usman, stood beside him. Usman was young and full of energy. He wanted to show that he was a very good farmer.
“I'm ready, Baba,” Usman said, adjusting his hoe. “The rain should come soon. Let's start preparing the land for planting.”

Baba Dogo looked at the clear sky thoughtfully. He knew the ground was still too dry and the rains unpredictable. It was late May but it had only rained once, two weeks ago. If they ploughed the field now and planted, they would waste their energy and lose their seeds.
“Usman”, said Baba Dogo, “we have to wait for the rains to be fully established before we plant.”

Just then, a group of people walked up to the big tree opposite Baba Dogo's house. Among them was Mallama Salamatu, a well-known Agric Extension Advisor. She had grown up in a farming family and had studied in the College of Agriculture. Salamatu had been advising farmers in the village. The farmers trusted her.

With her were two officers from Center for Microenterprise Development, Jummai and Hassan. They brought rolled-up charts and tools.

“Good evening, everyone,” Salamatu greeted them. “Permit me to introduce our guests who have come to speak to us about climate-smart agriculture. I have registered as one of their Volunteer Extension Agents to support farmers in our village. We are here to discuss about rain predictions, planting calendar, and predicting pest and diseases that may attack your farms. We want to help you get the maximum yield from your farms through Good Agronomic Practices (GAPs).”

Jummai opened a chart that showed the weather for the year and pointed to different parts of the map.

“The rain will come early in the south, around March or April. In the middle belt of the country, it'll start around April or May. But here in the north, we won't get good rain until June or early July. That's when it's safe to plant.”

The farmers nodded as she explained. She spoke about the importance of understanding soil moisture, the ideal temperatures for planting, and how to make the most of the short growing season in their region.

She explained that it is important to wait until the soil has enough moisture to support the seeds before digging. She informed them that the Nigerian Meteorological Agency (NiMet) has released the Seasonal Calendar for 2025 which stated that the rains will come late in 2025 and there will be a dry spell of three weeks.

Hassan explained “if you plant with the first rains, the seeds will germinate and start growing, but the young plan will not be able to survive the predicted three weeks dry spell!

Baba Dogo asked, “So we wait for the predicted planting date?”
“Yes,” Salamatu smiled. “If you plant too early, the planted seeds or new plants will dry up. We need three small rains—each with enough water—to make the soil ready.”

The crowd nodded, Usman leaned over to his father and whispered, “But if we wait too long, won't we miss the market season?”

Baba Dogo placed a hand on his shoulder. “Son, farming is not just about speed – it's about doing it right.”
Nearby, Malam Sani, a competitive farmer known for rushing things, mumbled, “Waiting is for slow people.” Some heads turned, but everyone ignored him.
“While we wait,” Hajia said, “clear your land, remove weeds, dig trenches, and get your tools ready. When the time comes, you'll be ready.”

Chapter 2

When the Rains Lied

The rain had come like a promise, and left like a lie! For two days, rain fell on the village. The ground became wet, and many farmers became excited. Malam Sani wasted no time. He called his workers, quickly ploughed his field, and planted maize. He was proud to be the first!

But the rains never came again, and there was no rain for seventeen days. The ground had started to crack. The farm did not show any evidence that anything had been planted on the farm.

“This sun is wicked,” Malam Sani said, walking through his dry dusty farm. “These seeds were strong. Maybe my soil is the problem.”

But in his heart, he knew it wasn't the soil. He had been unwise by not listening to the predictions about the rains and when to plant.

Not far away, under Baba Dogo's mango tree, Hajia Salamatu was sipping cold kunu. With her was Jummai and Hassan the Climate Smart Agronomist from Center for Microenterprise Development.

Baba Dogo offered them stools to sit on.

“Usman is at the back,” Baba Dogo said. “Still angry that I didn't let him plant.”
Salamatu smiled. “Let him come and listen. This is the best time to learn.”
Usman soon came, dragging his hoe. Sweat ran down his face.
“You called, Baba?” he asked, looking at Salamatu''s folder.

“Yes,” Baba Dogo said. “You always want to start fast. Today, you'll learn why it's important to wait.”

Talatu stepped forward. “I want to show you something, Usman.”
He looked at her. “What can your phone tell me that I can't see?”
She knelt beside the soil and opened an app on her phone.

“This app checks soil moisture,” she explained. “It tells us if the ground is ready to hold seeds or if it's still too dry underneath.”
She pushed a soil thermometer into the ground and waited. A few seconds later, a reading popped up on her phone.

“It's still dry inside,” she said. “Rain fell, but it didn't go deep. That's why seeds will suffer.”
Usman raised his eyebrows. “But the ground looks wet.”

“That's the trick,” Hajia added. “The first rain is a warning, not a signal to plant.”
Baba Dogo nodded. “We used to watch the movement of the clouds. Now we must read the

land too."
They all walked to the small patch of land near the house. Hajia picked up some soil and squeezed it. "Feel this. If it breaks too fast, there's no water. If it sticks, the soil is good."

The neighbours had started to gather, drawn by the sight of Hajia and the quiet wonder of a young girl testing soil with her phone. Among them was Maryam, a strong-looking woman.

"This girl is sharp," she said, smiling at Talatu. "Maybe you should teach our women's group how to use that phone."
"I'd love to," Talatu replied, smiling.

Just then, Danlami and Jummai arrived on a bike, bringing seed samples. Danlami whispered to Baba Dogo, "CMD says – wait one more week."

"NiMET predictions indicate that the real onset of the raining seasons will start in one week's time. This is also confirmed by our partner Ignitia that provides farmers with weather predictions."

Baba Dogo turned to Usman. "You hear that?"
Usman nodded. "Yes, Baba." Usman looked at the cracked field in the distance, where Malam Sani's maize field lied empty. Mallam Sani's effort was wasted!

Salamatu gathered everyone closer. "There's no shame in waiting. Waiting is wisdom. The season doesn't begin when the first drop of rain falls—it begins when the soil is ready to hold it."

"Let's use this week," Salamatu continued, "to prepare better. That way, when the rain really comes, we won't be rushing."
Everyone agreed.

Baba Dogo placed a hand on Usman's shoulder. “Farming is no longer just hands and hoes. Now, it is also brains and data.”

Usman smiled, finally understanding. “Then it's time I start using both.”
As the villagers returned to their compounds, one thing became clear: this year, they would not just follow the weather. They would understand it.

Chapter 3

Choosing the Right Seeds

The sun had just come up. In Baba Dogo's compound, the smell of wet soil filled the air. The early rains had made the ground soft.

Talatu was washing plates when she heard a knock at the gate. She wiped her hands and rushed to open it.

“Hajia Salamatu, welcome!” Talatu smiled. “My mother is inside. Please come in.”
Salamatu entered, carrying a small bag and wearing her blue scarf neatly. Inside the bag were seed samples and colorful papers from CMD. Talatu's mother laid a mat under the tree, and soon other women came with babies on their backs. The smell of hot porridge filled the air.

Under the mango tree outside, Baba Dogo, Usman, and other farmers gathered. Jummai and Danlami from CMD greeted them with smiles.

Back in the yard, Hajia began. “Today, we'll talk about how to choose good seeds. It's not only about planting, but planting seeds that will grow well and give you more harvest.”
She held up two seed bags. “This is the local maize you know. And this one,” she said, showing branded seed bag, “is improved maize seed known as Sammaz 15 that matures in 90 to 110 days.

The predictions for 2025 indicate that the rains will not last very long so Sammaz 15 will help you get a good harvest for 2025."

Talatu nodded. "My mum still uses the local one. But last year I tried the CMD maize in our backyard. The corn was bigger and stronger."

The women looked at her, surprised.
"I also learn from the CMD WhatsApp group," Talatu added. "Even rice and soya beans are available."

"You're right," Hajia said. "Good seeds save time, need less fertilizer, and can fight pests better."

Talatu's mother asked, "How do we prepare the seeds?"
"Before planting, soak them in Albit Organic Fertilizer as pre-treatment for the relevant number of hours. For example, maize should be soaked for 24 hours."

Meanwhile, under the mango tree, Jummai and Danlami gave the men planting charts to guide them.

"Spacing is key," Jummai said. "Maize should be planted 75cm between rows, and 25cm between plants. Don't crowd your crops."

Usman raised a hand. "Can I use a rope to measure?"
"Yes!" Jummai replied. "A marked rope works fine. You can also make a spacing stick. Accuracy matters. With the right spacing, your crops won't fight for sun and nutrients."


Sammaz 15 Maize
(Drought Resistant,
Early Maturing)
Faro 44
Paddy Rice
TGX 1951
Soya Beans
Groundnut
Seeds

Usman took out a string he had measured earlier using the chart Hajia gave him. “I've marked it already—see? This is for maize spacing.”

Baba Dogo smiled. “The young man is learning fast.” “Yes,” said Danlami, smiling. “And it's good that you're working together— young minds and old wisdom.”

Meanwhile, across the courtyard, Malam Sani walked up to Hajia, looking sad. “I made a mistake,” he said. “I planted too early and lost everything. Can I try again?”

Hajia nodded kindly. “Yes. You can plant soybeans. They grow fast. Use the improved variety —TGX 1951— and follow the planting guide.”

Danlami added, “We'll help you. Let's check your soil, add compost, and plant again.” Malam Sani sighed in relief. “Thank you. This time, I will not rush.”

Back in the courtyard, Hajia opened a small plastic container. Inside were local and improved rice and soya bean seeds. She passed them around, so the women could touch them, and feel the difference.

“The improved rice matures faster and uses less water,” she explained. “The soya bean variety grows well in sandy soil and doesn't need too much fertilizer.”
“What about weeds?” someone asked.

“Good question,” Hajia said.
“Use dry grass to cover the soil. It stops weeds and keeps the ground cool,” Salamatu replied.

“And if pests come?” another asked.
“We will talk about it in our future discussion,” Hajia said. She looked thoughtfully at Talatu who was eagerly listening, and smiled. “Talatu, I hope you'll study agriculture one day.”

“I will, God willing,” Talatu replied softly.

“Good seeds, Proper spacing, Healthy soil and teamwork. These are your tools now,” said Salamatu before leaving.

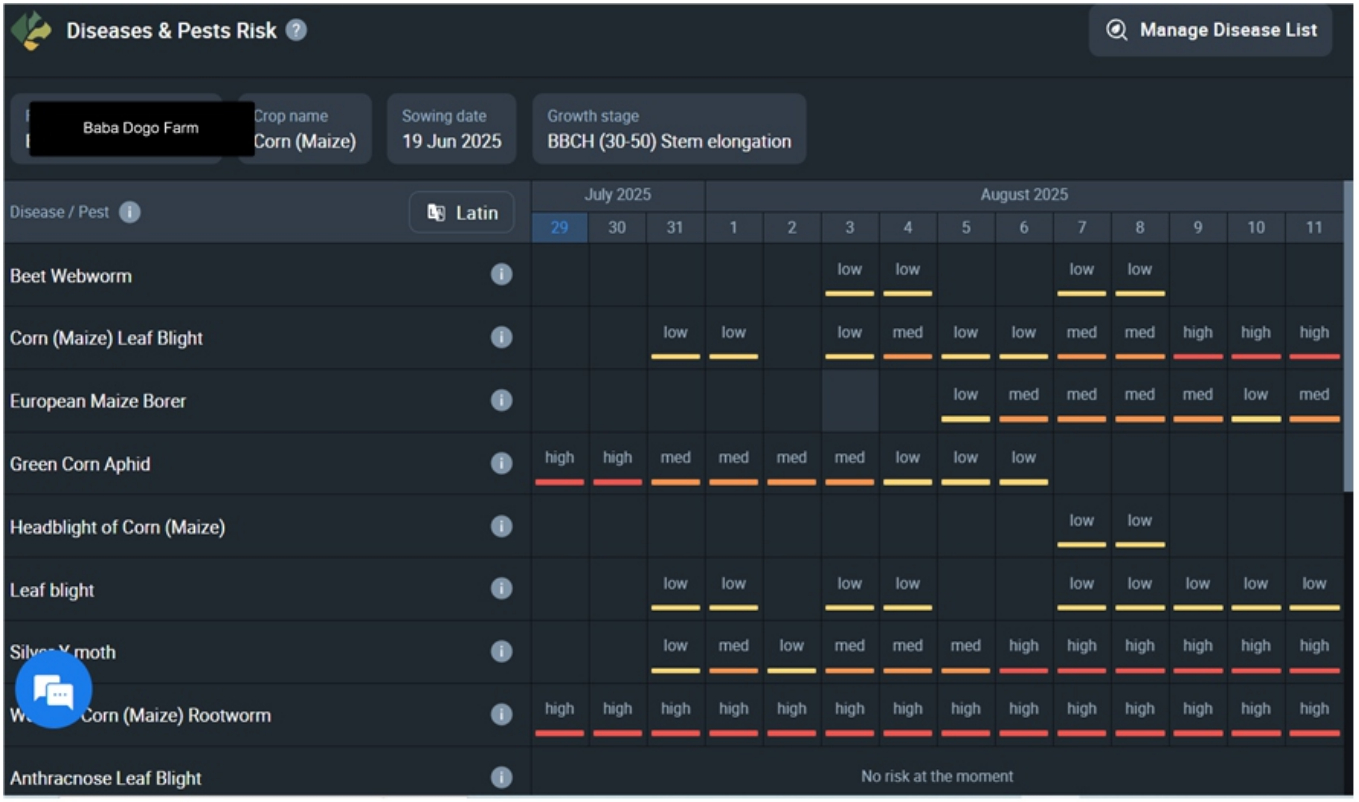
Chapter 4

Fighting Pests and Weeds

The sun had just risen when Usman came out of the house, rubbing his eyes. He turned and saw Hajia Salamatu coming with her bag and notebook. “I need to speak to your father urgently” she told Usman. “Please call him for me.”

“Earth Observation Satellite (EOS) predictions from CMD shows that your maize farm has two pest risks” said Salamatu to Baba Dogo. Salamatu showed him the image from EOS:

“The first one is green corn aphids, they eat maize leaves. Green corn aphids use piercing-sucking mouthparts to extract sap from plants, which can lead to wilting, curling, and yellowing of leaves…”



Disease and Pest Predictions

"In heavily infested fields, corn leaf aphids can cause significant yield losses, especially in warmer climates," Salamatu explained.

"The second risk is Maize Rootworm," She added. Larvae feed on corn roots, causing significant damage and potentially leading to lodging. Mature root worm beetles emerge from the soil, feeding on silks and potentially interfering with pollination.

Usman looked perplexed. "But I cannot see any of these pests that you have mentioned," said Usman.

“Yes, it is true. The satellite can see what you are not yet able to see with your naked eyes” answered Salamatu.

“So, what should we do?”
“Neem,” Salamatu said. “It fights pests, but is safe for the soil and good insects.”
Usman frowned. “I thought chemicals were better?”

“They are,” Hajia replied. “But they can also kill helpful insects like bees, and they stay in the soil for years. Your children may eat from this land one day. Wouldn't you want it to stay clean?”

Usman nodded, “Show me how to make the neem.”
“Boil neem leaves, let the water cool, and then spray it on the plants. It kills bad insects but saves the good ones.”

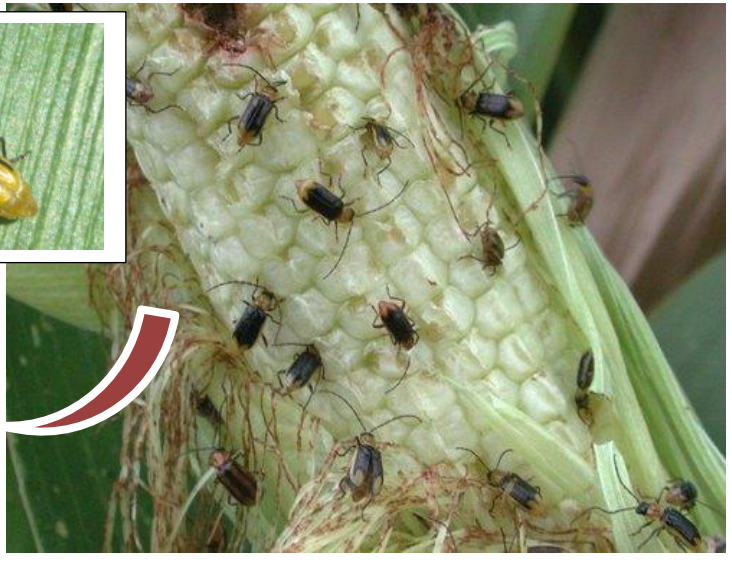
“Pests also have natural enemies, for example Green the natural enemies of corn aphids include ladybugs, lacewings, and certain parasitic wasps, which can help control their population,” added Salamatu.

Musa whose farm is adjacent to Dogo's farm had been watching and listening but he stated “I do not believe this; the farm of Dogo is doing very well. The pests are not visible.” He secretly decided that there was no need to waste effort and money to treat imaginary pests!

Dogo acted according to the instructions of Salamatu.
Two week after the visit of Salamatu , Musa rushed to the house of Baba Dogo who was under the tree. He was trembling. His farm had been overtaken by pests. The maize leaves were full of holes, and some plants looked sick.

Some of the maize plants had been damaged from the roots and they had fallen to the ground.

Green Corn Aphid



Maize Rootworm

Later, farmers gathered under the big tree. Hajia showed them how to use mulch (dry grass) to stop weeds, how to plant different crops together to confuse pests, and how to use bitter leaf and garlic to chase insects.

“What if we used chemicals before?” someone asked. “Then we must help the soil recover. Use natural ways now,” she answered.

Talatu came with fresh rice plants—green and healthy. Baba Dogo looked at them and said, “These are yours?” Talatu nodded. “You've done well. Even I'm still learning new things.”

Even Usman brought some maize leaves. “The neem worked! The caterpillars are gone,” he said proudly. People smiled. Even Malam Sani, who once refused training, was now listening quietly.

That evening, the village was alive with talk—not of problems, but of solutions. People shared tips—neem spray, ash, pepper water, and more.

For the first time in a long time, the community was talking not just about problems, but about solutions.

Chapter 5

Feeding the Soil

The maize in Baba Bogo's field had grown tall, almost reaching the waist. The green leaves danced gently in the wind. In nearby plots, rice stood in neat rows and the soya beans had started to flower. The farmers gathered once more under the big old tree, happy with how their farms looked. But Hajia Salamatu, sitting on her stool, looked serious.

“Your crops are growing well,” she said, “but remember, what we see on top comes from what's happening under the soil.” Everyone became quiet and listened.

“Your soil is like your body. If you work hard without eating, you'll become weak. The soil is the same. If it keeps growing crops and we don't feed it, it will get tired.”


NAGARI
NPK 20-10-10
INDORAMA
UREA 46-0-0
Albit
10ml
Neem Oil
1 Litre

Baba Dogo nodded slowly. “In our time, we just used cow dung. We put a lot of it, and it worked.”

Hajia smiled. “Yes, Baba, that was a good method. And it still works. But now, we plant more and don't give the land time to rest. That's why we need to return nutrients to the soil. We can use compost, manure, or even fertilizer.”

Danlami stood and held up a small bag. “This is called NPK fertilizer. It has three things that help crops grow strong—Nitrogen, Phosphorus, and Potassium. But you must know how to use it properly.”

Jummai added, “And composting is also good. It's cheaper, and you can do it at home.”
She opened a small container with vegetable scraps, leaves, and animal droppings. The farmers leaned forward to see.

“You can collect waste from the kitchen, chicken droppings, dry leaves etc. Put them in one place, turn it every week, and after six weeks, it becomes dark and rich. You mix it into the soil before planting.”

Usman frowned slightly. “But will it be enough for big farms like ours?” Jummai nodded. “It works, but slowly. It also helps the soil stay good for a long time. You can mix compost with a little fertilizer too.”

From the compound nearby, Talatu came out with a tray of kunu and zobo. Her mother brought roasted groundnuts. As they served, Hajia smiled at her.

“Talatu, you told me you've been composting at home. Would you show us?”

Talatu was shy but her mother gave her an encouraging nod. “Yes, ma. Come and see.”
The women followed her into the backyard, where a small compost pit sat behind the chicken coop. The men, curious, stood near the fence, watching from a distance.

“This is where we throw yam peels, leaves, and chicken droppings. We turn it often, and after some weeks, it turns dark. We mix it with the soil.”

A young woman raised her hand. “What if we don't have chickens?”

“You can use what you have,” Talatu replied. “Even ash from firewood helps. That's what we do when we don't have enough manure.”

“This is what we used to do before fertilizer. But now we're learning how to combine them properly. That's why Hajia and Jummai's training is helping us.”

Back under the tree, Baba Dogo turned to Usman. “You see, son? Farming is not just strength. It's about learning. Today, these women are teaching us.”

Usman chuckled, watching Talatu lead a group of older women through composting steps. “I guess we're all students now.”

Chapter 6

The Harvest Test

The air was cooler now. Dry wind blew through the farms. It was a sign the harvest season had arrived.

Usman walked slowly through his maize field. Some leaves were brown, and the cobs didn't feel heavy. He broke one open and frowned. “Did I wait too long to harvest?” he wondered aloud.

“Hajia said we needed to wait for the right harvest time,” he muttered to himself. “But what if I've already missed it?”

From behind, Talatu called out, “You're not too late. The maize still has some moisture.”

She held a small tool to check if grains were dry enough. Jummai had taught her how to use it. Talatu looked confident, carrying a notebook under her arm. She had been checking the rice and soybeans behind her house every day.

“I write down the moisture level,” she told Usman. “Rice should be harvested when the moisture is between 20% and 24%. We're almost there.”

Usman looked surprised. “So how do you know the right time?”

Talatu smiled. “I listen to CMD on radio, check this tool, and watch the weather,” she said. “If it rains again, it may spoil everything.”

At Baba Dogo's house, the elders sat under the tree with books. Hajia Salamatu was teaching them how to know when crops are ready.

“For maize,” she explained, “check if the husk is dry and the kernels are hard. If you harvest too early, the maize will rot. If too late, pests will eat it.”

Danlami showed everyone dry soybean pods. “When they're yellow and make a cracking sound, they're ready.”

In another part of the compound, under a mat, Jummai talked with women about how to store harvested crops.

“Dry them well, on raised platforms,” she advised. “When the maize is dry and thrashed, store the in airtight containers such as hermetic cocoons or storage drums.”
“What are hermetic cocoons?” asked Talatu's mother.

“They are storage sacks that have a waterproof lining and sealing capability so that the grains stored in it is air-tight.” Salamatu answered.

Talatu returned with drinks and groundnuts. She listened as Jummai mentioned neem leaves and pepper to keep pests away.

By the end of the week, harvest had started. Usman was now taking notes everyday – checking which crops grew well and what method worked best.

And Talatu? Her rice was perfect—full grains, clean, and dry. Jummai smiled and said, “This field is a classroom.”

Baba Dogo was watching quietly as children carried baskets of soybeans from the backyard.

He smiled. “The future has come,” he said softly, almost to himself. “And it has come in the hands of our children.”

Chapter 7

After The Harvest

Harvest time brought joy, dust, and the sweet smell of ripe crops. Farmers were happy, chatting under the big mango tree as they compared what they had harvested. Bags of maize, rice, and soya beans were piled nearby.

Soon, Hajia Salamatu arrived with Danlami and Jummai. People made way for her. Whenever she came, there was something new to learn.

“This time,” Hajia said, holding a chart, “we are not talking about planting—we're talking about storage.”

She showed pictures of solar drying mats, special sacks that allow air in (aerated sacks), and containers that don't let in air (airtight).

“Many people lose their crops after harvest,” she said. “If you store wet grain or leave it open, insects and mold will destroy it. All your hard work will go to waste.”

Danlami showed how to use a simple meter to check if grains were dry enough. Jummai also explained how to use sun-drying mats or raised wooden platforms, and how to listen for the crackling sound in rice when it's dry.

Baba Dogo raised his hand. “So even if I have a good harvest, I can still lose it if I don't store

it well?"
"Yes," Hajia said. "Storage is like a second harvest. You must protect what you've gathered. One way you can do this is by using hermetic bags."

"Her-metic?" Baba Dogo repeated slowly, tasting the new word.

Hajia smiled. "Hermetic bags are special, chemical-free storage bags for maize and other grains. They keep the air out completely—no oxygen, no moisture getting in. This airtight seal protects your grain for many months, even over a year."

"How does it do that?" someone asked.

"Well," Hajia said, "once you seal your dry grain inside, the little oxygen that's left is quickly used up by the grain, any insects, and fungi inside. This creates a low-oxygen, high–carbon dioxide environment. Insects can't survive in it, and fungi and mould can't grow. That means no aflatoxin, which can make people and animals sick."

Baba Dogo's eyes widened. "So, I won't have to use chemicals?"
"Exactly," Hajia replied. "And the grain keeps its moisture just right—no drying out, no becoming too damp. It's like giving your harvest a safe, clean room to rest in until you're ready to sell or eat it."

Around the mango tree, the farmers nodded thoughtfully, already picturing their maize resting safe in these magical-sounding bags.

Malam Sani stepped forward. "I planted too early this year. I lost many crops. But next time, I'll wait, ask questions, and listen."


MAIZE GRAINS - 100 kg
MAIZE GRAINS - 100 KG
MAIZE GRAINS - 100 kg
MAIZE GRAINS - 100 kg
MAIZE GRAINS - 100 kg
MAIZE GRAINS - 100 kg

Everyone clapped gently. Baba Dogo walked over and placed a hand on his shoulder. “A smart farmer learns more from one mistake than others learn in two years.”

That evening, the women met in Talatu's backyard. They were cooking fresh vegetables, maize meal, and fried soybeans. The firewood smoke rose gently as children laughed and helped serve food.

When everyone had eaten, Hajia asked Talatu to say a few words.

“Talatu wiped her hands and stood up, smiling shyly. “I'm happy you enjoyed the food,” she said. “But I'm even happier that we've all learned new things. My mother taught me how to grow vegetables. WhatsApp and CMD taught me about the weather and soil. One day, I want to go to university to study farming. I want more girls like me to grow food and teach others too.”

Everyone clapped again, louder this time. Baba Dogo stood up, touched her shoulder, and said with a smile, “You are one of the wisest farmers I've ever known.”

ABOUT CMD

Centre for Microenterprise Development Ltd/Gte (CMD) is a non-profit, non-partisan and non-governmental organization which has been in existence since 2002. CMD has been at the forefront of supporting the establishment and growth of micro, small and medium enterprises (MSMEs). Centre for Microenterprise Development works with small holder farmers (SHF) and micro, small and medium enterprises (MSMEs). We provide training and technical support to enable them grow and scale up.

Our support for MSMEs include development of business plans, development of manuals of operations, research, implementation of accounting software, and board development. Our training programs include our Innovation Enterprise Institute, tuition centre for Chartered Institute of Bankers of Nigeria and other soft skills training. Our support for SHF and MSMEs provide them with access to credit, quality inputs, and grains aggregation.

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