SUSTAINABLE AGRICULTURE

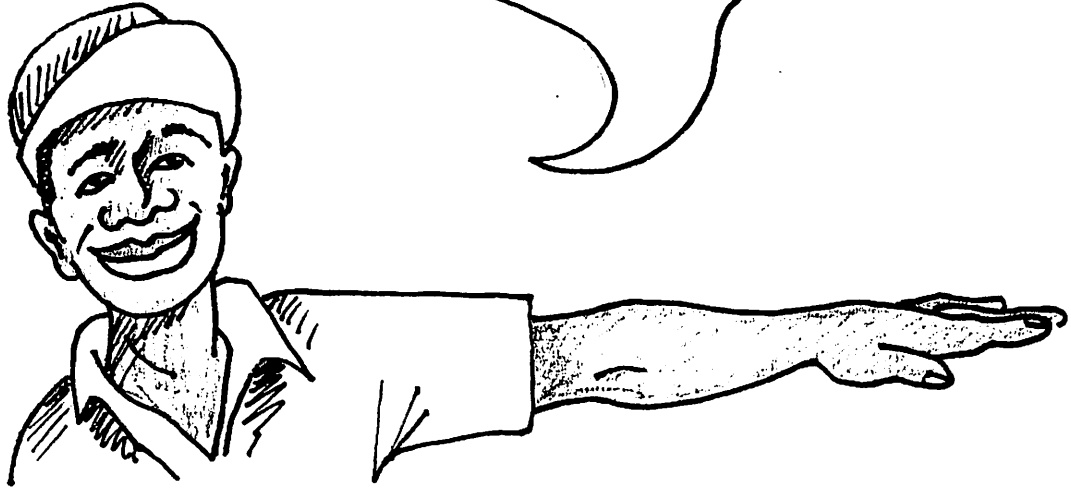
EQUILIBRIUM

1

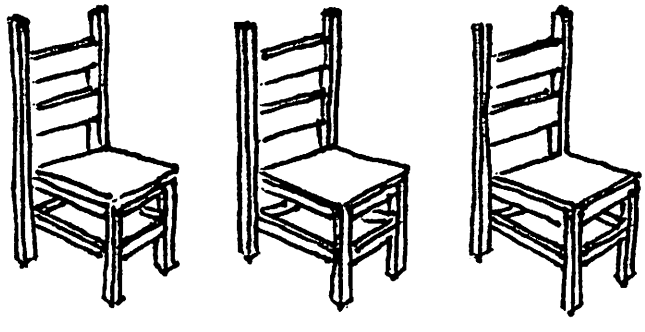
Food First, 2013

Translation: Brock Hicks

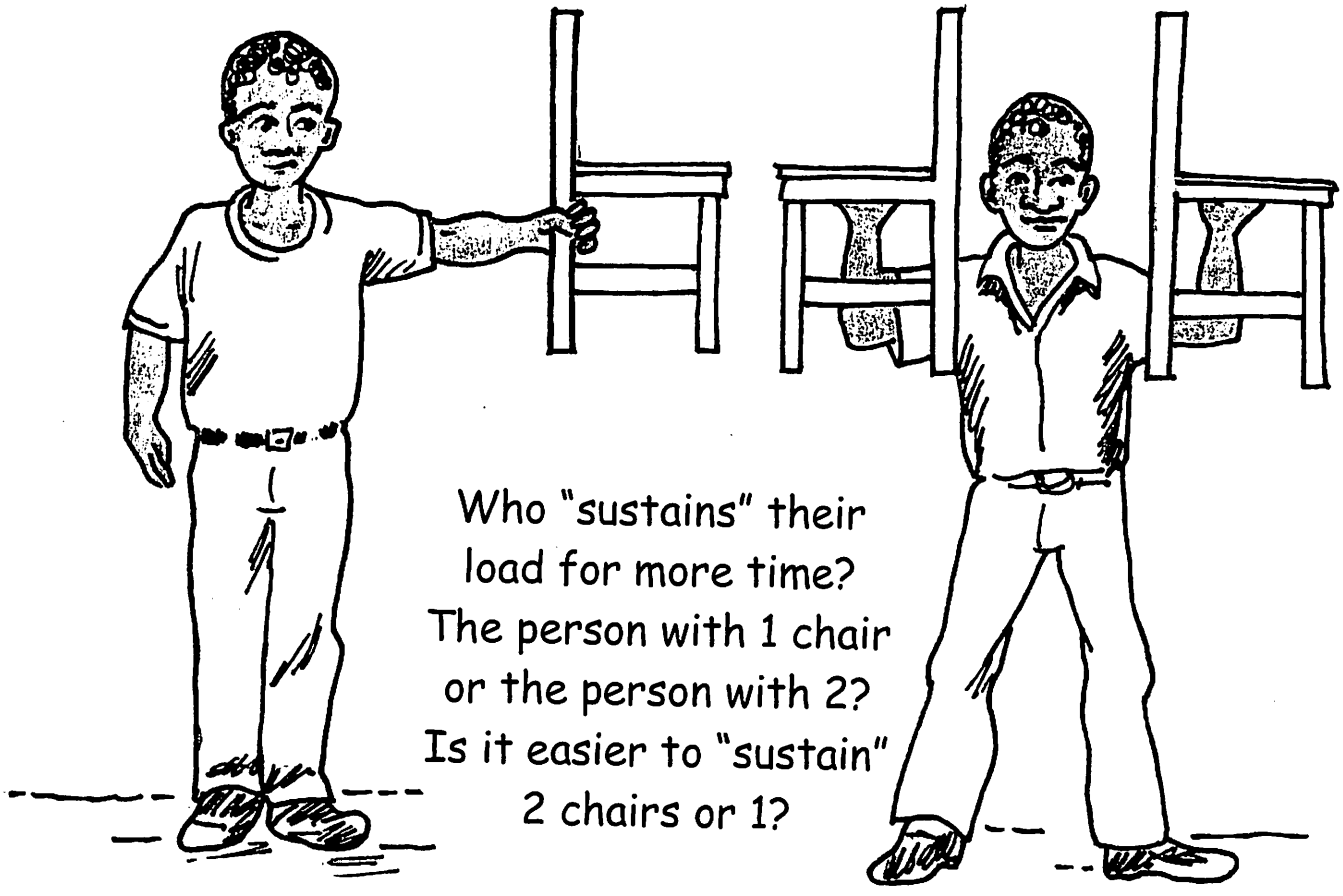
An exercise to demonstrate the importance of ecological balance for Sustainable Agriculture.



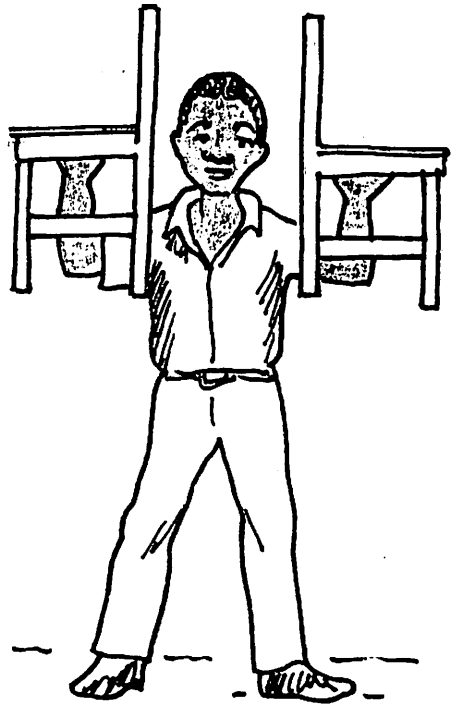
In order to carry out this exercise, you will need 3 chairs and 2 people that are equal in strength to each other.



With the help of 2 other participants, the volunteers place themselves in the following manner.



Who "sustains" their load for more time? The person with 1 chair or the person with 2? Is it easier to "sustain" 2 chairs or 1?



Balance

What happened?
Who got tired first?
Why did the person with a lighter load tire first?
Why couldn't he/she sustain his/her load?

Without equilibrium there is no strength, even if one is very strong. Sustainability is the capacity to maintain strength over time.

Does the same thing happen to the land?
Does the soil become exhausted?
Do the forests, rivers and grasslands become exhausted?
How?
Why?
Are our methods of cultivation in balance with nature?
Which things become exhausted first?
The soil?
The water?
The vegetation?

The natural equilibrium is altered by agriculture. Certain practices cause a big imbalance, such as erosion, droughts, outbreaks of pests, etc.

For how long can an imbalanced agriculture support us?
Are their examples of a balanced agriculture? Where? Why?
Can you re-balance what has already been unbalanced? How?
Why do we say sustainable agriculture?
How would it be in practice?

Ecological imbalance (disequilibrium), sooner or later, affects agriculture, resulting in higher costs of production and lower yields. It becomes unsustainable. Agriculture must ensure balance in nature if it expects to sustain itself over time.

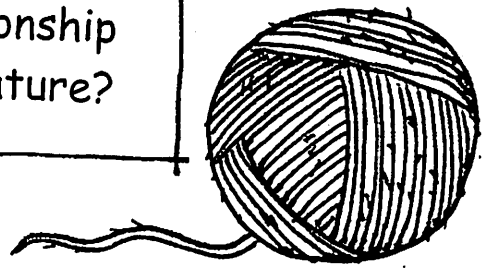
Technical Reflection:
It is important to understand the ecological relationship between equilibrium and sustainability. Without one, the other does not exist. Natural ecosystems achieved equilibrium through natural evolution. For this same reason, they endured for millions of years before the arrival of humans. When people changed ecosystems with agriculture, they became unbalanced. Some practices unbalance more than others. The objective of agroecology is to establish equilibrium in an agro-ecosystem (in other words, between nature and agriculture).

Suggestions:
It is important to discover the common words that people use for the concepts of imbalance, equilibrium and sustainability. You must ask for words and examples about these concepts from daily life and find a consensus about which words are the best suited for these concepts. This is especially important in indigenous communities where language terms often have profound ecological and spiritual content.

2

RELATIONSHIP

Does agriculture strengthen
or harm the relationship
between the elements of nature?

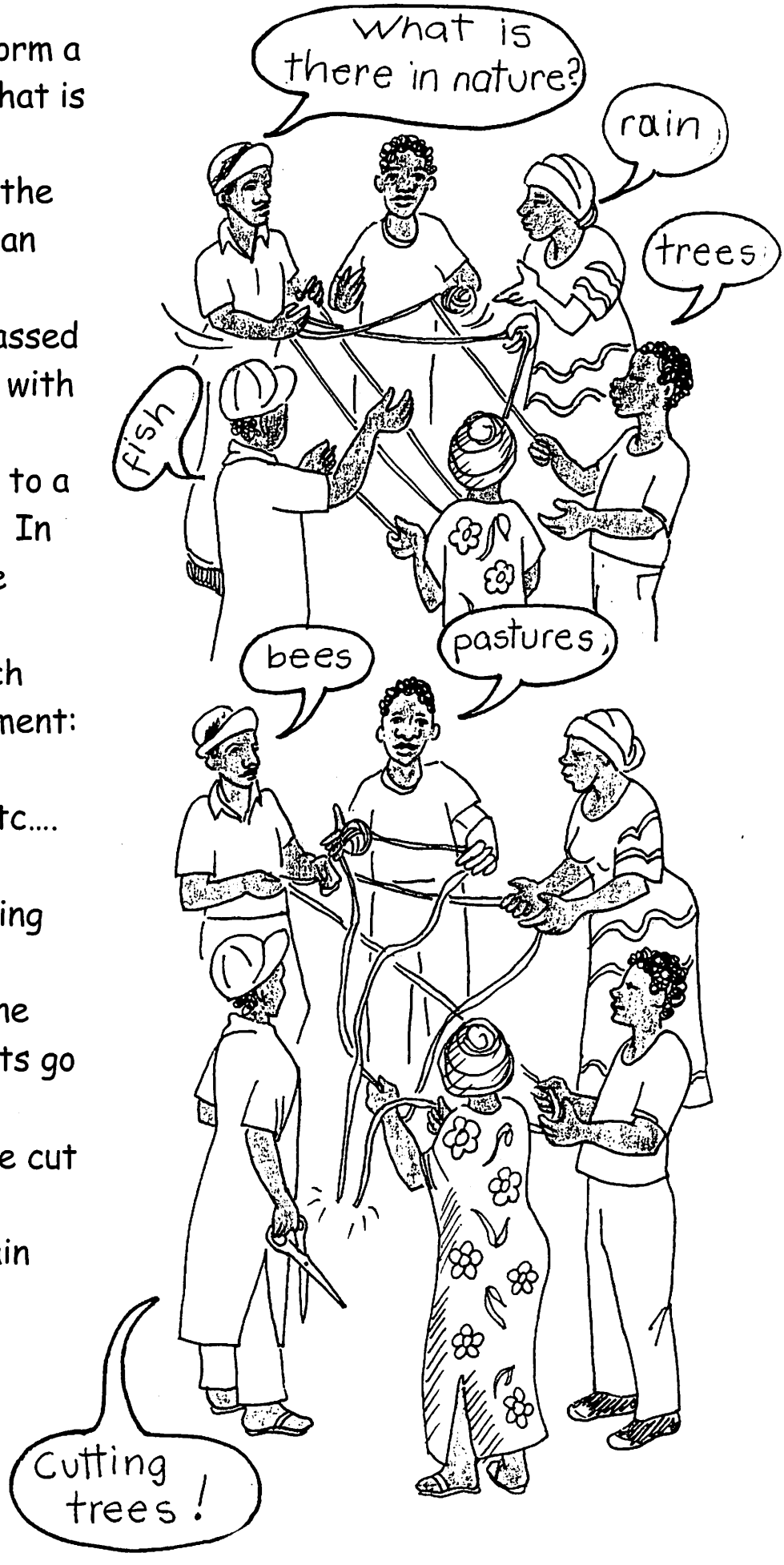


THE BALL

For this exercise we need:
A ball of string or cord
(30 or 50 meters in length)
A poster that shows the
components of nature.

The participants form a circle. You ask: What is there in nature? Whoever receives the ball responds with an element of nature. Next, the ball is passed to another person, with each person who answers holding on to a part of the string. In this way, the whole group becomes intertwined, as each person says an element: rain, fish, land, pastures, plants, etc....

What does the string mean?
What happens if one person leaves or lets go of the string?
What happens if we cut the string?
What are the 2 main aspects of an ecosystem?



The Ecology Ball

Questions

What does the string represent?
What important part of ecosystems do we not see?
Can plants exist without soil?
Can animals exist without plants?

All components of nature, including a human, are born, grow, develop and survive in a relationship with everything else. He/she requires relationships with everything else or requires balance between everything else. Sometimes these relationships are very subtle.

What would happen if one of the components disappeared?
If we cut the string and eliminate a component, what will happen to everything else?
Do we realize how one component affects the others?
Are there examples of these ruptures in our agro-ecosystem? Which?
In what ways do agriculture activities harm or strengthen these relationships?

Even though the mechanism isn't always obvious, a single component of nature can have larger effects in the functioning of everything else. In the same way that a missing bolt can stop the motor of a truck, the disappearance of an animal or plant species could have grave consequences for an ecosystem.

Technical Reflection:

An ecosystem is not just the sum of its parts; it is also the relationships between all the parts. Therefore, the whole is greater than the sum of all its parts. Ecosystems do not only include components, but also the relationships between the components. The energy that is produced by the relationships between the parts is called SYNERGY. It is impossible to disrupt one component without it affecting others, because it will, in one way or another, change the synergy between the parts of the system. Agriculture that takes synergy into account can aspire to be agro-ecological and sustainable.

Suggestions:

Keep the participants standing in the same place during this exercise. Afterwards, do the Environmental Link exercise.

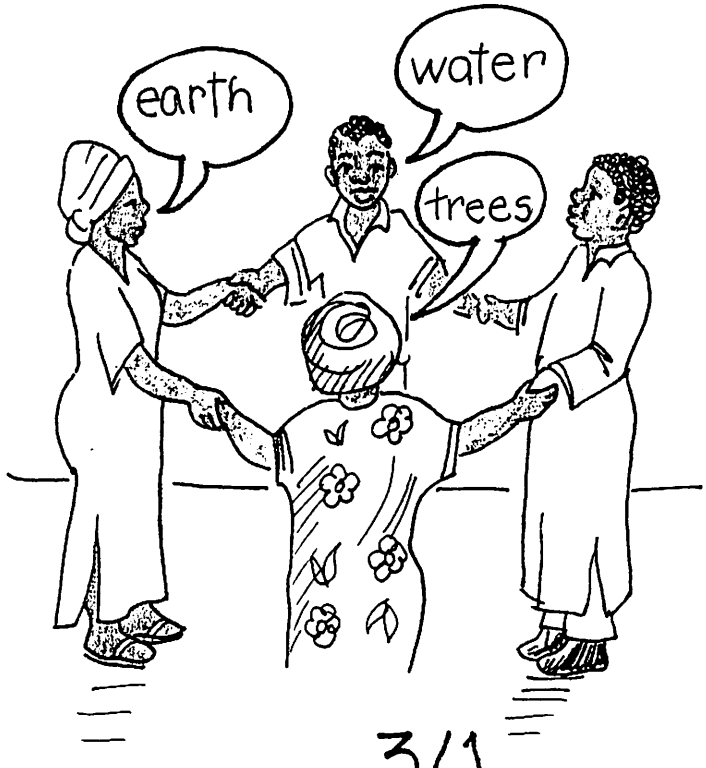
3

THE WEAK ENVIRONMENTAL LINK

Food First, 2013

What are the critical points of an ecosystem?
This exercise can demonstrate how fragile these points are.

With a group of 4 or 5 people holding hands, form a circle. Each participant represents an element of the environment.



Other participants, who represent stress factors (drought, flood, migration, erosion, economic crisis, clear cutting of trees), enter the circle and try to break the chain.

The chain will break, unable to support the weight of so many stressful factors.

Questions:
What does the chain represent?
Where did the chain break?
In which ring? Why?
What does it mean that the chain broke?

A system of linked relationships, like a chain or ecosystem web, breaks at the weakest link, in other words, it's critical point.

Do the environmental webs also break in the countryside?
Where do they break? How do they break?
What happens to ecosystems when a link breaks in the environmental chain?
What happens to agriculture?
What happens to people?

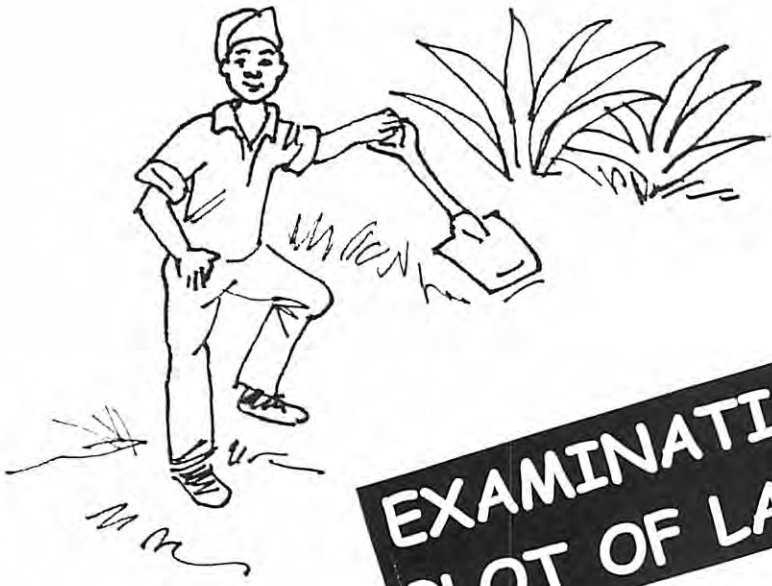
*When the **critical point** breaks down, the ecosystem collapses. It is no longer able to balance itself. It can manifest in exhausted soils that do not recover—even with fallowing, in forest or vegetation that does not reestablish itself, and eventually in desertification.*

How do the links in the environmental web weaken?
Do agriculture practices weaken or strengthen the environmental web?
Which practices weaken? Which practices strengthen?

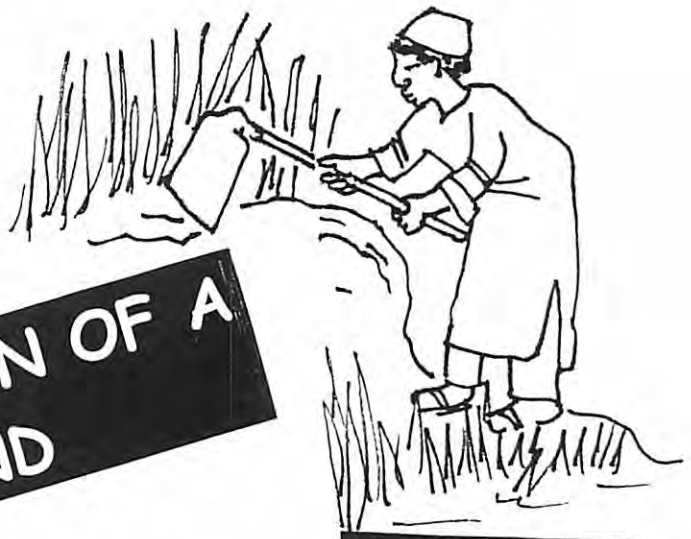
Agricultural practices that unbalance and degenerate the foundation of natural resources put pressure on the environmental web. The conservation of soils, water, and vegetation can avoid this pressure. If the critical link is already broken, regenerative efforts are required while conservation is carried out.

Technical Reflection:
To work in agroecology we must identify the critical links in the agroecological environment. For example, we need to know if the vegetation in the upper watershed is the critical link for the lower watershed, or if on a traditional hillside farm, the vegetation is the critical link for soil conservation and fertility. Agricultural intervention strategies need to strengthen critical links, starting with the weakest ones. If these are not addressed, we run the risk of an environmental breakdown when the links break.

Suggestions:
If there are not enough people to do the exercise, you can do a demonstration with a chain of paper or other light material.



EXAMINATION OF A PLOT OF LAND



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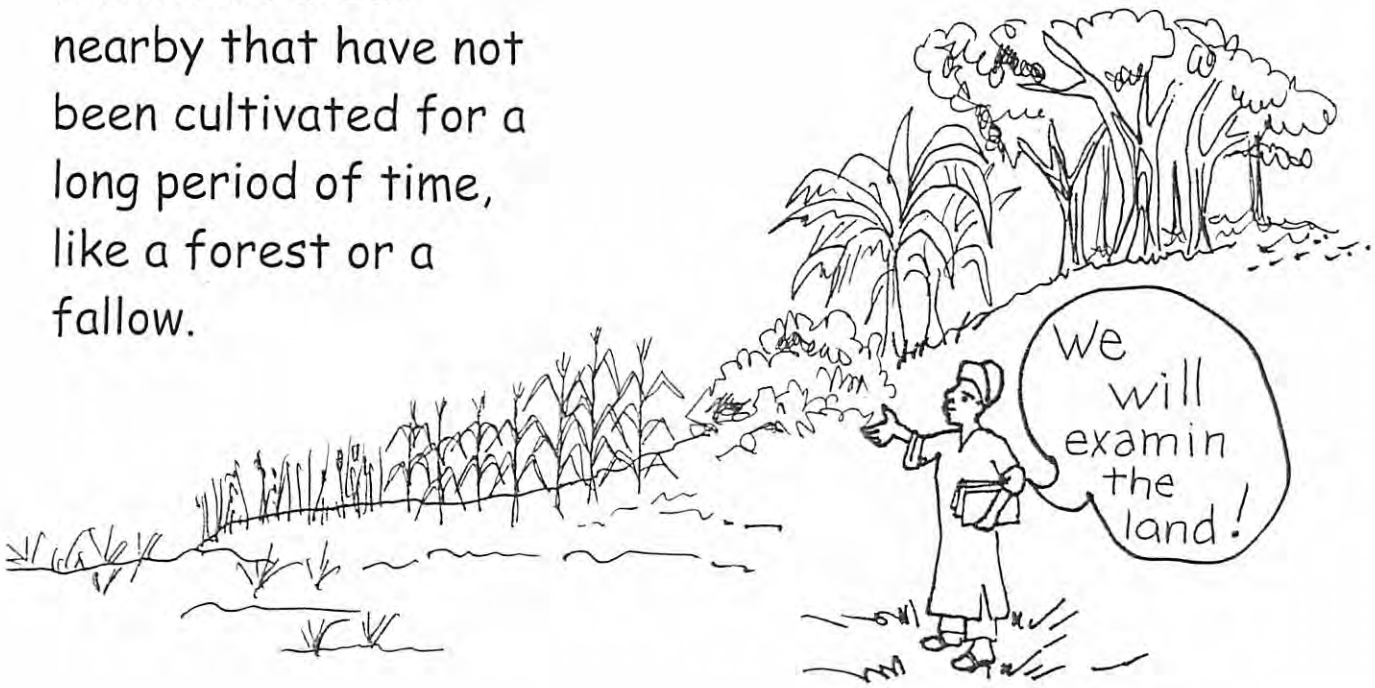
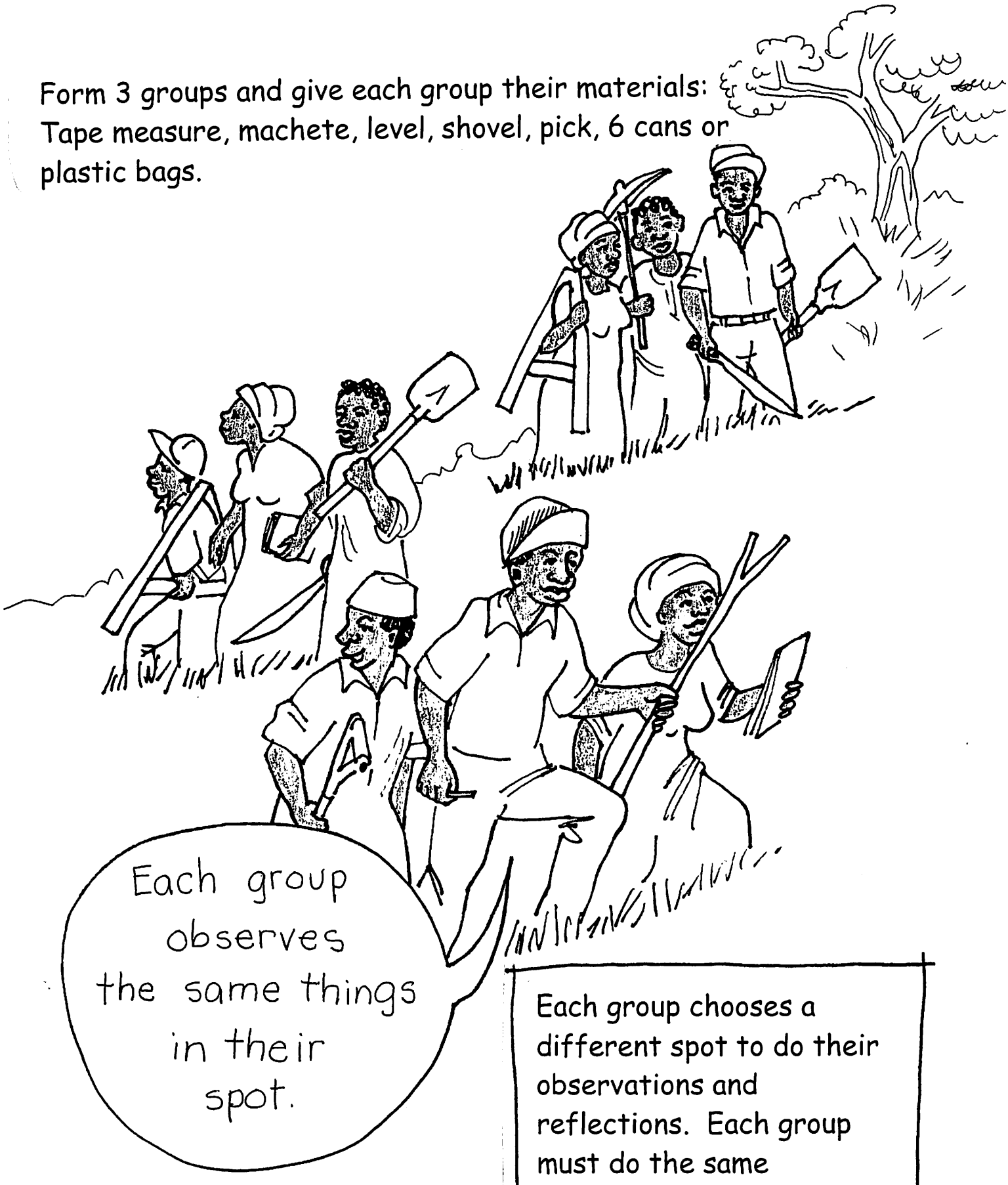
First, we must find a typical plot that belongs to a participating farmer. It is better to find a farm with areas nearby that have not been cultivated for a long period of time, like a forest or a fallow.

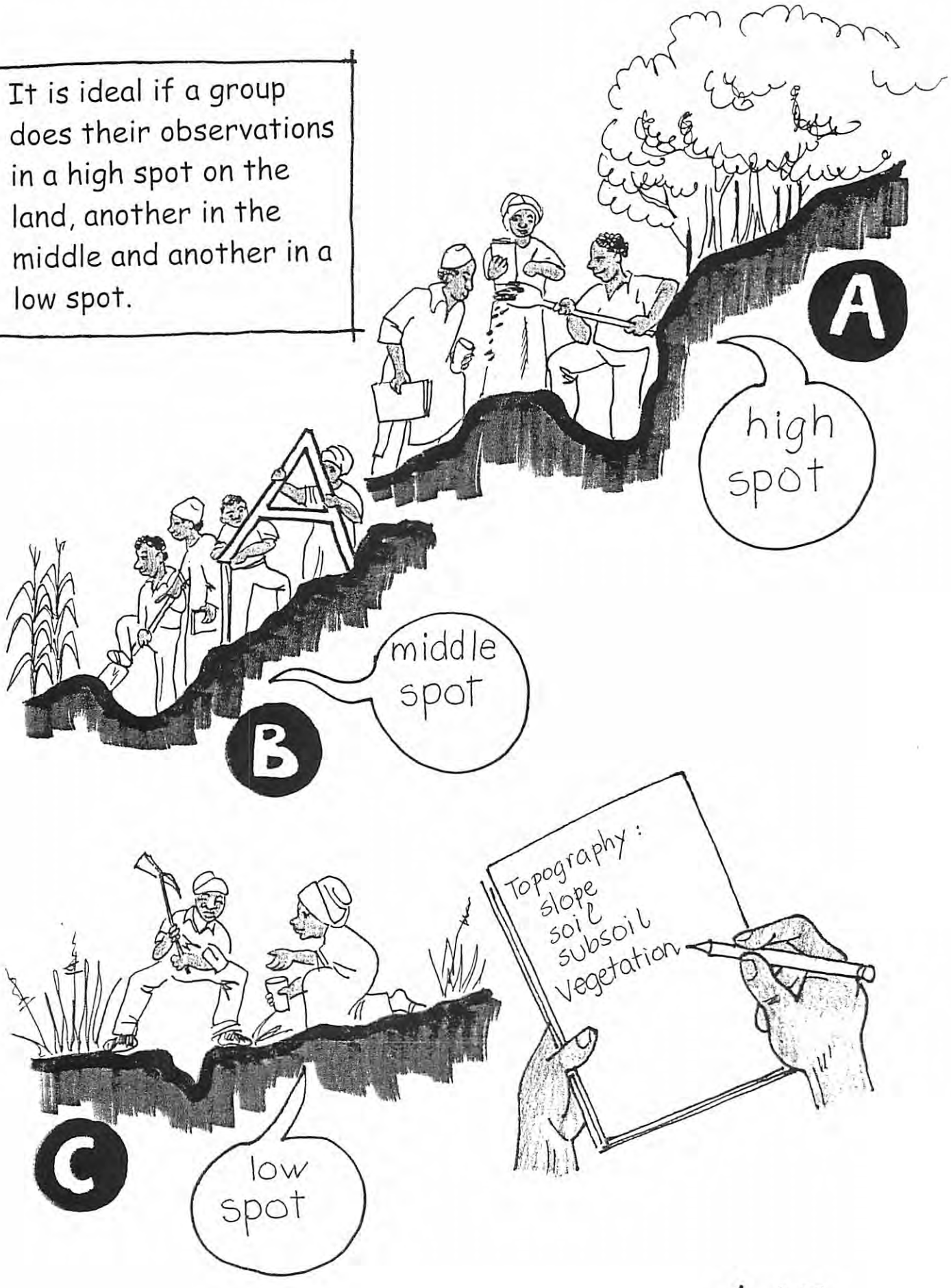


Form 3 groups and give each group their materials: Tape measure, machete, level, shovel, pick, 6 cans or plastic bags.

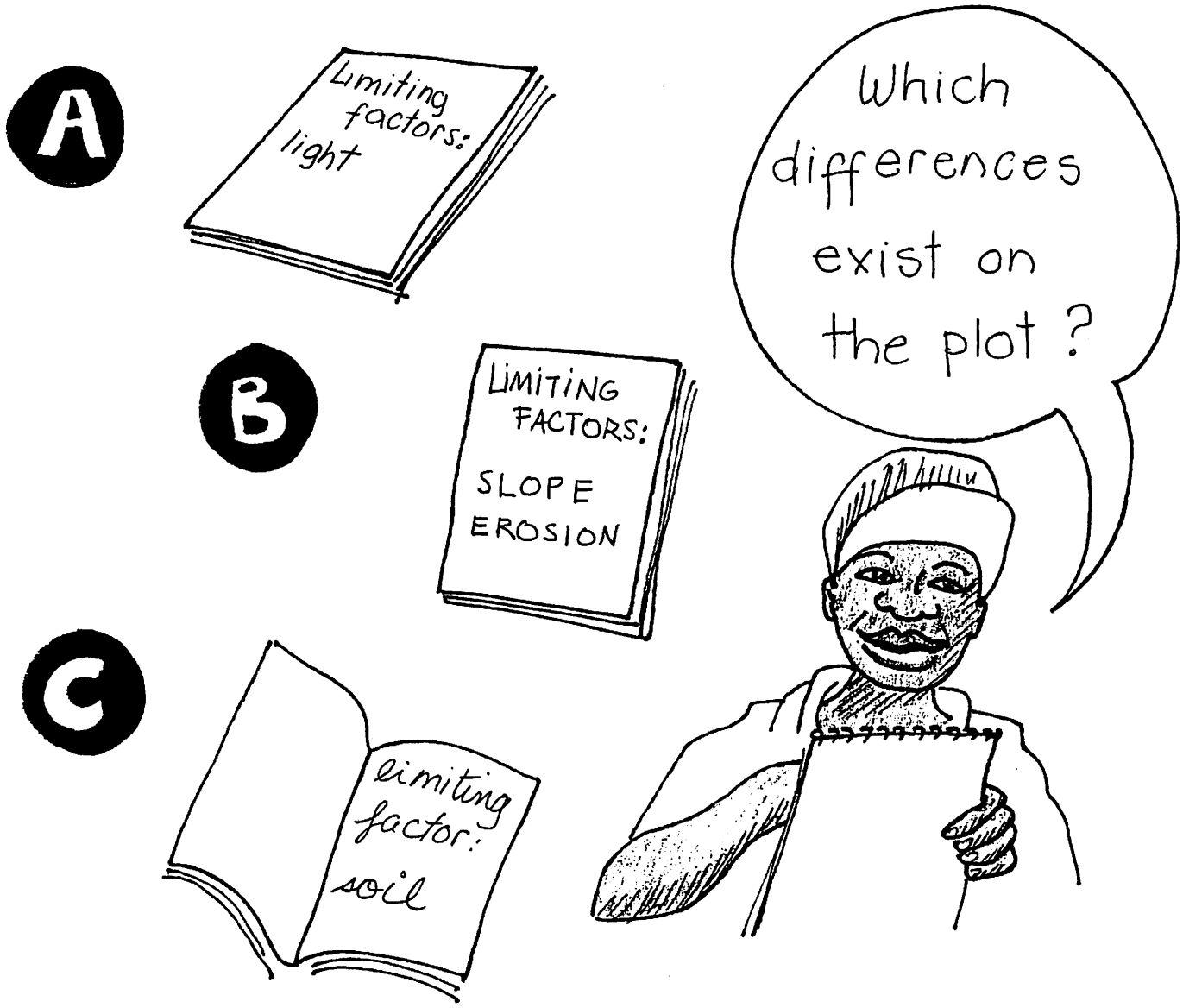


Each group chooses a different spot to do their observations and reflections. Each group must do the same observations and take notes on them.

It is ideal if a group does their observations in a high spot on the land, another in the middle and another in a low spot.



They should find the DIFFERENCES that exist on the plot: topography, slope, soil and subsoil, vegetation, animal life, limiting factors for production, the critical points of the ecosystem, the problems and potentials. They must note any other observation that can help to better understand the problems and their causes.



After doing the observation, the 3 groups meet to compare notes. On a flipchart, make a table to write up the notes from each group. The secretary of each group will tell the others what they saw.

The history of the plot is useful:
When the plot was cleared, was the vegetation removed for the first time?

How much did the plot yield before?
What pests were there?
How did you fight the pests?
When did you use fertilizers for the first time?
When did you use pesticides for the first time?
How much did you apply?
How is the land now?

With all of the information, it is useful to make the tables **AGROECOLOGICAL HISTORY** and **HOW TO IMPROVE.**

AGROECOLOGICAL HISTORY

Clearing of land (year):
Crops on the plot:
Technique used between harvests:
Historical yields (kilos/hectare or local units)
Pests:
First time fertilizers used: year
Fertilizer type & quantity: name, kilos/ha.
Pesticide type & quantity: name, kilos/ha.
Herbicide type & quantity: name, kilos/ha.
Yields:

Yes, we need to know a lot of information! We want to know as much as possible to find solutions to problems and improve production.

Questions:
Why has the amount of production changed?
Why have the layers of soil changed?
How have the pests changed?
Has the damage increased? Why?
Is there a relationship between the fertile layer of soil and the biological life of the forest and the levels of historical production?

Traditional agriculture was based in the fertility of the forest's soil. By losing the forest, we lost the source of organic matter that fed the fertility of the soil. Also, once the big forest animals lost their homes, they left. This allowed insect populations to increase. The harmful insects, the pests, adapted to insecticides, but the beneficial insects disappeared. This caused bigger and more frequent outbreaks of pests.

How has the introduction of costly inputs (fertilizers, pesticides and herbicides) affected the land?
How has the level of their application changed? Why has it changed?

It has been necessary to increase the use of fertilizers and insecticides in order to compensate for the ecological deterioration of the natural resources that used to support production. This has also destroyed the soil and unbalanced the insect populations.

Technical Reflection:

The natural fertility that is based on the original vegetation (forest) or in regeneration (fallow or fields in rest) has been the foundation of peasant agriculture. "Modern" agriculture has exploited but not maintained ecological balance. Now the balance and fertility are exhausted. Regeneration and conservation strategies can use the historical levels of production as a reference. These levels should be the goal of an ecological agriculture.

Suggestions:

This activity is good for starting a program or series of workshops and exercises in sustainable agriculture. In a simple and practical manner, the problems and possible solutions can form the content of a program of farmer experimentation.

FARMER EXPERIMENTATION
Introduction

Food First, 2013

We farmers are born experimenters. We are always trying new seeds, different products or attempting different management systems. In the patios of our houses, women are innovators, experimenting with plants, herbs, fruit trees and fertilizing methods. They have even invented methods to control pests with the flowers of the garden.

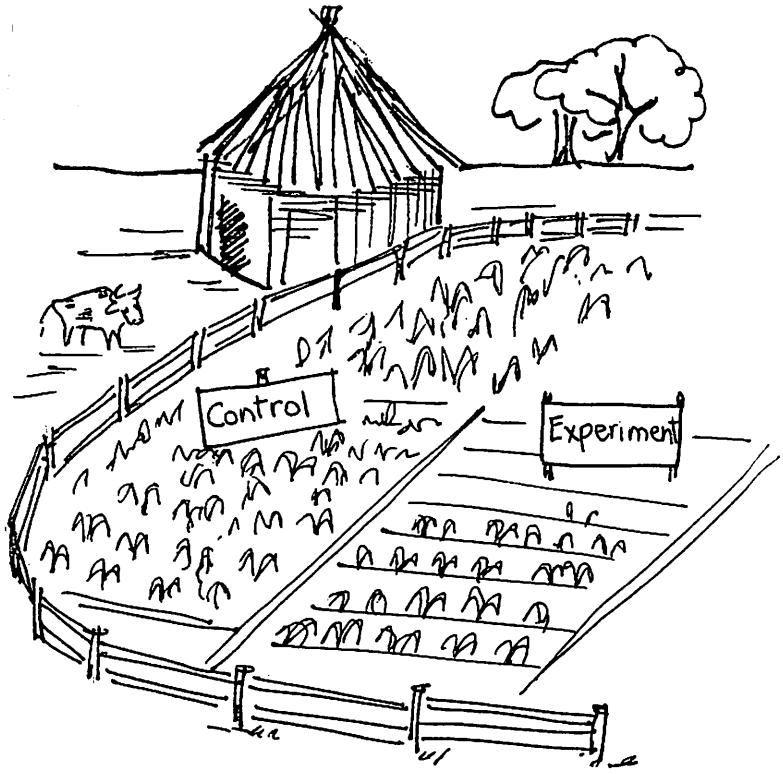
Over the years, farmer-technicians have perfected the way in which we can experiment. Here we offer a few tips so that those who want to experiment can do it well.

1. Experiment to overcome limitations

If we want to improve our agriculture in the most efficient manner, we should carry out experiments with alternatives that help us to overcome the famous "limiting factors" that we have identified in our plots.

2. Experiment on a small scale

In order not to risk the harvest nor the food for our families, we should experiment on a small scale, no more than 10 x 10 meters. In this way, if the alternative that we try does not work, we do not lose everything, but we do learn! The technique might fail, but not the farmer!



3. Experiment in a group

What one person lacks, others have... We farmers cannot control the rain, all pests, nor the animals of others sometimes. When we are trying a new crop or technique, it is a good idea to do it under many different conditions in order to see which is better. A group of experimenters can try something new en many different plots and soils, and later share their results. As one farmer-experimenter said: When I work with a group I bring one experiment to share and take home results of 20 more experiments!

4. Experiment in order to convince and promote

When a farmer experiments, she/he must compare, measure, take notes and evaluate. When she/he shares the results, they are an expert in the topic. If they has done things well, they will be confident of their new knowledge. Moreover, they will have clear criteria to convince others. Experiments almost always convince others better than any speech.

5. Experiment to discover

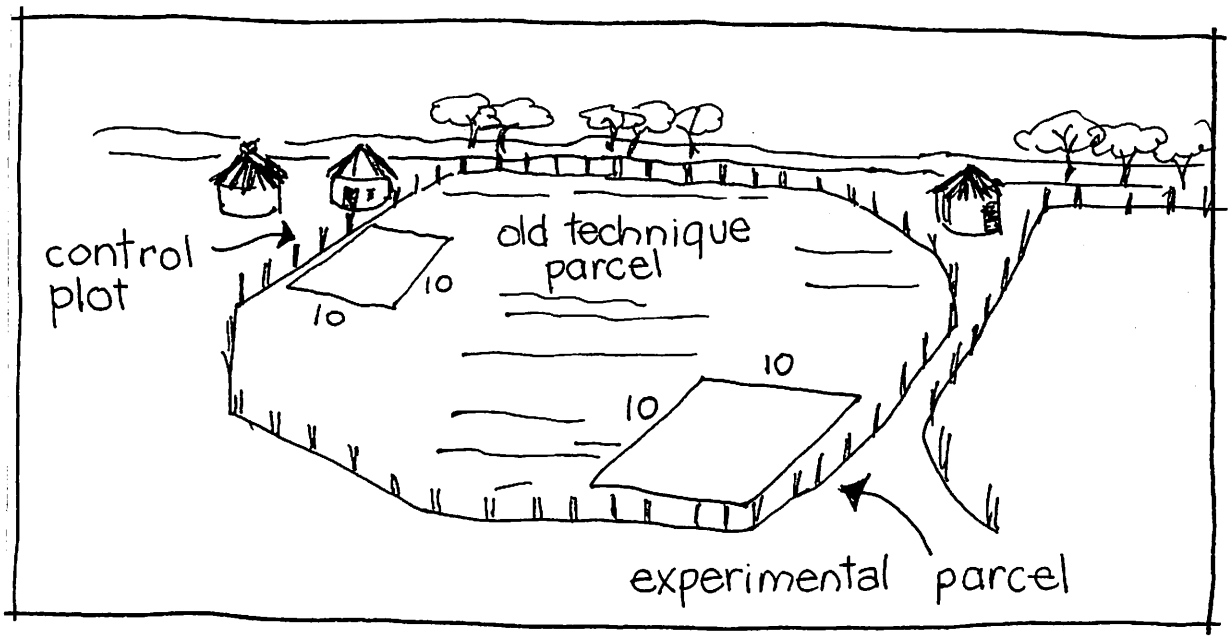
We farmers are also curious. Sometimes, we are not trying to solve a particular problem, we just want to learn. We are simply curious. We try seeds, we change the times we plant, or the distances between seeds or rows. In this way, important discoveries are often made. The patio of the house is also an excellent place for this type of experimentation.

Suggestions:

When experimenting, there are a few important things that we should not forget:

1. Measure well, without mixing systems of measurement.

Measure in multiples of 10. If you measure in hectares, the experimental plot should be 10 x 10 meters. In this way, when gather the results, you will not get confused and can say "so many kilos per hectare," or "pounds" per acre."



2. **Always compare the new technique with a parcel of the same size** where you used the old technique, as a control plot. The comparisons of the old with the new must be in the same conditions. In the old parcel, where you use the old technique, we measure a parcel of the same size as the experimental parcel. We should keep the harvest of this small parcel separated, and the harvest of the experimental parcel separate also. This allows us to compare the results of the new technique with the old.

3. **Only use one new technique in each experimental parcel.** You should not mix several new techniques in one experiment. If we want to try a new seed, we should do it in a small, separate parcel. If we want to experiment with changing the distance of planting, we should do it in its own, separate parcel. If we mix the two experiments in the same parcel, we will be unable to tell which results came from which experiment. The advantage of experimenting on a small scale is that we can have various experiments at the same time, in small parcels, within the larger traditional plot. We can do several experiments at the same time, but we cannot mix them up.

4. **Finally friend, you should take notes on everything!** If you do not know how to read or write, get yourself a helper who can. Is this not why our kids go to school? There are many great experimenters, with notebooks full of notes from their years of experiments, even though they cannot read or write. If we do not take notes, we cannot do good comparisons. We also will not be able to share and exchange as many experiences (because we will forget them).

THE LIMITING FACTOR (The Leaky Bucket)

5

Food First, 2013

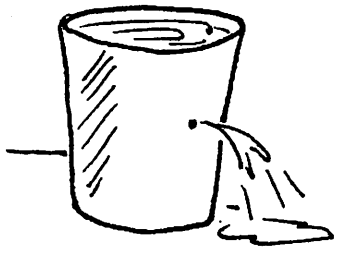
It is important to know what are the problems and limitations of production. And how to fix the "leaky bucket."

Materials:

- A plastic bucket or plastic jug that holds over 2 liters of water.
- A hammer and a thick nail

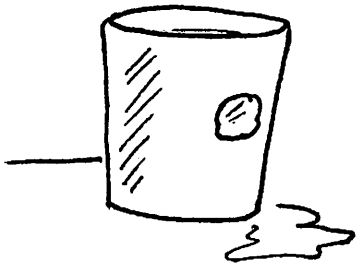
Exercise:

Fill the bucket or jug with water.
Open up a hole in the top third of the bucket (or jug).



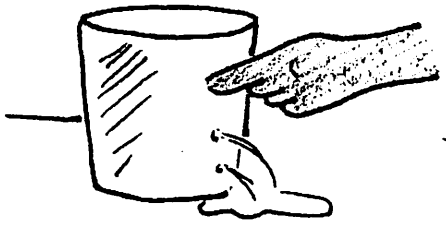
Now we have a problem! The water is leaking out!

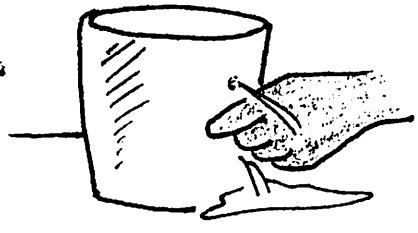
Put your finger over the hole, stopping it up. Did you solve the problem?

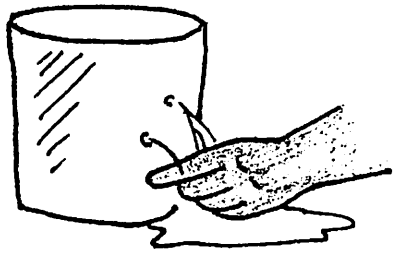


Now open holes in the middle and lower third of the bucket.
Fill it up again with water.

Now what will you do? (You can only use one finger to solve the problem)
Which of the holes should you stop up first? The top one? The middle one? The bottom one?







Questions:
Did you solve the problema by stopping up the top hole? Why? Which of the holes most *limits* the capacity of the bucket to hold wáter?

The bucket is a system for holding water. It's limit is the top of the bucket.
When you put holes in the bucket it limits its capacity to hold water down to the lowest hole.

What is the solution?
Where should we start stopping up holes? Why?
Where do we stop up next?

Stopping up the holes is the solution and the sequence is important. If we don't start with the lowest hole, it won't make any difference if we close the others.

How should we go about solving problems in our fields?
What are the factors that most limit our production?

The production system is similar to the water bucket. The holes are similar to the problems of production. There is always one production problem, called "the limiting factor." If this problem is not solved first, solving the other problems will not have the full, positive effect on the productive capacity of the field.

Technical Reflection:

We need to identify the limiting factors to production in our fields and first try to solve the one that is most limiting our production. The success of on-farm research and experimentation in the field and farm depends on correctly identifying the limiting factors. If we can overcome the most limiting factor we will get a rapid and recognizable result.

THE VARIABLES
THE BACK PAIN SUFFERER

6

Food First, 2013

-Ay! I can't take the pain in my back anymore!

People recommended that she:
- Go to the doctor.
- Go by the bone-setter's house.
- With an herb tea, you will be cured.

- I am going to see the doctor, she said.
When leaving the doctor's office, she runs into the bone-setter.

- It's great to run into you Don Chepe, she said. I have a pain.
- Do you want me to give you a cure? said Don Chepe.

- Ah! The bone-setter sorted me out right, she said.

The sick woman went to her house and prepared the herbal tea that her friend had given her, and drank it together with the medicine from the doctor.

The next day:
- How great! The pain is gone!
- How did you get better? Asked her neighbors.

- How? Well, I think it was the doctor...
- Or was it the bone-setter? Or the tea?

- You did all the treatments at the same time, they told her. How can you know which one relieved the pain?

Questions:
Why did the woman not know how to answer her neighbors?
Which of the treatments was the one that cured the pain?
How can you know? Why?

By mixing the treatments, we cannot know if the woman was cured by only one of them, or by a combination of two or three. One would have to try the three treatments with three different people, or on three different occasions on the same person with the same pain.

What happens when we experiment by changing several things at the same time on the same plot?
If it goes well, or goes badly, how can we know which change was the cause?

The experimenter that mixes a new fertilizer with a new seed, plus new planting distances between crops on her experimental parcel cannot compare the result with that of her traditional parcel. It is necessary to compare only one innovation at one time. By doing the experiment on a small scale, she can do three small and separate experimental parcels. In this way, she can assess the results of each innovation next to her traditional plot.

Technical Reflection:

Because the technological packets mix the variables, they do not permit the farmer to assess which of the innovations is the significant one. Therefore, the limiting factor cannot be specified either. This custom negatively affects farmer's experimentation when they design the experiments. Frequently, they apply two or three treatments to the same parcel without a control parcel with which to compare the yields. Therefore, you cannot specify which is the limiting factor, nor the effectiveness of the experimental innovation.

Suggestions:

This story can be presented as a skit. It is recommended to do it after the **Examination of a Plot of Land**, when the participants have noted the alternatives or innovations to try. It is a good idea to do the skits before designing the experiments.

THE THREE BLIND PEOPLE AND THE IMPORTANCE OF COMMUNCATION AND EXPERIMENTATION

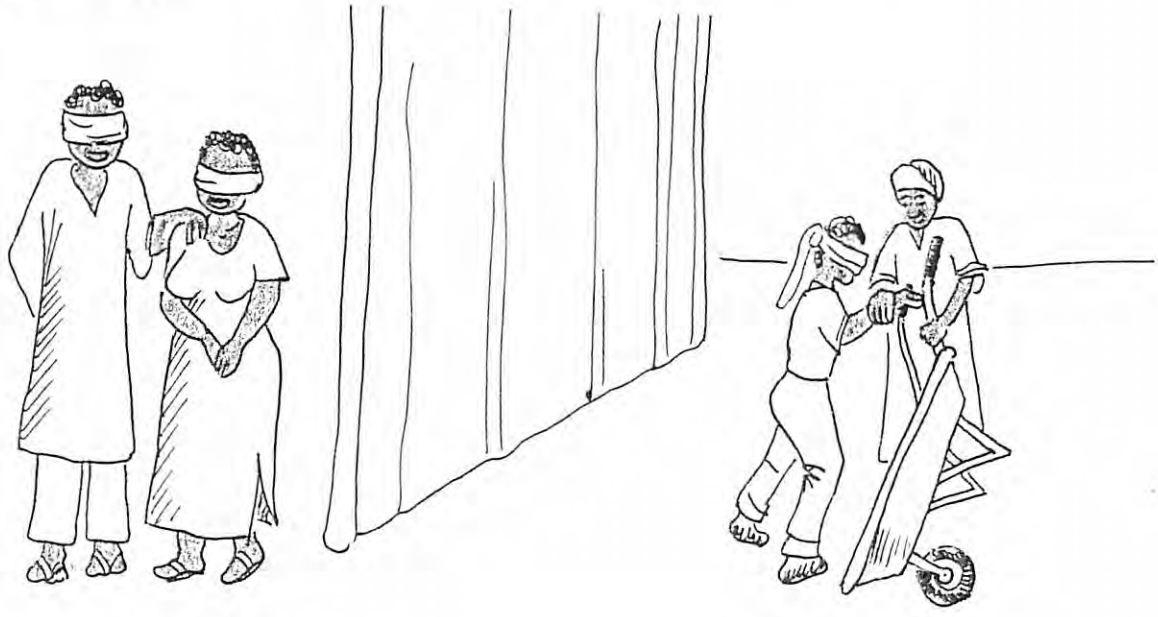
7

Food First, 2013

Three participants will be blindfolded. Explain to them that they must try to figure out what object they are touching, and can only touch it once.

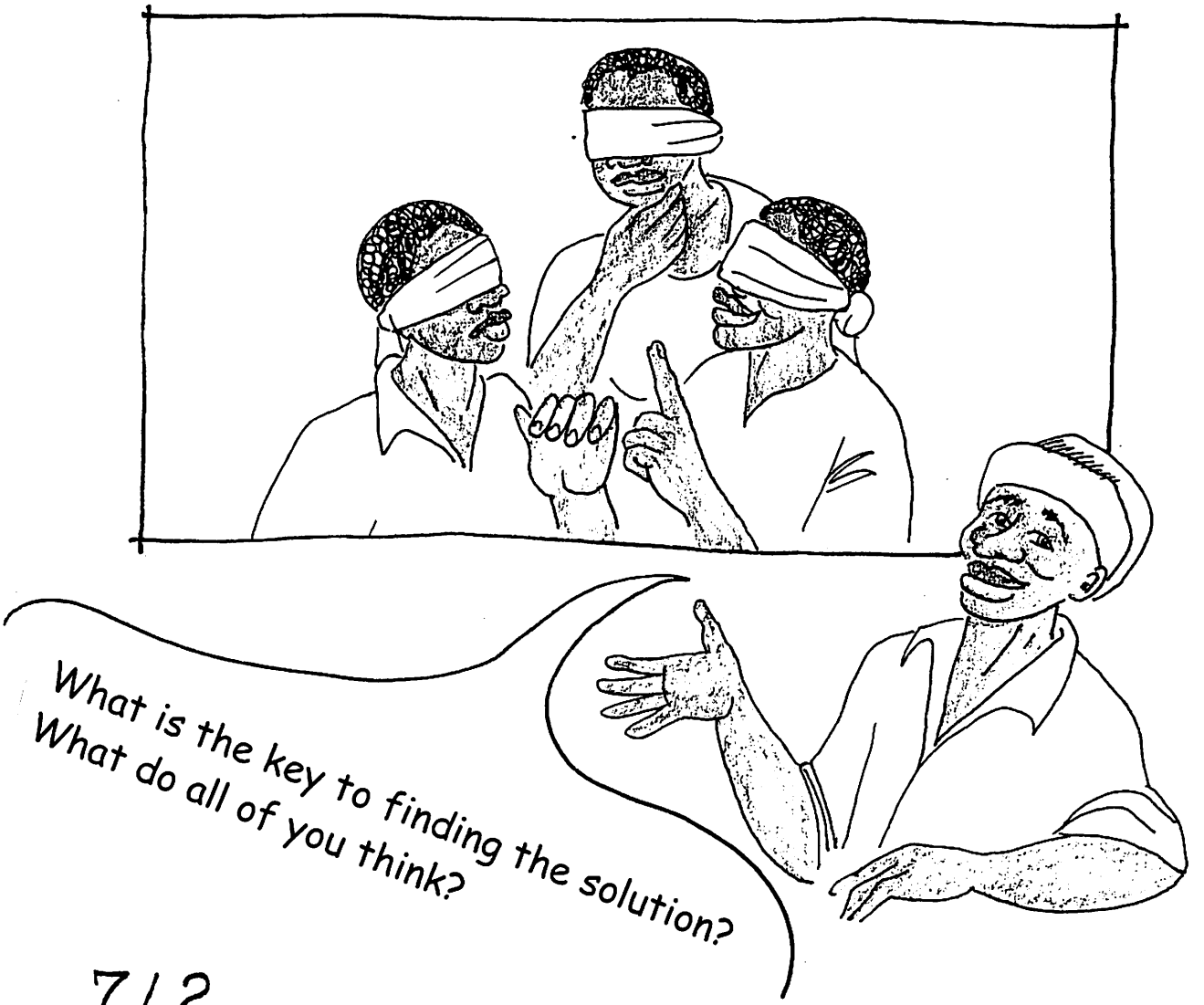
Material:
Whatever large object that has three or more parts.

The three "blind people" are outside the room and do not see the object.
Each blind person will touch the object for 10 to 15 seconds. What is it? After, they must leave the room. They cannot talk amongst themselves. If none of the three can guess what the object is, the game can continue.



In front of the objects, the three blind people will again touch the part of the object that they touched before. But this time they can talk to each other and exchange ideas.

- It's a barrel!
- No, it's a fender.
- Could it be a can?
- It seems rusted.
- It's a wheelbarrow!



Questions:
What happened?
Why didn't you guess it at the beginning?
Did what each person said about the part they were touching make sense?
Why couldn't they guess what the whole object was?
Did they guess it together? Why?

When you only know a small part of the whole, it is difficult to understand it. When several people know a part of the whole, they can understand it by communicating.

Does the same thing happen in agriculture?
Do we always know all the aspects of a problem of low production? (pests, low fertility, etc.)
Why would it be important to communicate our experiences when we are trying to understand or resolve a complex problem?

The farm, or parcel, in reality is a set of problems. In order to understand it well, it is necessary to understand it from several points of view. Exchanging information between experimental farmers, we can advance the process of discovery and innovation.

Technical Reflection:

In an agricultural system, a problem can have several causes or aspects. Sometimes, one thinks they have found the solution, but, when she doesn't get results, she realizes that she has not understood the problem completely. Sometimes the complexity of agricultural systems demands several treatments and repetitions to isolate the problem and find the adequate solution. Individually, farmers do not have the time or resources, to do the treatments and repetitions like a formal researcher. However, the peasant culture is a great resource. Groups of farmers can experiment about a set of problems or a common issue. The key to finding the solution is good communication between the experimenters, as much in the definition of the problem and the design of the experiment as in the sharing and analysis of the results.

Suggestions:

Do this exercise after the **Examination of a Plot of Land** and **The Limiting Factor**.

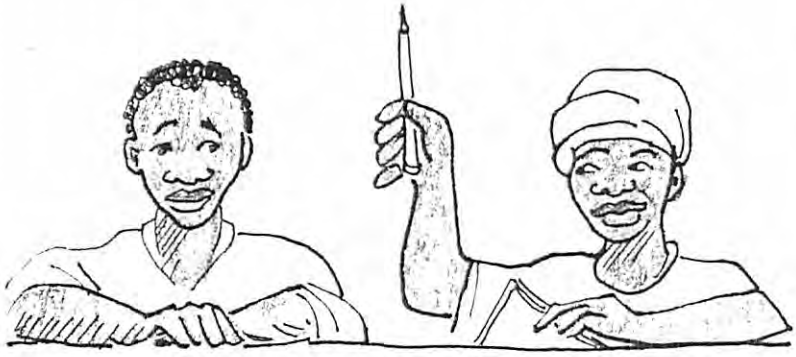
THE FARMER'S MEMORY: REMEMBER OR TAKE NOTES?

8

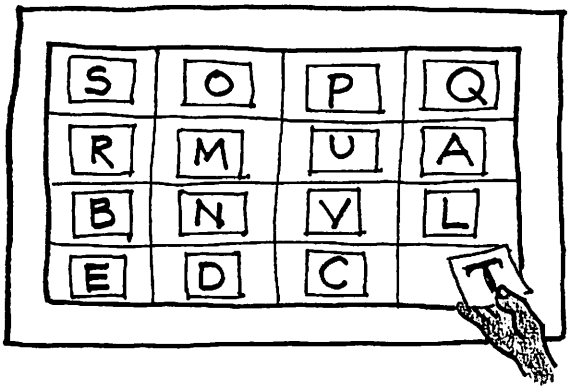
Food First, 2013

How well does our memory serve us?
How much can we remember?
How important is it to take notes on a piece of paper or in a notebook?
Is the pen better than the most brilliant memory?

To demonstrate, we have two participants:
One is MEMORY, the other a PEN.

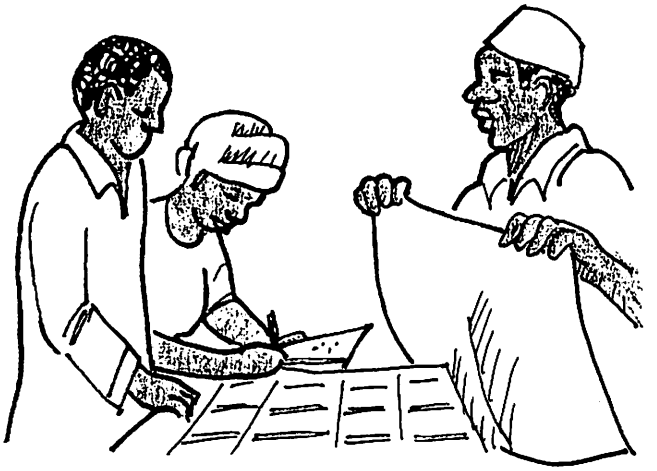


Materials:
25 letters on cardboard or paper
Chalk or marker
Notecards or paper
Clock
Cloth, 2x3 meters
Flipchart
Various random objects.



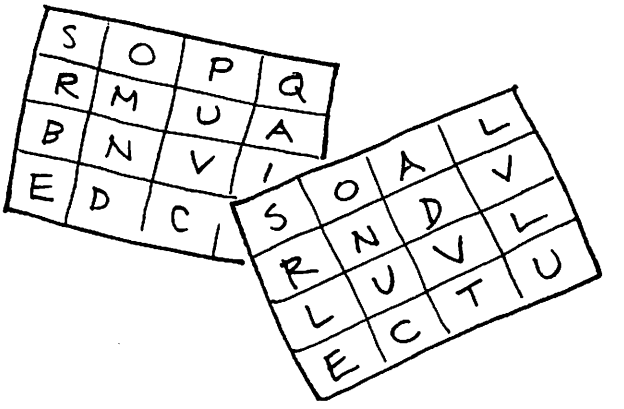
On a flipchart or on the floor, draw a chart with 16 spaces (4 rows by 4 columns). In each space, put one letter.

MEMORY and PEN, the two participants, should not see the combination of letters. Note the combination of letters and cover the chart with a blanket.



The 2 participants can now look at the chart. MEMORY memorizes the combination of letters. PEN notes them down on a piece of paper. When the PEN finishes writing, cover the chart again.

Give each participant a sheet of paper in which they can write the letters of the table. Each one turns in her sheet and compares it with the original chart.

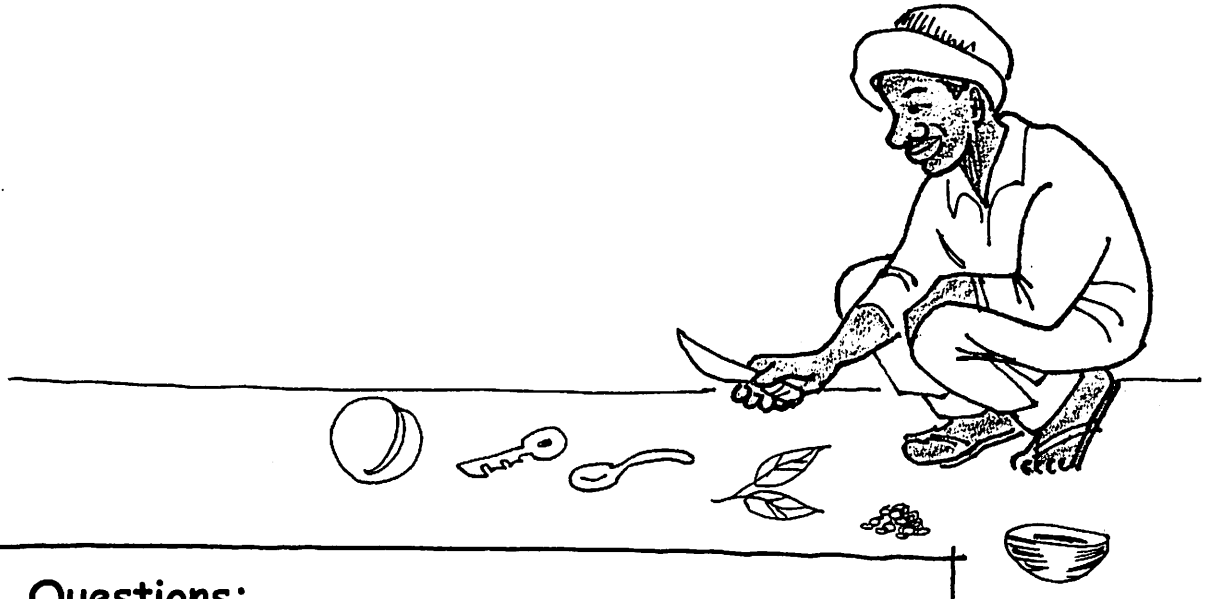


Who had errors? Who had the advantage?

This exercise can have variations, changing the place of the letters and asking the participants to identify the changes.

The exercise can also be done using objects and placing them in different combinations on the floor.

Farmers have a good memory, but.... What happens when we want to remember steps and results year after year.



Questions:
What happened?
Who made a mistake? Why?
Who had the advantage? Why?
How do we get used to remembering things?
What things do we forget?

Technical Reflection:

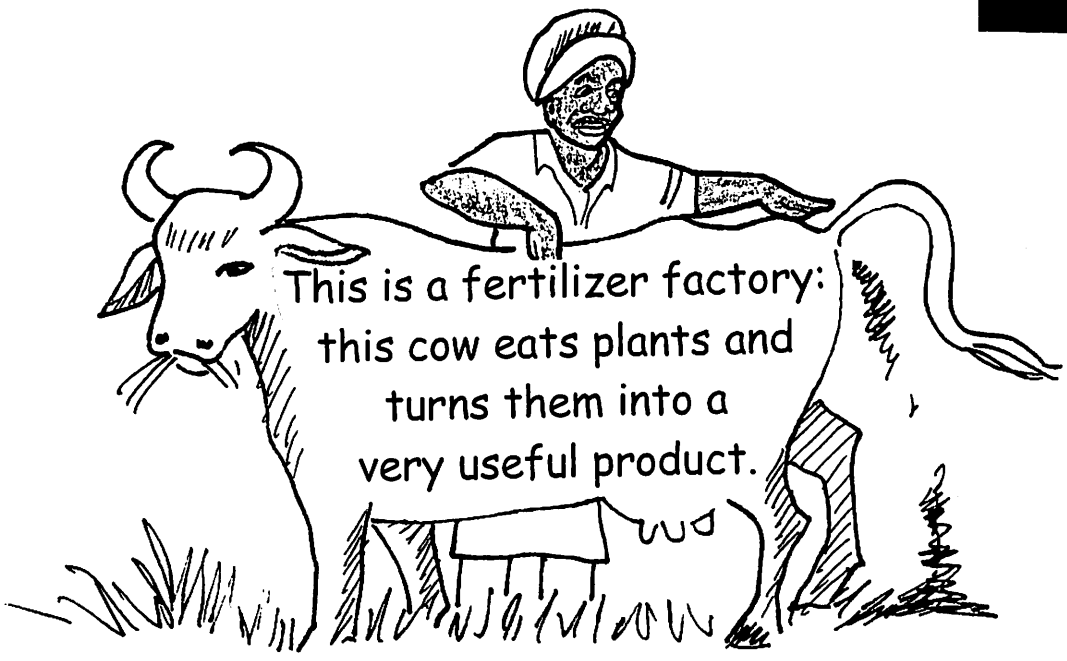
The memory of farmers and peasants is usually much better than those of the agricultural technicians, especially in relation to their plot of land, the dates of planting, the rains, etc. It has had to be, because the majority are new readers or illiterate. They do not usually use notes to remember things so they have to develop much greater abilities of observation and knowledge retention. However, when there are new elements and changes, or with the passing of time, even the best memories can fail. If our memories fail us when we are doing important experiments, this can affect the results or the correct interpretation of the results. We can arrive at erroneous conclusions, or even lose money. For this reason it is important to take detailed notes.

- You can do variations of the exercise, to emphasize distinct aspects of memory. Without taking notes, you can compare the capacity for memory of a group of 5 farmers against just 1 farmer. The 5 can come to an agreement of which line each will memorize (collective memory).
- You can compare the capacity for retention with fewer objects (9-12). You have to remember three groups together (as if it were the information from 3 years).

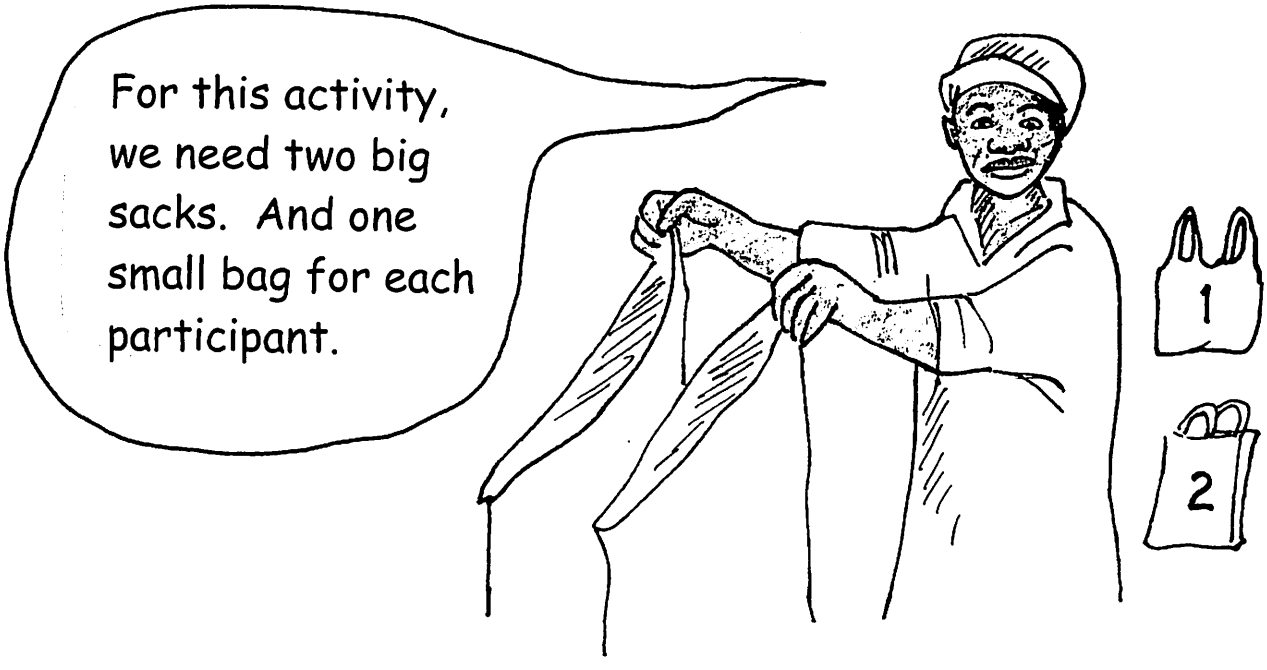
WHAT IS ORGANIC?

9

Food First, 2013



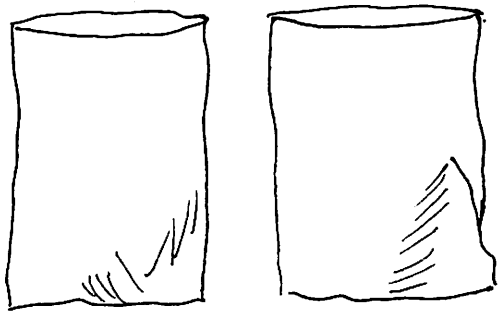
In order to prepare a good compost pile, we need some organic matter. What are some different types of organic matter?



1. Ask the participants that go to the fields or to the streets to pick up objects and trash that they consider ORGANIC.

2. When they return, put all the bags together, and begin to take out each object one by one.
3. Ask the group if the object is organic or not, and why. According to how they respond, put on one or the other of the two big sacks.

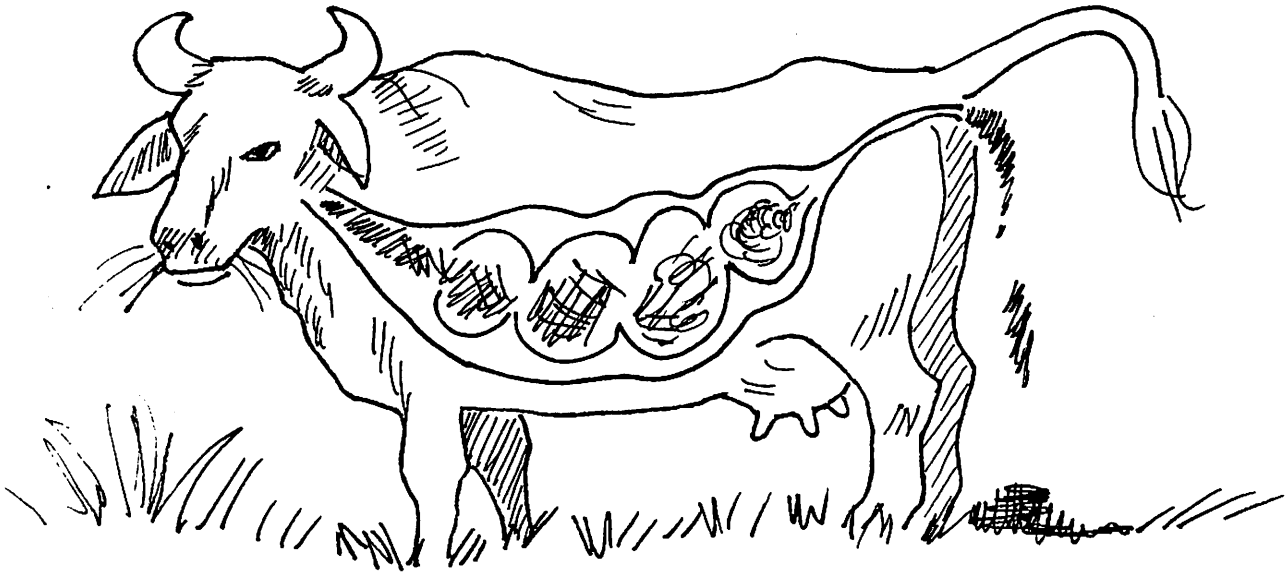
From the sack with organic matter, select the objects that will rot within 6 months. This will serve to go into the compost pile.



Heat, moisture and air will do the rest, with the help of the cow that has given us the first ingredient: MANURE.

The process of decomposition of food in the digestive system of a cow:

1. It eats grass or fodder.
2. Air, heat and moisture, plus bacteria.
3. They produce manure.



The bacteria in the manure make it so the brush, leaves, peels and other organic objects rot in the compost pile.

Questions:
How do things rot?
Why do some things rot more quickly than others?
What basic elements do we need for decomposition?
What essential elements does cow's manure have for decomposition?

Bacteria does the job of decomposition. This process happens slowly in nature, but quickly en the stomach of cows because of the favorable conditions that the cow offers to bacteria: water, air, heat and vegetation very well chewed up.

Technical Reflection:

An understanding of organic matter and the relationships between carbón and nitrogen, decomposer bacterias, water, heat and air, is essential in order to understand the processes of decomposition of vegetation, green manures, and compost piles. These processes are well represented in the digestive system of the cow, who eats plants with a good nitrogen-carbon ratio and that has rumen with decomposer bacteria, heat, moisture and oxygen. The first product of the decomposition process is manure, rich in bacteria and nitrogen. This is a good base to start a compost pile.

Suggestions:
Do this activity before building the compost pile.

CONTOURS ON THE COCONUT

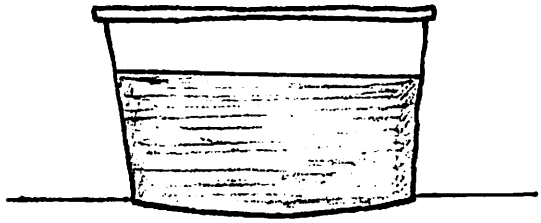
Food First, 2013

10

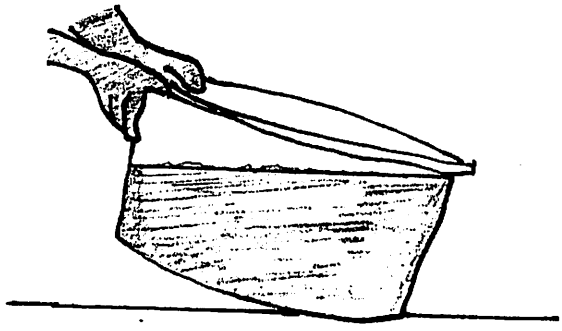
In order to understand the concept of level, do a simple demonstration. We only need a tub, water, Indian ink, and a coconut with a good shell.

We fill the tub with water and put some ink until the water takes its color.

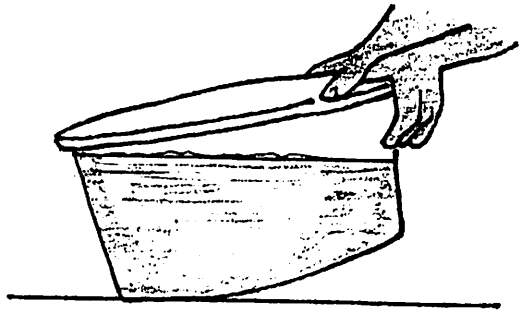
Put the tub on a level table or spot, so that everyone can see the level of the water. Now lift up one side of the tub, but without spilling the water.

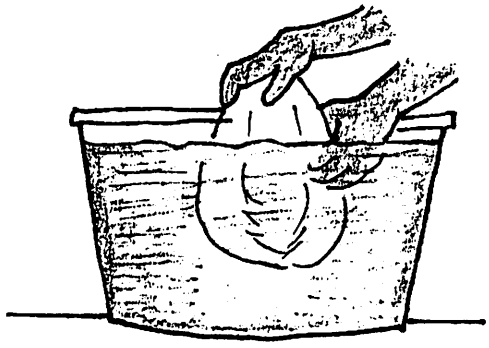


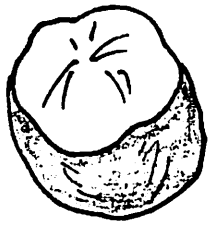
Does the water maintain its level? What do we observe? Now we put the coconut in the water with ink and observe. How does the coconut stay?



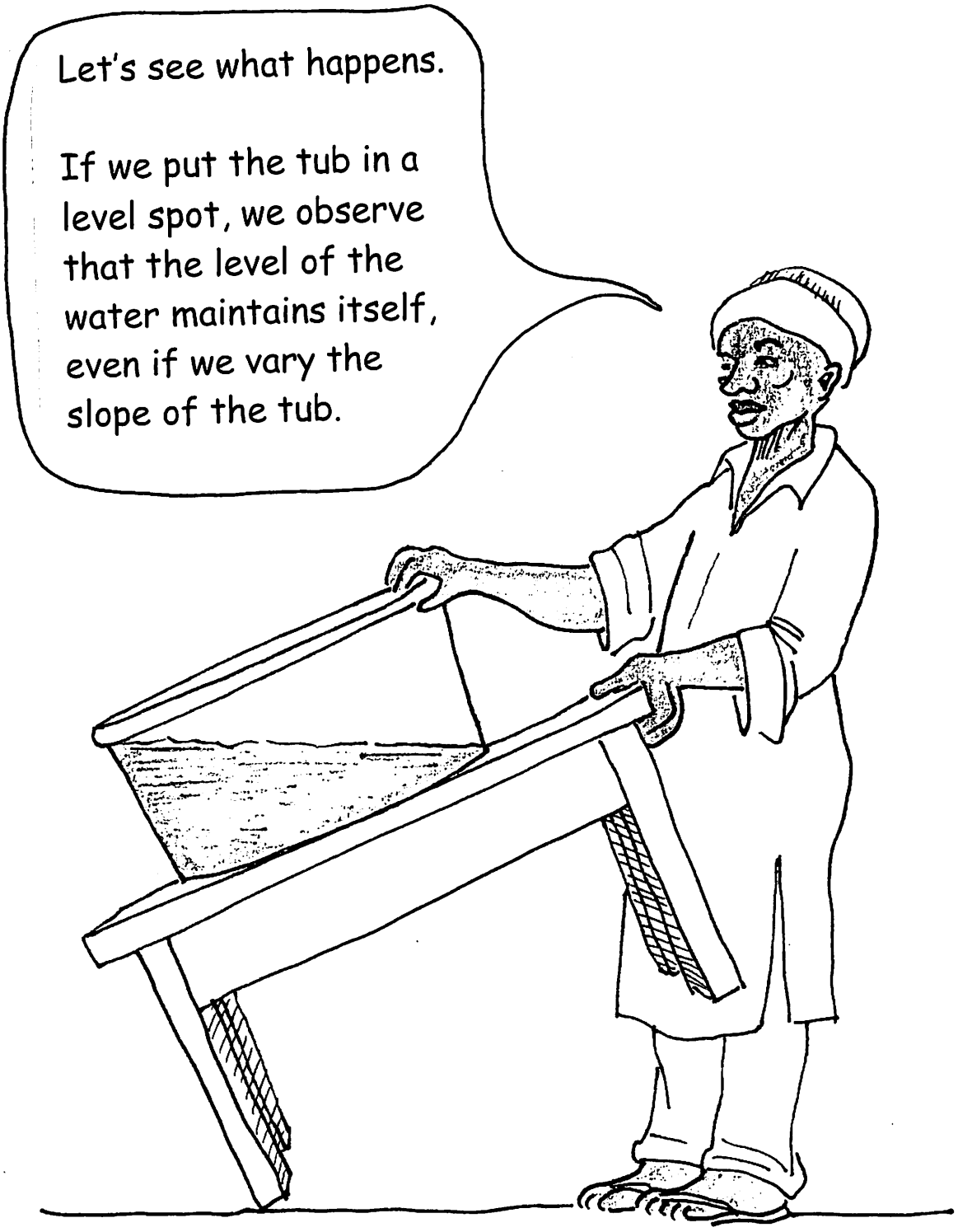
Seen from the side? From above?







Contour lines: How would a hill look with level ditches (also known as contour lines)?


Let's see what happens.
If we put the tub in a level spot, we observe that the level of the water maintains itself, even if we vary the slope of the tub.

Questions:

What is level?

How can we know if things are level?

Why do carpenters and masons use water to find level?

What does the coconut demonstrate?

How did you mark the coconut?

How did the ink take into account the imperfections and wrinkles of the coconut?

How will an uneven hill look with contour lines?

Technical Reflection:

Sometimes it is very difficult to translate the concept of LEVEL to the land. You can make lots of mistakes by trusting in the apparatuses and rulers without understanding the basic concept. LEVEL is whatever plane or series of points that are parallel (equidistant, or at the same distance from each other) on the surface of a body of water (like the sea, a lake, a bucket, or a hose with water). This demonstration shows why CONTOUR LINES around a hill cannot come out in a snail's spiral.

Suggestions:

Compare various smooth objects (balls) with others that have imperfections or irregularities, like cubes or non-round objects.

THE A FRAME & CONTOUR LINES

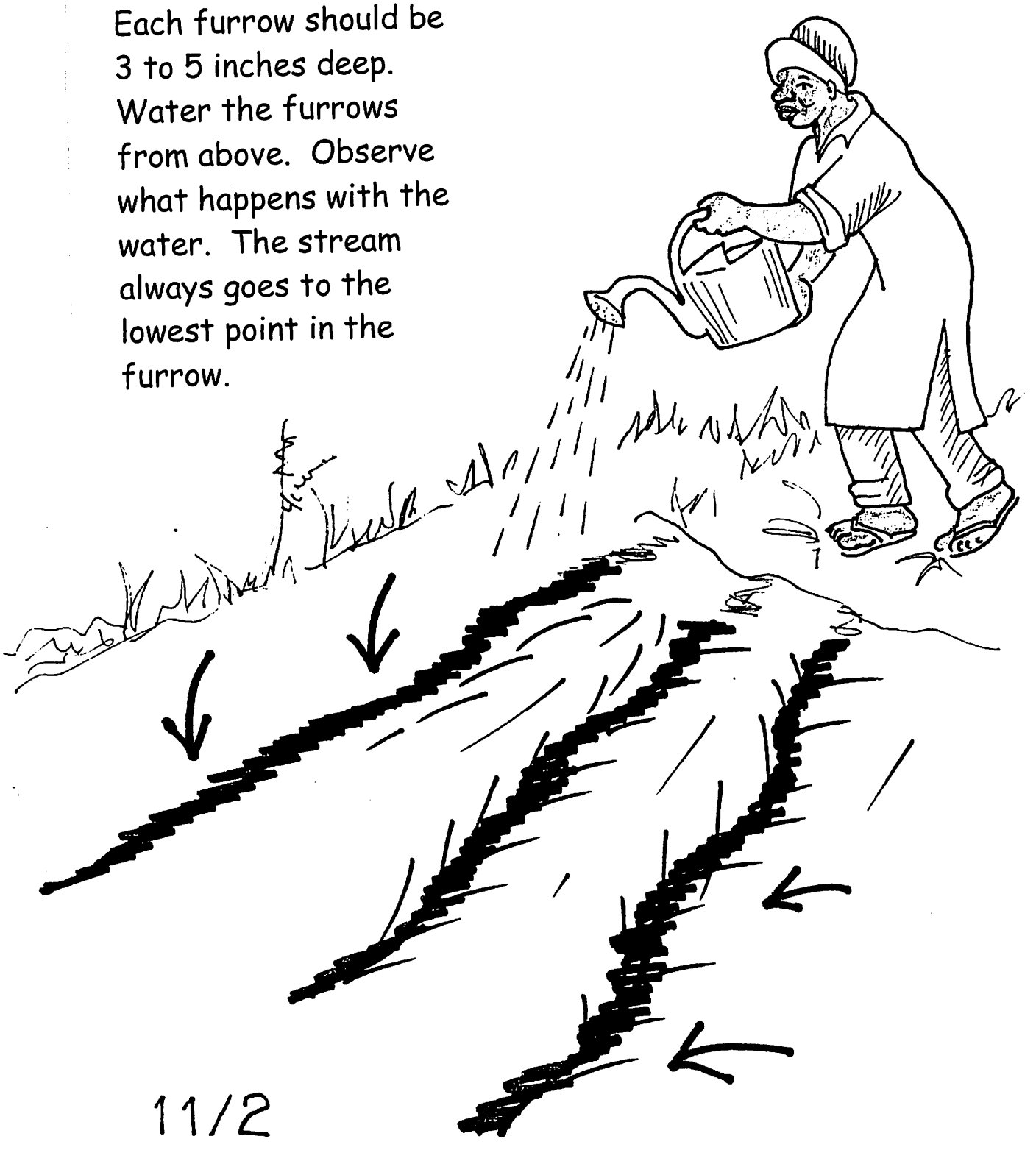
11

Food First, 2013

We are going to see how to use and what uses the A frame has. The best friend of the farmer is the contour. Why do they prevent the torrents of water from washing away the soil of hillsides? First, we need to find a slope of 10 to 30 percent.

We will work on a small piece of land to begin with. The same process is used on big pieces of land. Clear the ground of undergrowth. It is a good idea to do the training on rugged land. On the cleared ground, irrigate with water and observe what happens. The water gathers in the low parts and gains speed.

Starting at the top, make 3 furrows, with a distance of 20 to 30 cms. between them. Each furrow should be 3 to 5 inches deep. Water the furrows from above. Observe what happens with the water. The stream always goes to the lowest point in the furrow.



Starting at the same points as the straight furrows, lay out the contour lines with the A frame (at the same level throughout).

Mark the new points with stakes. The A frame helps us draw lines in which all the points are at the same level. In this way, the water stops and the water runs even.

Questions:

How does the A frame work?
How do you mark a contour line?
Why do we need contour lines?
What resources do we manage when we make contour lines?
Why do we use a small A frame instead of a large one?
When we water the contour lines, why do they not overflow as easily as the straight furrows?

Technical Reflection:

It is hard to demonstrate the advantages and disadvantages of contour lines without at least a few heavy rains. Making them takes a lot of time and effort. Few farmers are willing to risk their work without being sure it is worth the trouble. The small A frame demonstrates how to mark level curves on a small scale and with immediate results without a great investment of labor.

Suggestion:

Use the A frame after the Coconut Level exercise and before making a large A frame.

THE TREASURE

What is the treasure? Where is it?

12

Food First, 2013

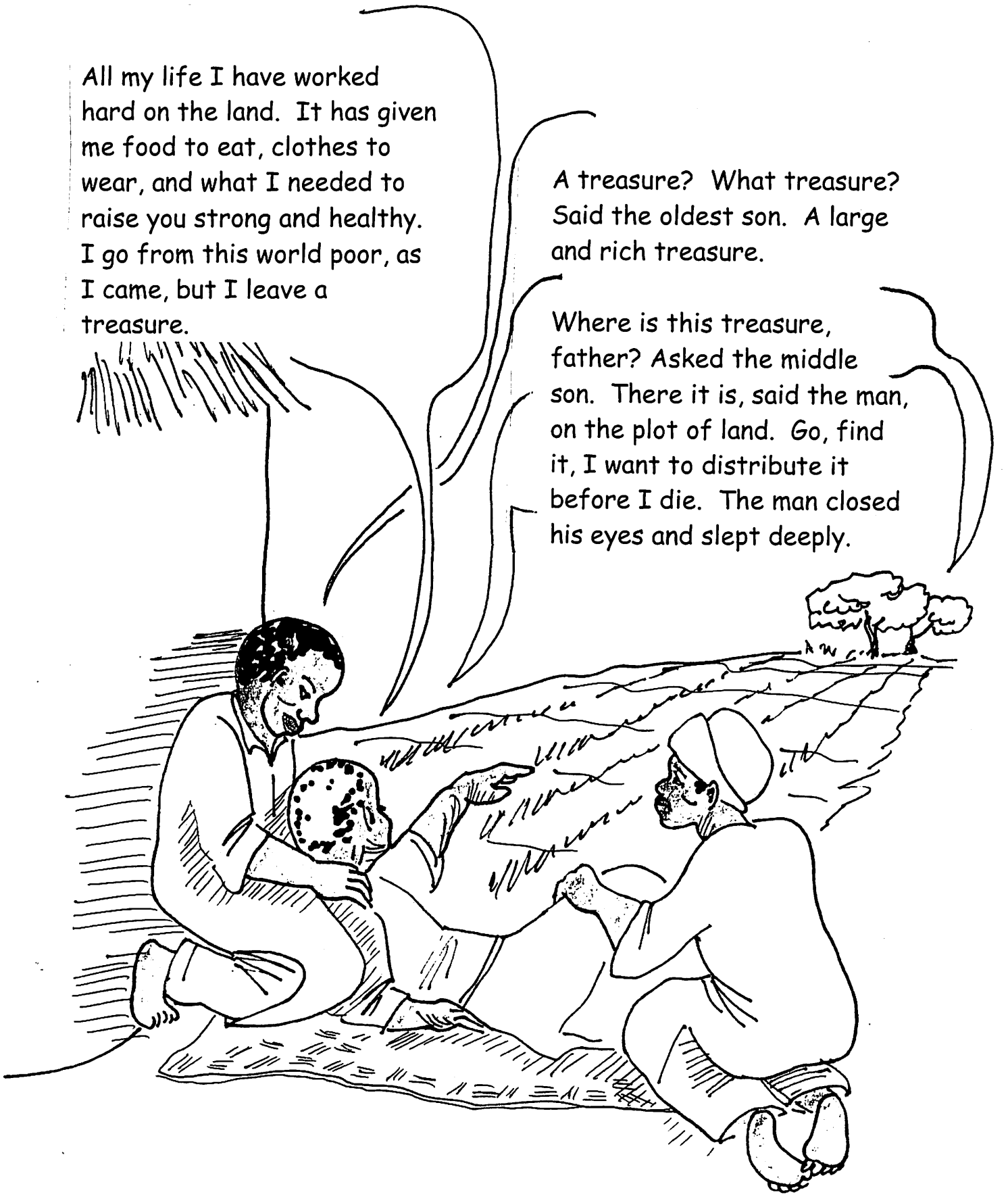
Once upon a time, there was a man that worked very hard on the land, so that he could feed and educate his three children, who he loved.

The children grew up healthy and strong because of the fruit of their father's labor, but they did not help in the work, even though they loved their father.

Time passed, and the man aged quickly because of doing so much work by himself. One day the man fainted from so much fatigue.

His children brought him home and called the doctor. It would be better to call the priest, this man is finished, said the doctor.

When the priest gave him the last sacrament, the man said: Children, I leave you with a treasure!


All my life I have worked hard on the land. It has given me food to eat, clothes to wear, and what I needed to raise you strong and healthy. I go from this world poor, as I came, but I leave a treasure.
A treasure? What treasure? Said the oldest son. A large and rich treasure.
Where is this treasure, father? Asked the middle son. There it is, said the man, on the plot of land. Go, find it, I want to distribute it before I die. The man closed his eyes and slept deeply.

The children took shovels, picks, hoes and went to the land to find the treasure. They spend all day digging the earth. Six days passed, then seven, digging. Each night when they returned they asked their father: where? He responded, there, there where I worked all my life. Have you turned all the earth?

Has all the vegetation mixed with the smooth and spongy soil? If so, then you have done what I could not do alone: make a fertile soil. This is the treasure, work it always like this and it will always give you good harvests. THIS IS THE TREASURE. With these words on his lips, the man died.

Questions:
Why did the man say he had a treasure?
What did the children look for?
What did they find?
What does treasure mean to you?
What will you leave to your children?
How can you ensure that they inherit a treasure?
How will you also ensure that your grandchildren inherit a treasure?

Note:
To plow the land means to change its structure in order to improve its porosity and fertility. It is not always a good idea to do in sandy soils because of its fragility or on very sloped land because of erosion. It is important to be cautious on clay soils. It must not be very moist, because it makes big hard clods when it dries.

Technical Reflection:
Peasant culture can see the land in a much more complex way than just cost/benefit. It is the base on which family and peasant culture is reproduced. Because of this, many times the peasant is willing to make big sacrifices to ensure the wellbeing of it. This is similar to the concept of ecological "sustainability" and suggests that the peasant is an actor with will and cultural interest in developing a sustainable agriculture.