

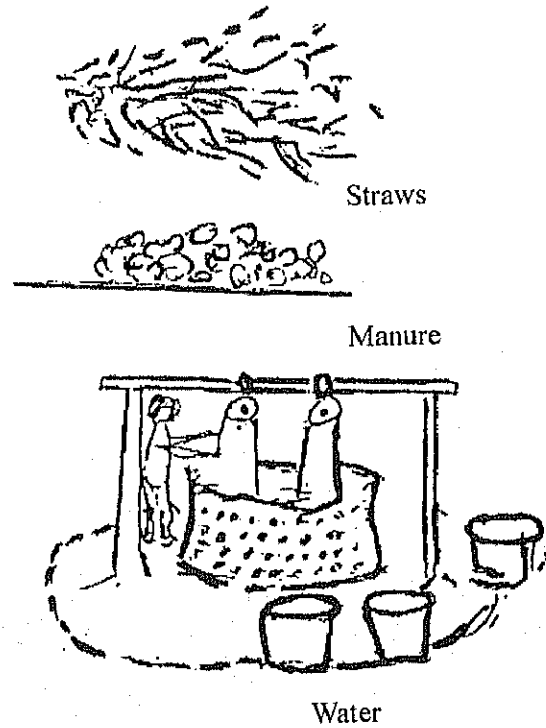
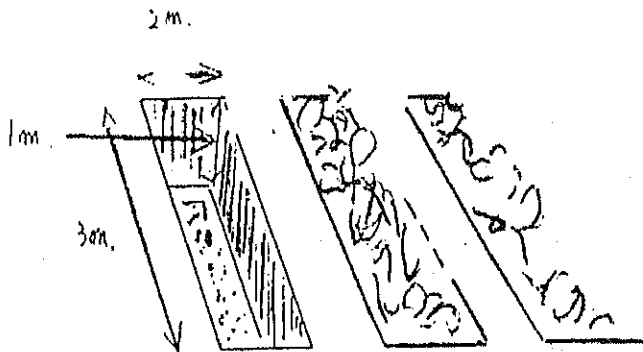
III Technical materials

1 Field of agriculture

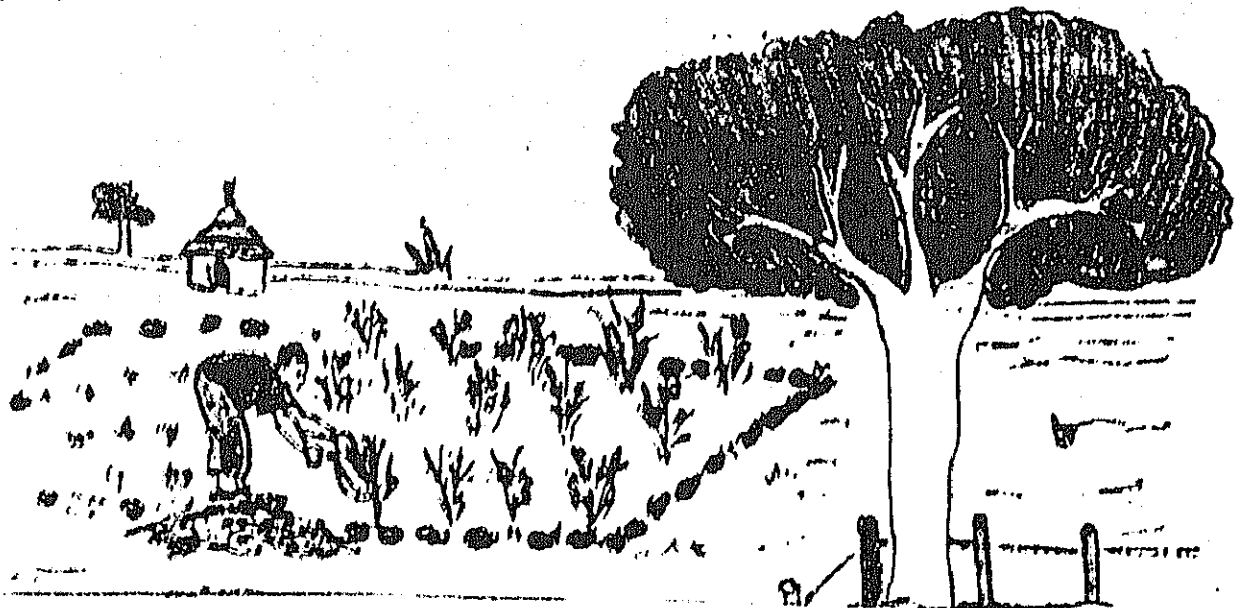
1-1 Rainy season crop growing improvement

(1) Sorghum

1) Product of compst

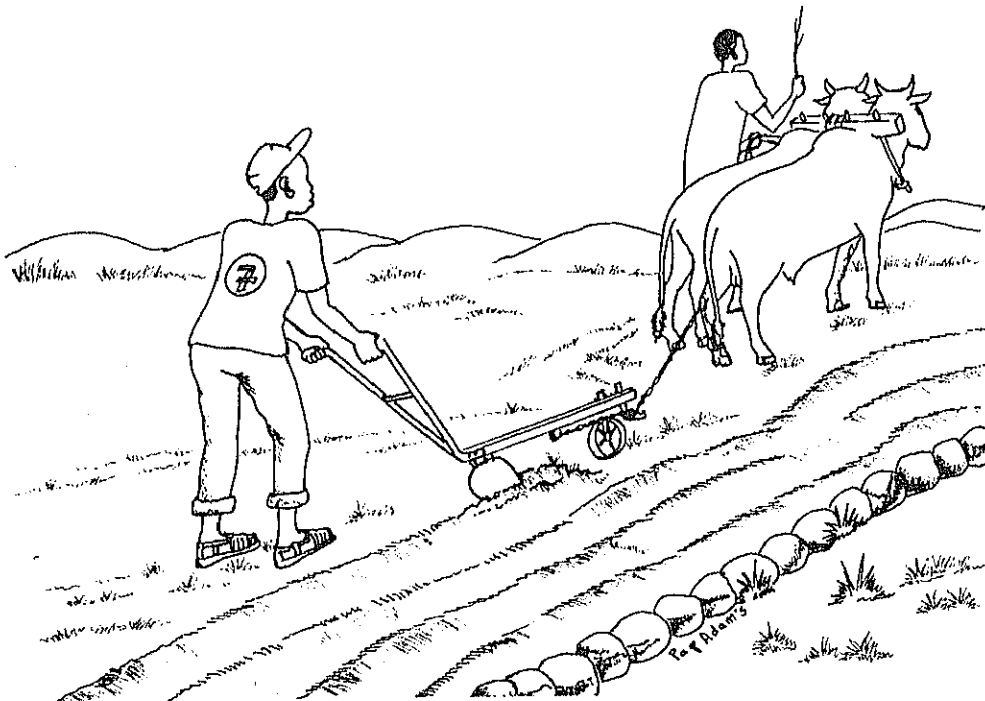


2) Preparation of fields



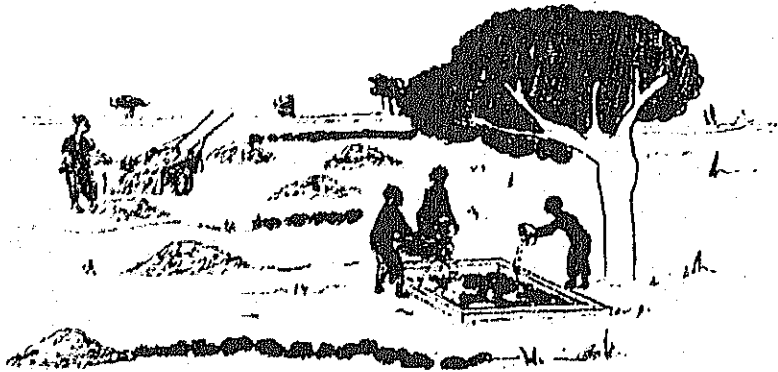
- To select the lands flat or land which can be flattened
- Deviser fields of culture
- To remove the bad herbs and garbage

3) Plow with an animal traction



- To plow with plow or a pick
- 15-20 cm of depth
- To plow in line right

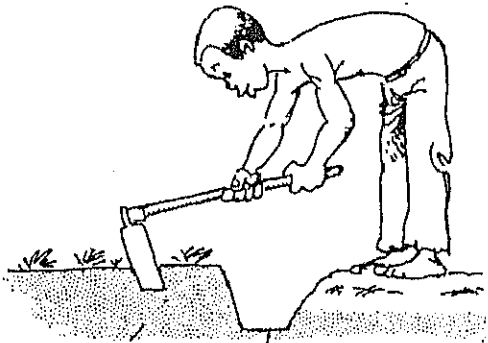
4) Fertilization



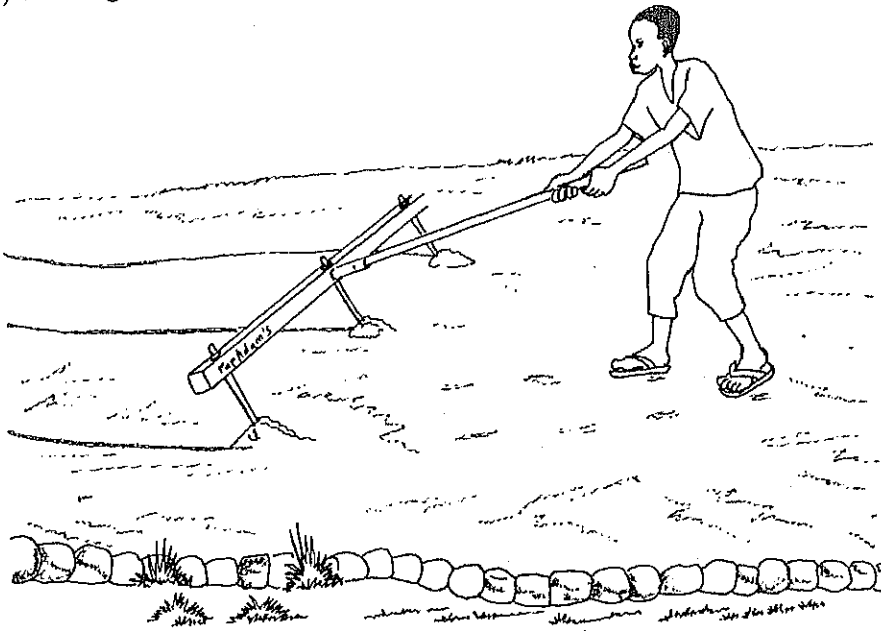
- To put of compost all 5 ha of fields(The whole should become fertile).
- 100kg of NPK and 50kg of Urea by 1ha
- To retort compost fairly

5) Weeding or Mixed manure and soil

- To return the soil with Daba or Hilaire
- Mixture manure and soil from 14 cm of depth

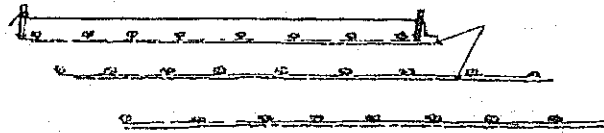


6) Seedling

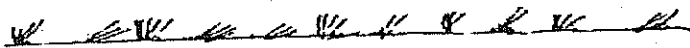


-A slot end machine (iron or wooden) is used.

- To prepare a rope and two pegs
- To put the rope between the two pegs
- To raise pegs of every field rating
- 80cm of furrow
- 40cm of spacing

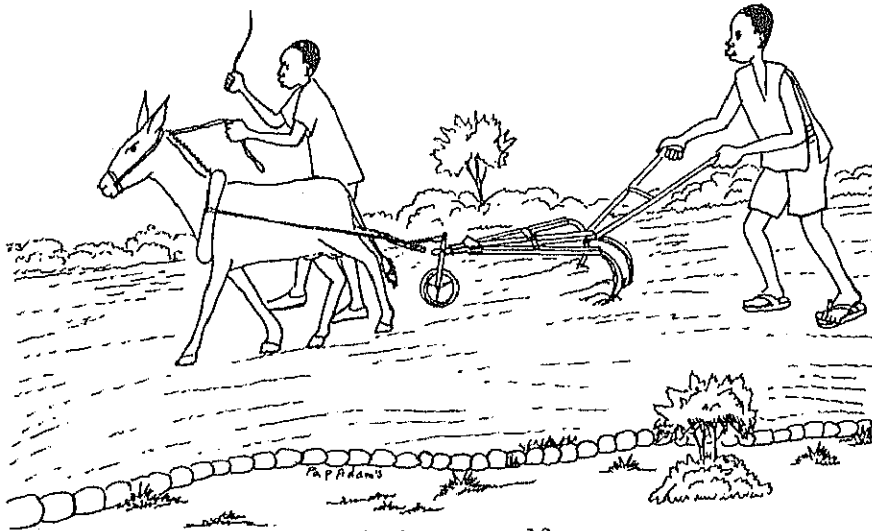


7) Thinning



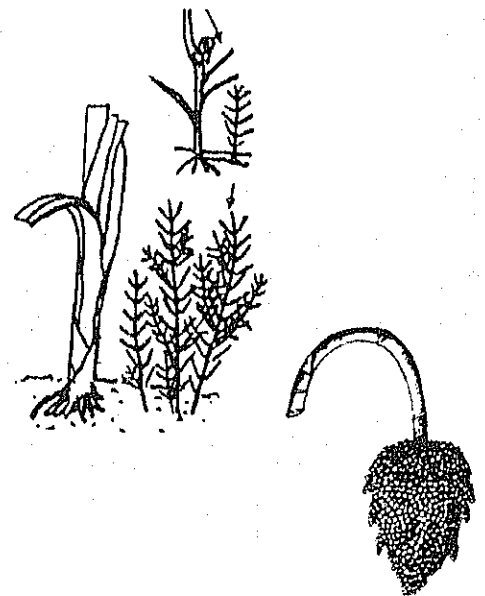
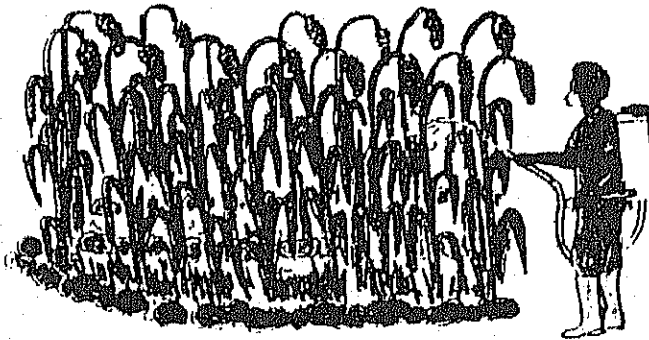
- To remove the weak plants
- To let the vigorous plants
- To equalize spacing

8) Weeding



- To make the weeding in the space of furrows
- To bury the bad herbs
- To avoid to cover soil cultivates
- To repeat two or three times during the growth of plants

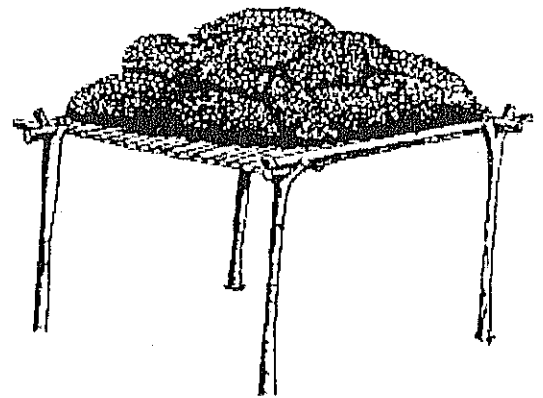
9) Growth and maintenance



- One considers three phases in the cycle;
 - The first goes from the seedling has the floral intimation
 - The second of the floral intimation has the pollination
 - The last of the pollination has the maturity
- To treat plants to follow the "technical service" advice

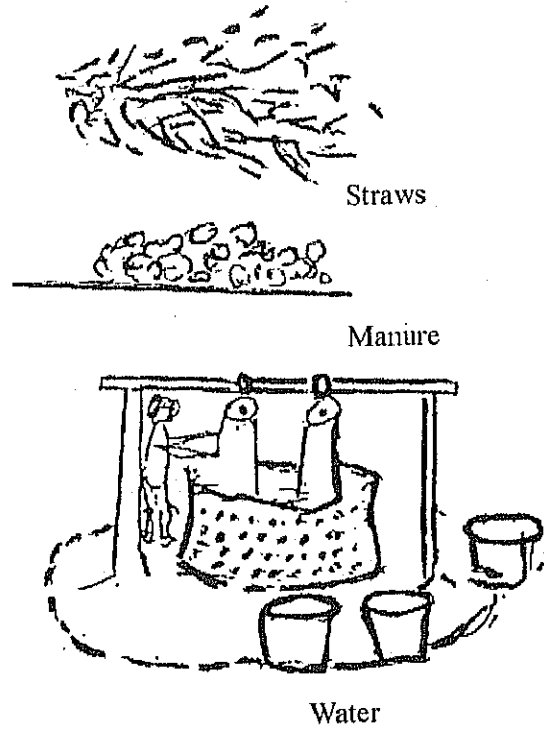
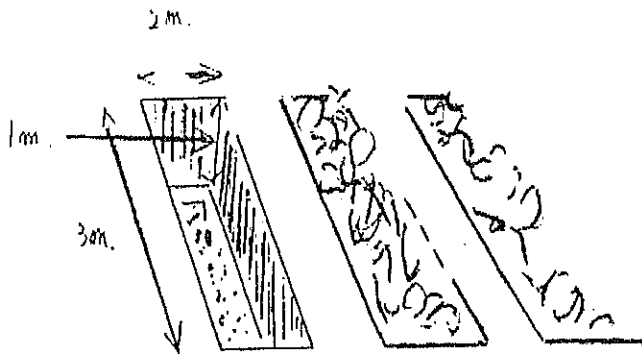
10) Harvest

- To only harvest ears
- To dry ears on the " depot "
- To preserve ears on the " depot " or in a store



(2) Cowpea

1) Product of compst

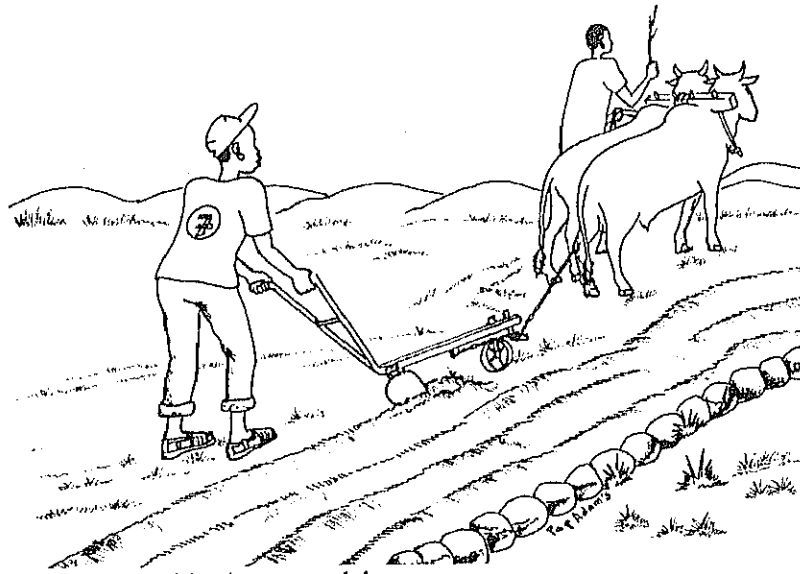


2) Preparation of fields



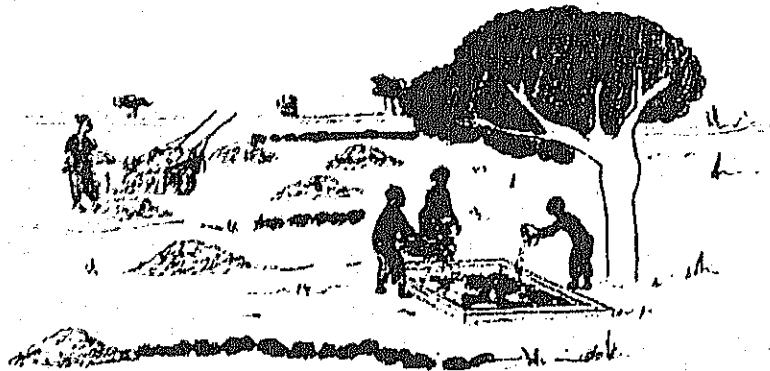
- To select the lands dish
- Deviser fields of culture
- To remove the bad herbs and garbage

3) Plow with an animal traction



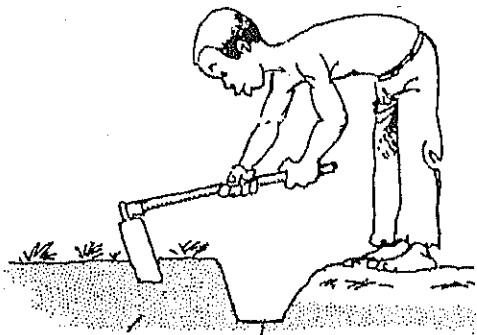
- To plow with plow or a pick
- 15 cm of depth
- To plow in line right

4) Fertilization



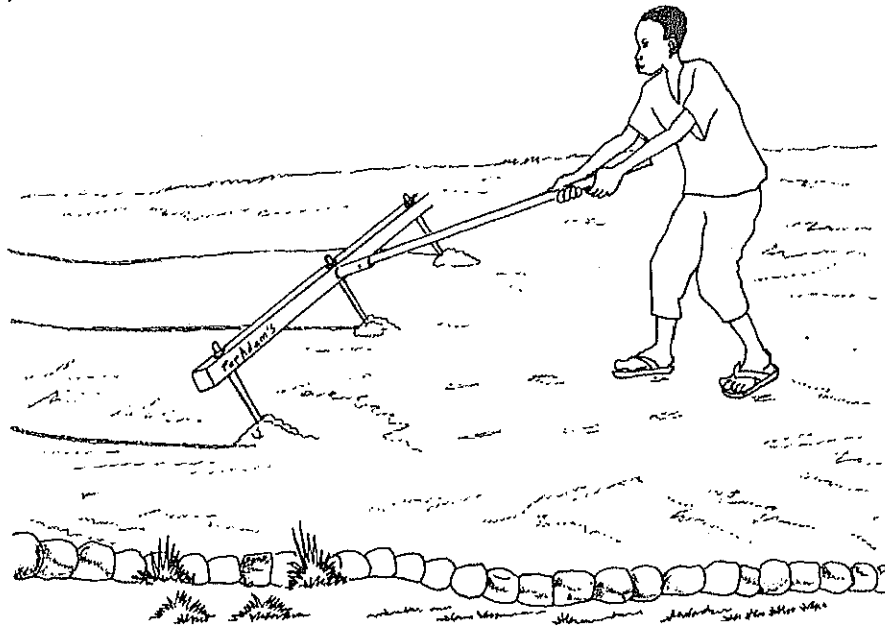
- 100kg of NPK by 1ha
- To rotort compost fairly
- Buries manures to the 5cm of depth

5) Weeding or Mixed manure and soil

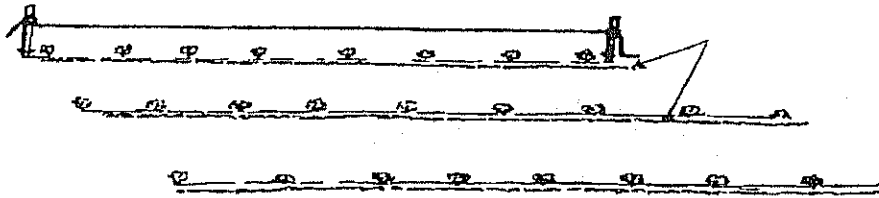


- To return the earth with Daba or Hilaire
- Mixture manure and soil has 14cm depth

6) Seeding

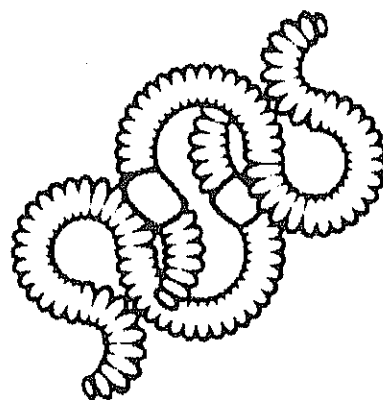
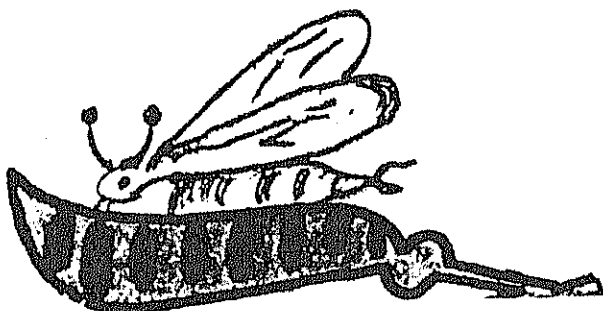


-A slot end machine (iron or wooden) is used.



- To put the rope between the two pegs
- To raise pegs of every field rating
- 80cm of furrow
- 40cm of spacing
- To use 15-20kg of seeds by hectare

7) Insecticide treatment



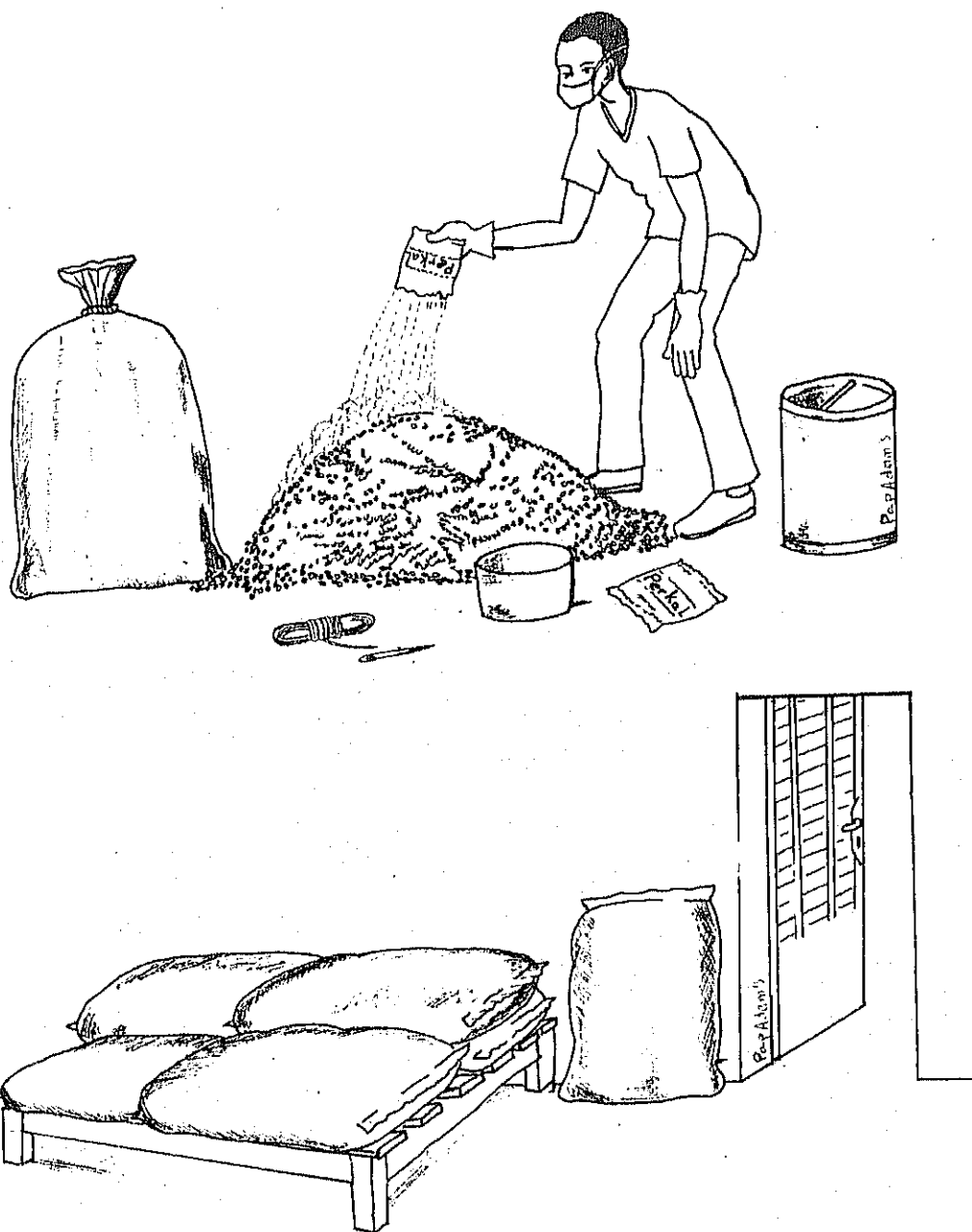
- Bugs eat grains of cowpea
- It is necessary to protect by damages of bugs
- To treat plants to follow the "technical service" advice
 - : The first treatment is 35 days biting seedlings
 - : The second is 15 days biting 1st treatment
- The illness insect pest control of three types is required.
 - : treatment of seed
 - : treatment of plant under growth
 - : treatment under preservation in a storage place

8) Harvest



- To harvest the husk differently and of fade them
- To dry the husk and of fade them on the " depot " or in a store

9) Conservation and treatment



Before the conservation it is necessary to deal the husk with chemical gunpowder as Perkal, Altelik or Fostoxin

- To preserve the husk putting in heap or in bag
- To sell to the walks or to tradesmen

1-2 Market gardening

1. Confection of pits composts and manufacture of compost

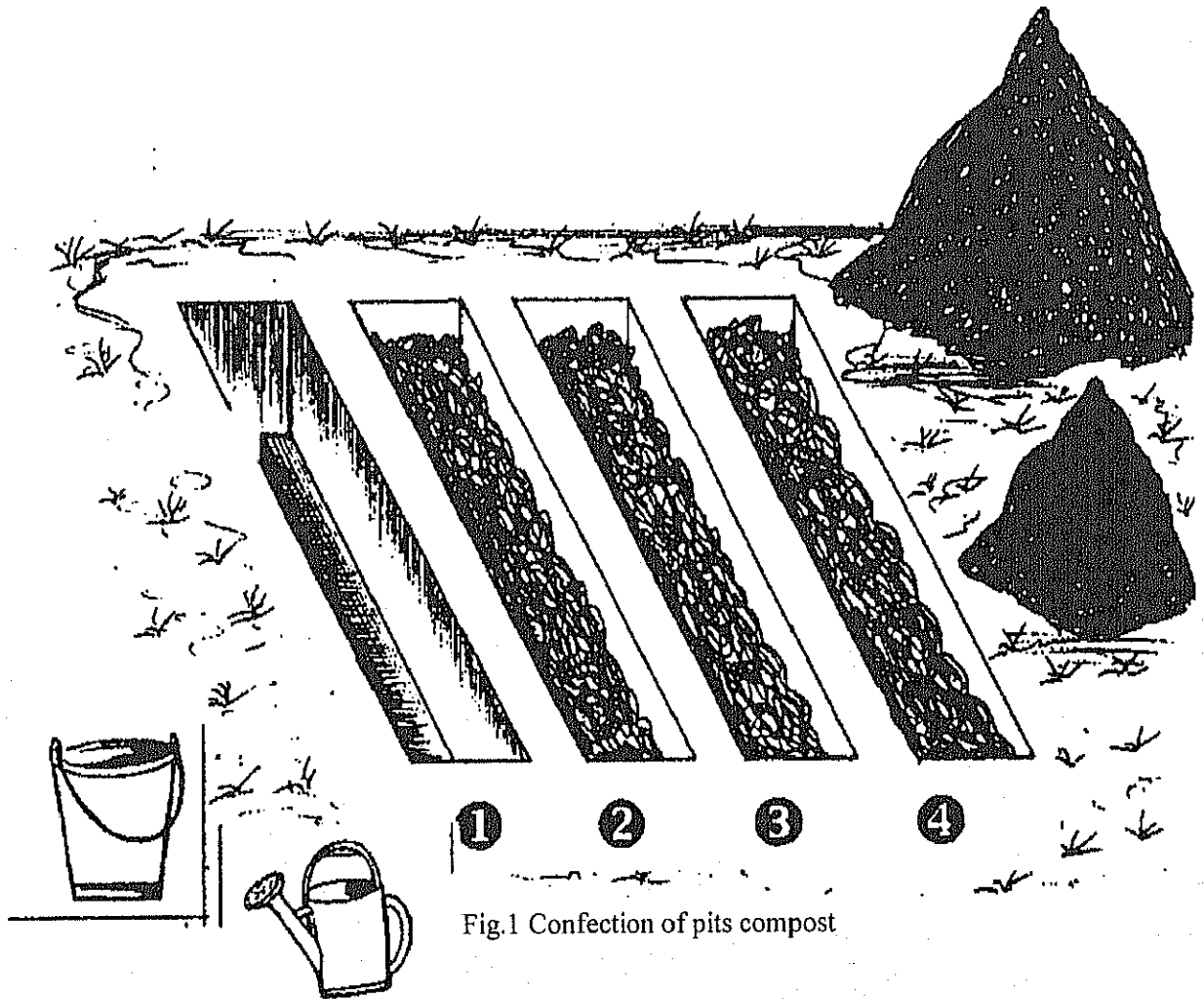


Fig.1 Confection of pits compost

- a) To choose a place to shade to put the barn yard manure in place;
- b) To always implant the barn yard manure in a perpendicular way to the slope. Of preference to choose the quotes North - South;
- c) Measurements of holes must be identical. They are the following:
 1. In the cases of two or more
 - Length: 3~4 m
 - Width: 1~1.5 m
 - Depth: 0.5 m
 2. In the case of the singular number
 - Length: 3.4 m
 - Width: 1.5~2m
 - Depth: 1.1~1.2 m

2. The seed bed

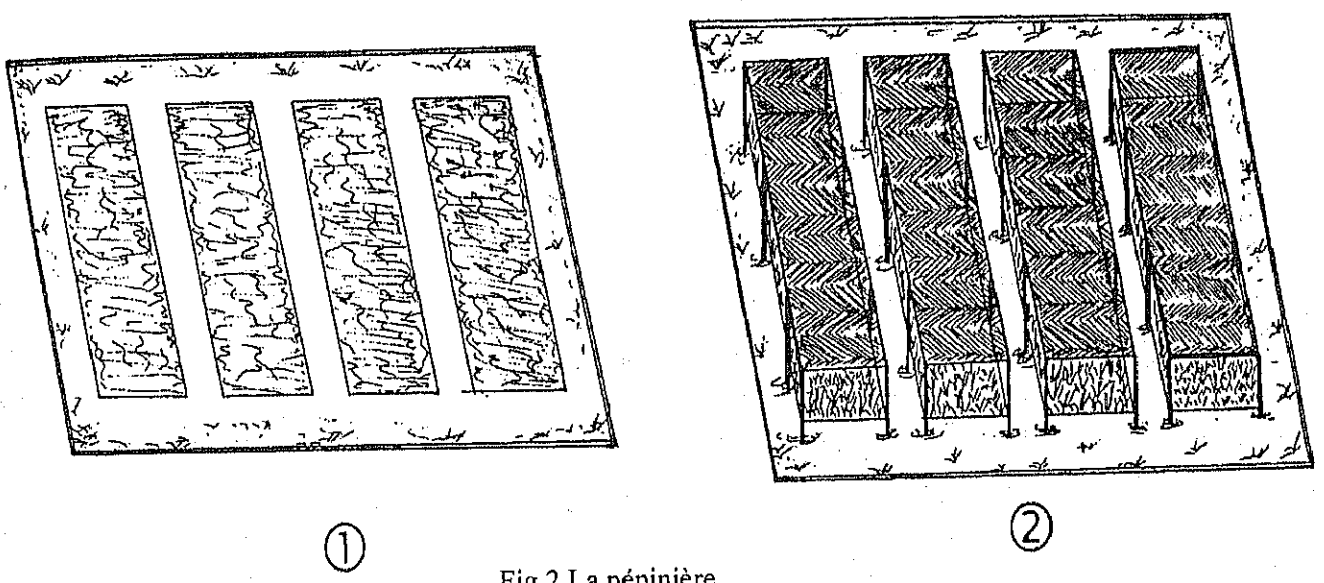


Fig.2 La pépinière

3. Preparation of the field and recording

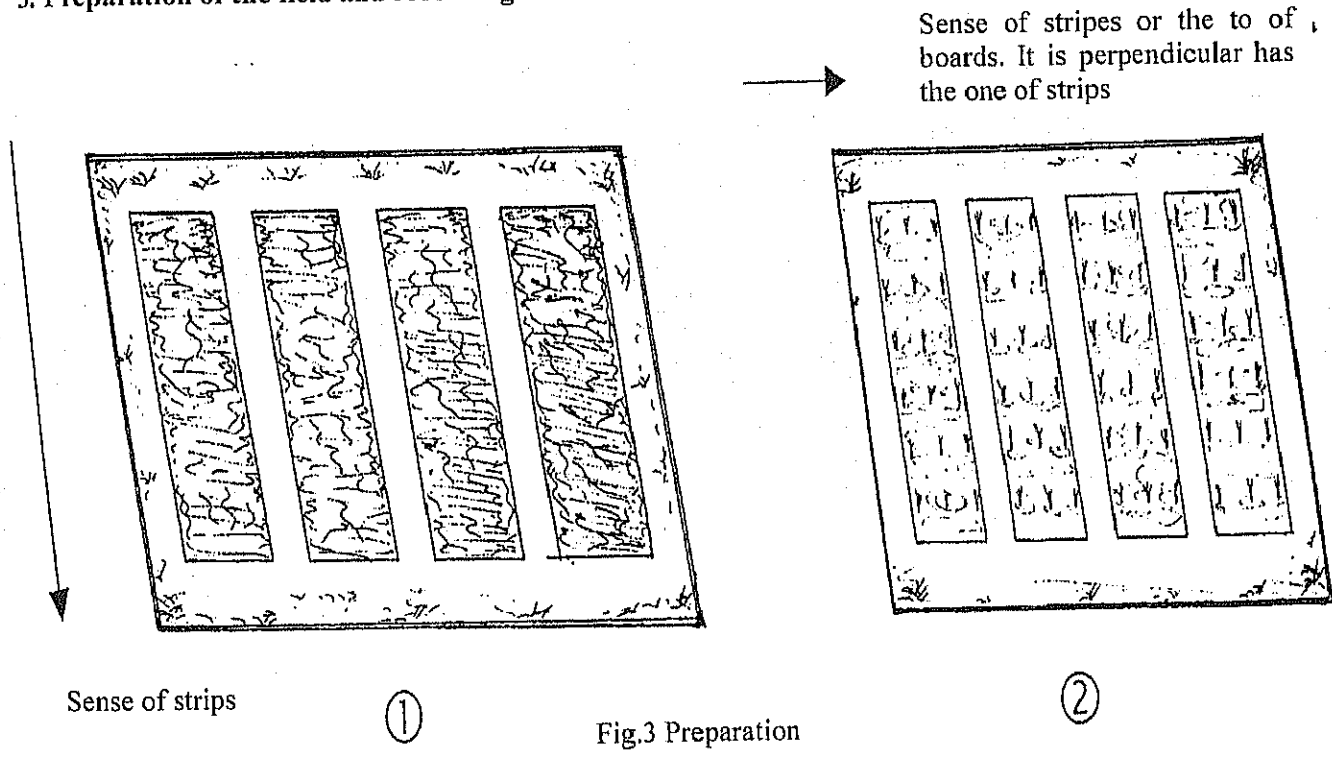


Fig.3 Preparation

4. Method of irrigation

Water must be poured with a certain sweetness of manner to what it doesn't cause any damages at the level of passages to prevent a good irrigation. In other words it is necessary to control the debit of water during the irrigation or the watering well. It need be to put a heap of grass on the place or water is poured.

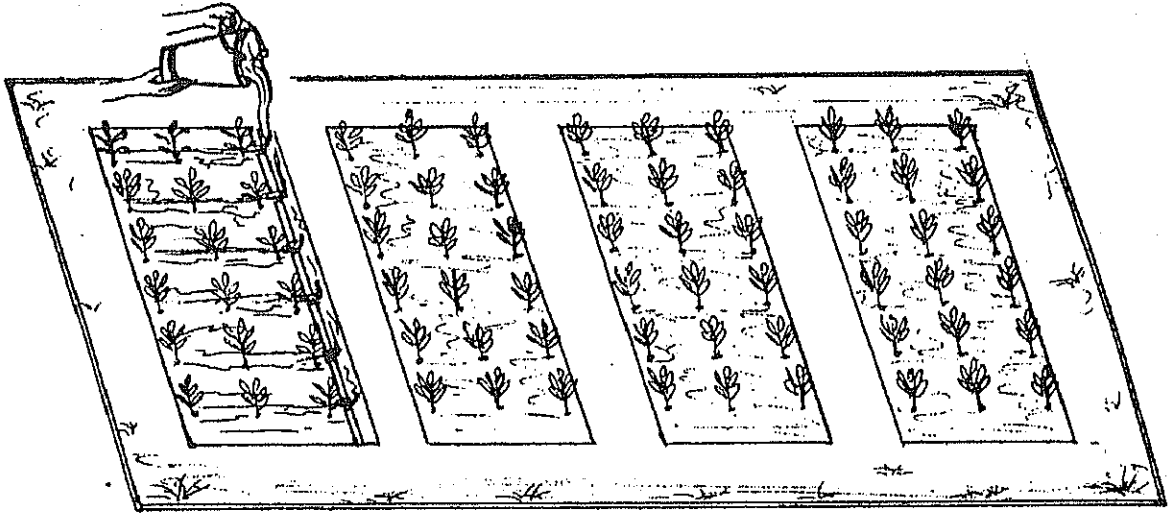


Fig.4 Method of irrigation

5. Weeding and management of the manure

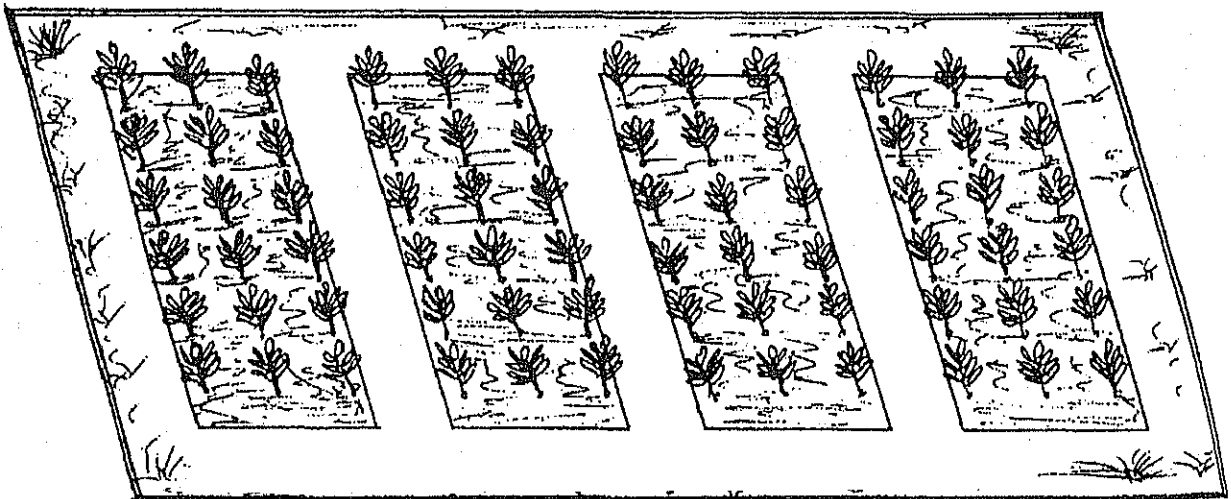


Fig.5 Weeding

6. Harvest and merchandising

1. Harvest

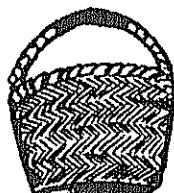
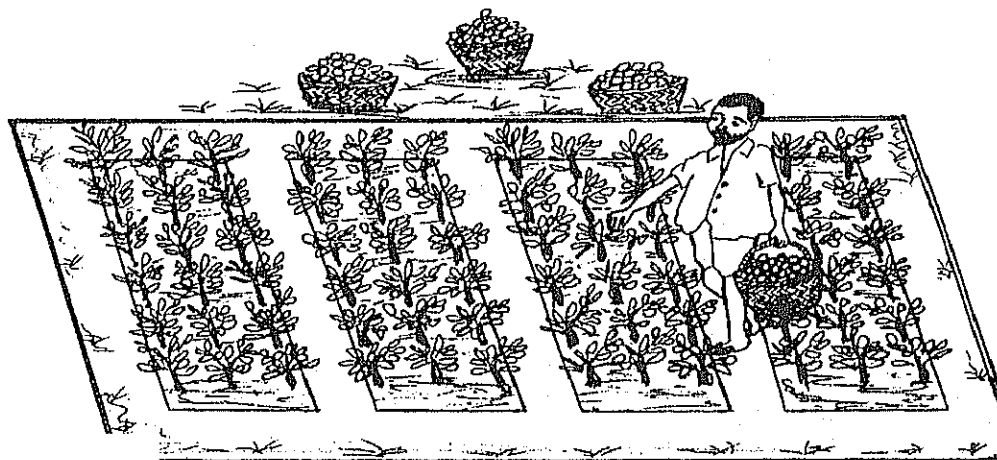


Fig.6 Harvest

It exists two ways to harvest depending on whether the vegetables are destined for immediate consumption, for conservation or for transportation over long distances. For vegetables destined for immediate consumption, they can be harvested as they are. For vegetables destined for conservation and transportation, they must be harvested in a tender state, that is, they should be green or completely white. It is advised to space the days of harvest to allow for the young fruit to develop. It is preferable to proceed with the harvest in the evening before or after watering.

2. Merchandising



Fig.7 Merchandising 1

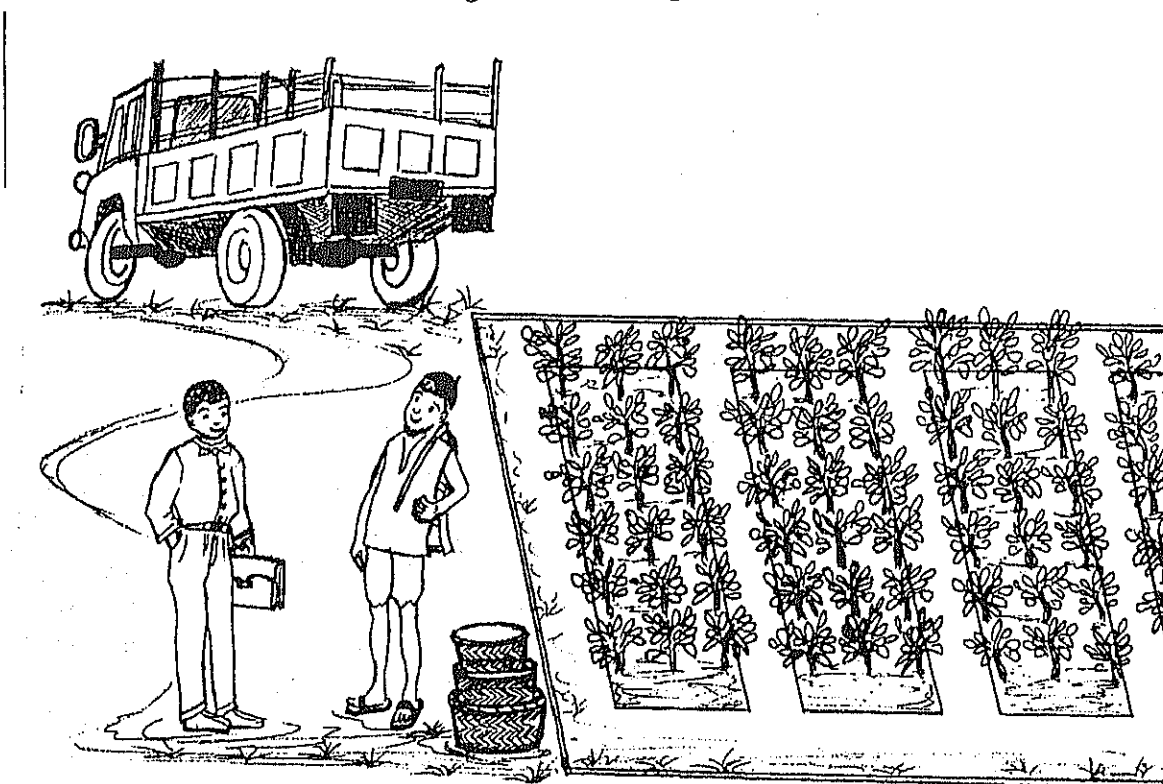
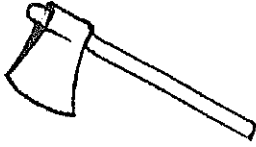


Fig.8 Merchandising 2

This manual doesn't certainly contain all common techniques in the garden products but gives some useful indications for those that want to exercise it.

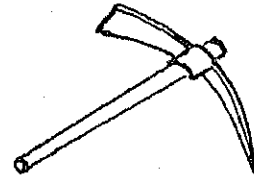
Some tools use in the practice of garden products



Une Hache



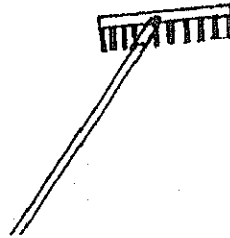
Un coupe-coupe



Une pioche ou
pic-casse



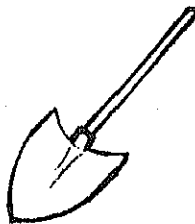
Une houe



Un râseau



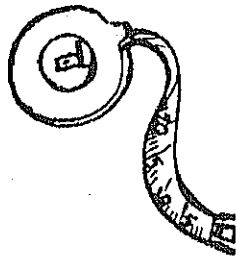
Une brouette



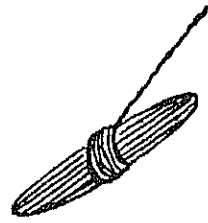
Une pelle



Un panier



Un mètre ruban



Un cordon



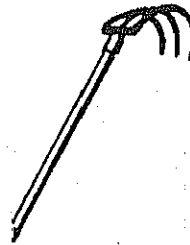
Un plantoir



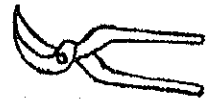
Un transplantoir



Un binette



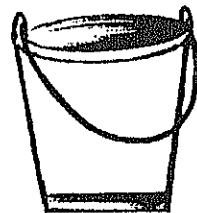
Une serfouette



Une griffe



Un arrosoir



Un seau

2. Field of livestock farming

2-1 Improvement of chicken breeding

1. Limiting factors of poultry farming

1.1 Poultry farming in villages

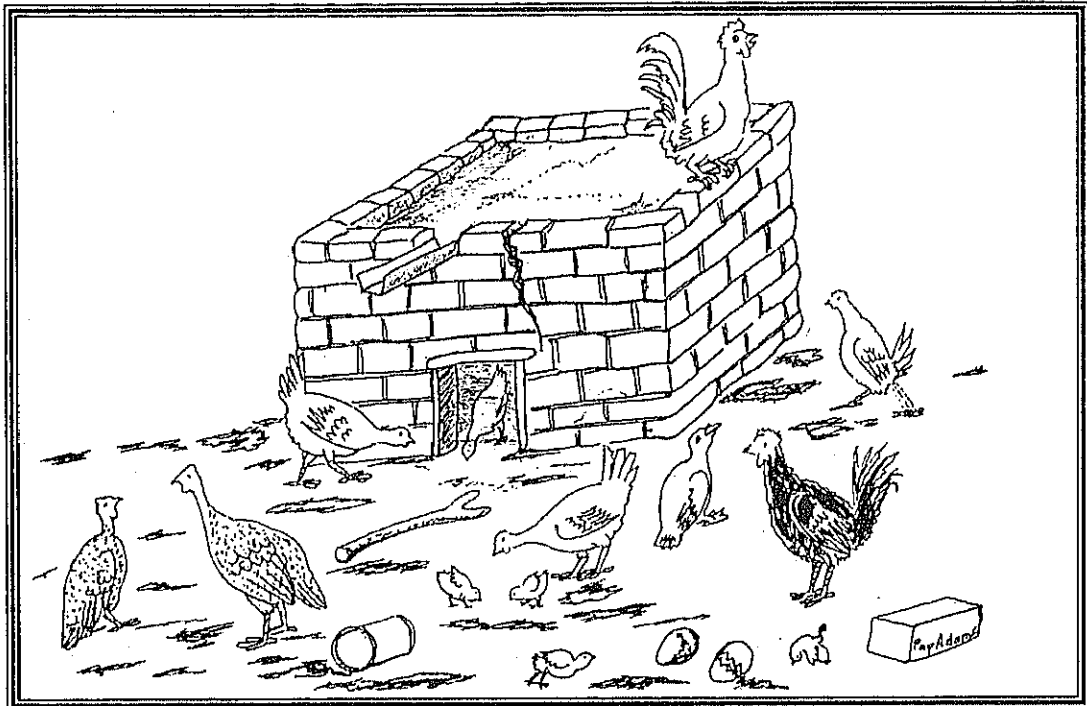


The poultry farming in farmer's area in most cases is rather considered as a secondary activity for supporting family economy. People devote very few time to it. Poultry live in liberty to the inside and around a barn. Farmer doesn't take care enough their health and their food. It gives a bad result. The sale doesn't produce a lot of money

2. Village poultry farming improvement techniques

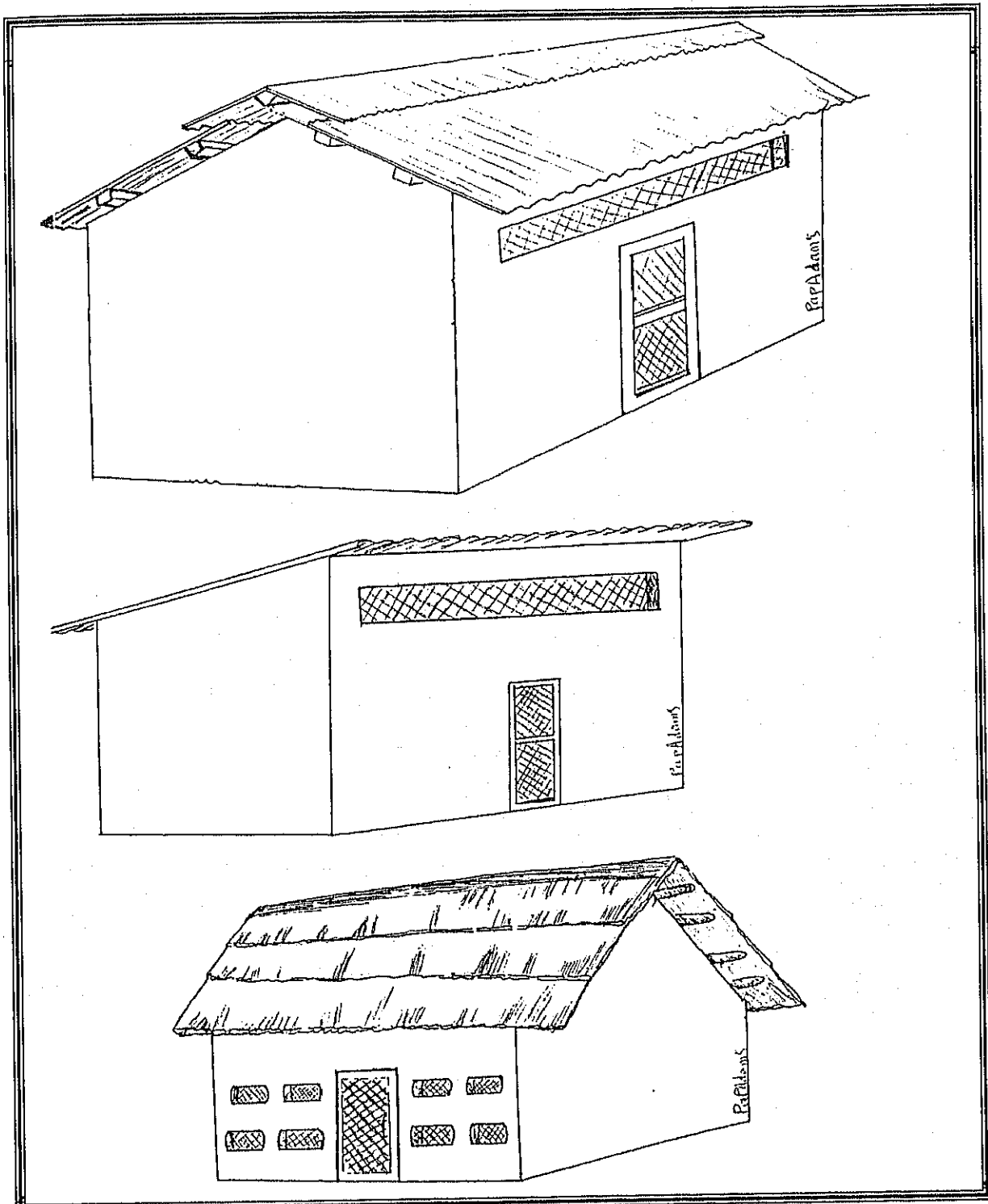
2.1 Traditional habitat

In most cases of traditional breeding, even henhouse exists, it is just come down to a small room.



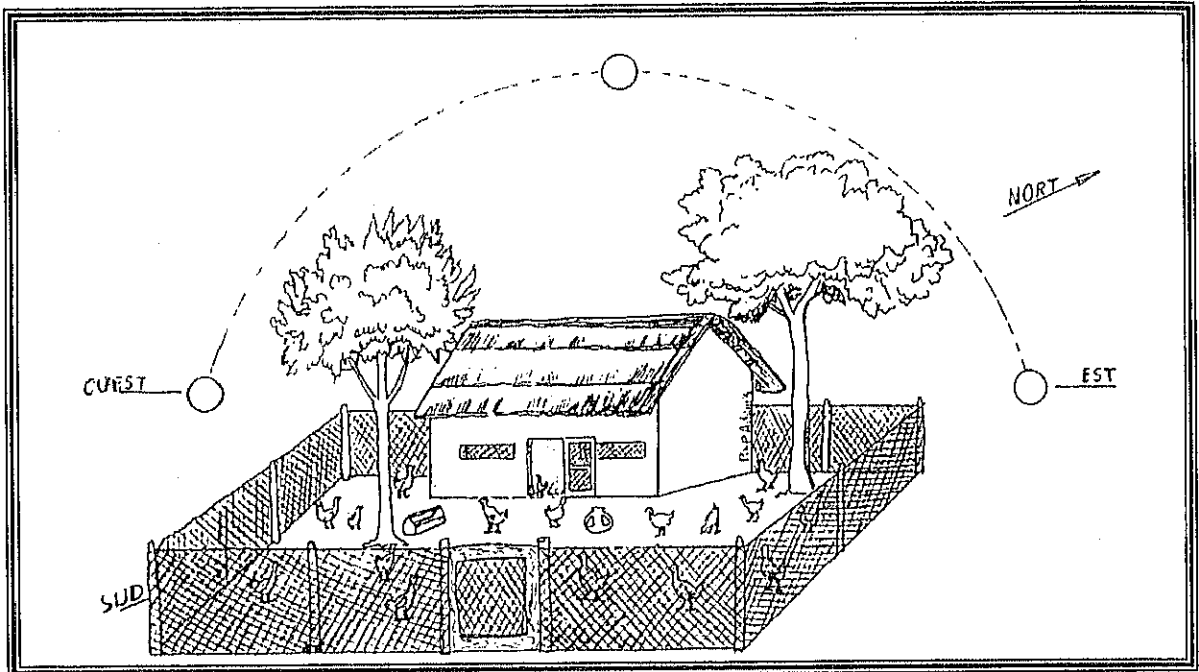
Poultry's droppings mixed sometimes to bad eggs or to chick carcasses is an environment for bacterial culture.

2.2 Three types of modern hen house



The models of hen house are numerous. Some constructs in hard or in improved banco , in sheet metal or in straw

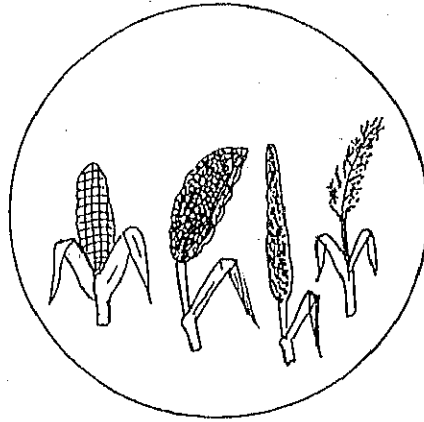
2.3 Direction of a henhouse



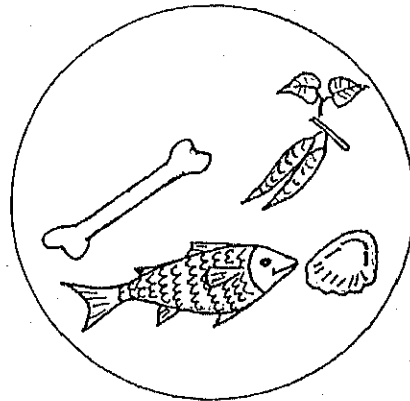
The henhouse must be orientated in taking into account winds and rains (east-west)

3. Food improvement
3.1 Energy-giving foods

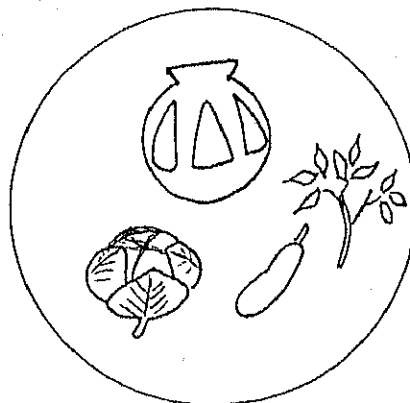
-Carbohydrate foods
(millet, corn, sorghum, rice)



3.2 Tissue-development foods
Tissue-development foods
bone powder, fish meal, shellfish, bean

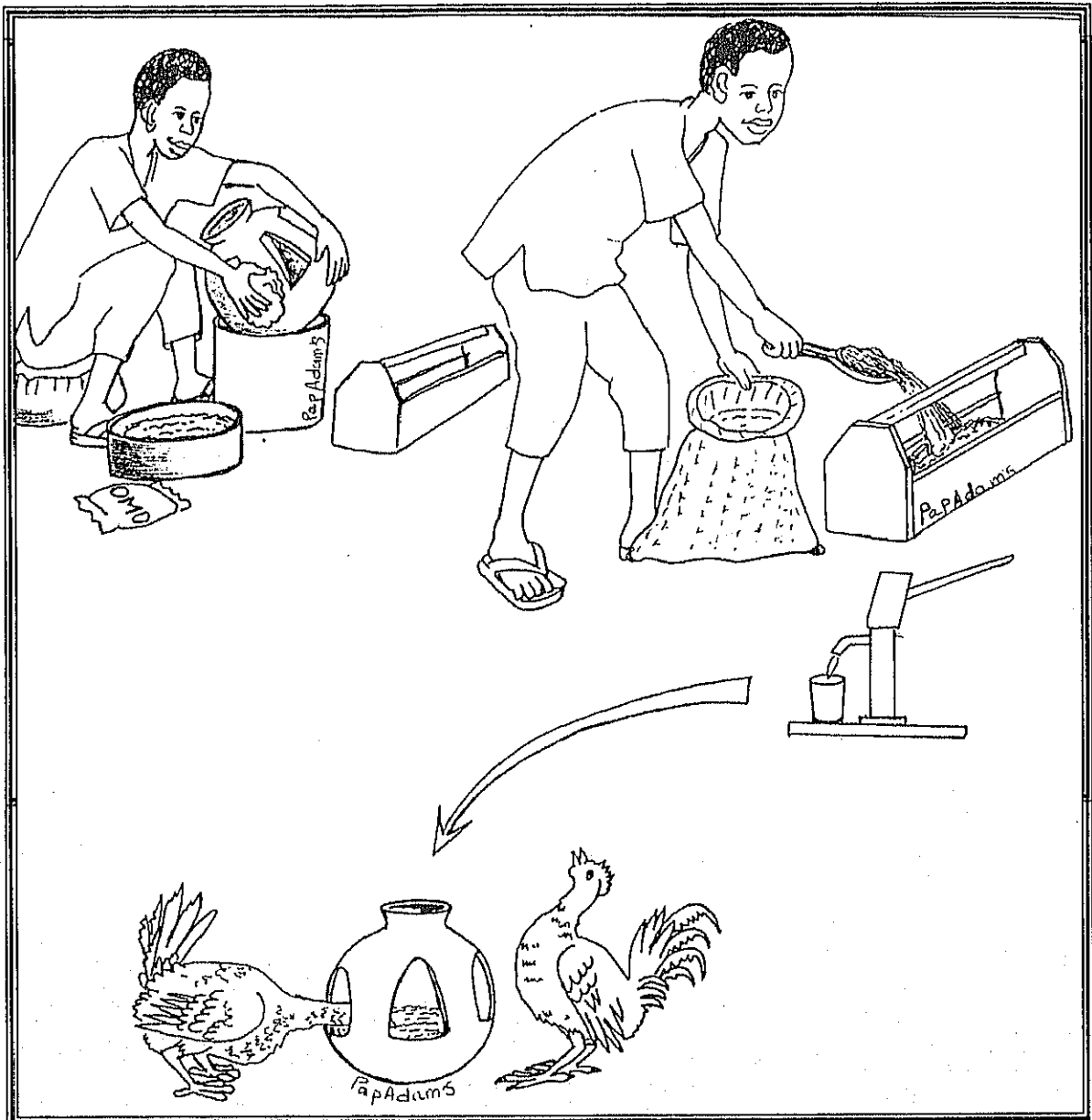


3.3 Vitamin and trace elements-supplier foods
Vitamins and trace elements are in green vegetables,
fruit, cereals, and water.



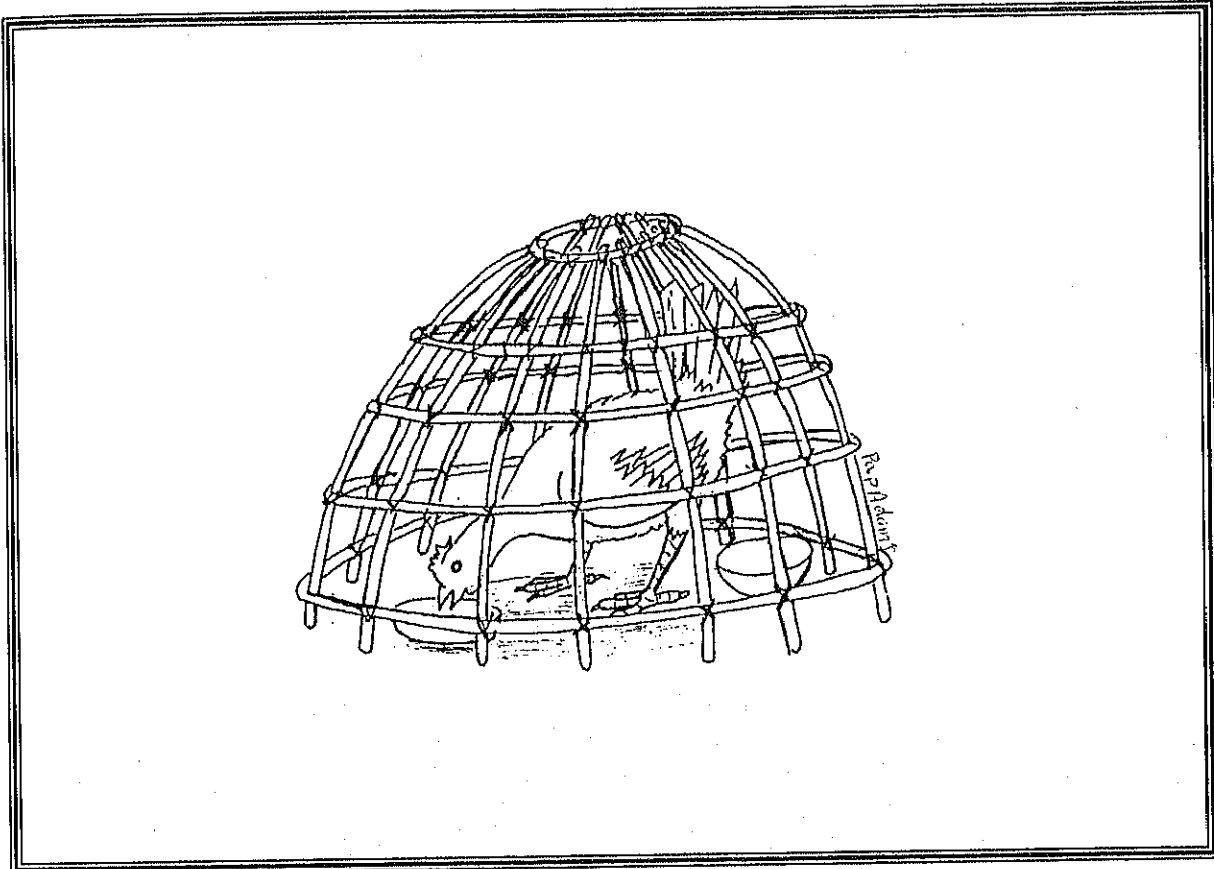
4. Health conditions

4.1 Hygienic conditions of the equipment, food and water.



Every morning to clean the feeder and drinking pot before filling new feed and water

5. Putting in quarantine



Putting in quarantine consists in avoiding to infect an illness in the hen house
To see if it is sick or not, a chicken either bought or received must be isolated in a cage during at least 15 days before putting it in the hen house with the other hens and it is necessary to immediately VACCINATE and DEPARASITE it.

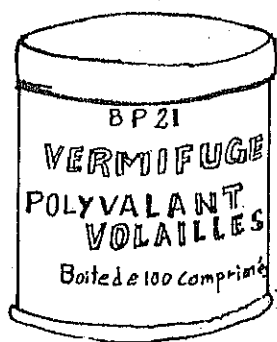
6. Medical prophylaxis



The most current diseases are as follows: Newcastle, plague, cholera and smallpox. It is a matter of using vaccines essentially in order to prevent infectious diseases and vitamin-enriched hang-ups against stress. For all these cases, fowl breeder will get in touch with the village resident in charge of vaccination or the breeding specialist to know the kind of behaviour to be held.

7. Etiological prophylaxis
 7.1 Struggle against microbes and parasites
 We distribute VPV (Vermifuge Polyvalent Volaille) pill to hens and guinea fowl. In the day of the vaccination the VPS will kill parasites in intestine of poultry.

0 to 4 months
 500g

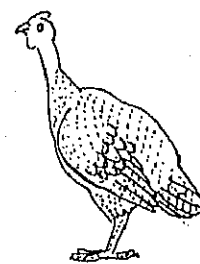
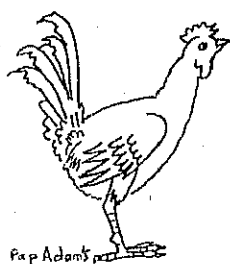


1 pill per 2kg live body weight

4 to 6 months
 1kg



More than 6 months
 2kg



8. The external parasites

8.1 Struggle against external parasites

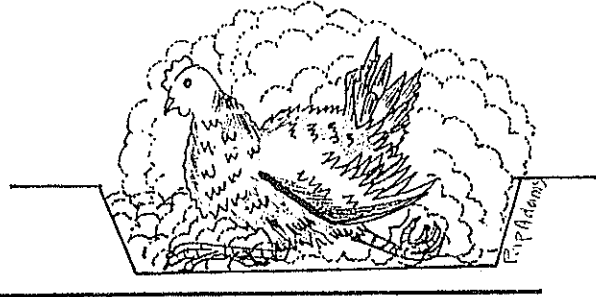
To struggle against external parasites it is necessary to make an external insecticide treatment on the body of the parasitic poultry. Therefore it is necessary to use the sepou (insecticide in sachet of 100g). We use the dipping in bath or the spraying.

Powder tank

1 measure of sepou

+

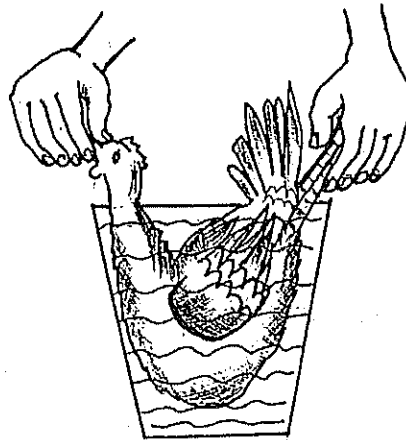
20 measures of wood ashes



Bath 5 spoonfuls soup of sepou

+

10 liters of water mixture and to bathe
poultres



Spraying

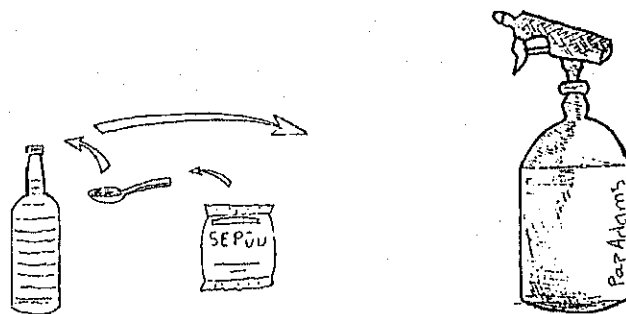
Prepare 1 liter of water.

1/2 spoonfuls soup of sepou

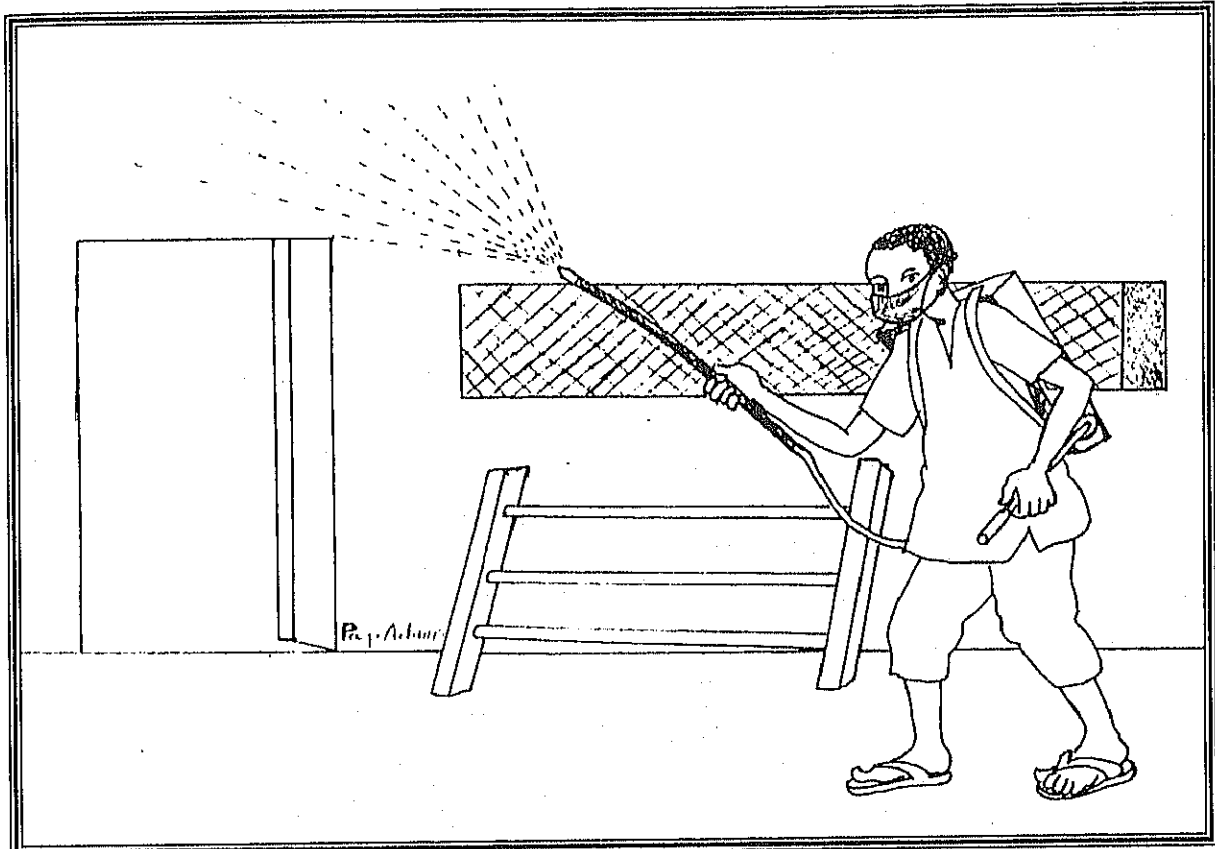
Mix well

Pour it into the sprayer

Spray it to poultres



8.2 Treatment of hen house

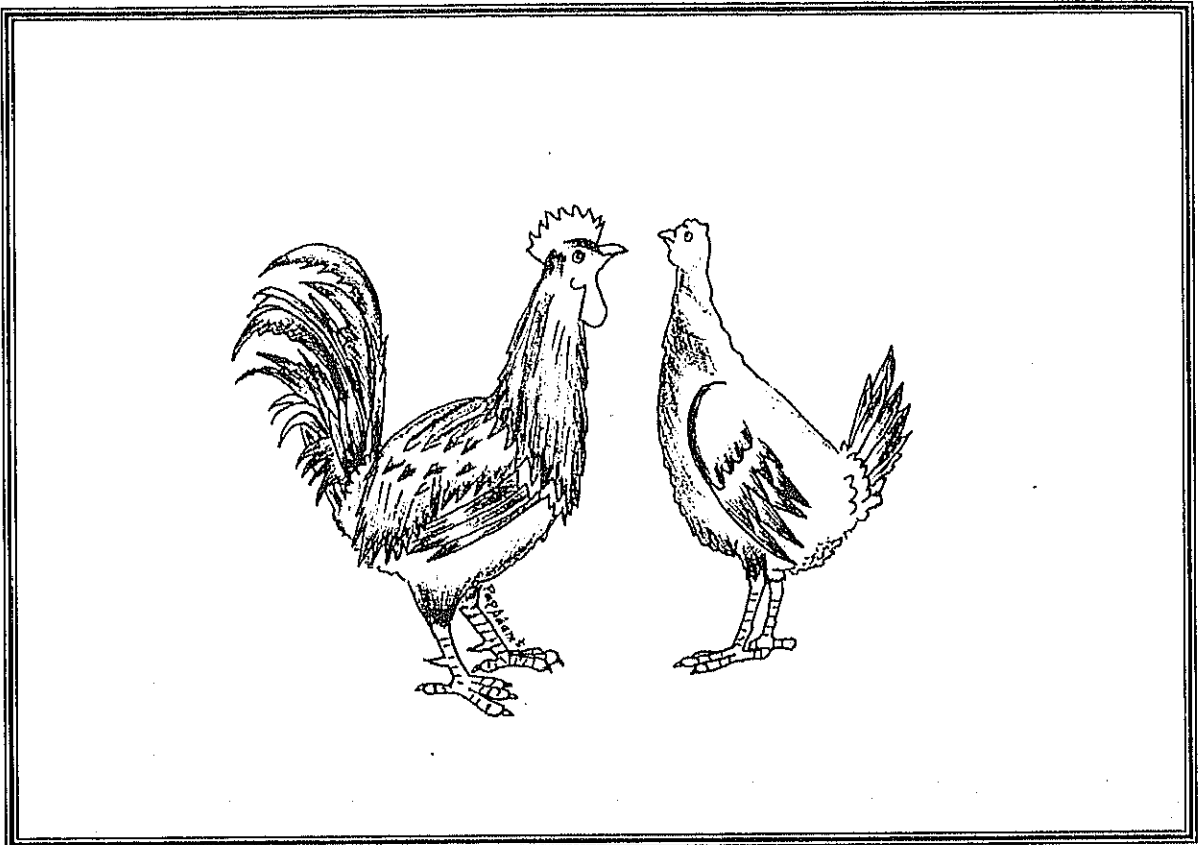


It is necessary to spray the inside and the outside every 3 months (4 times per year) to prevent it.

9. Genetic improvement

9.1 Selection and crossbreeding

The genetic improvement consists of selecting the races or crossing one improved race to other



different race bred.

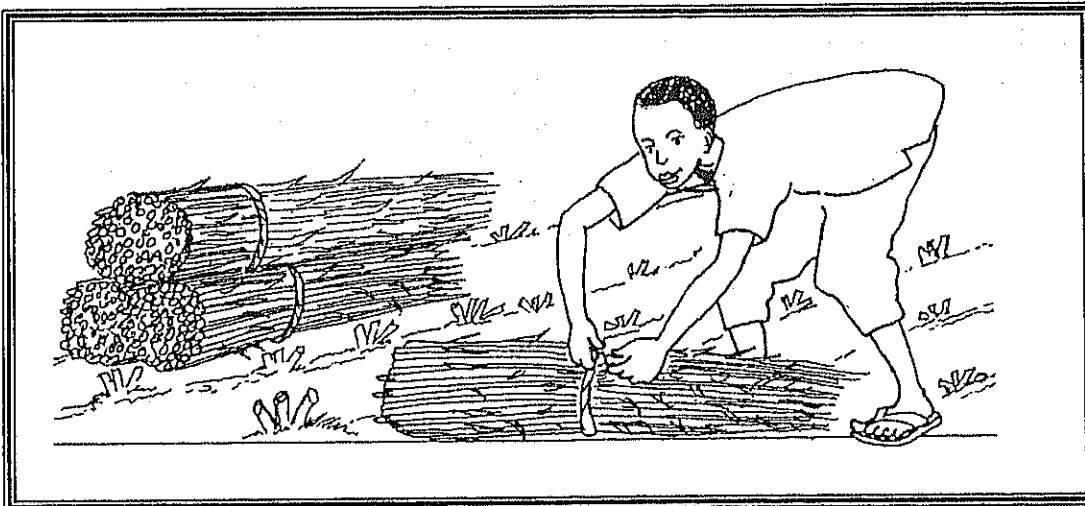
2-2 FODDER PRODUCTION

Fodder production is made up of three (03) activities :



- Collection crop residue
- Cutting and conservation of natural fodder
- Fodder cultivation

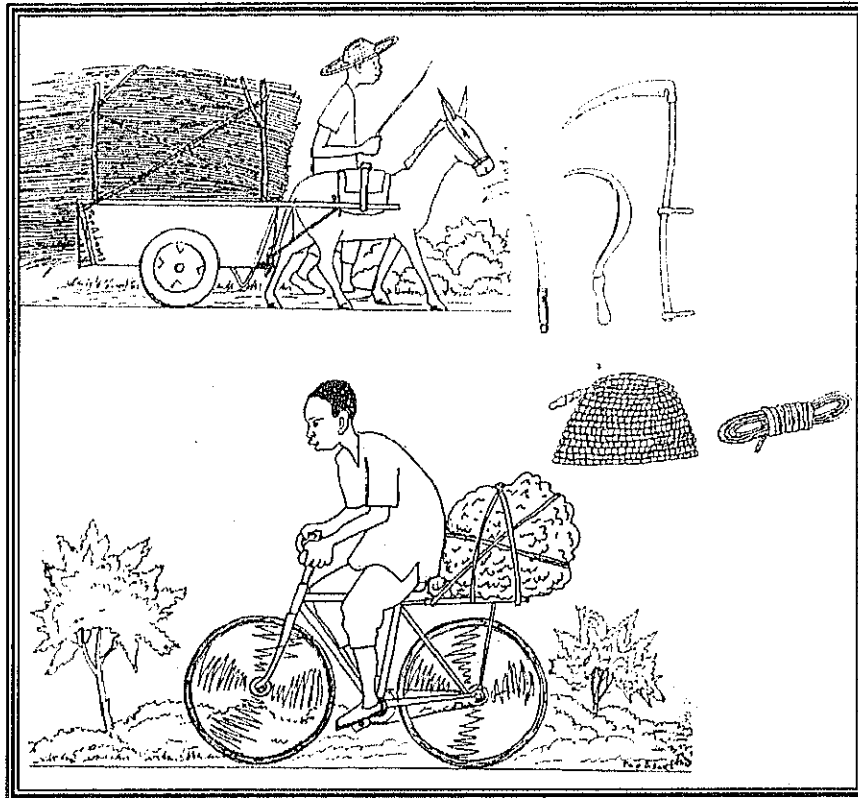
1. The collection of residues



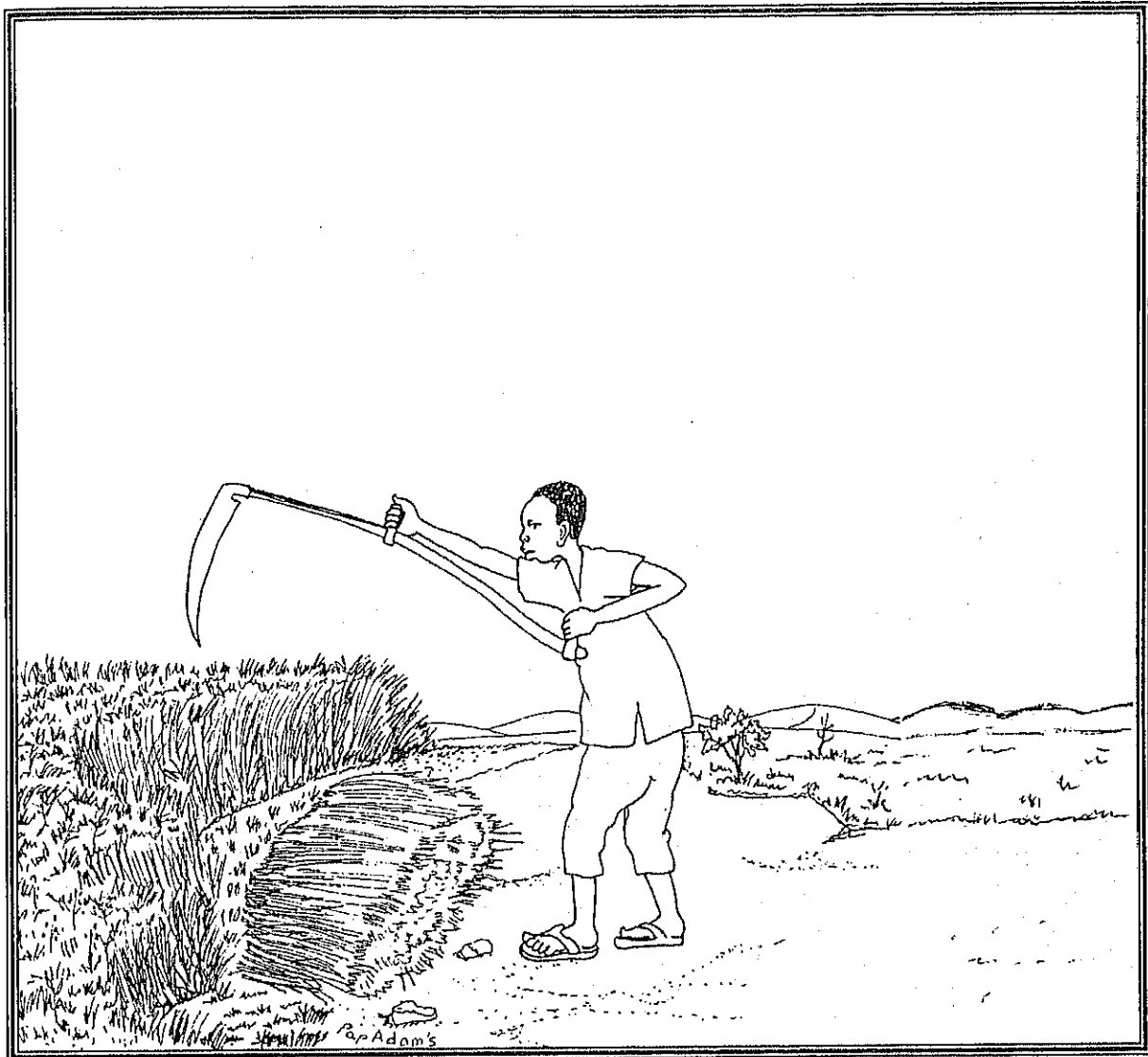
The residues of harvests must take place after the harvest to avoid that residues lose their nutritional value by the effect of the sun (stem of millet, leaves of cowpea and peanut)

2. Cutting and conservation of natural fodder

2.1 Equipment



- Cutting equipment: machete, knives, scythes
- Transportation: by head, bicycle, wheelbarrows, carts
- Conditioning equipment: mould, excavation of hole, straw-baller, strings or creepers



2.2 Which species to cut?

To cut all local species of fodder brought by animals. It is important to know these species and to know the site of abundance.

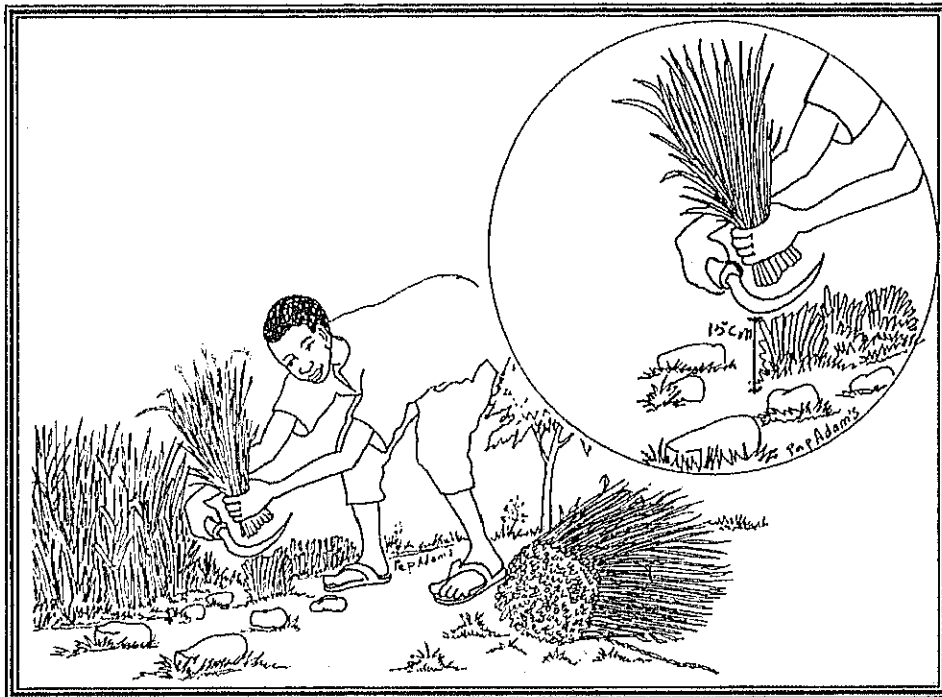
2.3 Cutting period

Cutting must start when the graminaceous plants reach ear emergence stage and the leguminous plants are flowering. At this stage, all the nutritional elements of the plants are concentrated within the stems, leaves and pods.

2.4 Cutting time

It is preferably to cut in the morning when it is not rainy time and after evaporation of the dew.

2.5 Cutting techniques

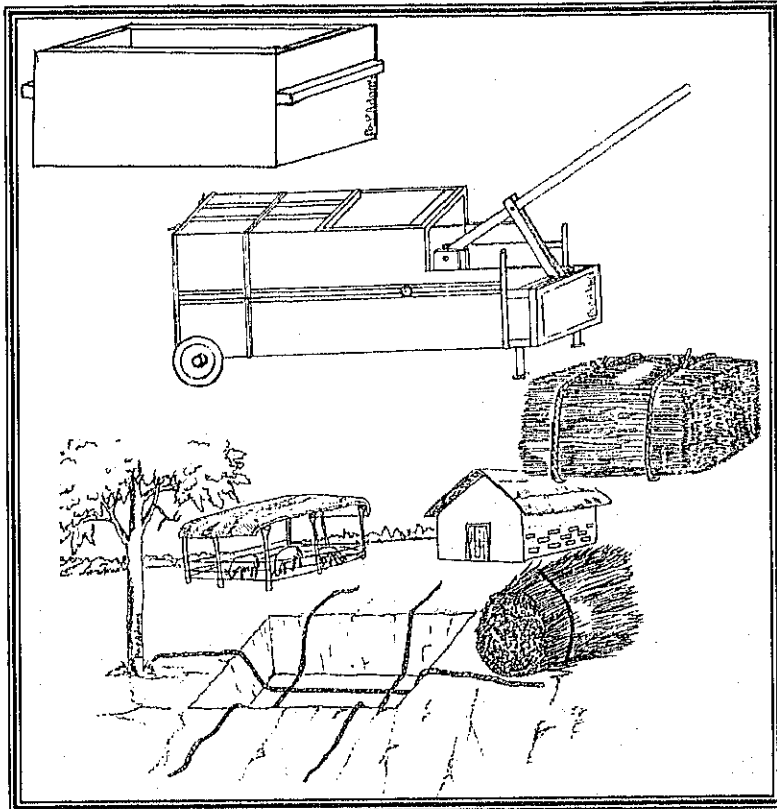


To cut at about 15 cm from the soil. To avoid systematic cutting of species. Not cut at the lowest part at the risk of wound or to damage one's equipment.

2.6 Drying



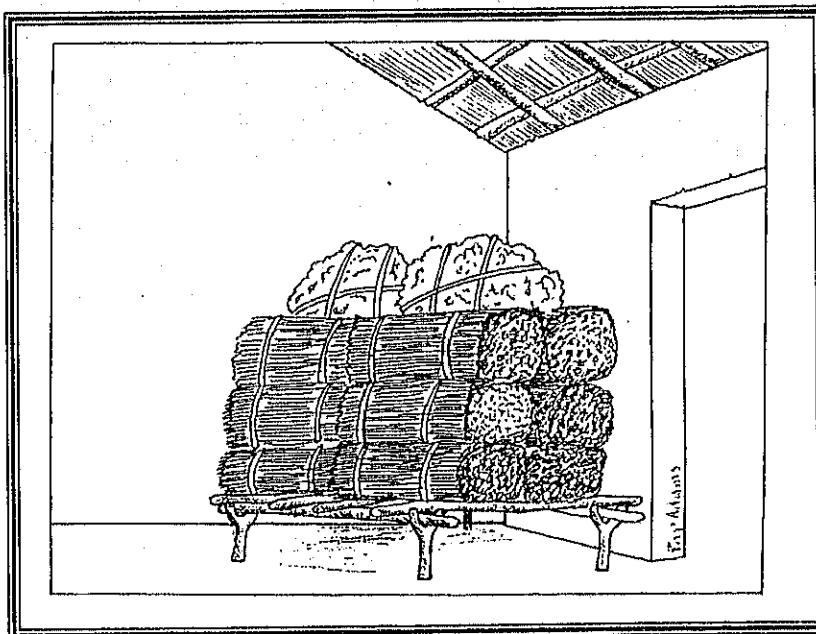
- Place: to dry preferably in a clearing or in a dry place. To make light layers for allowing quick drying and underneath ventilation. The duration of drying goes from 1 to 3 days (but depending from the fact that it is sunny time or not).



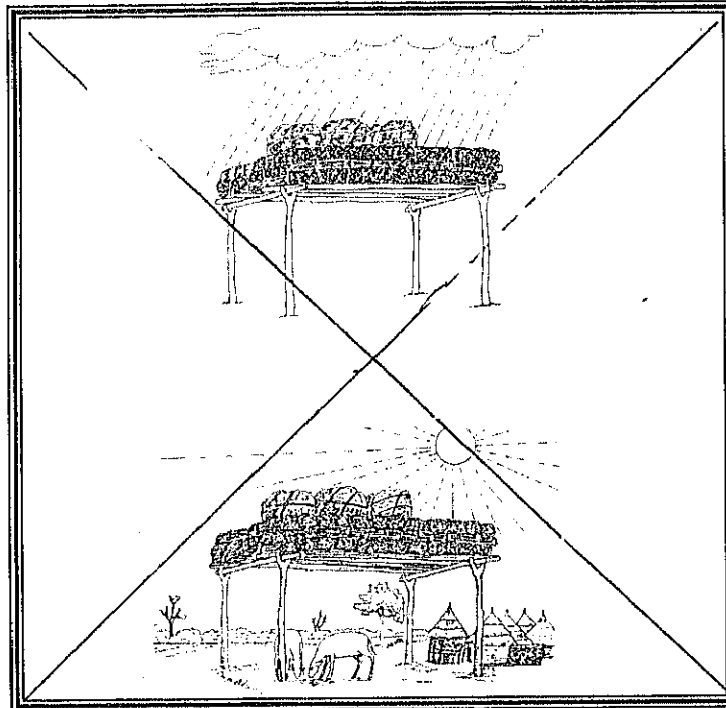
2.7 Conditioning

The gained hay will be assemble in bunch with help of a mould (or baler or excavated hole) in order to have bunches with approximate weight.

2.8 Conservation



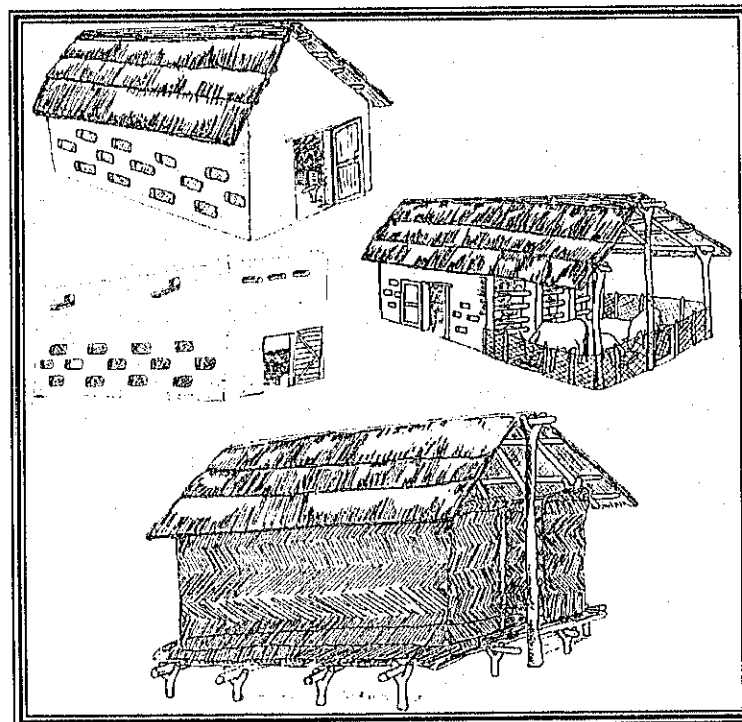
The stocking of the hay will be made in a facility fitted for this purpose (hay loft or barn). The bunches must be stored on a riddle or floor to avoid termites's attack and to allow a continuous ventilation.



2.9 For the conservation of fodder

It won't be necessary to preserve fodder on a haggard to the risk to expose fodder in the sun and rain.

2.10 Different Type of hey sheds or barn



There are different types of hey shed or barn. We can construct it in banco or in straw, It is necessary to implant the hey shed or barn in a high place next to the production unit.

3. Fodder cultivation



3.1 It exists several species of fodders

There are proof species such as the "sirratro" and some annual species such as "solique lab-lab". There are also dual-objective species of fodder (annual one) such as corn fodder, cowpeas fodder.

3.2 The cowpeas fodder

This type of cowpeas is a leguminous plant with erected habit, semicreeping hardy stem, fitted to sandy-clayey-type soil. This species has semiripeness-type cycle of 75 days, 60 cm of height with sweet taste white colour grains.

3.3 The culture

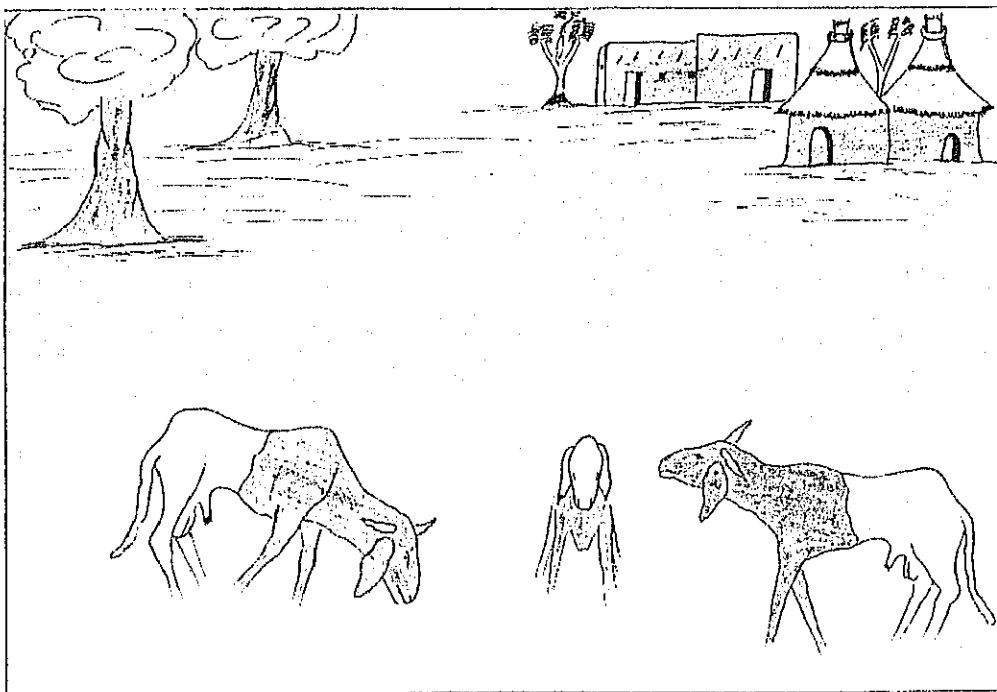
To Manure, sow after plough. Maintenance of fodder growing: 2 to 3 weedings; singling to 2 seedlings per planting hole; sanitary treatment. To start harvesting the pods from ripeness and mow immediately the haulms.

2-3 OVINE REARING

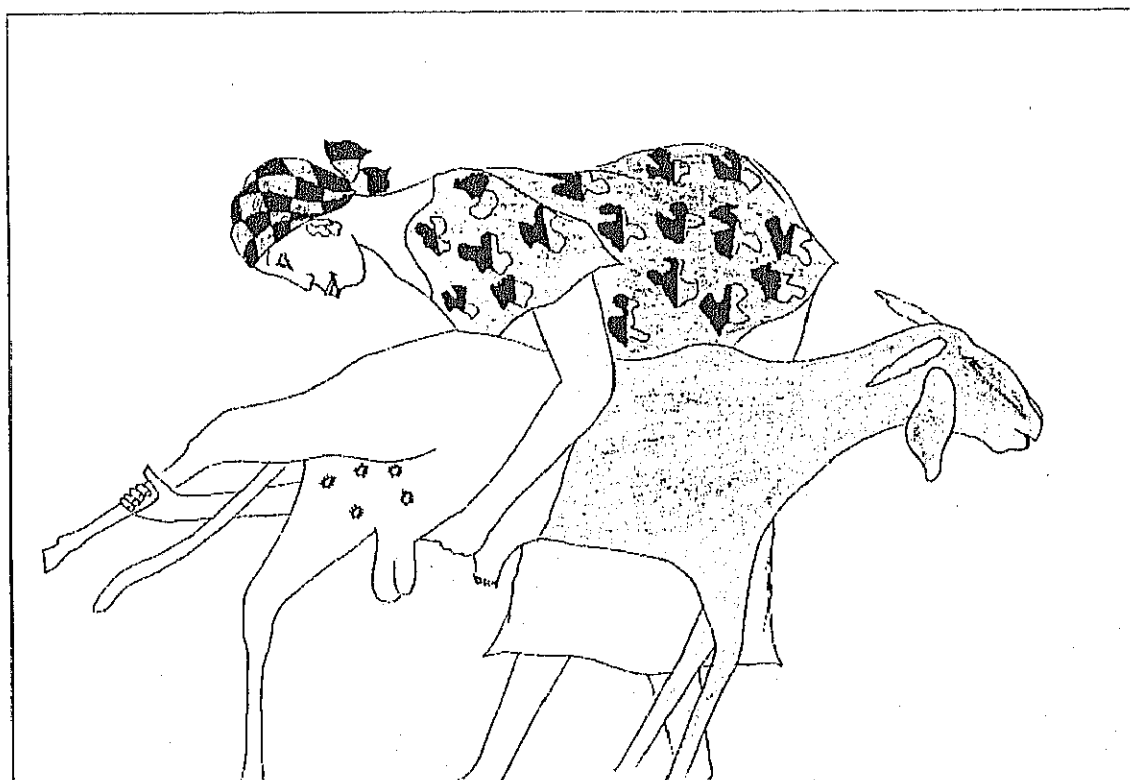
1 Organization



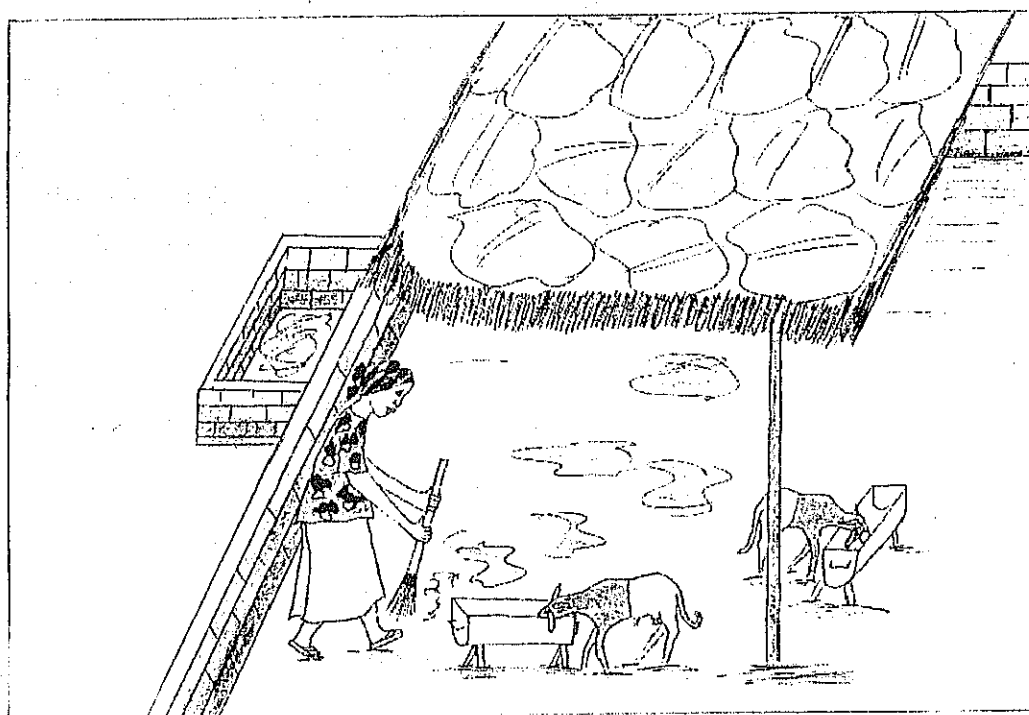
2 Environment



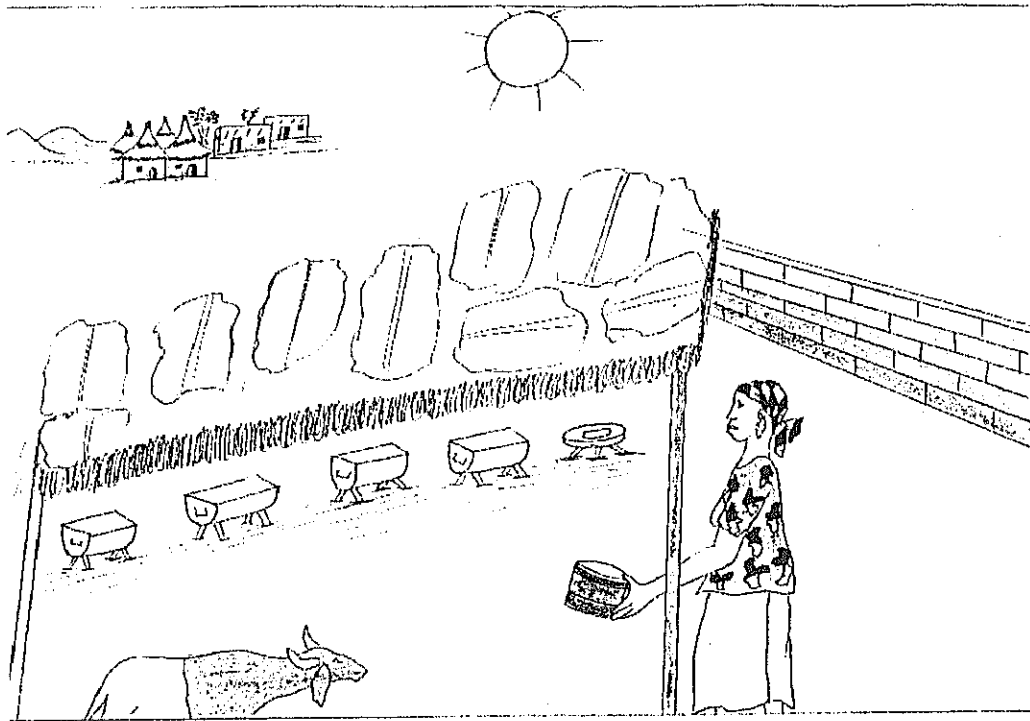
3 Selection of animal (age,race,coat,health)



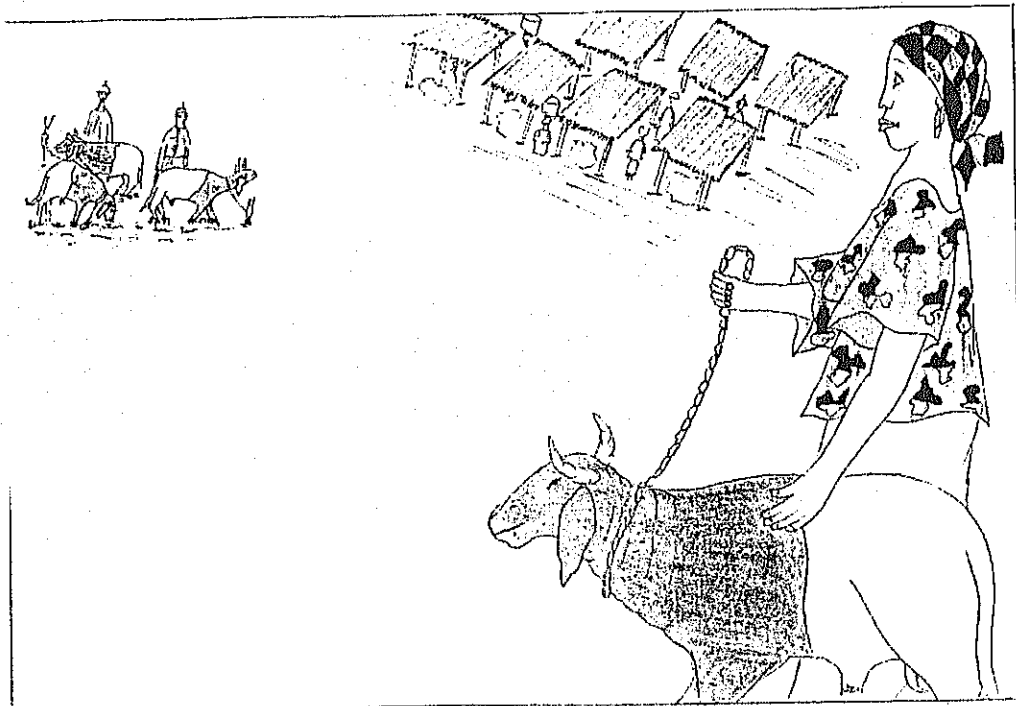
4 Improvement of the habitat



5 Improvement of rationing techniques



6 Improvement of the market research



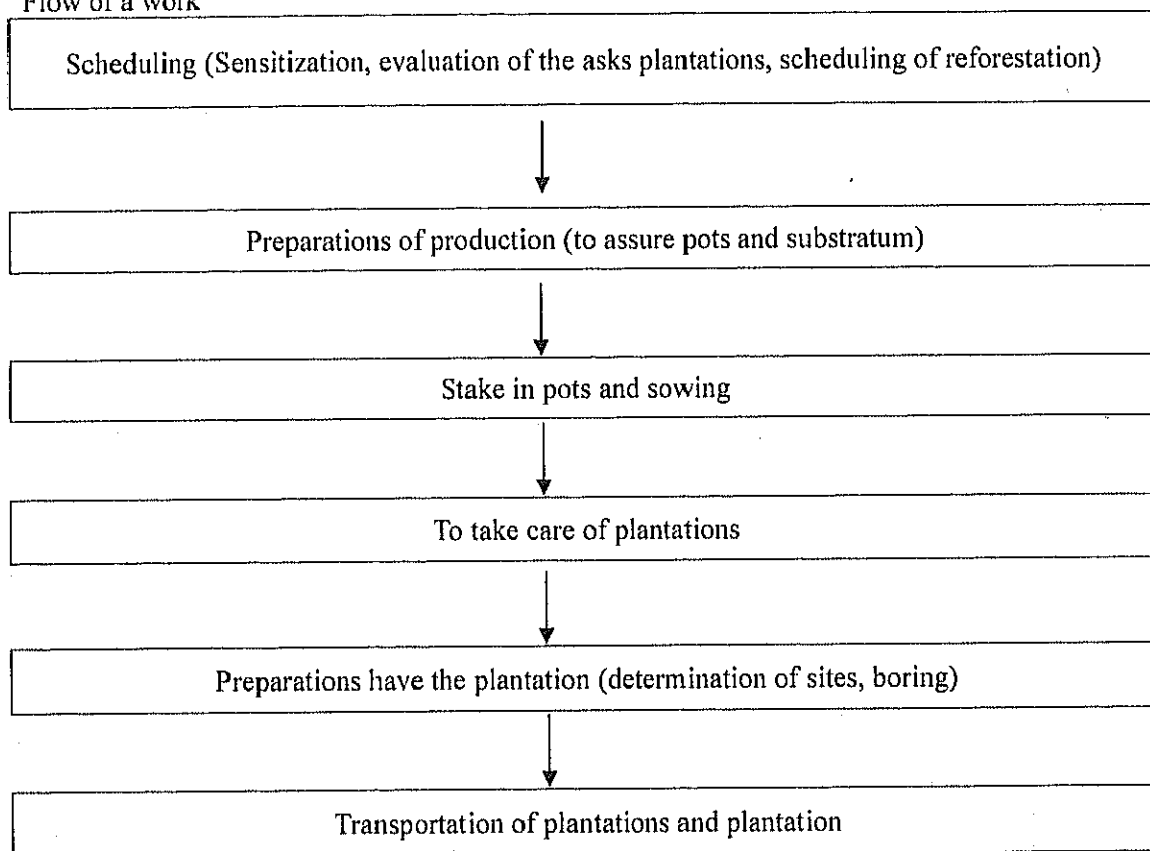
7 Improvement of the market research



3 Field of forest resource

3-1 Production of seedlings in a village nursery

Flow of a work



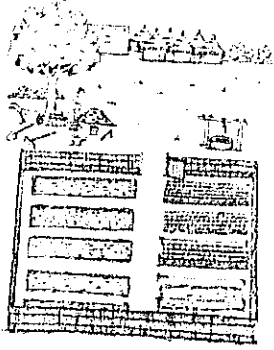


Fig. 5 A diagram of mini-nursery



Fig. 6 An example of nursery

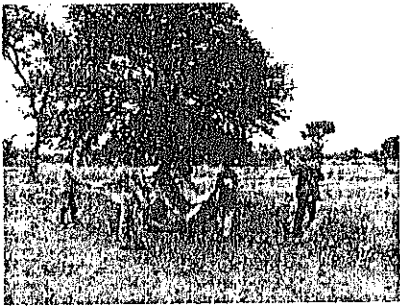


Fig. 7 Collection of seeds

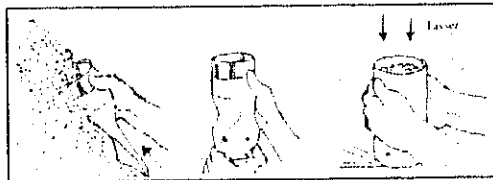


Fig. 8 Replenishment of pots

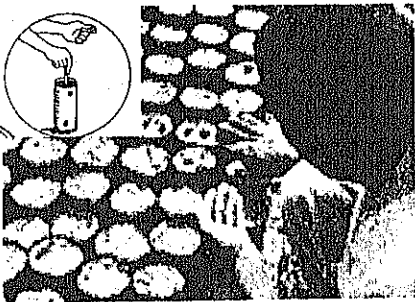


Fig. 9 Sowing

Technical data sheet: Technique of plantation

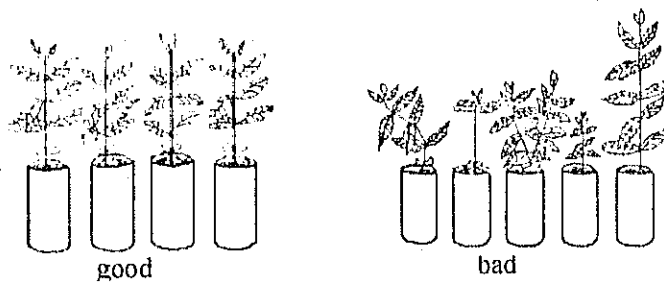


Fig.10 Example of seedlings

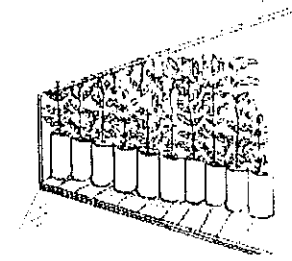


Fig. 11 A good example of transportation

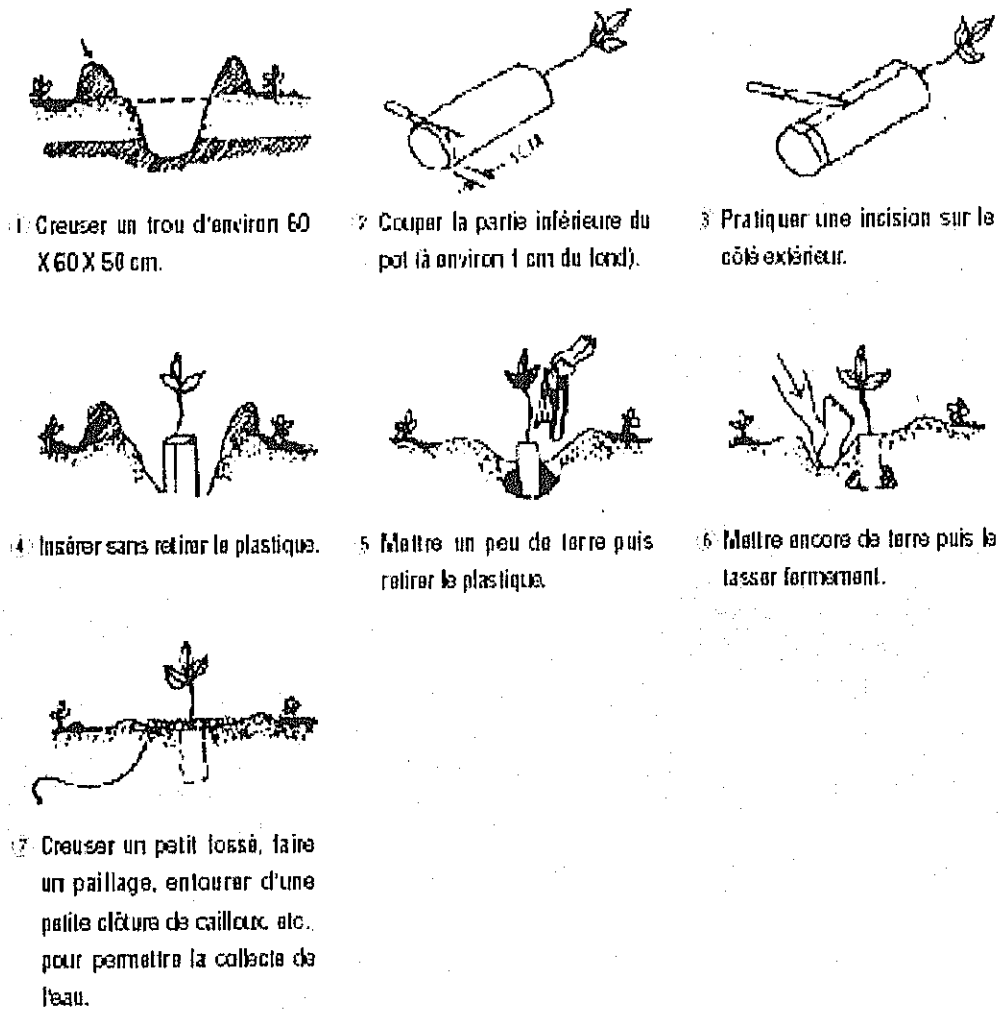
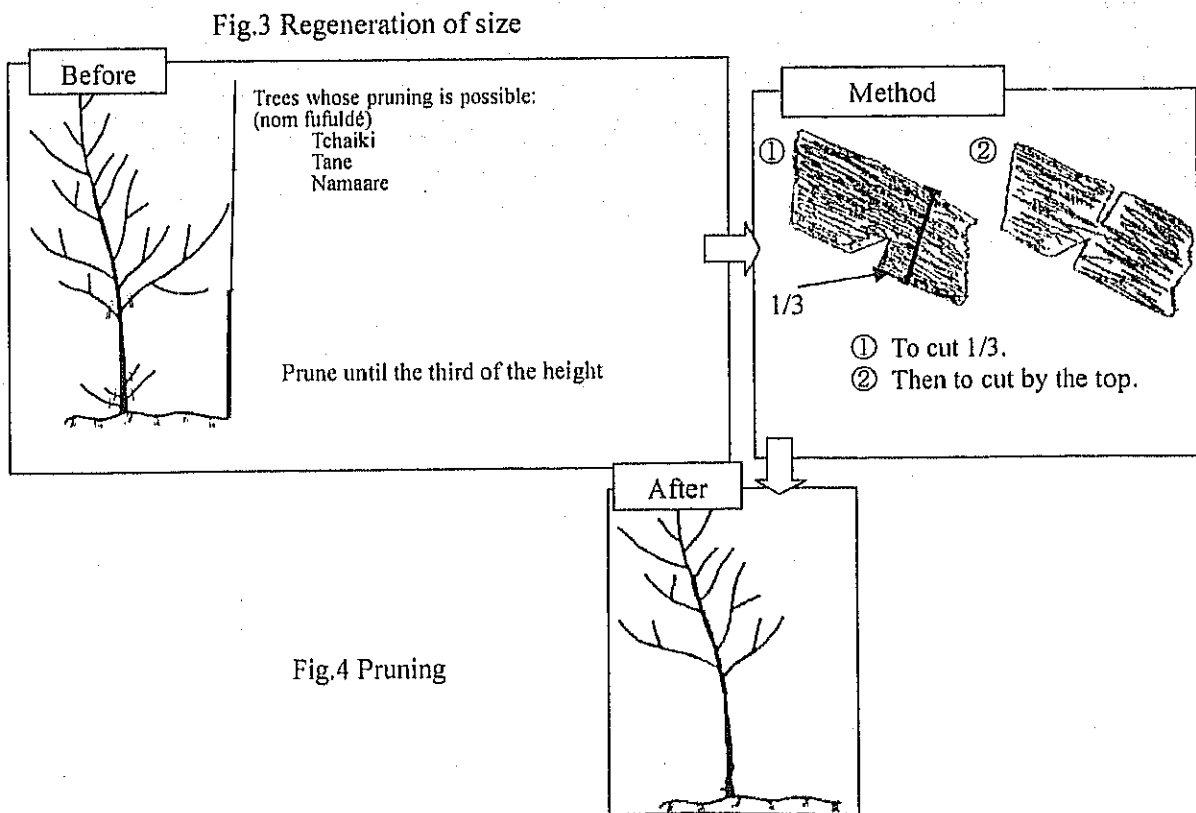
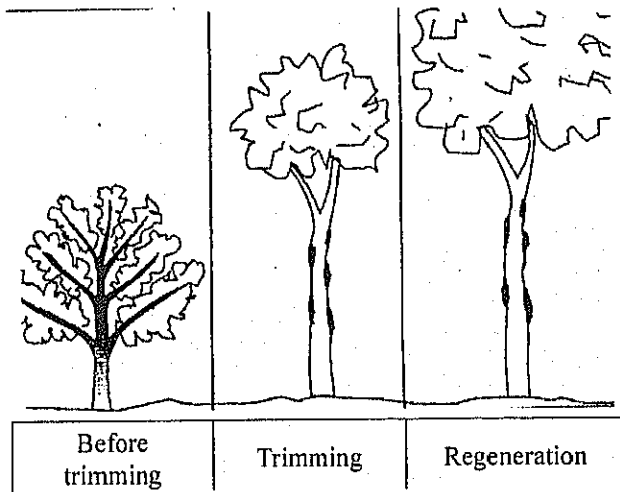
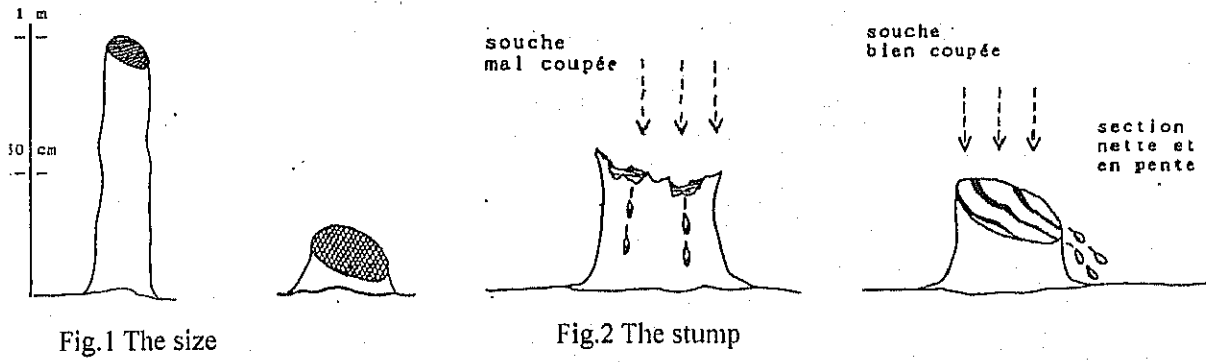
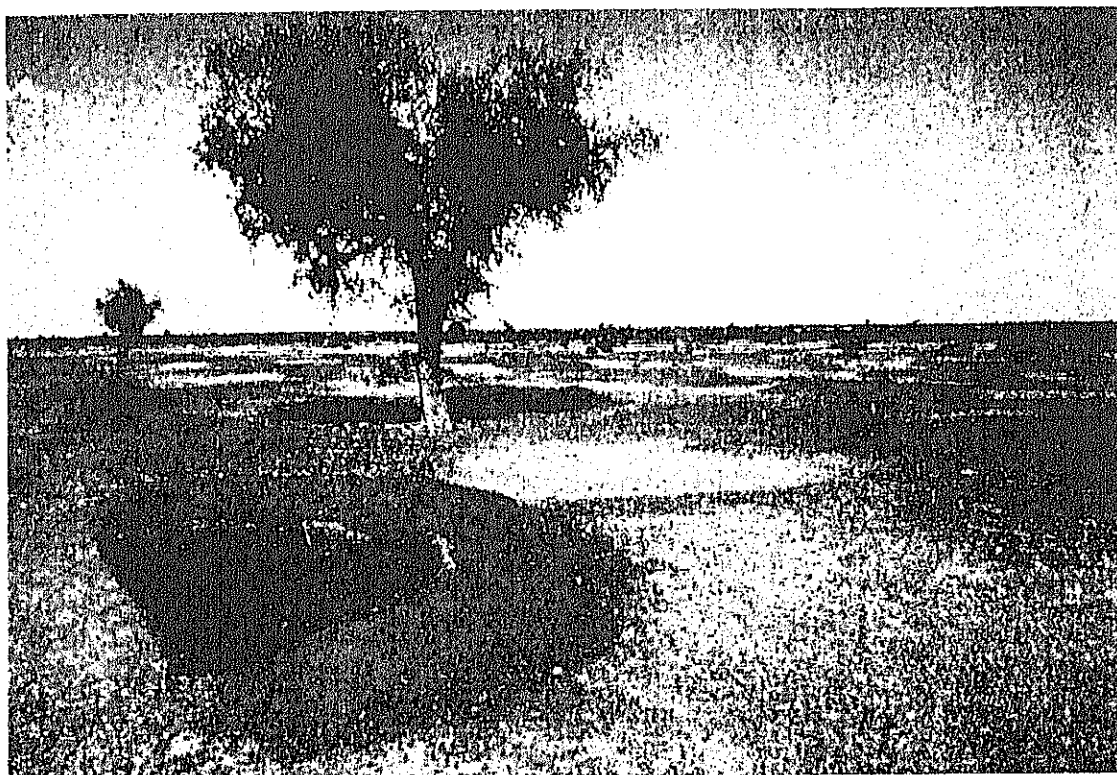


Fig. 12 Plantation

3-2 Forestry resources preservation



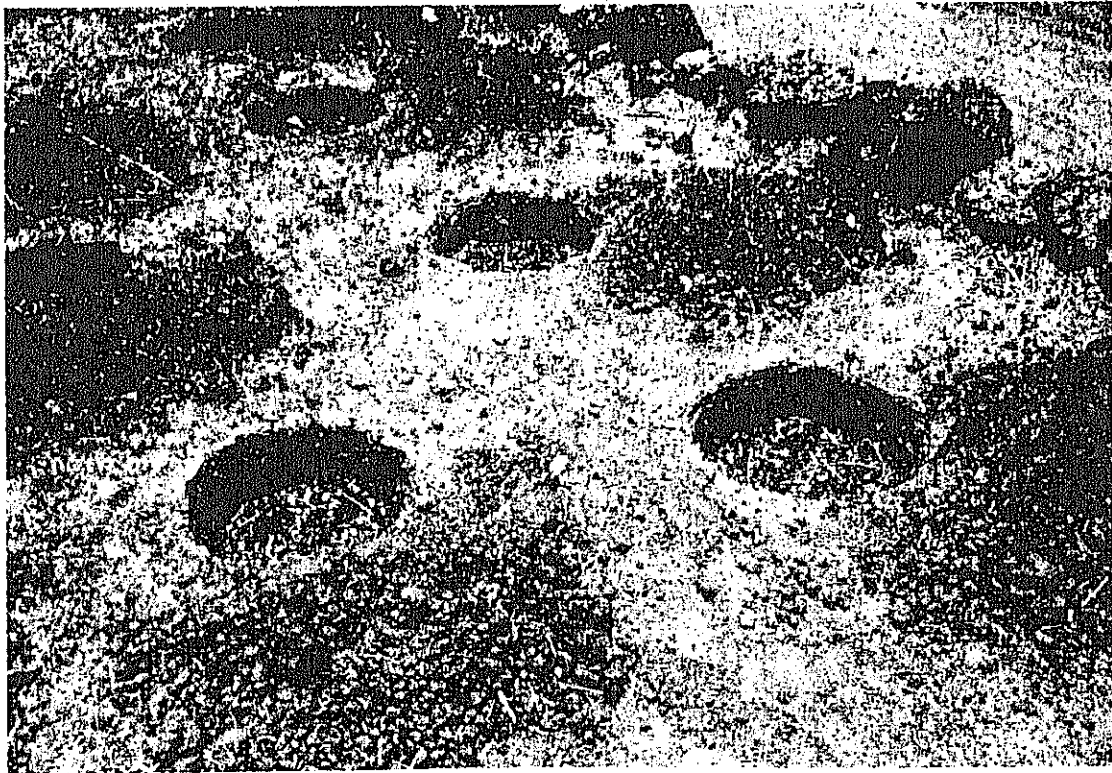
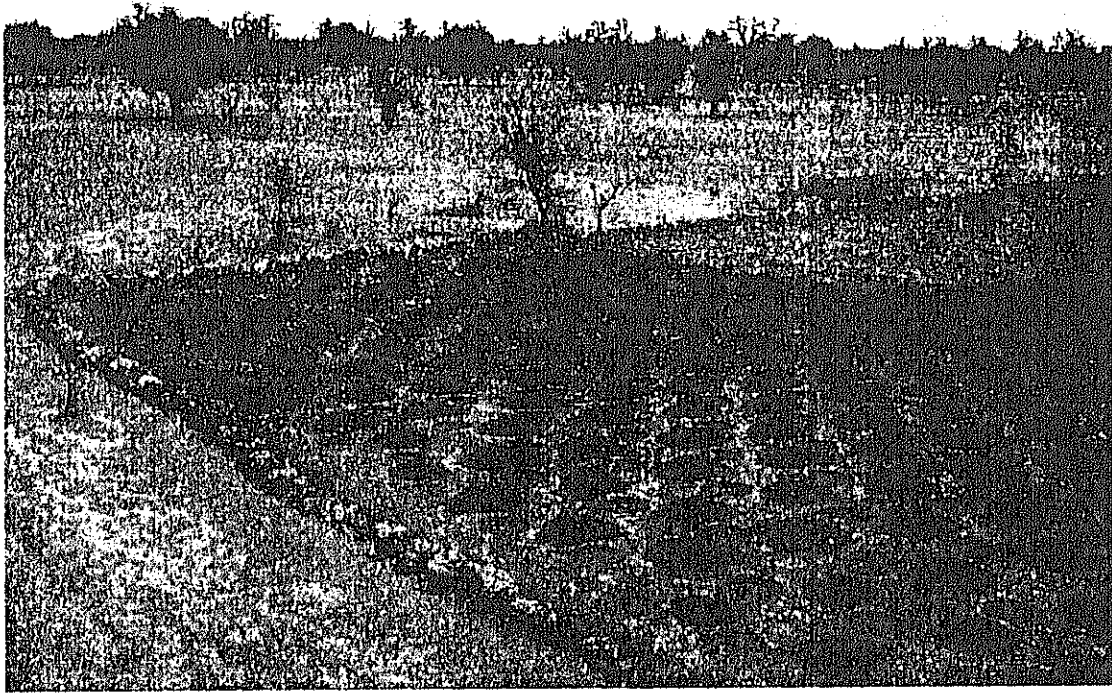
La demi-lune



La haie vive



Le ZAI



4 Management of the natural resources

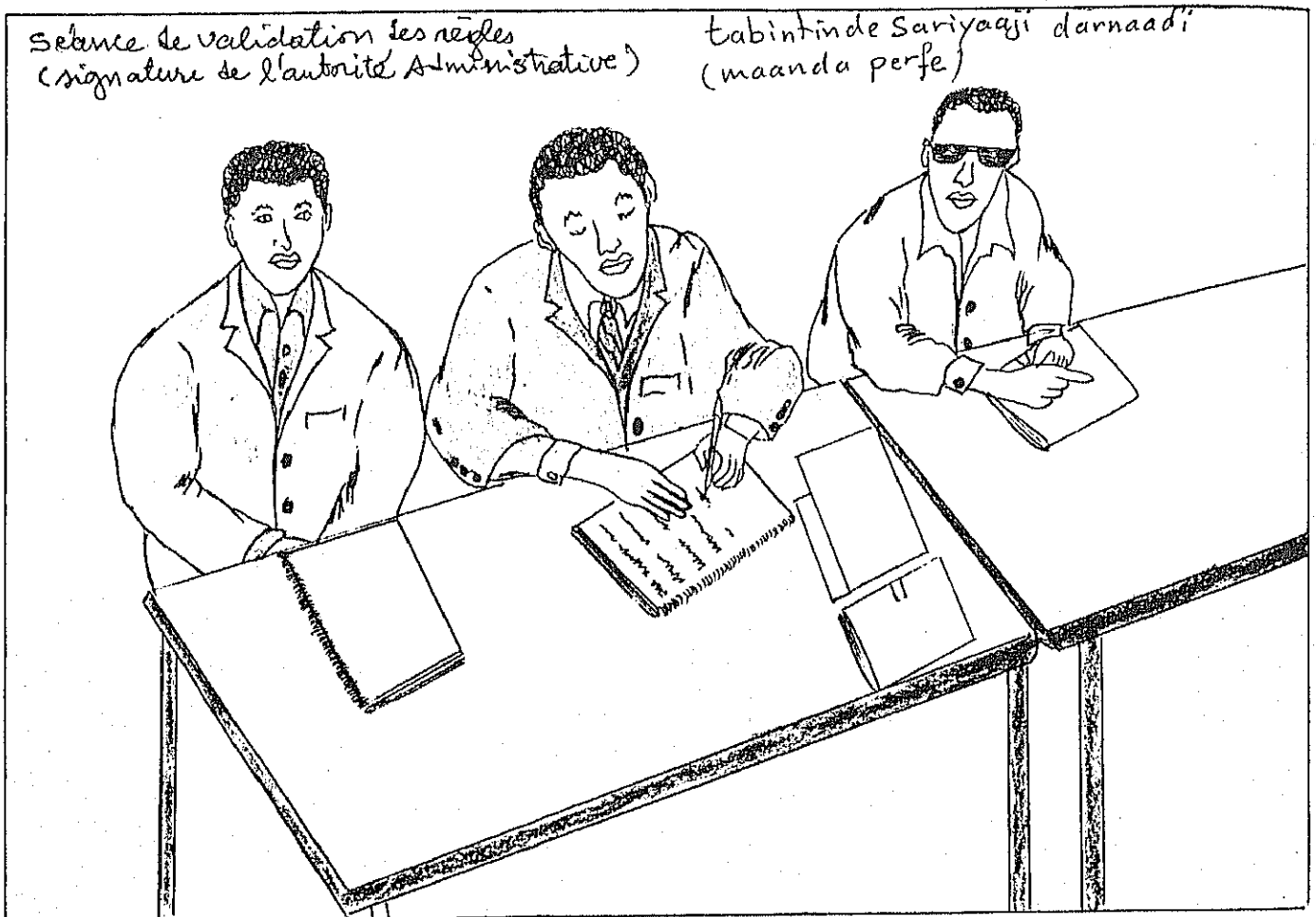
Session of reflection on the problems bound to the use of the natural resources.



Session of amendment of the controlled proposed by the communities by the technical services of the state.



Session of validation of the rules (signature of the administrative authority).



Session of validation of the rules (signature of the person responsible of the structure).

séance de validation des règles
(signature du responsable de
la structure)

tabintinde sariyaaji daarnaadi
(maanda mawfo kladde)



Session of assessment of the management rules technical services and communities.

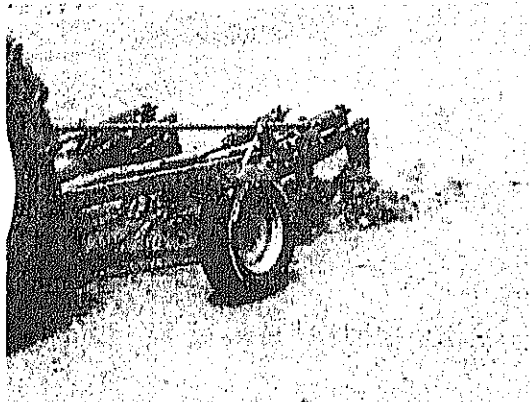


5 Field of the agricultural land conservation

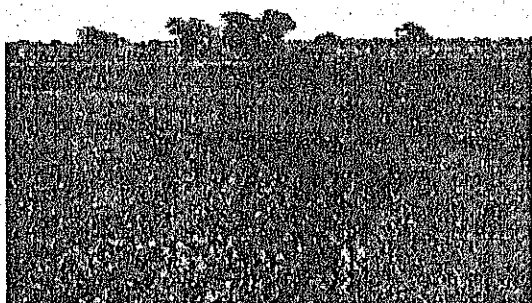
5-1 Recovering of bare lands



Before the execution



Shallow tillage by tractor and subsoiler

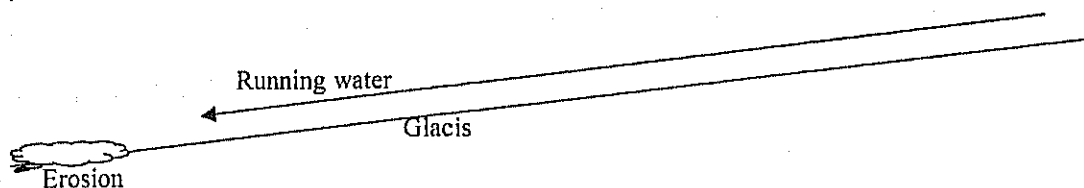


After the execution

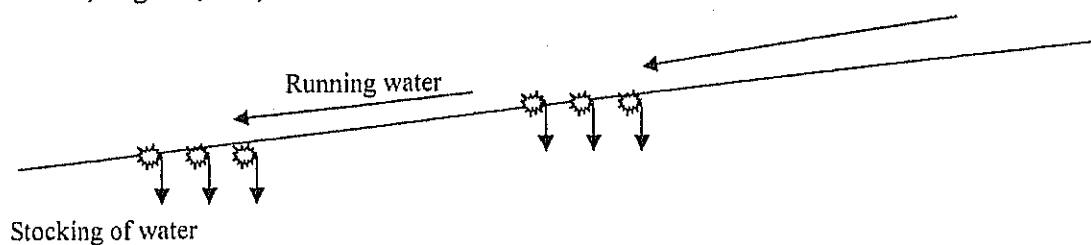


Restoration of vegetation

(1) Situation of bare lands (land surface erosion by running water)



(2) After shallow tillage (infiltration of running water, sheeps and goats' droppings, seedling of millet, sorghum, etc.)

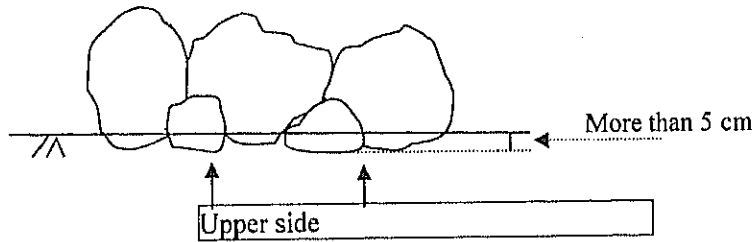


5-2 Stone lines building

Simple survey

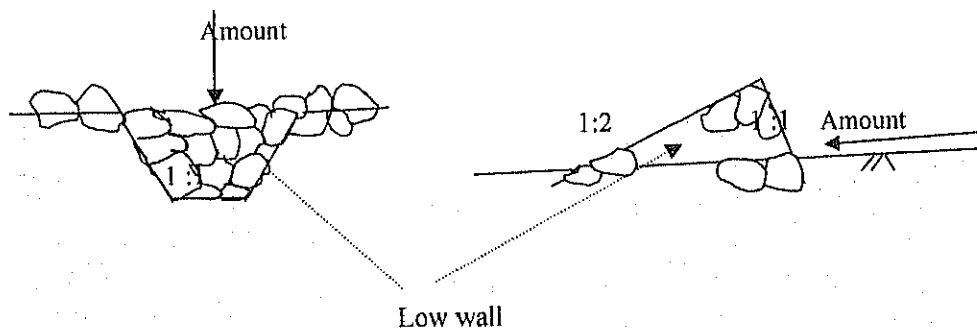
Stone lines construction

(1) Installation methods (PDS) : Erected stones with subsoiling method



(2) Infiltration blocks in a gully of fields

(The two ends are connected to the stone lines)



(3) Plan of arrangement : In case of gully in a field

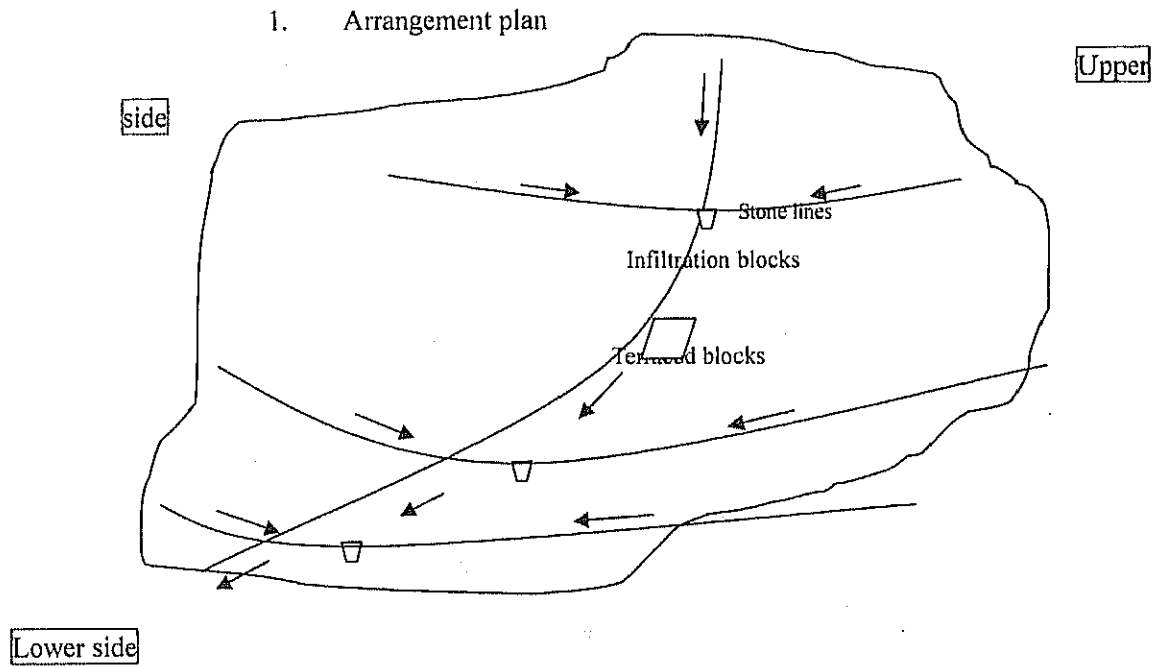


Figure 1: The filtering breakwater (by Dr. Albert BARRO, INERA- SARIA) :

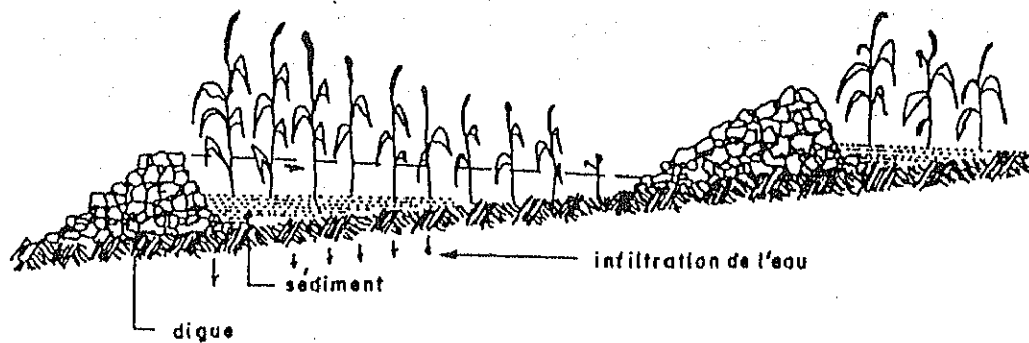


Figure 2 : Filtering and semifiltering breakwater (by Dr. Albert BARRO, INERA-SARIA) :

- Effets :
- rendements sorgho
 - sécurité
 - ralentit le ruissellement
 - érosion en ravine

- Problèmes :
- coût : env. 500.000 CFA + travail collectif profite à 1 ou 2 propriétaires
 - zones ± humides
± engorgées
± sédimentées

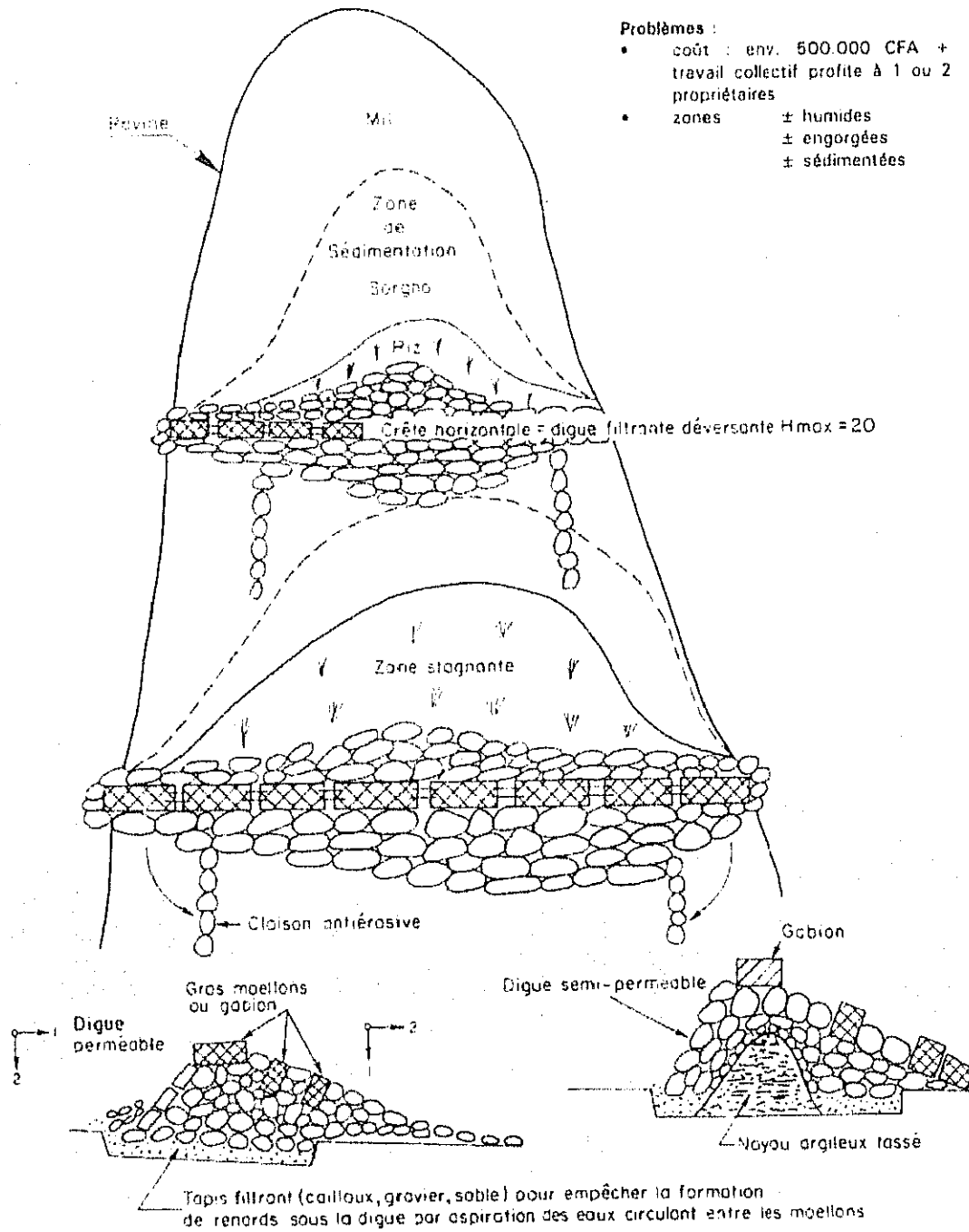
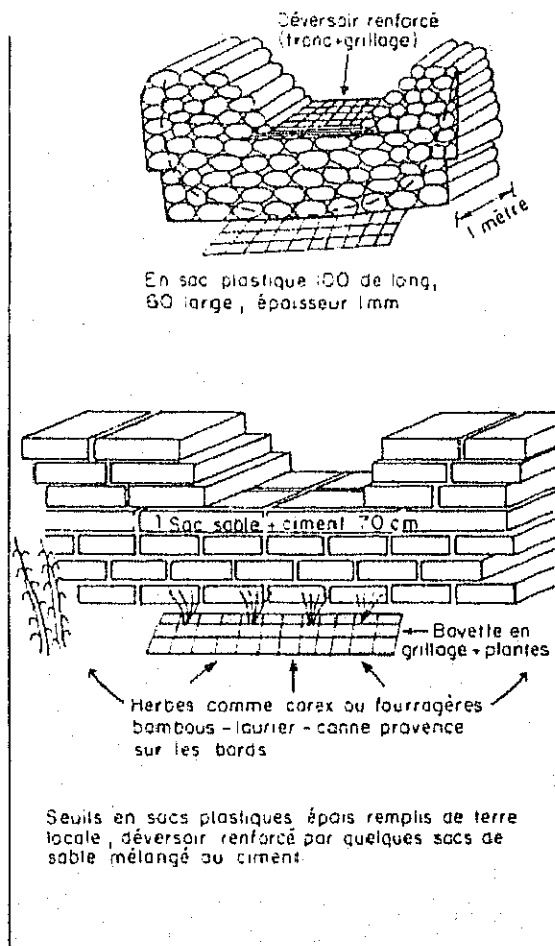
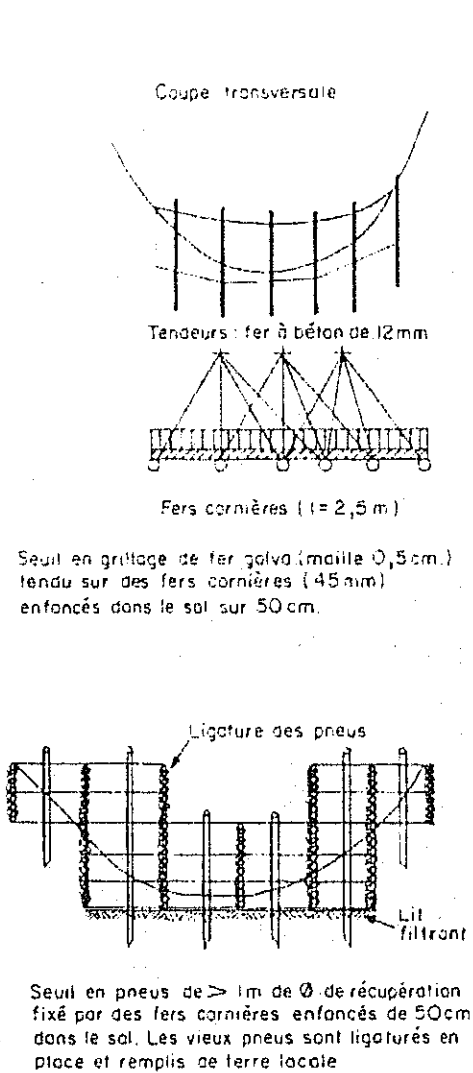


Figure 3 : Various classic examples of inexpensive, flexible sills, easy to install with local materials (by Dr. Albert BARRO, INERA- SARIA) :



6
6-1

Field of Livelihood Improvement
Cereal Bank

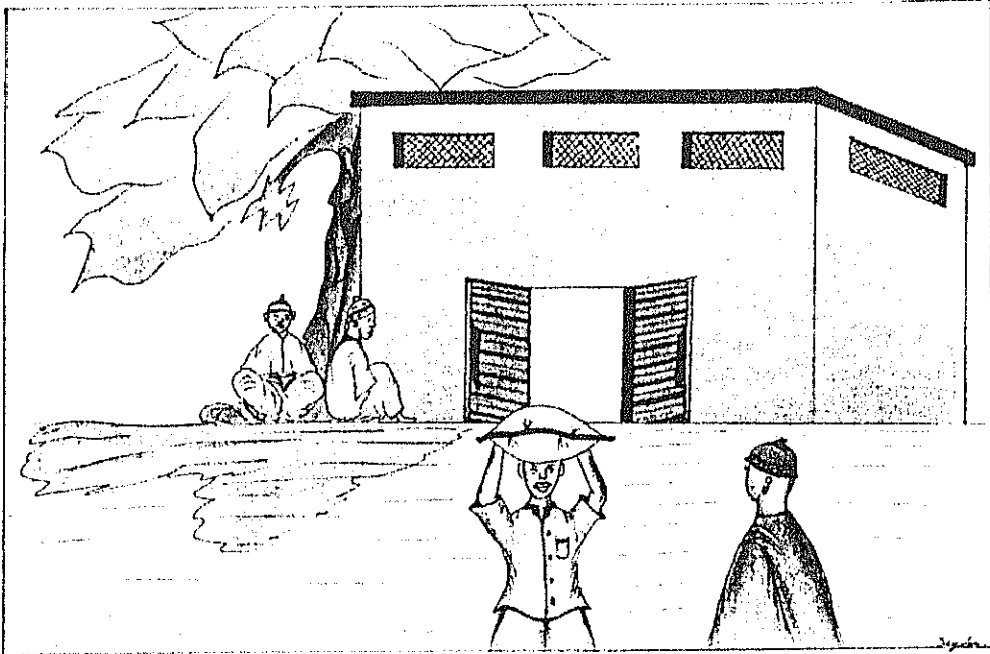


Fig No1 Cereal bank

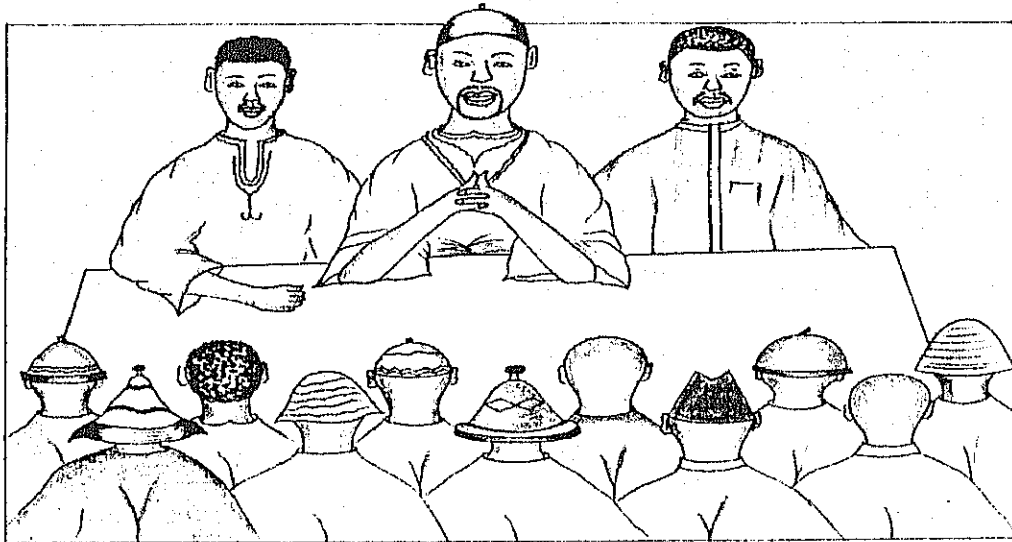


Fig. No2 Reminding of the roles and tasks of the members of the CVGT in the cereal bank management



Fig. No3 CVGT president's role and tasks in the management of the cereal bank

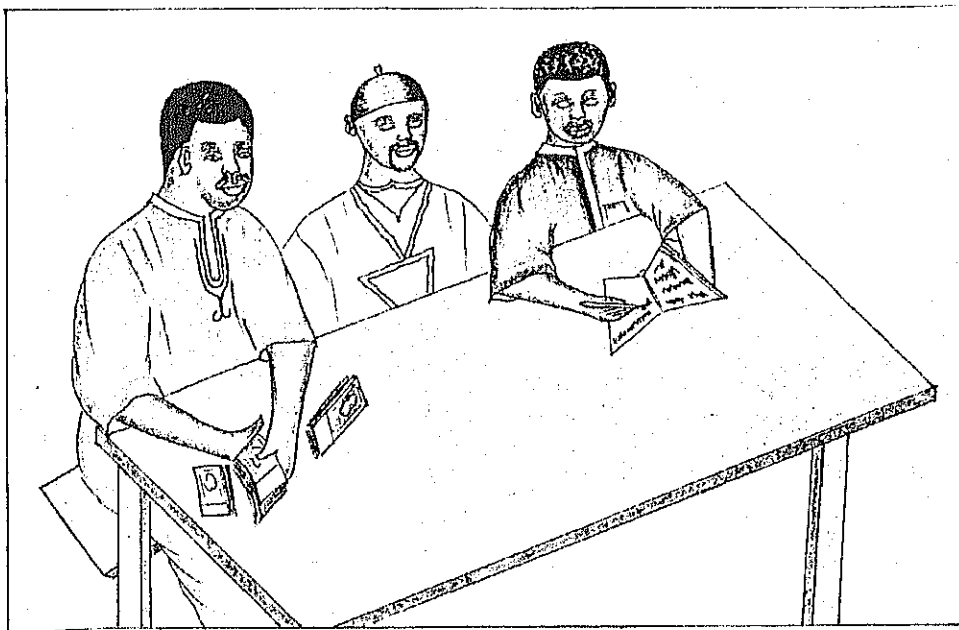


Fig. No4 Case of a good president

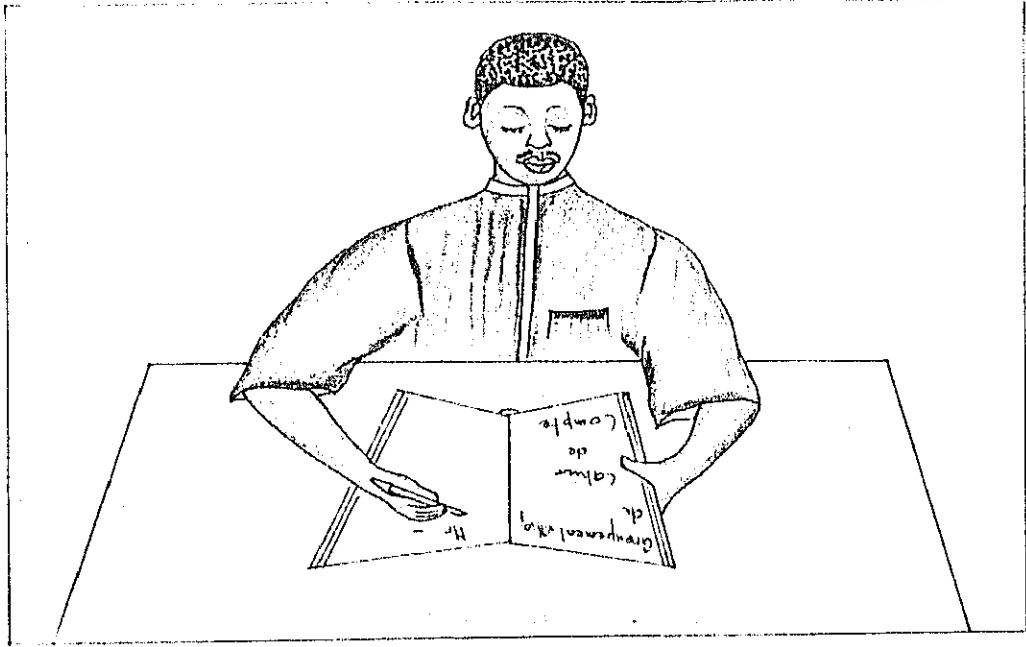
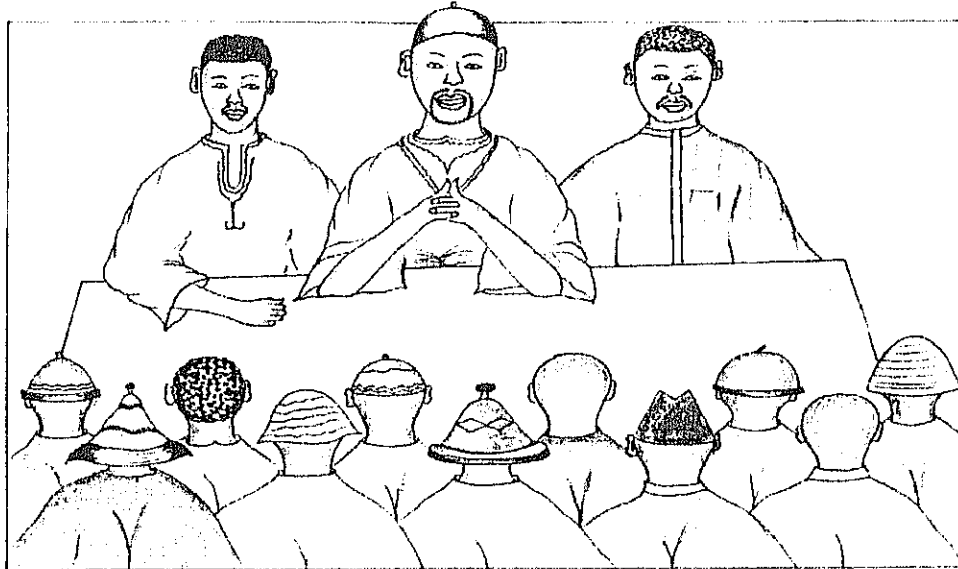


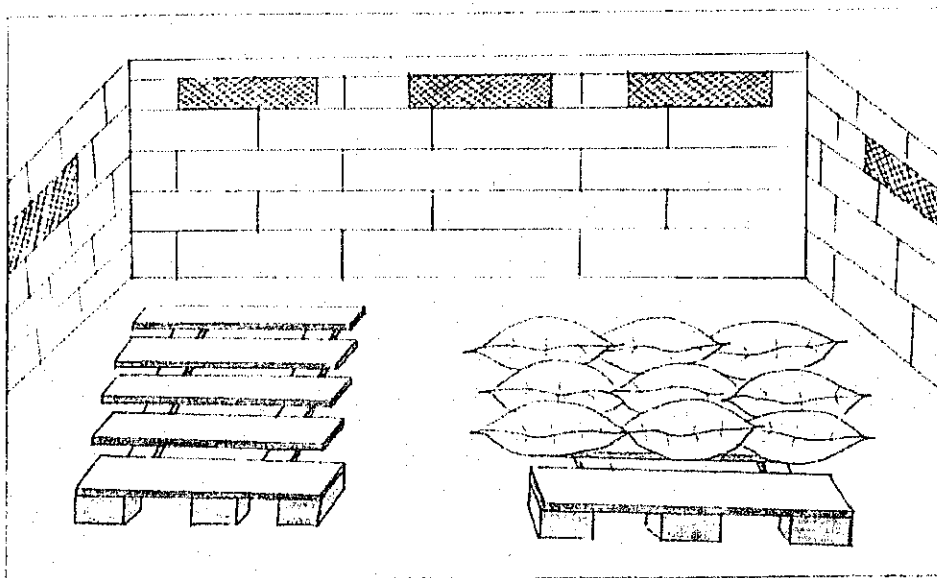
Fig. No 5 Secretary's roles and tasks



Fig. No 6 Treasurer's role and tasks



(1) Fig.No7 The cereal bank supplying



(2) Fig. No8 The good stocking

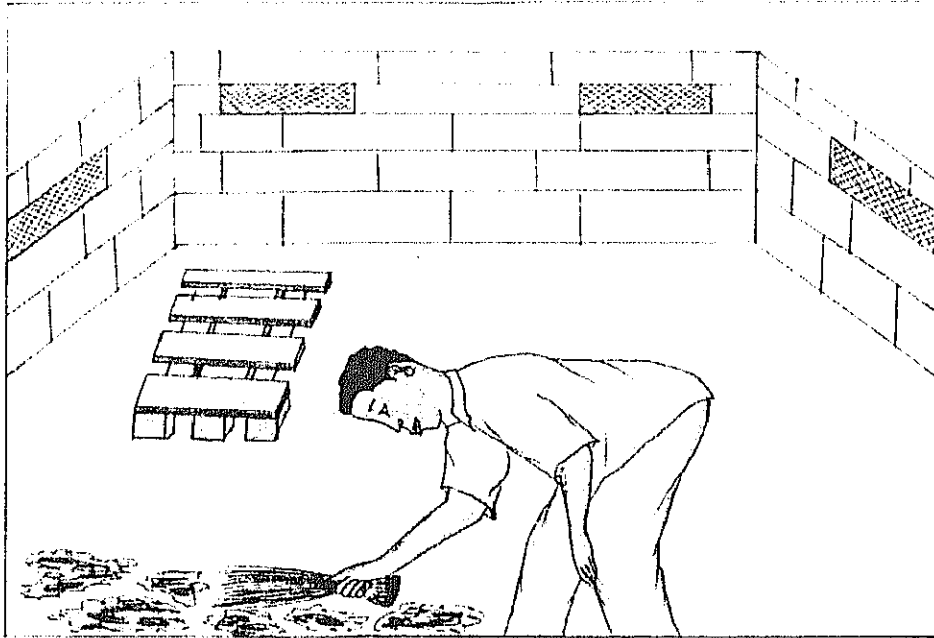


Fig. No9 Cleaning the warehouse

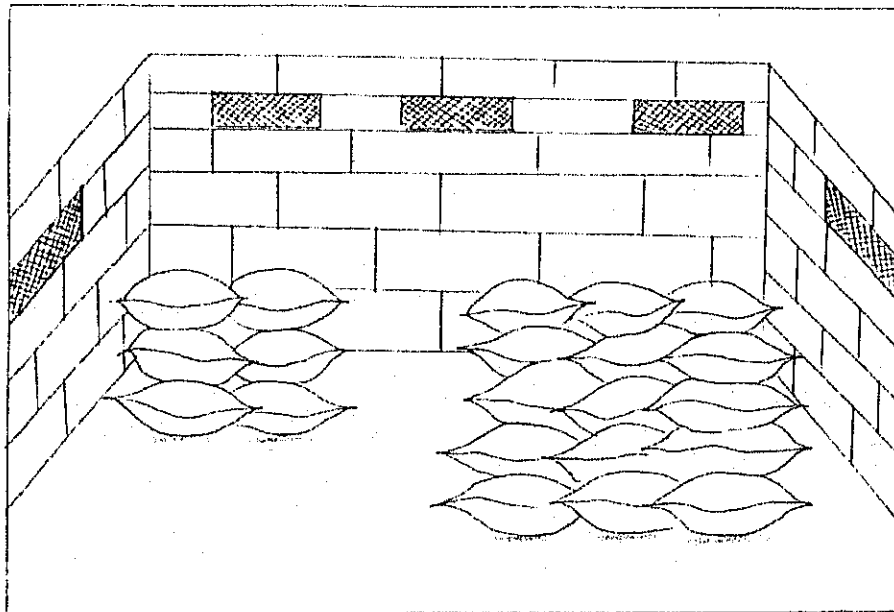
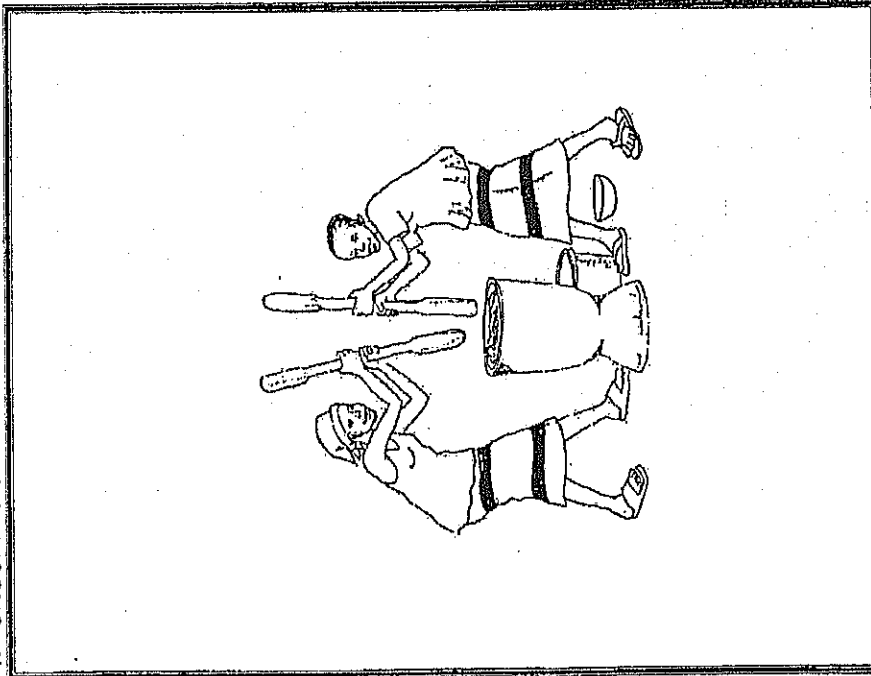


Fig. No10 The bad stocking



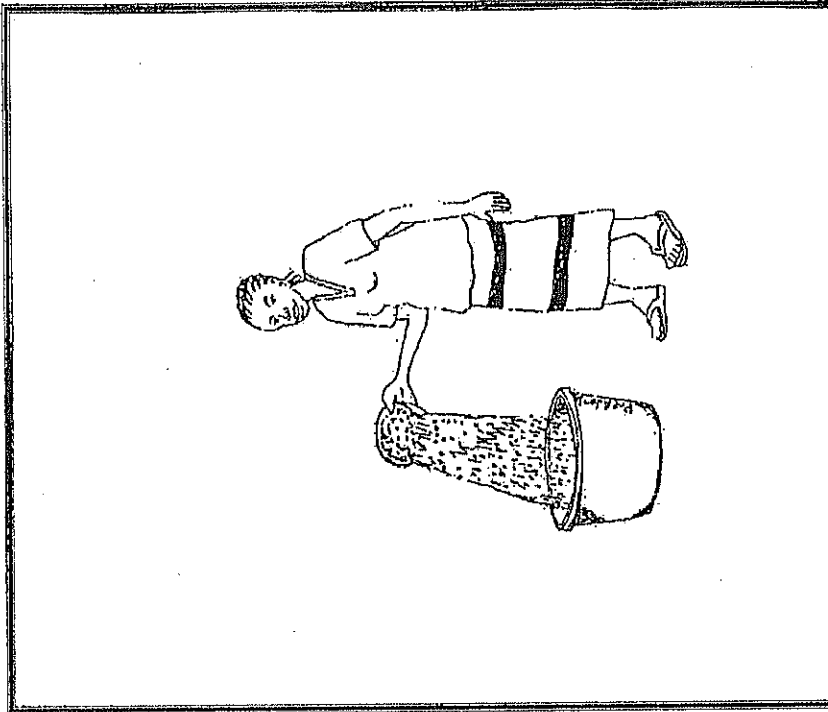
Fig. No11 The sale of cereal

6-2 PRODUCTION OF SOUMBALA
1. - CRUSHING SEEDS



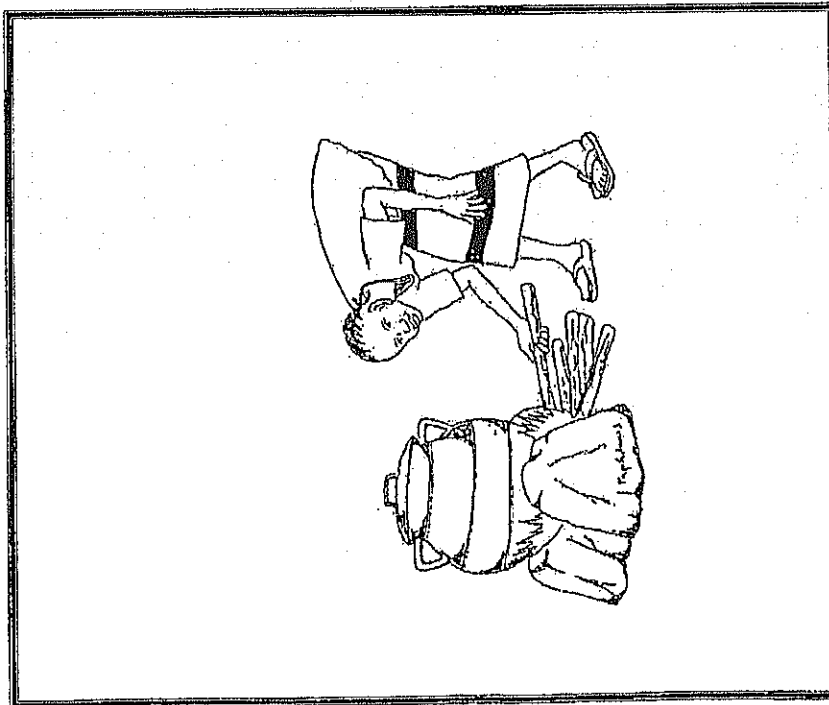
- To wet and to crush seeds of néré with ash until they become black.

2. - WINNOWING AND WASHING OF CRUSHED SEEDS



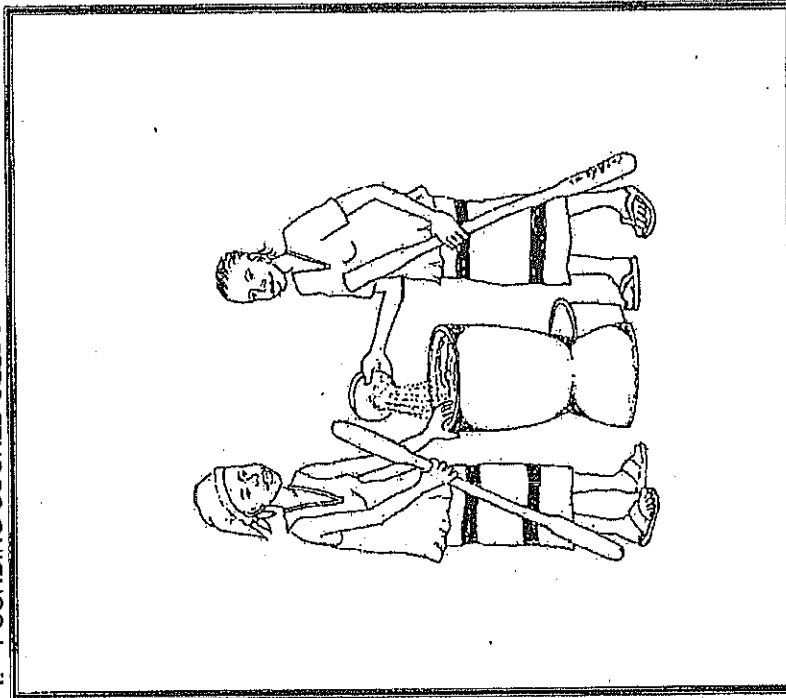
- To winnow and to wash the crushed seeds.

3. - TO COOK SEEDS



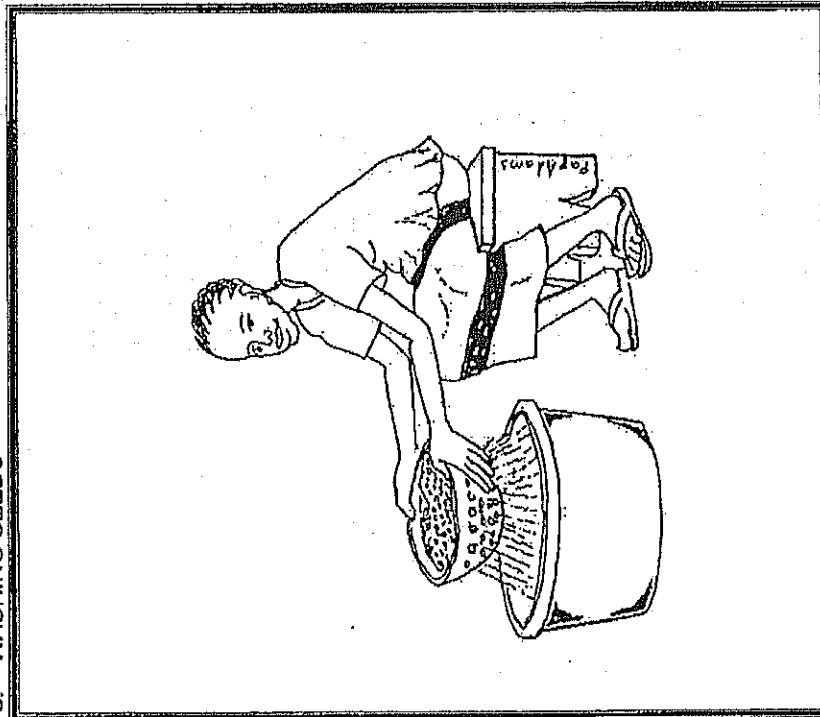
To Cook the seeds for 24 hours.

4. - POUNDING COOKED SEEDS



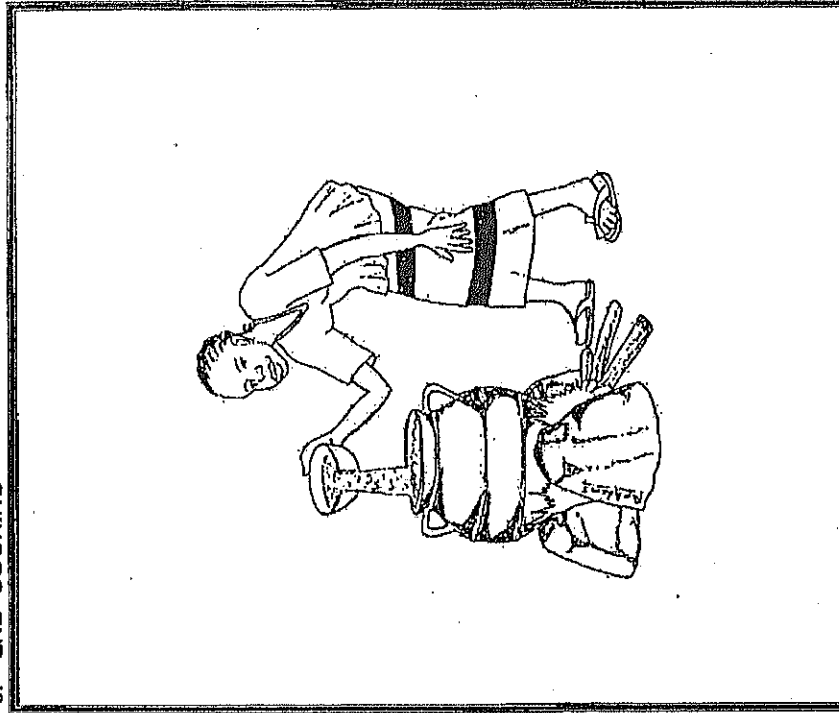
To Pound the cooked seeds in a mortar.

5. - WASHING SEEDS



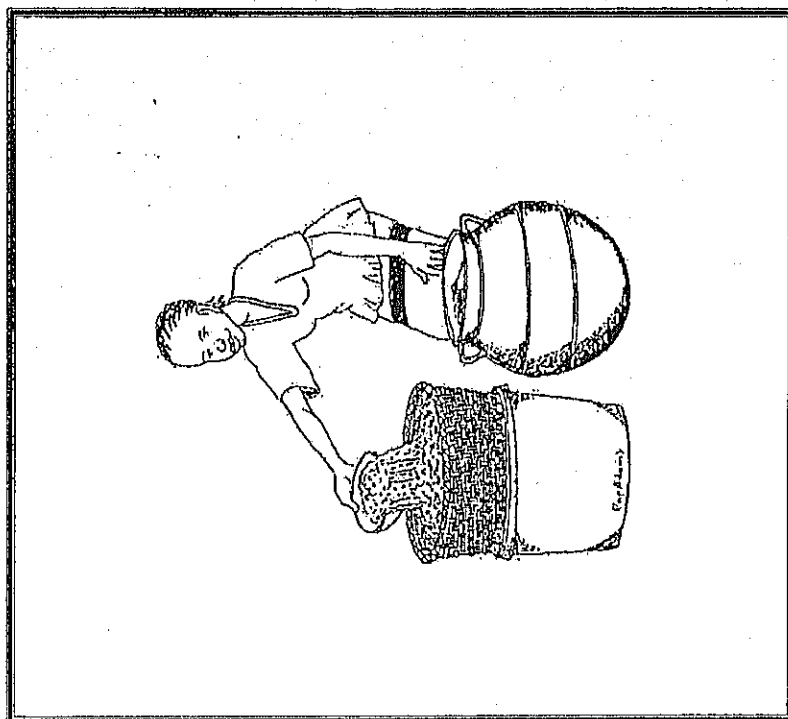
- To wash the cooked and crushed seeds on the punched calabashe in a big amount of water.

6. - 2ND COOKING



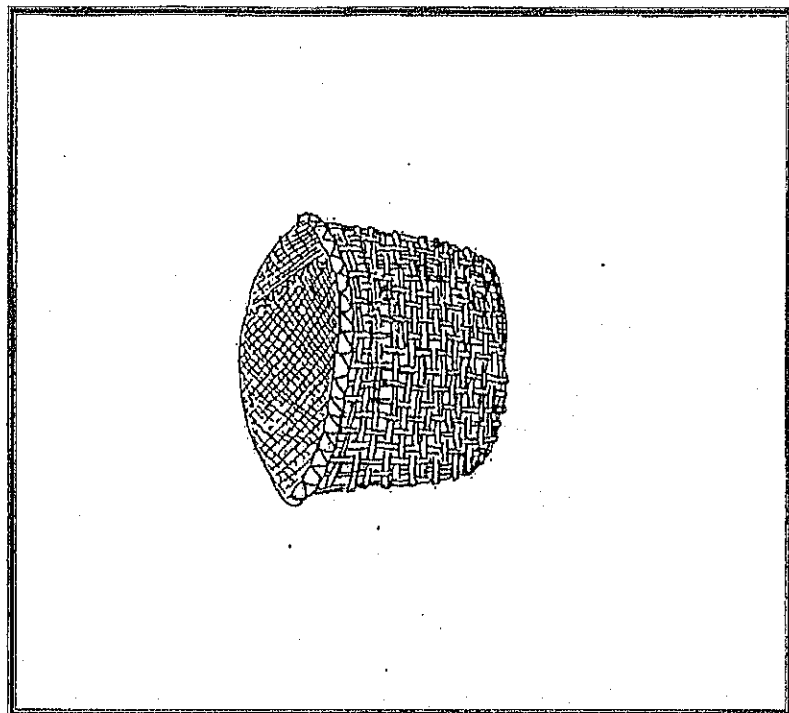
- To boil the seeds about 30 mns.

7. DRYING



- To dry cooked seeds in a basket.

8. -SETTING FOR FERMENTATION



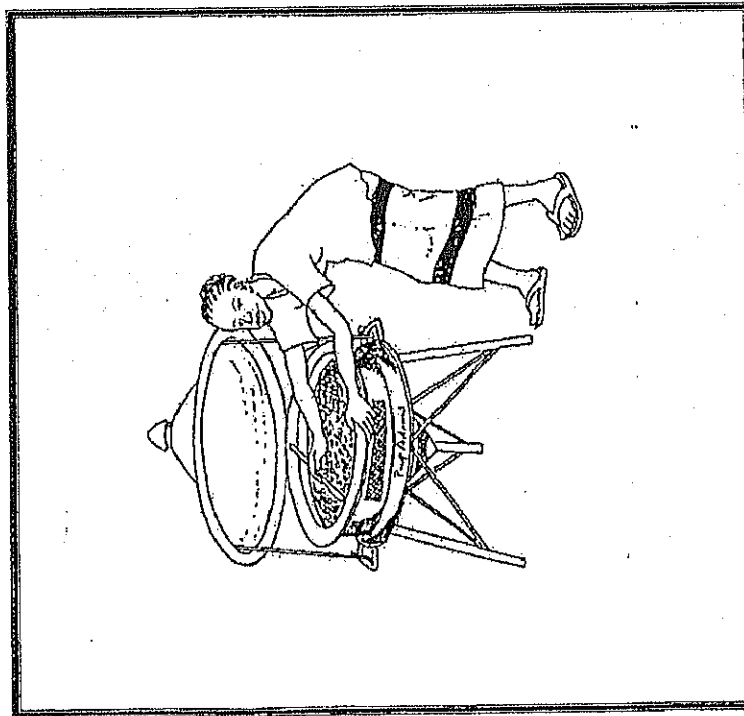
- To Place the plastic bag in the basket.
- Then to overturn the seeds.
- To Cover well, to place the all in an uninhabited house or at the heat.
- Fermentation takes 48 hours.

10. - MAKING SEEDS INTO BALLS



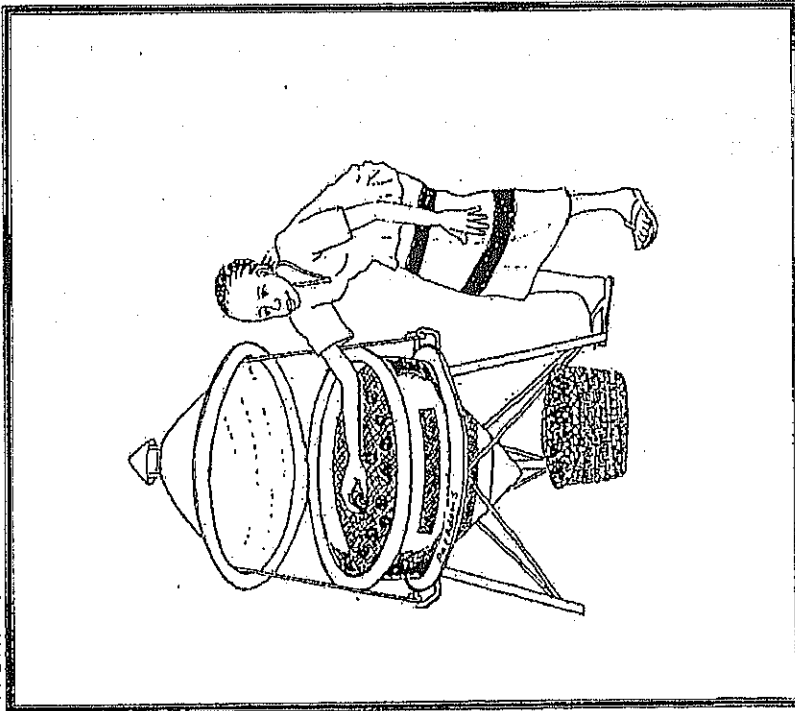
To take some amount of seeds of soubala and to make balls.

9. - PRE - DRYING



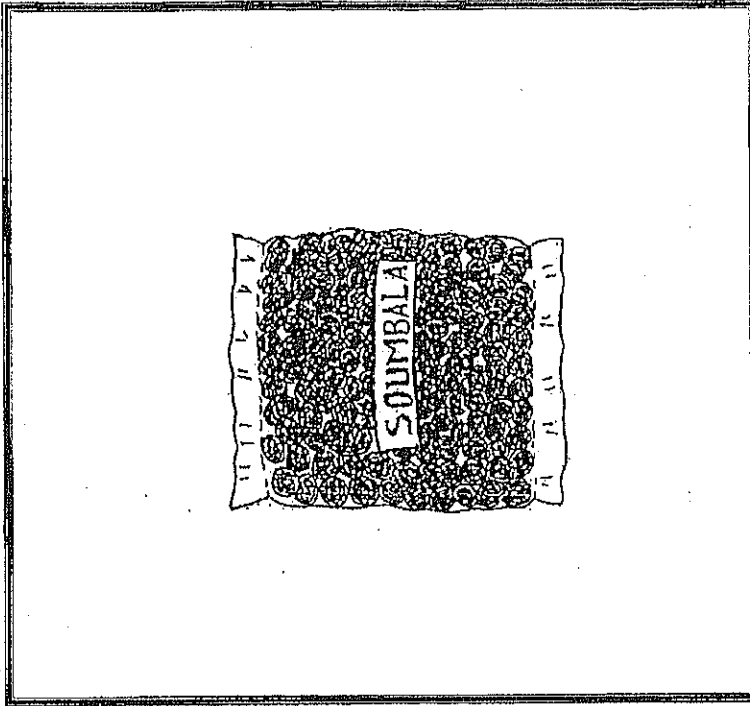
- To leave seeds of soubala in the driers for keeping them in clean and drying fast.

11-DRYING BALLS



- Put back balls of soumbala in the drier to dry them completely.
- It takes about 2 to 3 days.

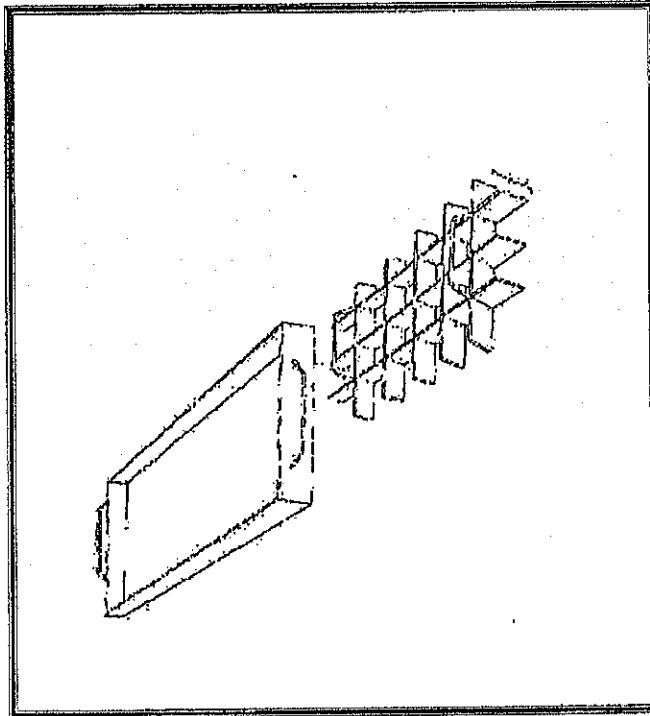
12. - TO PLACE IN SACHET



- To contain the soumbala in a packing bag for the merchandising.

6-3 TECHNIQUE OF SOAP PRODUCTION

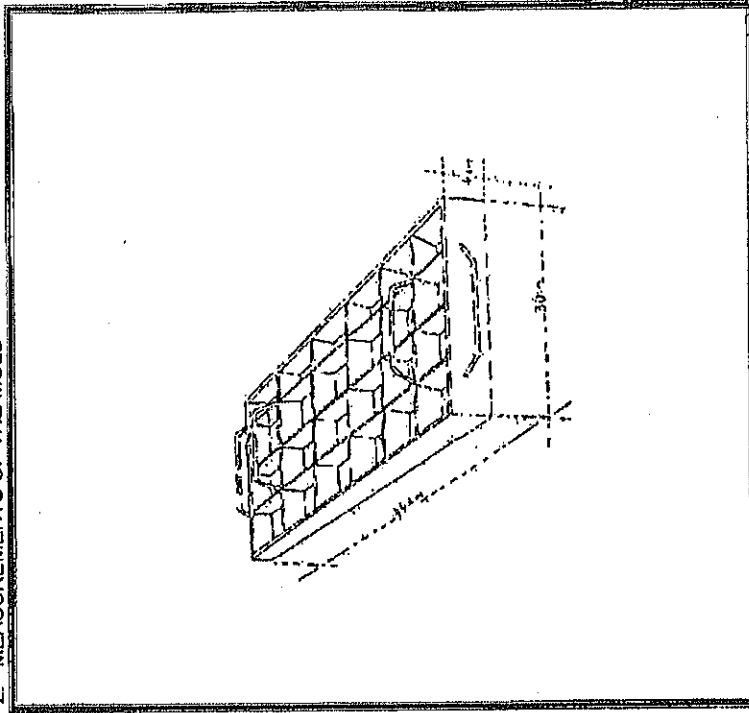
1. - PREPARATION OF THE MOLD



The mold is composed of two parts:

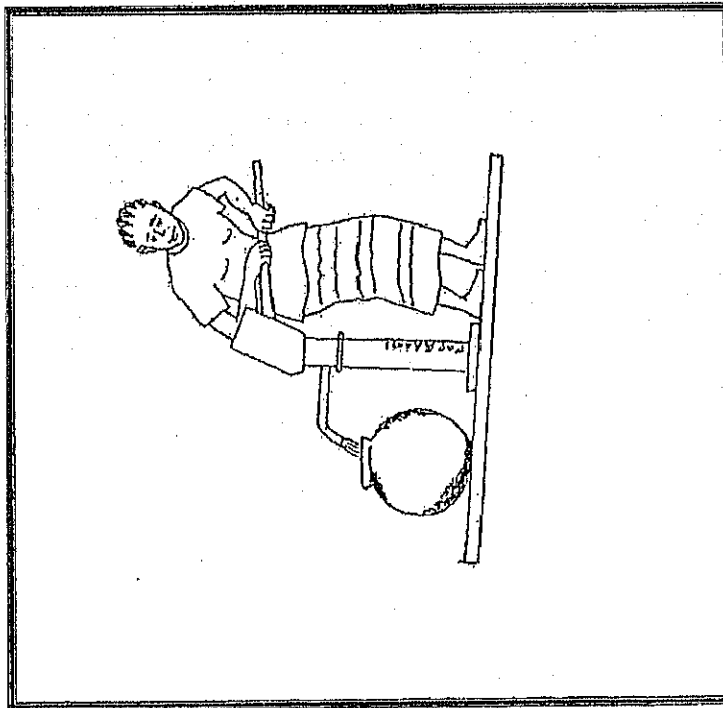
- 1st left: The main body of the mold has an oblong and hollow shape.
- 2nd left: The rod of cut

2. - MEASUREMENTS OF THE MOLD



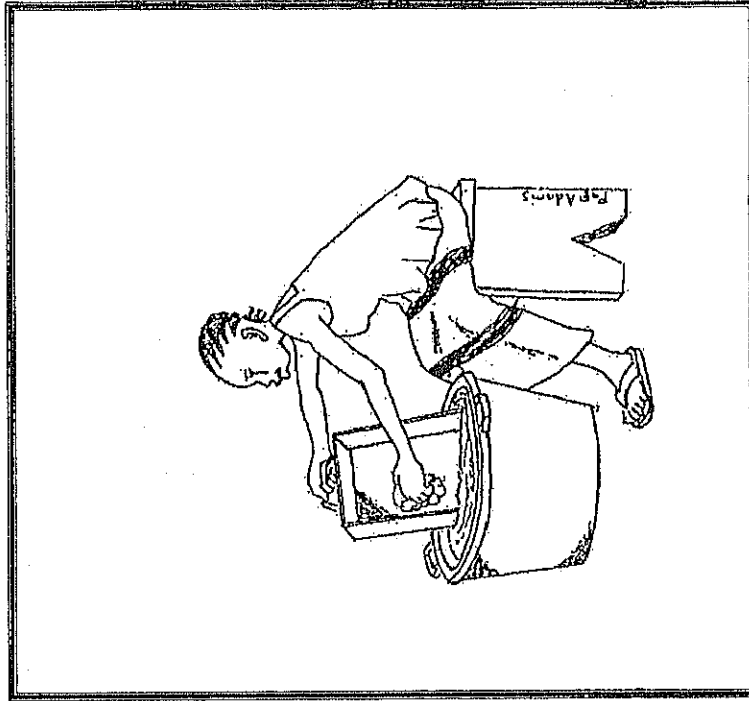
Measurements of the mold are: 44 cm of long on 35 cm of large and 4 cm of top. It can be made by craftsman welders.

3. FETCHING WATER



For the production of savon, water is needed. Water should be fresh from wells.

4. - WASHING TOOLS



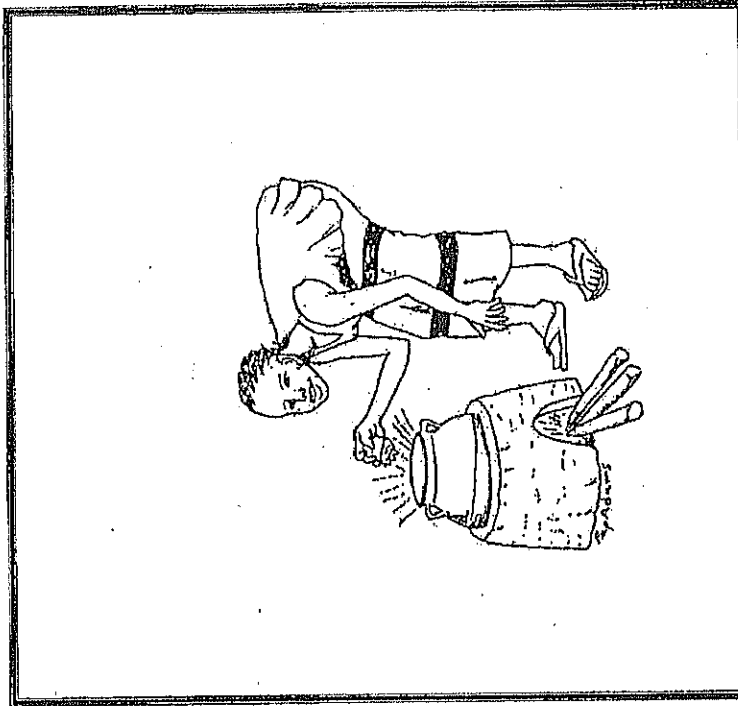
All the tools should be washed with soap before production.

5. - MELTING BUTTER



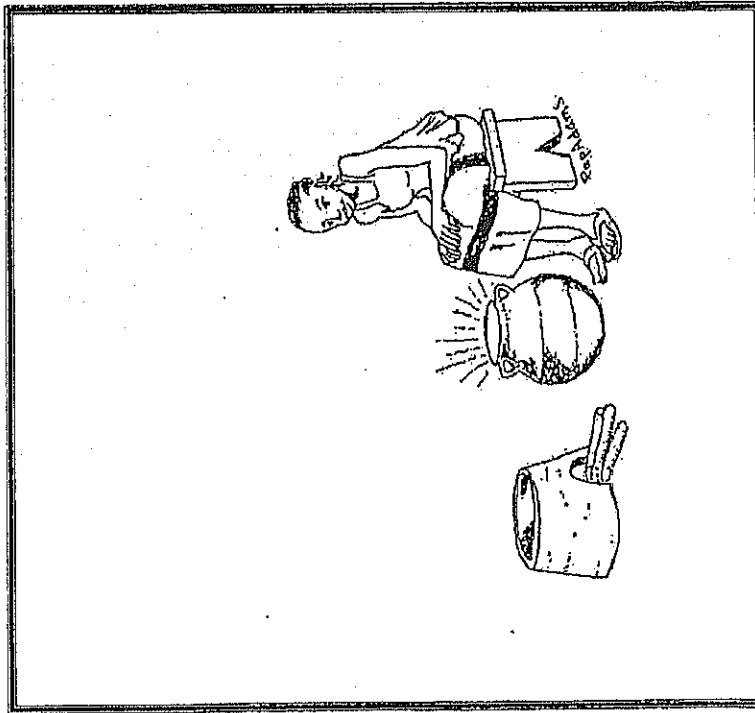
To put the washed pot on fire, then to overturn butter and to make it melt well.

6. - FLOWERING WITH LOMON



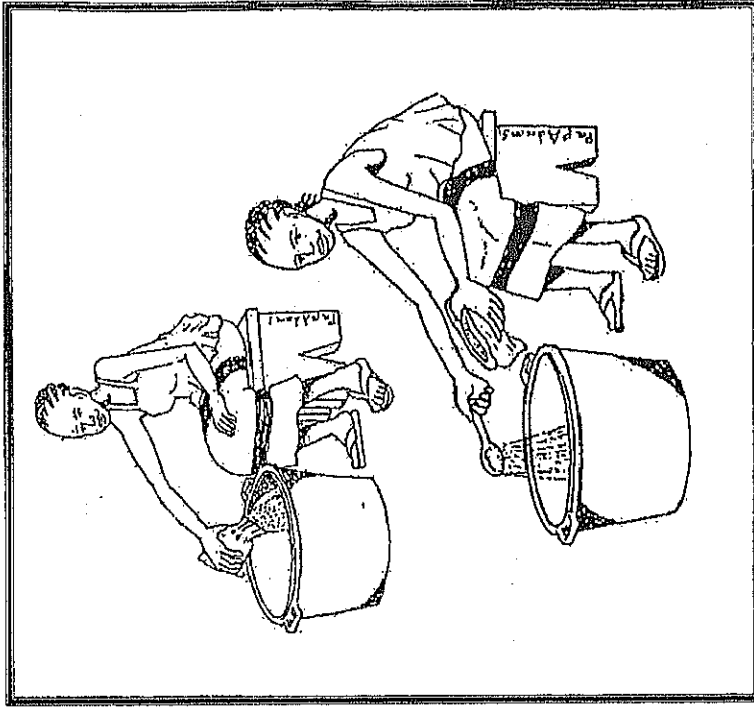
To press lemon juice into butter while the pot is always on fire. One can add some smelling leaves there to attenuate the odor of butter.

7. - COOLING OF BUTTER



To take off the pot from fire and to let butter get cold completely.

8. - PREPARATION OF SODIUM CARBONATE



In the plastic bowl, put

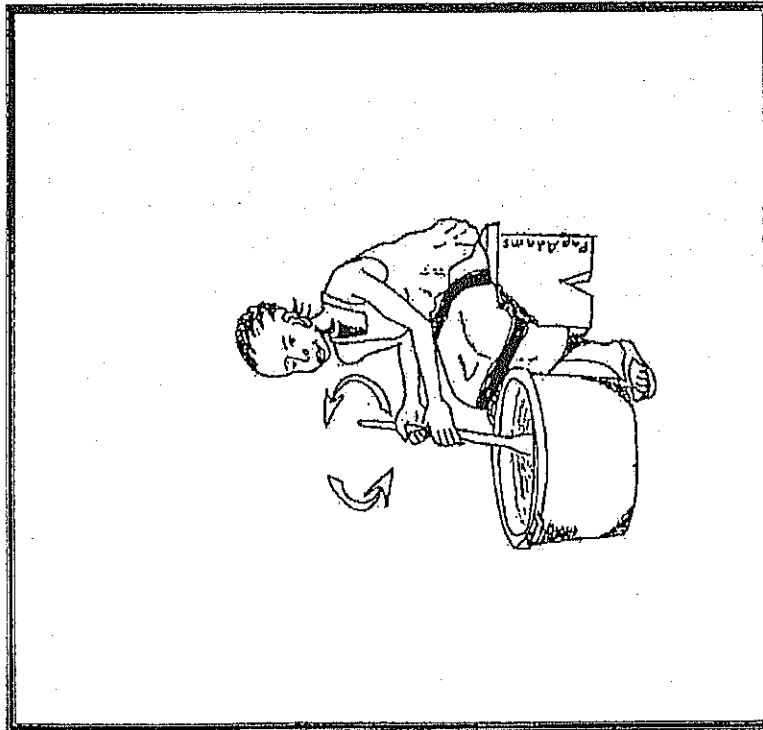
- 4 litres of water
- ½ kg of caustic sodium
- 2 spoons of borax
- 1 sac of orno (equivalent to 60 Fcfa)

Stir well not to get clots.

Keep it for cooling down.

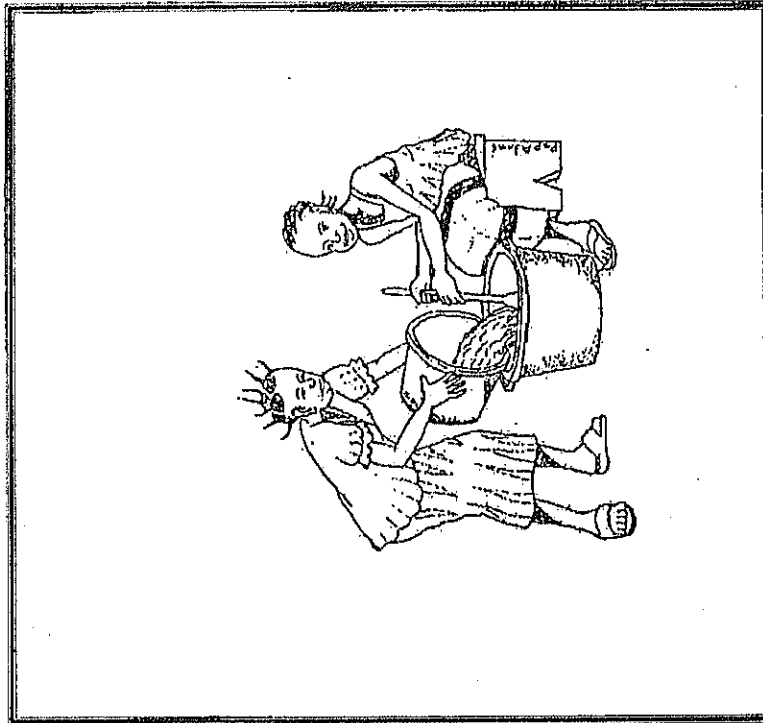
This chemical should be kept well with cautions as it is corrosive.

9. - MAKING MIXTURE OF OIL AND BUTTER



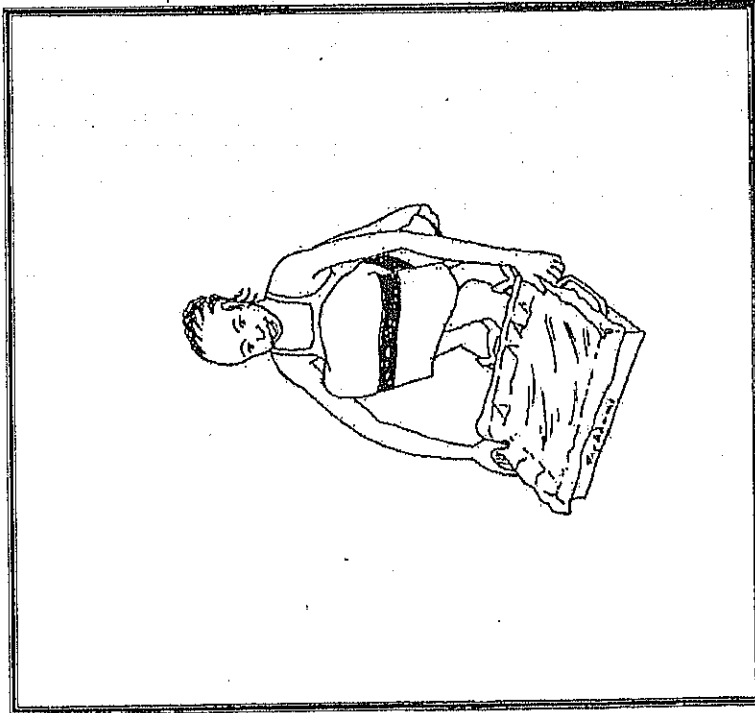
In the big plastic bowl, mix 3 liters of butter and 1 liter of oil.

10. - PREPARATION OF THE DOUGH/PAST



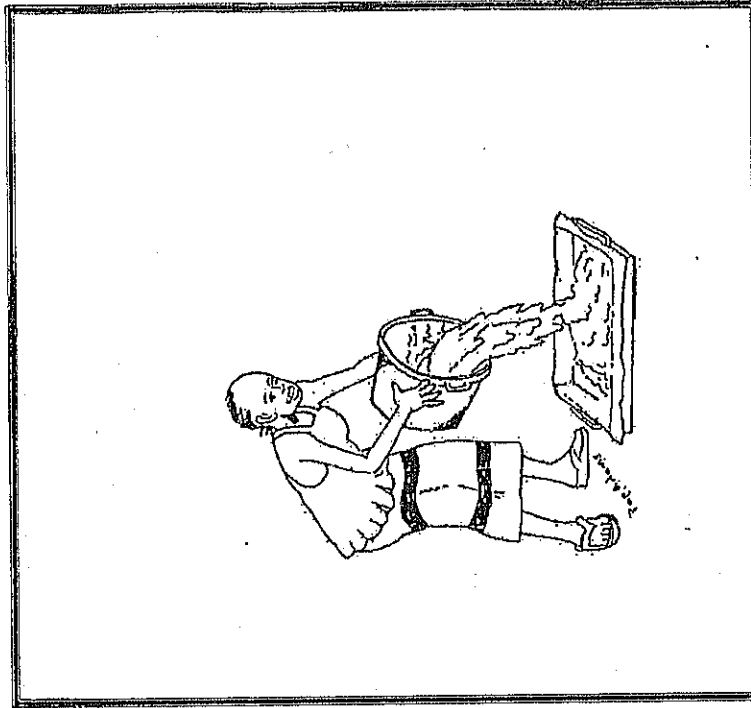
This stage of production requires 2 persons. One needs to pour the past (the mixture of gras and oil) into the Sodium solution. Another should stir continuously while pouring.

11. -TO PLACE THE PLASTIC SHEET IN THE MOULE



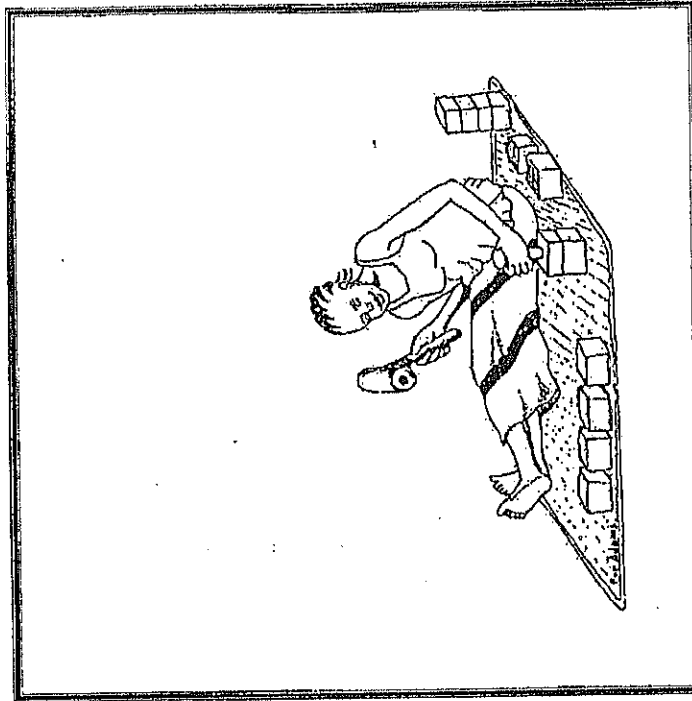
To Place the sheet in the moule. it facilitate remouving of the soap when it is solid.

12- POURING OF THE DOUGH/PAST INTO THE MOULE



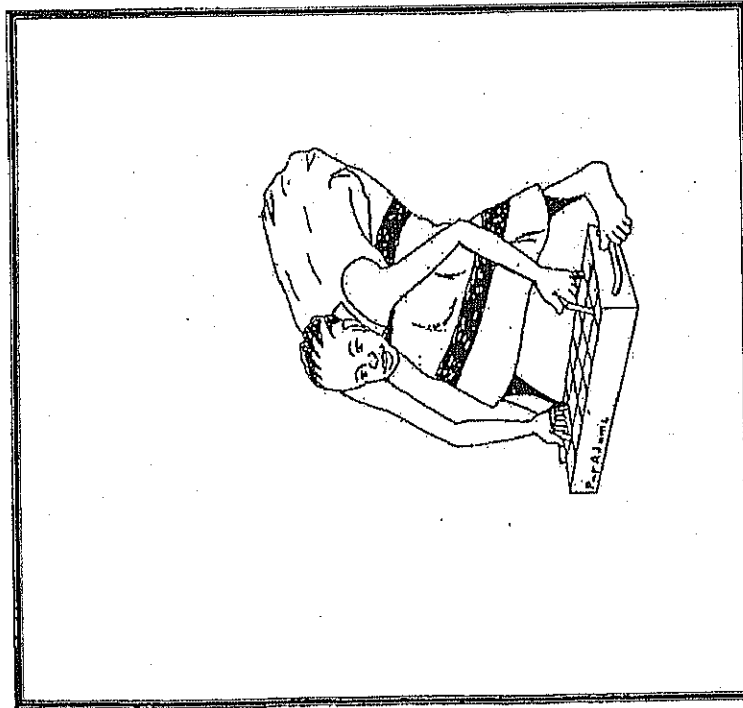
- To Pour the dough/ Past into the moule/
- After that, place the framing rods.

14. STAMP



Press the stamp onto blocks of soap.
It is easier to do this stage while the dough is soft.

13. — TAKING OFF FROM THE MOULE



Take off the framing rods.
Then remove the blocks of soap from the moule.

7 Field of the development of resources in water

Stage 1 :



FIG.1 SURVEY OF THE MIDDLE

Stage 2 :

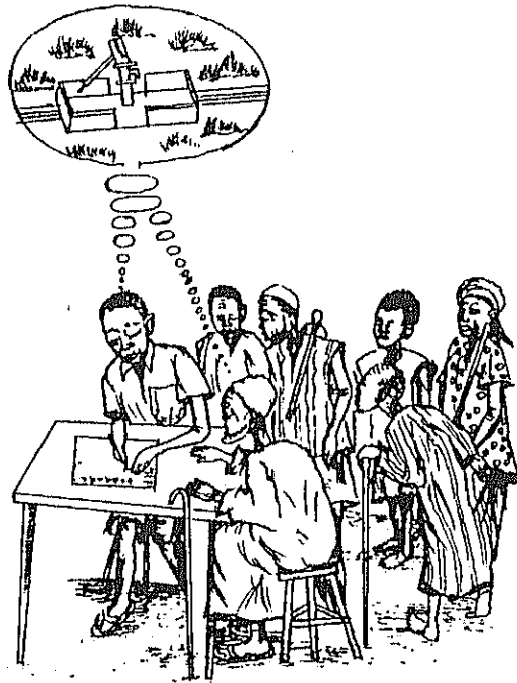


FIG.2 MEETING OF RESTITUTION OF RESULTS OF THE SURVEY OF THE MIDDLE AND SENSITIZATION

Stage 3 :

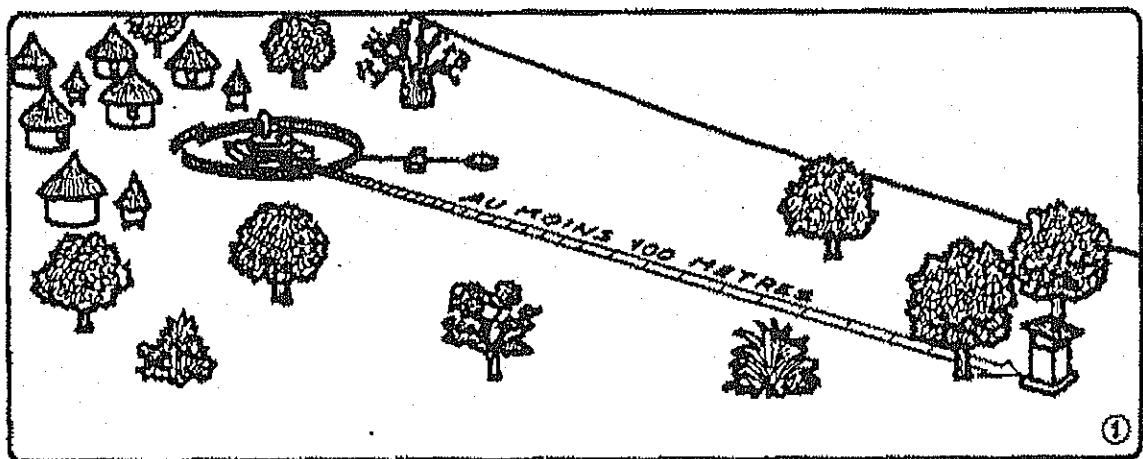


FIG.3 DEFINITIVE IMPLANTATION OF THE SITE

Stage 4 :



FIG.4 ORGANIZATION OF MANAGEMENT COMMITTEES

Stage 5 :



FIG.5 MEETING OF USERS

Stage 6 :

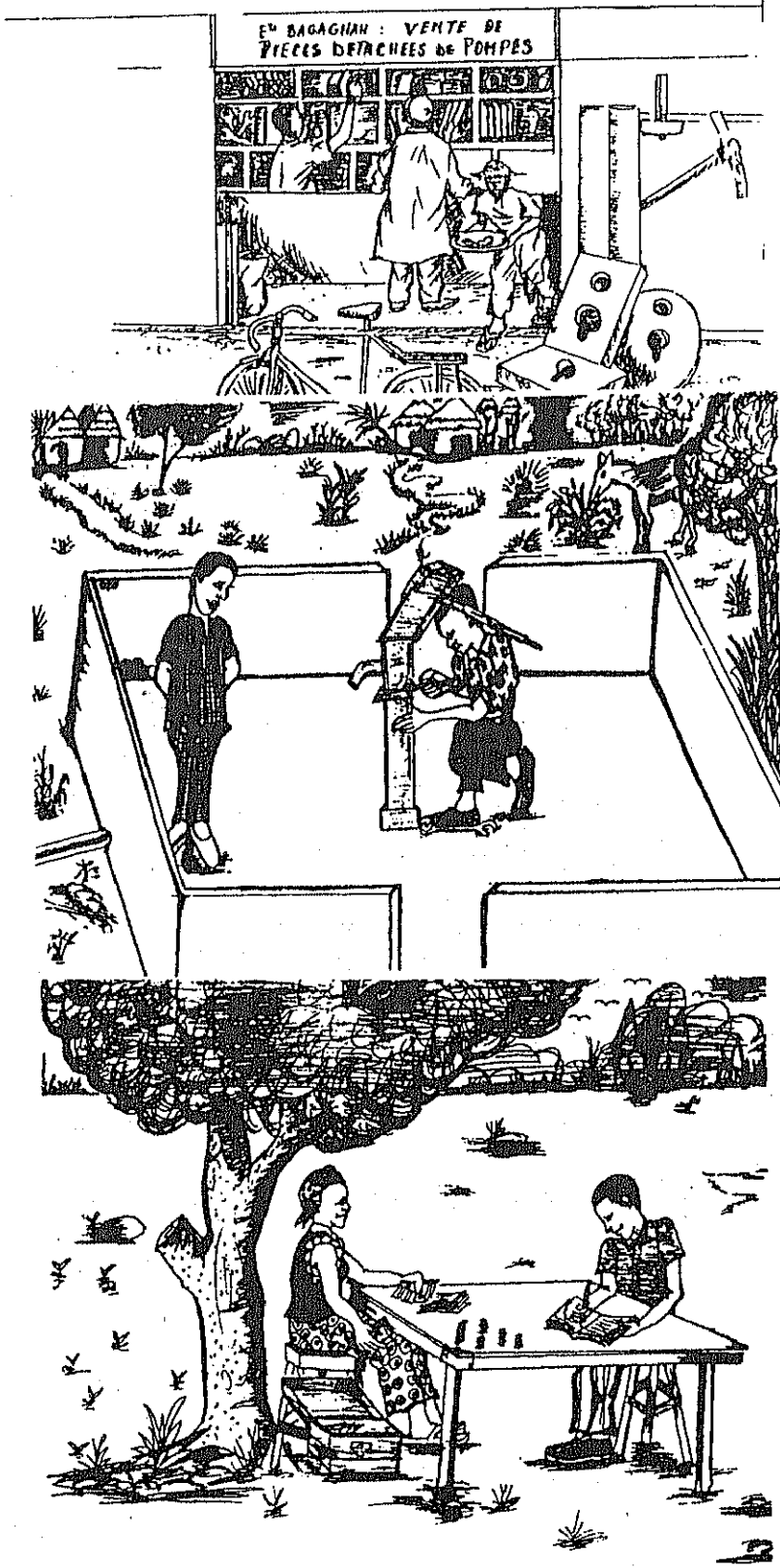


FIG.6 MEETING OF THE POINT OF WATER

