



# Family Poultry



# Scavenging chickens



# Training Handbook



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# 1. BACKGROUND

Billions of village or backyard, mainly scavenging, chickens are found in almost all developing countries throughout the world. In many African countries, village chickens make up 70-80% of the national flock. Village chickens are extremely important, despite their poor production, in providing, albeit in small amounts, valuable high-quality protein, poverty alleviation and income and food security. Despite their importance, in surveys of village food resources, village chickens are sometimes ignored.

These chickens are usually cared for by women and children, and are mostly kept in small numbers, unmanaged, but are sometimes given supplementary feed. They have to find most of it by scavenging for insects, grubs, snails, seeds, fallen fruit and berries. As a consequence, village chickens grow very slowly, lay few eggs and mortality is high.

Their meat and normally small eggs are prized and in some countries may fetch a higher price than those commercially produced. A village can support only a limited number of chickens based on the concept of 'the scavenging feed resource base'. This is the amount of feed available to scavenge in a particular area. The amount and variety of feed will change with season and so will bird numbers and production. They usually produce much less than their genetic potential because of few inputs so there is opportunity to increase egg numbers and meat yield.

The origin of village poultry genotypes varies from the jungle fowl to introduced breeds that have interbred. Several recognized genotypes of village chickens have survived in many countries. Most have developed various characteristics that allow them to live under harsh conditions, to resist many diseases and to escape from predators by flying short distances. Introductions of superior breeds that lack some of these characteristics invariably result in failure. They are unable to survive.



Ayam Cemani, a variety of the Black Kedu (Indonesia), is completely black and reputed to have black organs and black blood.

If you wish to improve your village poultry production, you must be *observant* and watch them carefully so that you can identify *superior* birds and their *behaviour*.



**Before we commence the course there are things that we need to do.**

1. Your first task is to introduce yourself – tell us your name, what village you come from; a little about your family and background, why you are here and what you hope to get out of the course
2. The trainer will now introduce himself/herself
3. When everyone has been introduced, you may wish to ask questions about the course or any other matter





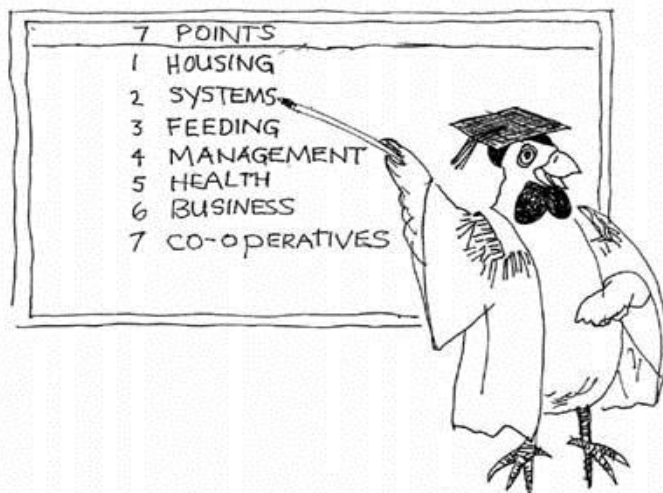


If throughout the course there is anything that you do not understand, or words that you are uncertain of their meaning, please ask. Usually there are others who do not understand either!

## 1.1 What will you learn from the course?

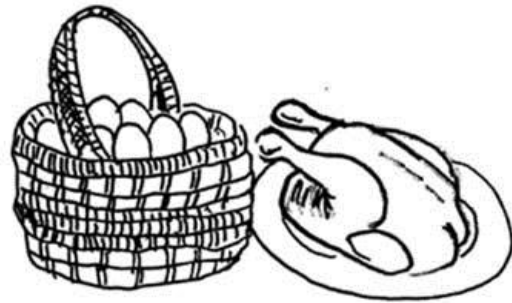
At the end of the course you should understand the structure of the village poultry system and where small improvements can be made to increase productivity. We will deal with:

- Housing
- Breeding and incubation
- Rearing chicks
- Health
- Different production scenarios (situations)



## 1.2 Why poultry are very important for you and your family

- Chicken meat and eggs contain essential nutrients
- They are particularly rich in the good proteins
- That your body needs to grow and remain healthy



To

- allow your children to grow and be strong,
- allow their brain to develop and be clever at school,

- help to protect your children from colds and coughs, and allow mothers to produce healthy babies and to nurse them well
- Eggs and meat contain important vitamins and minerals sometimes unavailable in other foods





- It is therefore very important that when you have eggs and kill meat chickens, remember your family comes first

## 2. HOUSING

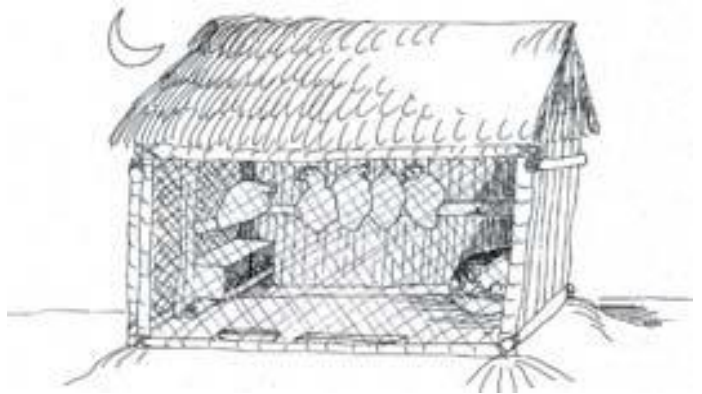
Village chickens need to be housed at night.

- Do not allow them to roost in trees
- Count them and inspect them for ailments often





- Collect eggs from one place



- Give them supplementary feed just outside the house at dusk





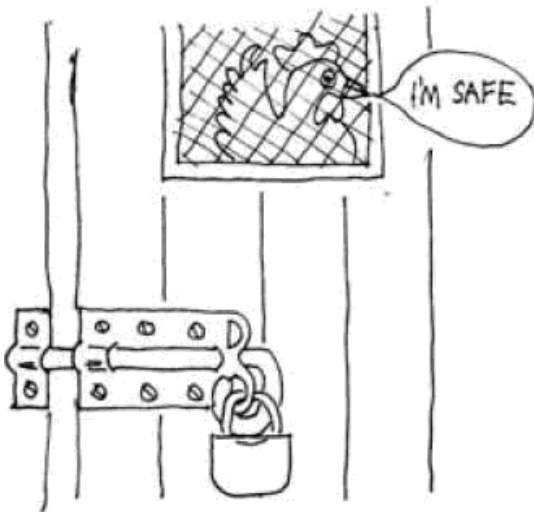
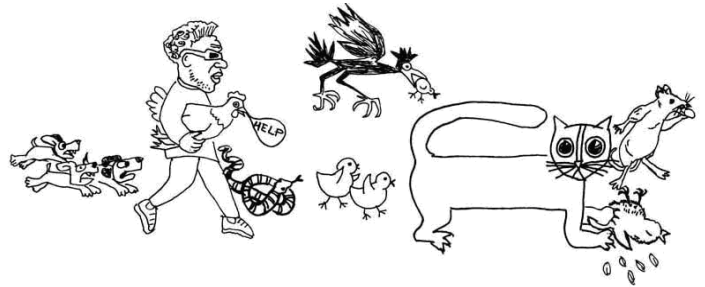
## 2.1 What kind of a house should I build?

You should plan carefully where you will build the house. It must be a strong house to protect your poultry:



- From the weather

- From predators



- From thieves

- It must allow in plenty of light and air movement
- If it is off the ground this will allow it to be cool and unlikely to flood
- The roof should have good overhang

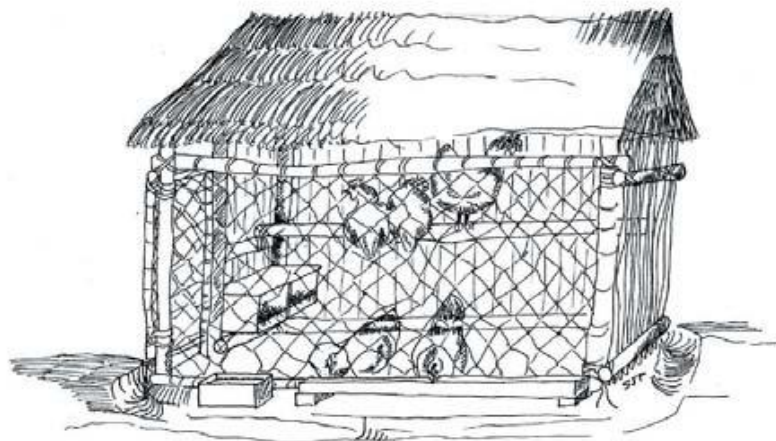
## 2.2 Where should I build my poultry house?

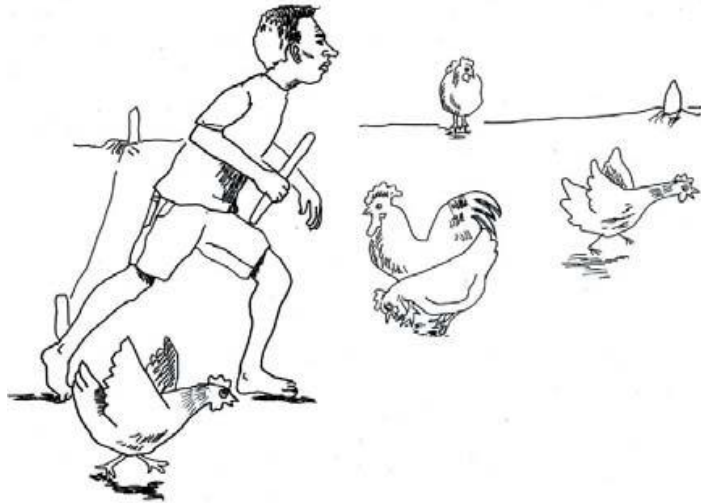
- It should be built in a shady, dry area
- On flat, raised ground to keep the floor dry
- Close to your own house to prevent stealing
- Put a metal cones around each stilt or leg to prevent rats from climbing up



## 2.3 What size will my house be and what materials should I use?

- This will depend on the size of your flock
- A small house may be sufficient



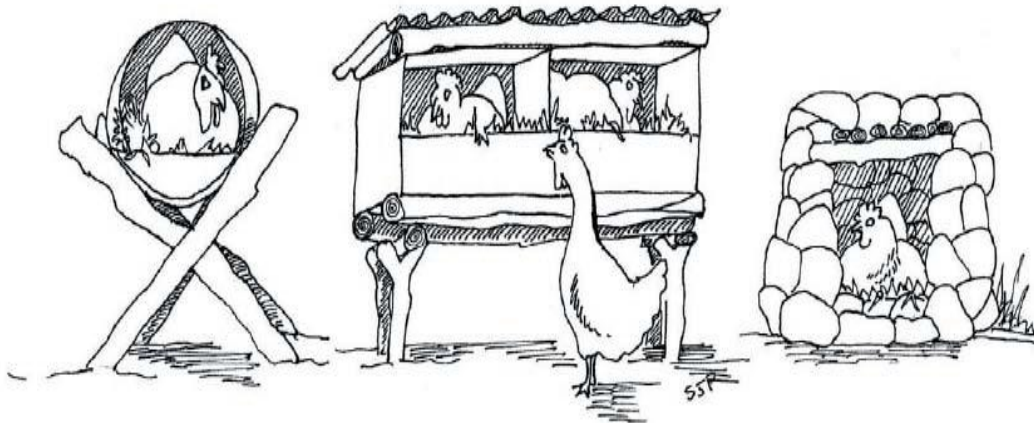


- For 10 to 15 adult birds it will be 2 large paces (metres) by 2 metres
- It should be tall enough to allow you to enter comfortably (1.8 metres high)
- It is better to make it large so that you can expand your flock size
- It should have space for nest boxes. These can be a basket woven from coconut or bamboo leaves, or made from stones or timber
- Nest boxes should be off the floor
- In a safe place
- Put in dried grass and dry leaves as nesting material
- Change the nesting material regularly
- One nest box for 3-4 hens
- Use as much local materials as possible
- The floor can be made of split bamboo strips 2 cm apart





- The floor should be easy to keep clean
- Put in wooden perches – about 4-5 birds/metre and about 0.5 metres apart
- You can collect the manure from under them and use it on your garden
- There should be a simple drinker for holding clean, fresh water
- It can be made from bamboo or an inverted can or bottle

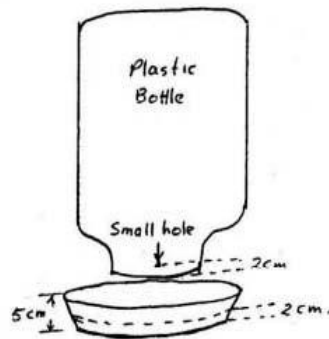
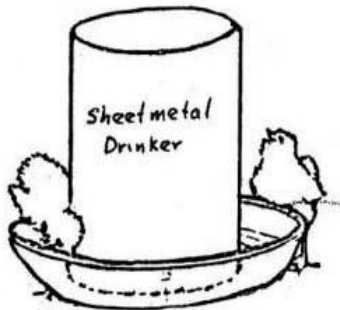
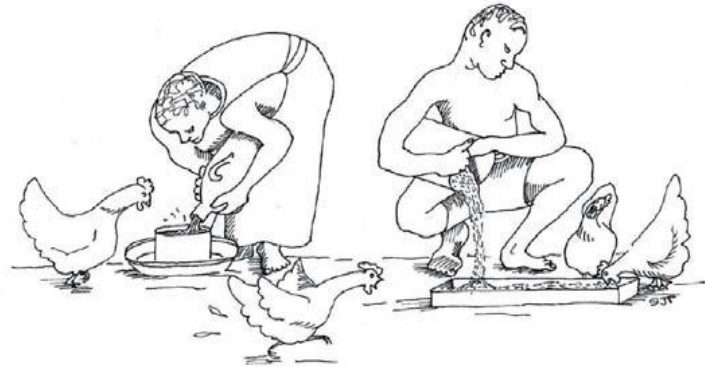


There are several kinds of simple nest boxes

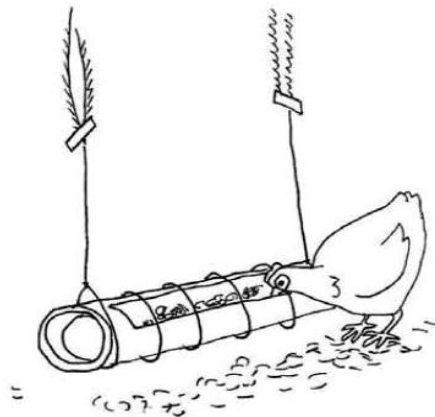
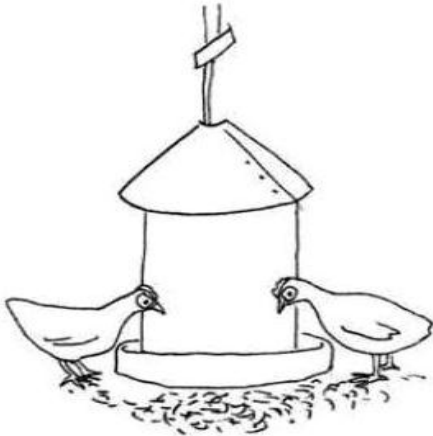




### 3. FURNISHING THE HOUSE



- The feeder should be at a height that will allow all chickens to eat but not to scratch in it
- It can also be made from local materials



- You must allow your chickens to adjust to their new home
- By keeping them in with feed and water for a few days
- Then let them out for a few hours at a time
- So that after a week they will know that it is their home at night

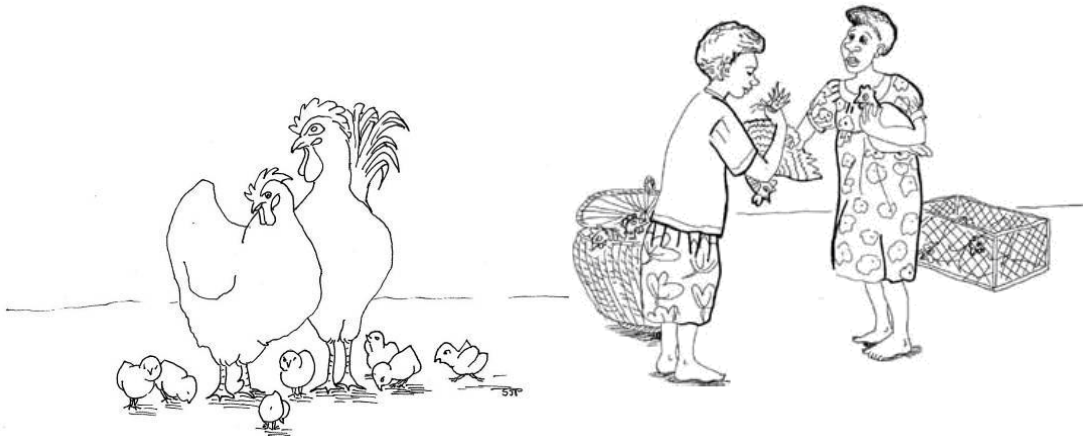


## 4. BREEDING AND INCUBATION

Village chickens normally breed indiscriminately (cocks do not select any one hen) and there is sometimes inbreeding. That is father mating with daughter or sister with brother. The offspring usually do not produce many eggs or grow well.

### 4.1 How can I improve my poultry flock?

- Watch which hens lay well
- Observe those hens that sit and hatch most of their eggs
- Are good mothers
- Care well for the chicks
- Keep those hens that produce strong, healthy chicks
- Mate hens with the fast-growing big cockerels



- Chicks that grow rapidly are usually the males and are best to eat
- Swap cockerels with your neighbour now and again
- This will reduce inbreeding (mating with brother and sister) and
- produce better chicks that will grow fast and lay more eggs

## 4.1 Should I have a breeding program?

If you want to have more eggs to eat and better chickens for meat you should have a simple breeding program. There is great wastage in the present system

- Hens usually lay a clutch of eggs
- Then sit on them; often as many as 15 eggs
- Do not always allow this to happen



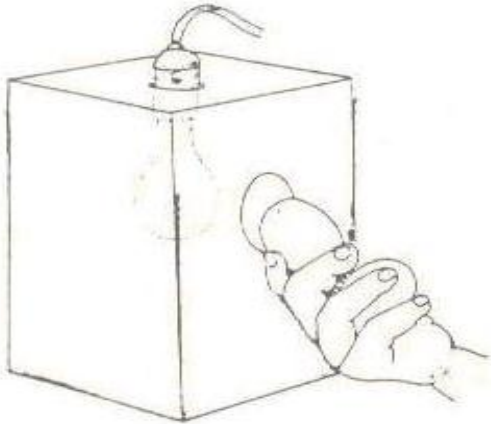
- Do not let all broody hens incubate their eggs
- Remove all eggs each day

- When a good mother hen becomes broody put only 6-7 fresh (no more than 8 days old) eggs with sound shells and not misshapen under her
- Have a special nest in an isolated part of the hen house for egg incubation
- Give the broody hen a supply of feed and water close to her nest

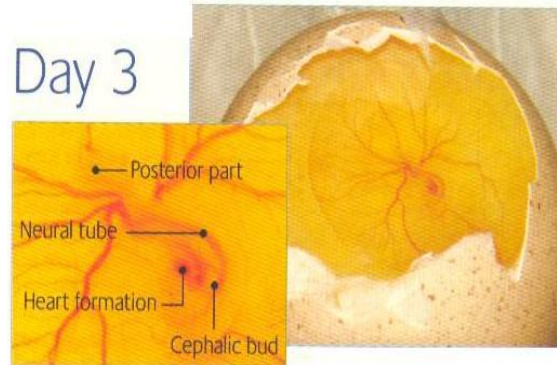


## 4.2 Candling eggs

- This allows you to determine if the egg is developing into a chick or not
- A small 3 cm hole is placed in a can or box holding an electric bulb
- A flash light or sunlight entering a dark room can be used
- After about 5 – 8 days thin blood vessels may be seen from a dark red spot and the chick is developing
- If not, eat or discard the egg



Egg candler

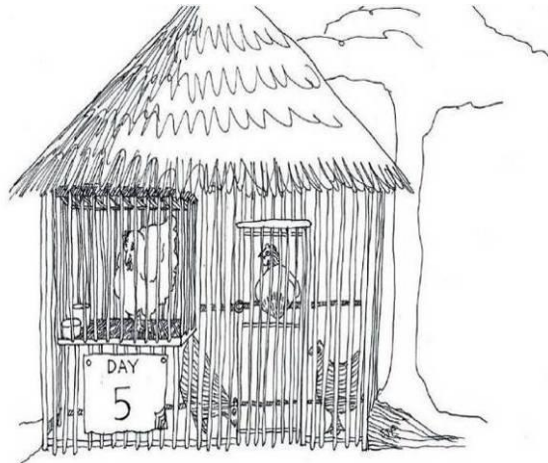


Embryonic development – day 3

## 4.2 What will I do with my broody hen if she has no eggs to incubate?

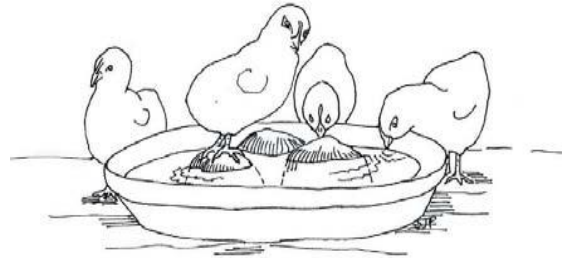
You must get her back into production as quickly as possible by:

- Isolating her in a small cage with feed and water for 5 days
- Dipping the hen in water 3-4 times a day for 3-4 days as well, is the most effective way of stopping broodiness especially if the hen is isolated
- This means that the hen will return to laying eggs in about 10 days instead of being out of production for about 17 weeks if allowed to incubate and raise her chicks

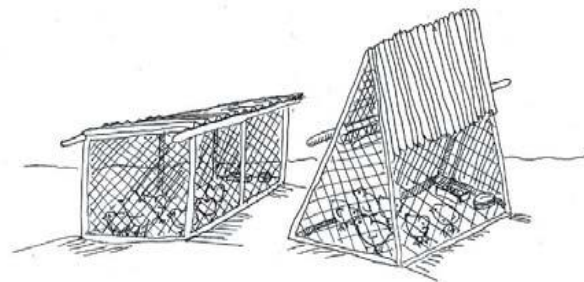


## 5. REARING CHICKS

Raising chicks successfully is central to improving village poultry production. Mortality is normally 60-80% when a mother tries to raise her 12-15 chicks. One way is as suggested to allow the mother to incubate only 6 eggs. From this it will be possible to allow her to raise 4-5 chicks if steps are taken to protect the chicks and feed them well for the first 3-4 weeks. The following steps should be taken.



- Mother and chicks should be isolated and given special feed during the day
- Chicks should be given a drink of water immediately
- Put stones in an open drinker to avoid chicks drowning and clean often
- Chicks can be given their feed in an area protected from their mother



## 5.1 Feeding chicks

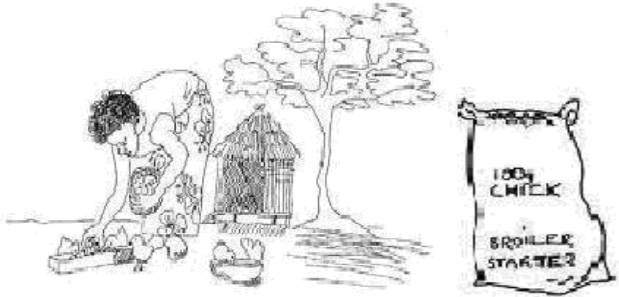


- An inverted bamboo basket or bamboo strips with a small entrance will allow only the chicks to enter and feed.





- Feed can be chopped boiled egg to start with. This will get them eating quickly
- Chicks will eat such little feed at this age that it will not be expensive even if you buy chick starter feed from a feed company



- Household table scraps, broken rice grains, crumbled bread should be given later
- The mother will teach them how to scavenge for worms, insects, grains etc
- They should be given scraps and other feed after 14 days, twice daily, until they are well grown (10-12 weeks)

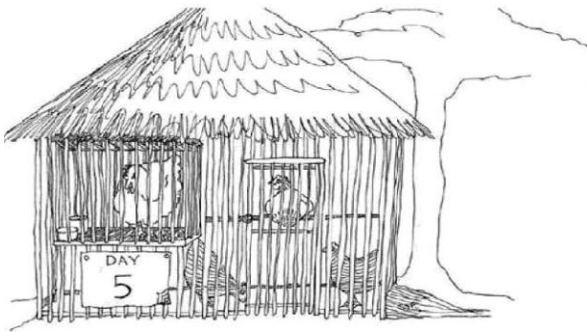
- Dead chicks must be removed and buried quickly. They can spread disease



## 5.2 Is there another system of raising my chickens?

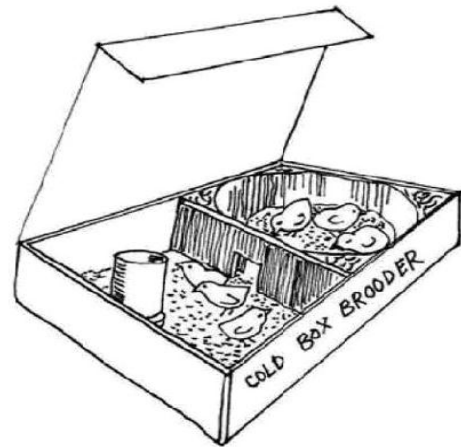
Yes. Separate them from their mother.

- Another way is if the hen is allowed to sit on 12 of her eggs (check them first for sound shells) and hatch, say 10 -11 chicks
- These chicks should be immediately separated from the mother
- This requires good management skills, more work and extra feeding
- But most of your chicks should survive although you will still lose 2-3: remove and bury them



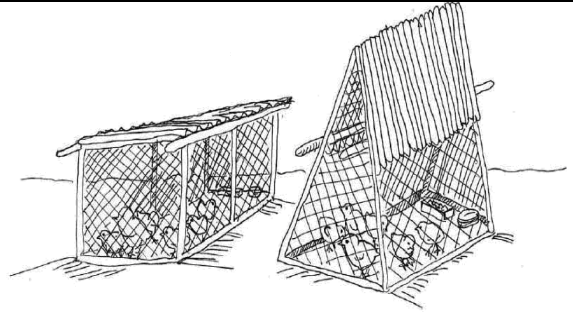
- The mother hen should be treated to stop her broodiness by dipping in water and isolating her in a cage for 5 days
- The chicks should be placed in a brooder with extra heat, or in a box and taken indoors at night

- A cold box brooder requires no heat but should be well insulated and of sufficient size for 10-12 chicks for about two weeks
- The floor should have dried grass or other litter
- Chicks should have clean, fresh water and clean feed containers



- They must be protected from predators at all times when outside

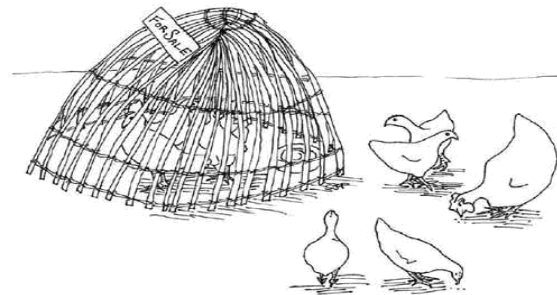
- Again this could be an inverted basket woven from bamboo strips or later a small moveable ark or pen
- Move the ark to give them clean, fresh ground to find new feed each day



## 5.2 What will I do with my chickens?

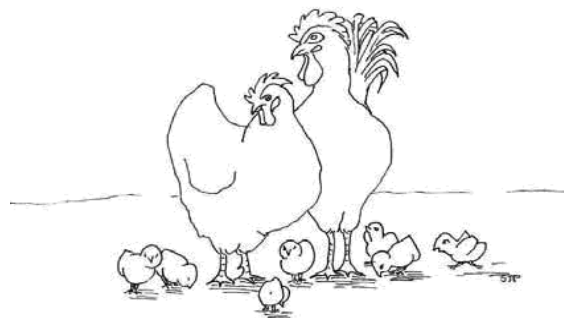
You must now decide what you are going to do with the new chickens. You will have 4-5 males and 4-5 females.

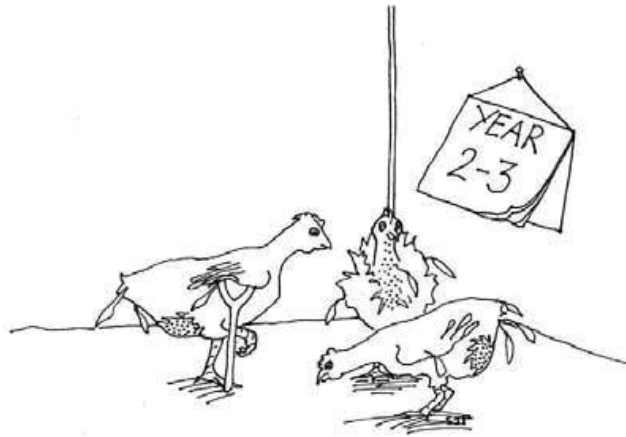
- When the males are 12-15 weeks of age (about 1 kg), some should be eaten and some sold
- Do not keep them beyond this age as they are becoming expensive to feed.
- Do not keep them only for celebrations but eat them regularly



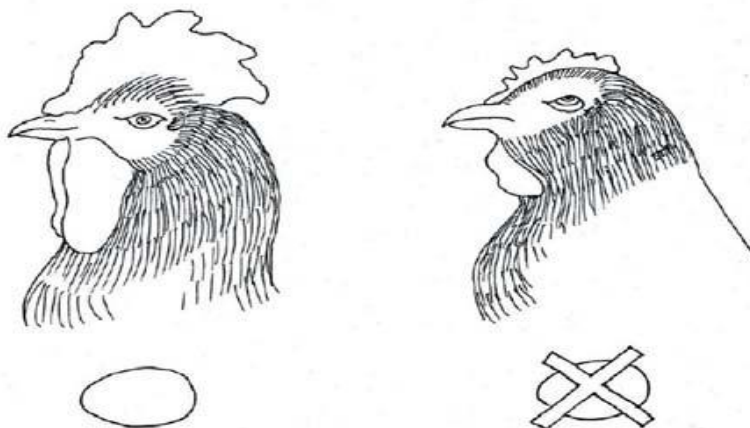
- Your family should eat a chicken 1-2 days each week
- If you see among the 4-5 males, a handsome cockerel that grew fast, keep him for breeding
- and later discard your oldest cockerel in the flock

- Keep only 1 cockerel for 7- 8 hens but you should always have a young cockerel ready for replacement
- You should keep some pullets to replace your old hens for breeding





- They will begin to lay when about 30 weeks of age
- You can tell if a hen is laying by the colour and shape of her comb. It will be large, red and healthy looking
- A non layer will have a pale, scaly comb with dry rough wattles and a small dry vent instead of moist and large vent



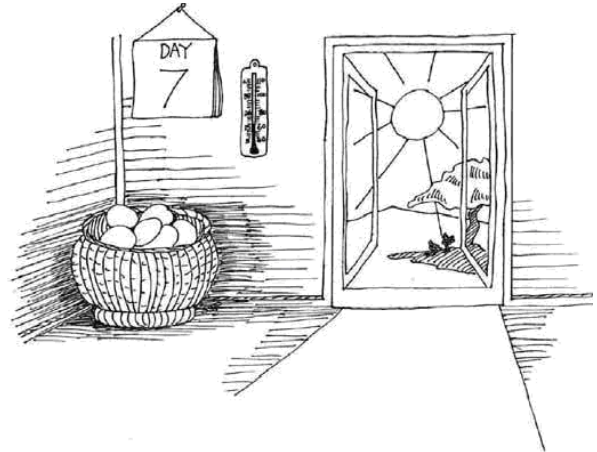
- Sell or eat hens who have laid for about two years or those who are younger but lay few eggs
- Old hens and non producers still need feed and give you nothing in return!

### 5.3 What will I do with my extra eggs that I will now have?



- You may have now more eggs than your family can eat
- Each child should have at least 3 eggs each week and an adult 1-2

- You should not keep them for more than 7-10 days or they will start to go stale



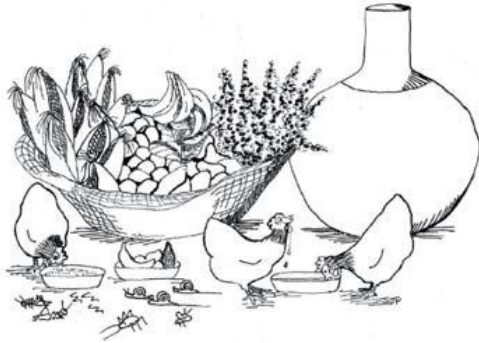
- You should sell any surplus eggs as soon as possible or boil them and sell them as boiled eggs
- Boiled eggs will also keep much longer and fetch more money



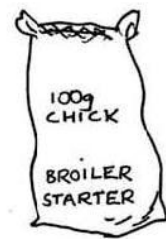
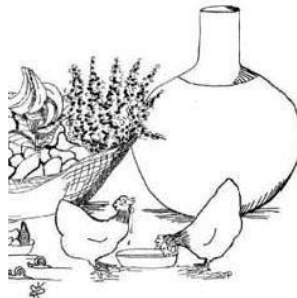
## 6. FEEDS AND FEEDING

If you want your chickens to produce more eggs and meat you must feed them.

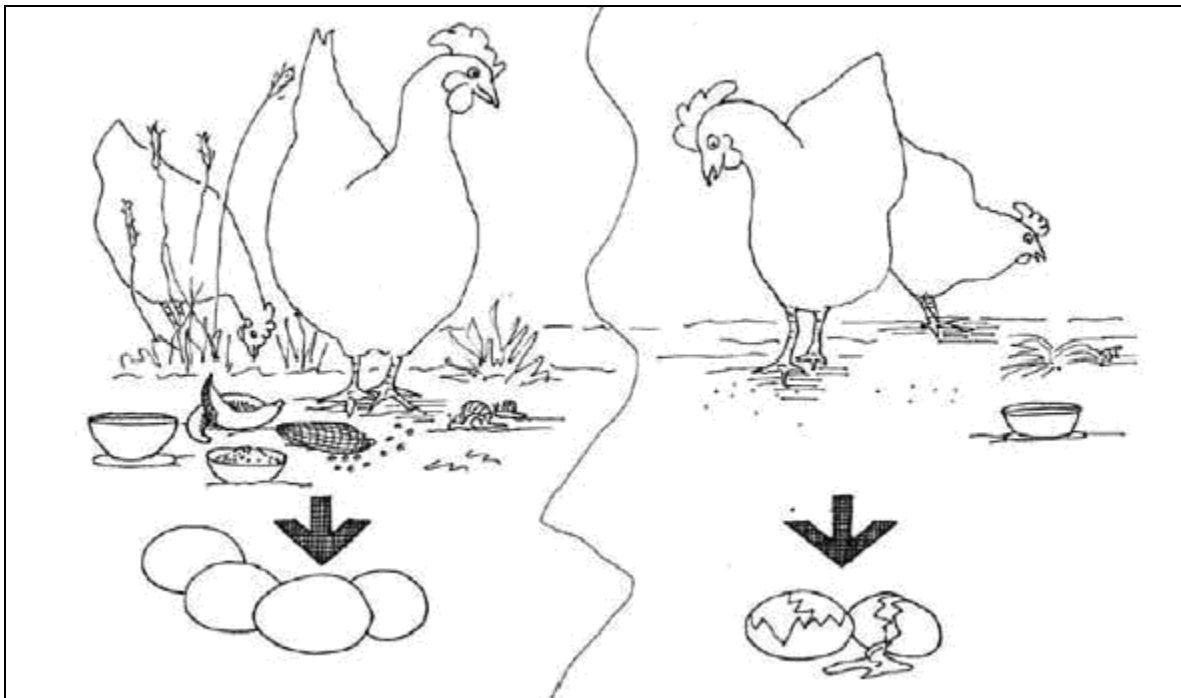
- Feed is the major constraint (drawback) to raising village chickens. The scavenging area is limited and usually over-scavenged so you can not expect it to produce many eggs or chickens to grow fast
- You can also feed them crushed shells and coral collected from the beach



- Chicken should be given a variety of feedstuffs
- Already mentioned is to give chicks a boiled egg when they first hatch out
- For very young chicks you should consider buying chick broiler starter crumbles



- Although expensive, each chick will consume only about 50-100 grams in the first 10-15 days and will then get a good start to life and grow fast
- Copra meal is cheap and if you have a variety of feeds it is sometimes better to put them in separate containers such as grains, copra meal and a calcium source
- Do not over-fill the feeders or you will waste some



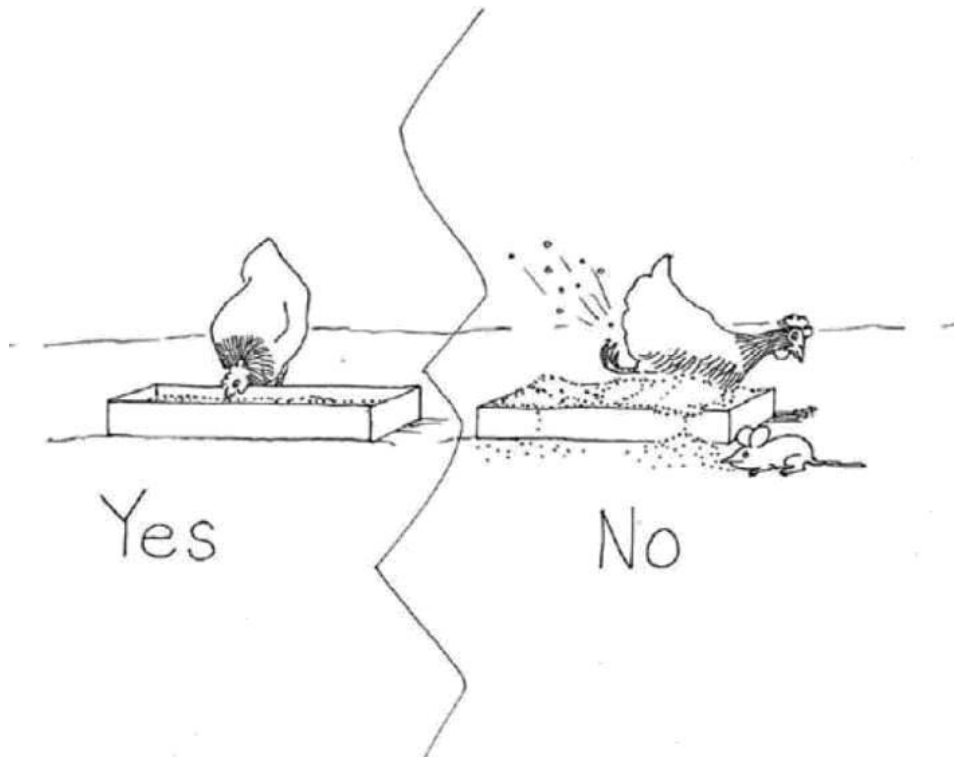
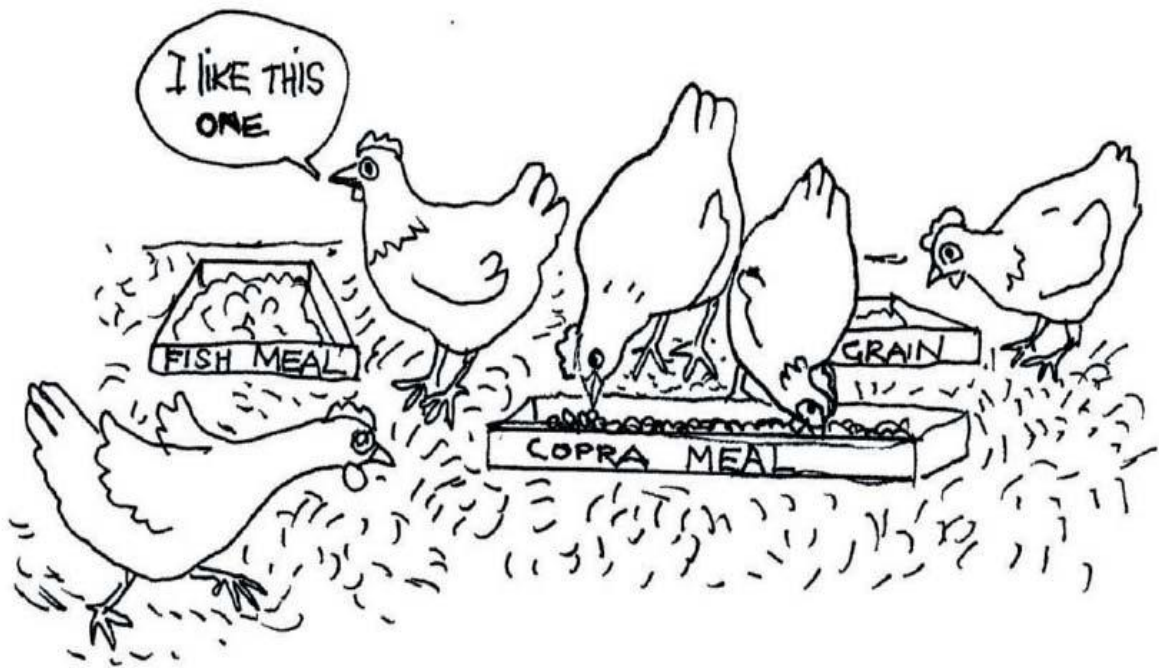
- Hens need a supply of calcium and phosphorous for them to lay many eggs with sound shells
- You can feed old egg shells and crushed chicken bones back to the hens but you must boil them first



FEED AT 17 WEEKS OF AGE



- Kitchen scraps, fruits such as bananas, coconut pulp, cooked starchy roots and tubers (cassava, sweet potato, taro, yams). Fish and fish waste (cooked) are very valuable feeds
- Grains are not normally available although wheat bran and rice bran are produced from milling the grains by feed companies and may be available



## 7. HEALTH

There are some simple steps that you should follow to keep your flock healthy. Only healthy birds will lay well and grow fast. Some we have already mentioned.



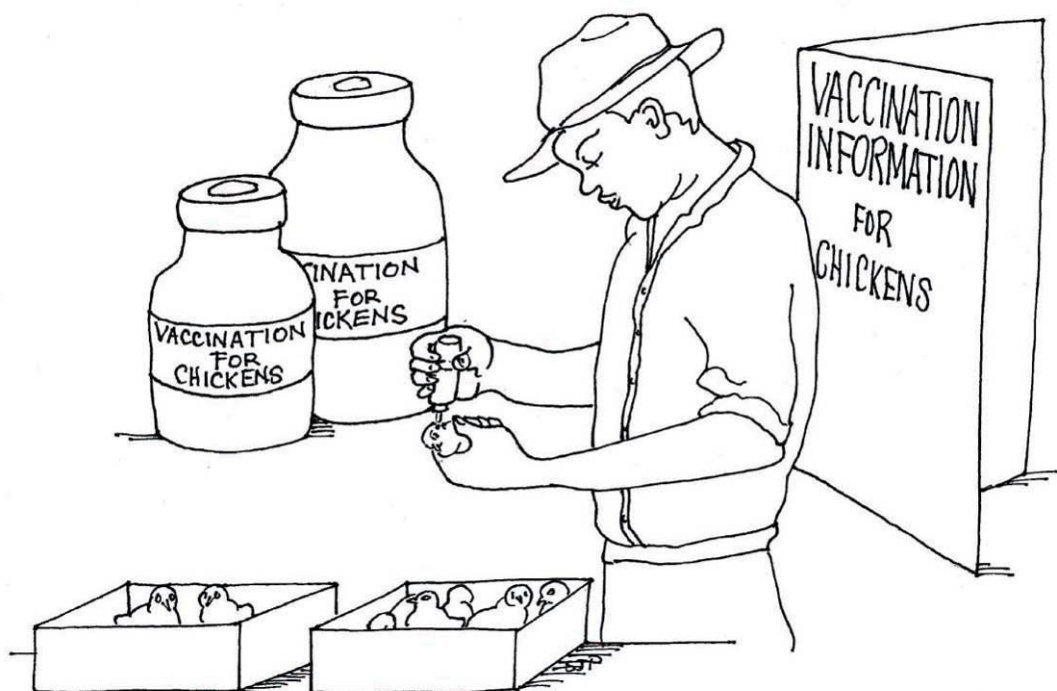
- Check your flock at night and in the morning
- Remove and bury dead birds immediately
- Remove sick birds. They will be seen to have drooping feathers, sitting and not eating, and away from the rest of the flock
- Give them feed and water

- If they don't improve, kill them and bury them but do not eat them. Your family may get ill
- Keep your feeders, drinkers, and poultry house clean
- Disinfect the floor with Jeyes Fluid or another disinfectant



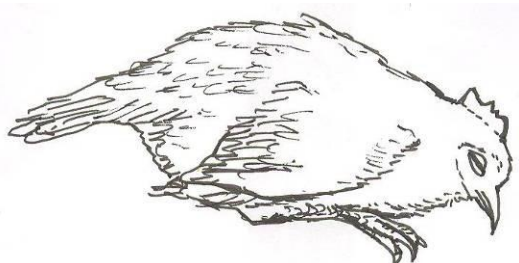
- If there is a disease outbreak in your village it may be necessary to call in an expert for advice

You may be advised to vaccinate your flock or give them medication. There are government organisations that you can call on for advice.

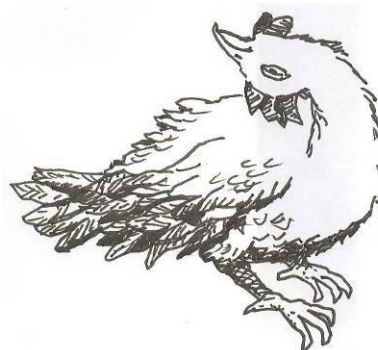


### Newcastle Disease

There are two diseases that are particularly dangerous in many low-income countries. Newcastle disease (ND) is endemic (there always) in many countries and becomes active particularly at the start of the wet season. It can wipe out entire village flocks although a few individual birds often do survive. There are now ND vaccines that will withstand the heat for a short period (thermostable) of time. Vaccination is most effective by eye drop and birds should be vaccinated a month before expected outbreaks by a trained person. There is also a need to treat the birds at intervals throughout their life. This is a specialised area and the poultry keeper will need help from experts but it is well worth the effort



Chicken with wing feathers dragging on ground



Advanced stage of ND



### **Avian Influenza**

The H5N1 strain of highly pathogenic avian influenza (bird 'flu) is particularly dangerous not only because it can infect different poultry species and wild birds but it can also kill humans. Village poultry are especially at risk because they are outside and may be in contact with wild birds and other poultry species (ducks, geese). The virus can be spread by eating infected birds and can kill the consumer particularly if she/he is young. Household poultry keepers should keep themselves informed about the situation in relation to bird 'flu as it often appears at particular times in the year.

## **8. SCENARIO (SITUATION)**

### **8.1 The Status Quo (current situation)**

Village owner has a flock of 3 hens and 1 cockerel (there are also 10 chickens of different ages-these will be ignored here)

#### **Incubating all eggs**

One hen lays a clutch of 12 eggs in 24 days. Farmer removes 3 eggs for his/her family. Hen sits on 9 eggs. Eight chicks hatch out. Mortality is 75% - 6 die and only 2 chicks reach maturity.

#### **Time the hen spends out of production**

Laying eggs	24 days
Sitting on eggs	21 days
Raising chickens	80 days
Back in lay	15 days
<b>TOTAL</b>	<b>140 days</b>

In one year each hen will produce 2.6 clutches (365/140) and provides the farmer with 8 eggs and 5 chickens as replacements and to eat.

The flock of 3 hens will produce in one year 24 eggs and 15 chickens. The 47 chicks that have died will have eaten some feed.

### **8.2 Scenario 2**

#### **Incubating only some eggs**

Flock size is the same - 3 hens and 1 cockerel.

The hen lays a clutch of 12 eggs in 24 days. All eggs are removed each day. The farmer will keep 7 eggs for himself and family. Five sound, fresh eggs from this hen and other hens are returned to the broody hen to incubate. Four eggs should hatch and 3 chickens should survive because the hen can look after fewer chicks much better. Improved management and feeding also allow this high survival rate.

The hen is still out of production for 140 days. In one year the hen will provide the owner with 18 eggs and 8 chickens.

The flock of 3 hens will produce in a year 54 eggs and 24 chicks.

Compared to Scenario 1, for the same flock there are 30 more eggs and 9 more chicks with better management, care and virtually no extra inputs

### 8.3 Scenario 3

#### Chicks removed from mother at hatch

Same flock size of 3 hens and 1 cockerel.

Hen lays 12 eggs in 24 days. Farmer removes 4 eggs for the household. Hen incubates 8 eggs and 6 chicks are hatched out.

The chicks are immediately separated and the hen is treated for broodiness ([see 5.2](#)).

The hen would have spent - 24 days laying eggs  
21 days sitting on eggs  
19 days coming back into production

**TOTAL 64 days out of production**

Mortality of chicks is now only **15% so 5 chicks** reach maturity for keeping, eating or selling through this cycle of 2.6 times in a year or 167 days; there are 198 days remaining for the hen to lay. If fed and managed well, the hen may lay an additional minimum of 40 eggs (20% production). If 3 hens go through the same cycle there will be 31 eggs taken from the clutches (4 eggs per hatch). There will be an additional  $3 \times 40 = 120 + 31$  eggs giving a total of 151 eggs per year. There will be  $5 \times 2.6 = 13$  chickens per hen  $\times 3 = 45$  chickens per year.

With the same flock size it is possible to increase annual egg production (**scenario 1**) from 24 eggs to 151 eggs and from 15 chickens to 45 per year with few extra inputs using simple management methods. It will take care, time and a little extra feed.

## 8.4 Where do I go from here?

The next phase of improving production of village poultry will focus mainly on those producers who have successfully managed to increase their poultry production as a result of following the suggestions made in this course. You will then move up to another level of management.

One way of improving output of eggs and meat is to form a discussion group where ideas can be exchanged and some trials undertaken. There may be opportunity to set up a small hatchery to produce village chickens for sale locally. Historically there has almost always been a strong demand.

### 8.4.2 Confinement

Confining scavenging poultry to a small enclosed area will reduce mortality by excluding predators, thieves and accidents. It will also allow the farmer to manage better the flock. On the other hand there will be less feed to scavenge and additional supplementary feed will be required. It also allows the farmer to improve the flock by for example introducing a superior cockerel to mate with his/her best hens. The area may be subdivided so that there are two or more flocks, one of which can be improved at a time.



### 8.4.3 Small Scale Layer or Broiler House

The house (120 x 59 x 45 cm high) is constructed entirely from local material and can house either 50 hybrid broilers or 30 hybrid layers. The slope of the floor is 1 in 8 to allow hen eggs to roll outside the enclosure. It is ideally suited to a family wanting to get started in semi-commercial poultry production but with limited finance. The pen can be subdivided and the house can be moved by two persons and the manure is then easily collected.



## 8.5 LOCAL FEEDSTUFFS

There may be opportunity to find local feeds at little or no cost around your village. These could be byproducts from the food industry (e.g. production of tofu), rice bran, brewery waste, coconuts or the aquatic plant, duckweed (*Lemna*). It grows widely and vigorously on shallow ponds; it can yield up to 20 tonnes of dry matter/ha and has about 25% of high quality protein on a dry matter basis. Although it has a high water content, it can be mixed with other feedstuffs such as rice bran to provide chickens with an excellent diet. There is a wide range of edible seeds e.g. kapok tree seeds, rubber seeds, seeds from *Leucaena* sp that will help to increase meat and egg production. Starchy roots and tubers (energy sources) and their green tops such as cassava and sweet potato vines, when dried, are also rich in protein and many other nutrients.



Duckweed pond (photo provided by R.A. Leng)

End of course