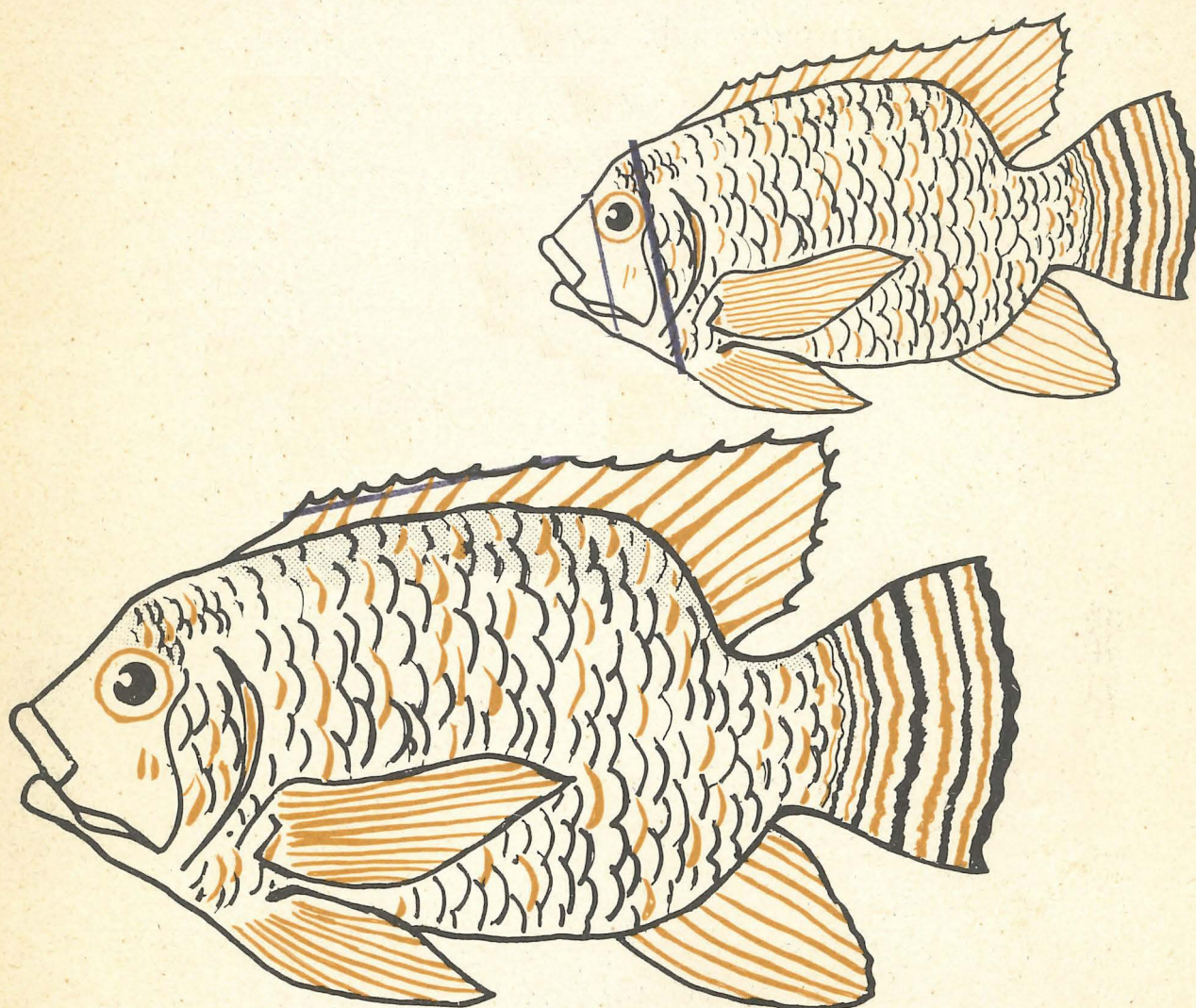


# **better freshwater fish farming**

## **the fish**



## **BETTER FARMING SERIES**

Thirty titles have been published in this series, designed as handbooks for agricultural education and training. They may be purchased as a set or individually.

### **FIRST YEAR**

1. The plant: the living plant; the root
2. The plant: the stem; the buds; the leaves
3. The plant: the flower
4. The soil: how the soil is made up
5. The soil: how to conserve the soil
6. The soil: how to improve the soil
7. Crop farming
8. Animal husbandry: feeding and care of animals
9. Animal husbandry: animal diseases; how animals reproduce

### **SECOND YEAR**

10. The farm business survey
11. Cattle breeding
12. Sheep and goat breeding
13. Keeping chickens
14. Farming with animal power
15. Cereals
16. Roots and tubers
17. Groundnuts
18. Bananas
19. Market gardening
20. Upland rice
21. Wet paddy or swamp rice
22. Cocoa
23. Coffee
24. The oil palm
25. The rubber tree
26. The modern farm business
27. Freshwater fish farming: how to begin
28. Water: where water comes from
29. Better freshwater fish farming: the pond
30. Better freshwater fish farming: the fish

# **Better freshwater fish farming**

The fish

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome 1981

P-69

ISBN 92-5-101200-8

## PREFACE

---

FAO's Better Farming Series is essentially based on the *Cours d'apprentissage agricole* prepared in the Ivory Coast by the *Institut africain de développement économique et social* for use by extension workers in contact with illiterate or semi-literate farmers. The approach is deliberately a general one, the intention being to constitute basic prototype outlines, to be supplemented in each area according to local conditions of agriculture.

Many of the booklets deal with specific crops, while others, such as this one, are intended to give the farmer information concerning the general agricultural context, and thus to allow him to gain some understanding of why he does what he does, so that he will be able to do it better.

Adaptations of the series, or of individual volumes in it, have been published, among others, in Amharic, Arabic, Bengali, Creole, Hindi, Igala, Indonesian, Kiswahili, Malagasy, SiSwati and Turkish, an impressive list which is some indication of the success and also of the value of the series. This volume has been prepared by the Inland Water Resources and Aquaculture Service, Fishery Resources and Environment Division of the Food and Agriculture Organization of the United Nations.

Requests for permission to issue this manual in other languages and to adapt it according to local climatic and ecological conditions are welcomed. They should be addressed to the Director, Publications Division, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, 00100 Rome, Italy.



# OUTLINE OF COURSE

---

● <b>Introduction</b> .....	3
Filling your pond with water .....	6
Fertilizing the water in your pond .....	8
Putting fertilizer into the crib .....	10
When is your pond ready? .....	11
Taking care of your pond .....	12
● <b>The fish</b> .....	14
Growing your own baby fish .....	15
Feeding the fish in your nursery pond .....	20
Moving your baby fish .....	23
Carrying your baby fish .....	25
Putting baby fish into your big pond .....	28
Feeding your big fish .....	28
● <b>Taking care of your fish</b> .....	33
● <b>Harvesting your fish</b> .....	36
Harvest without draining the water .....	36
Harvest by draining all of the water .....	38
Harvest by draining part of the water .....	39
What to do with your big fish .....	40
What to do with your baby fish .....	41
● <b>Now you must begin again</b> .....	46

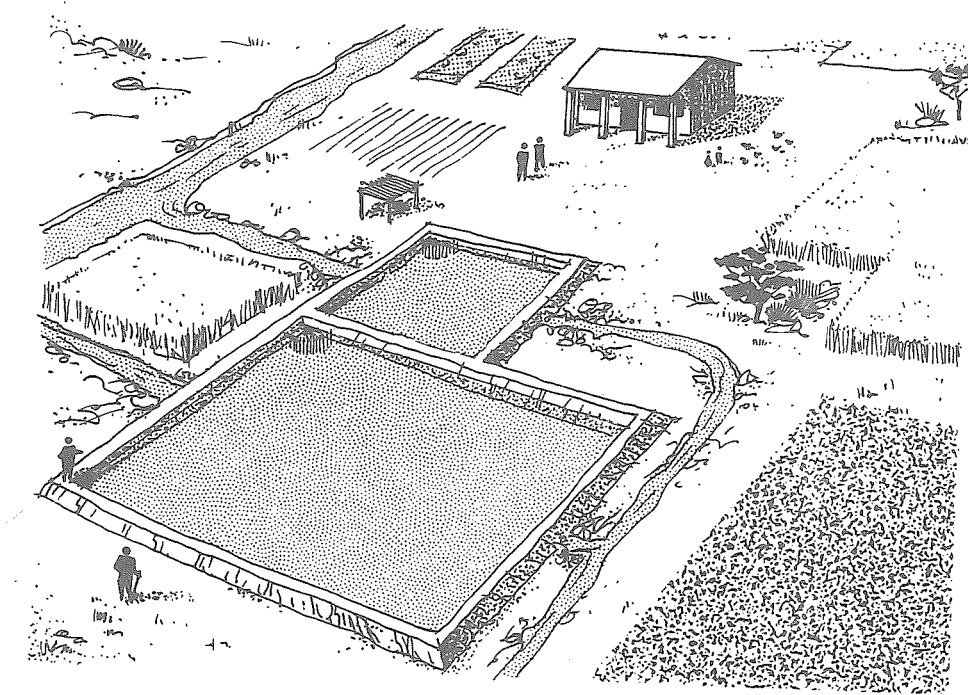




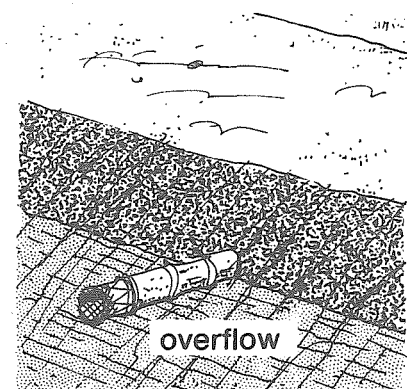
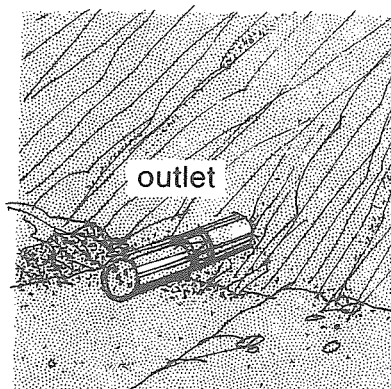
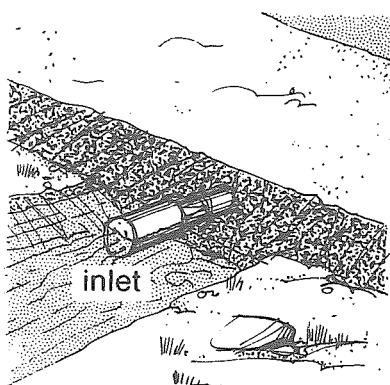
# INTRODUCTION

---

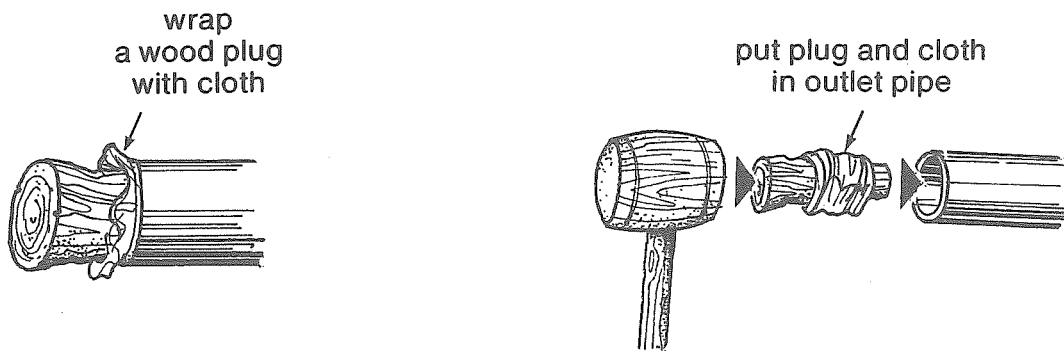
1. You have built the new bigger pond described in Booklet No. 29, **Better freshwater fish farming: the pond.**



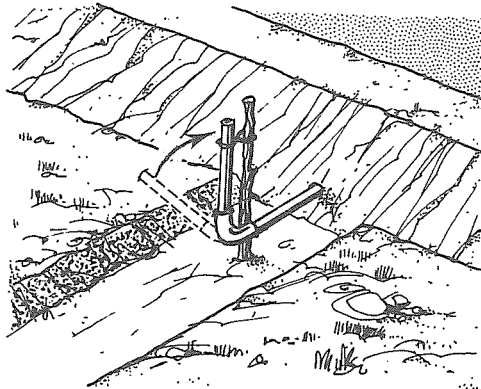
2. Before you let the water into your new pond, there are a few things that you must do.
3. Make sure that the screens on the inlet, outlet and overflow are in place and tight.



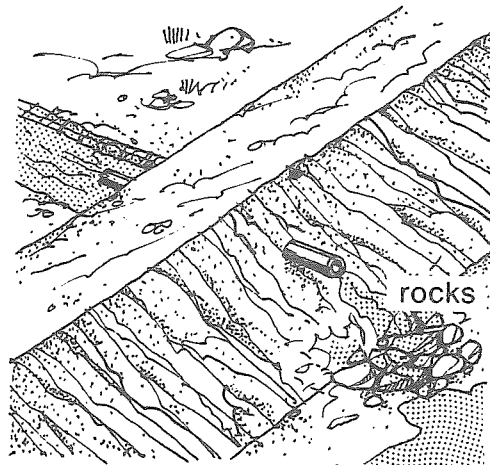
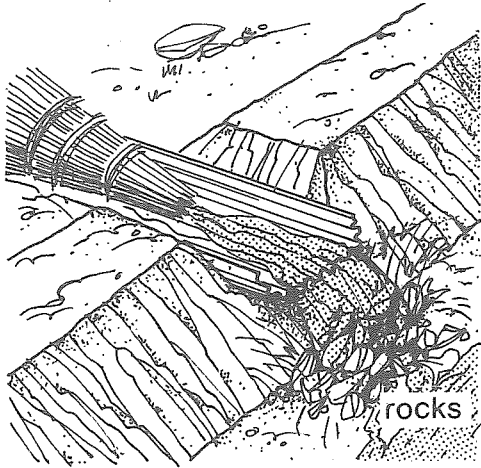
4. Make sure that the outlet is tightly closed.  
To do this,  
wrap a wood plug with old cloth,  
put it in the outlet pipe  
on the outside of the pond  
and tap it lightly with a hammer  
so that it will stay in the pipe  
when the pond fills with water.



5. If you have built a better outlet with a T or an L piece (see Booklet No. 29, Items 97 to 101), turn it to the upright position.



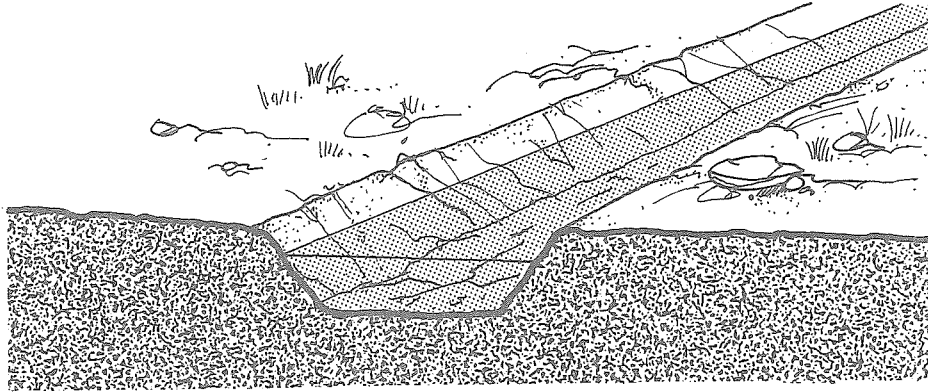
6. Put rocks on the bottom of your pond under the inlet where the water will fall when it begins to come into the pond.



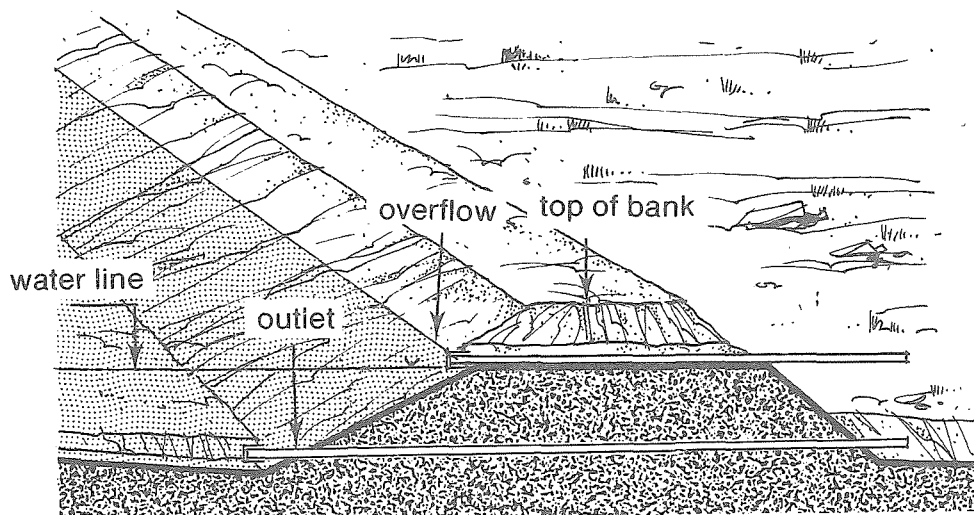
7. This will keep the bottom from washing away. It will keep the water from getting too muddy. It will make the water splash when it first comes into the pond and bring air for the fish to breathe.
8. Now you are ready to fill your pond.

## Filling your pond with water

9. Dig a small ditch from the water source to the inlet to bring the water to your new pond.

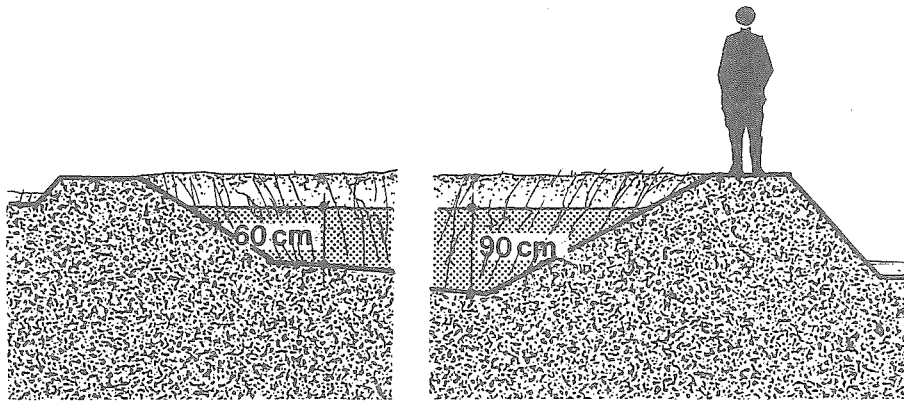


10. Let the water run into the pond until it reaches the level of the overflow pipe on the inside of the pond.

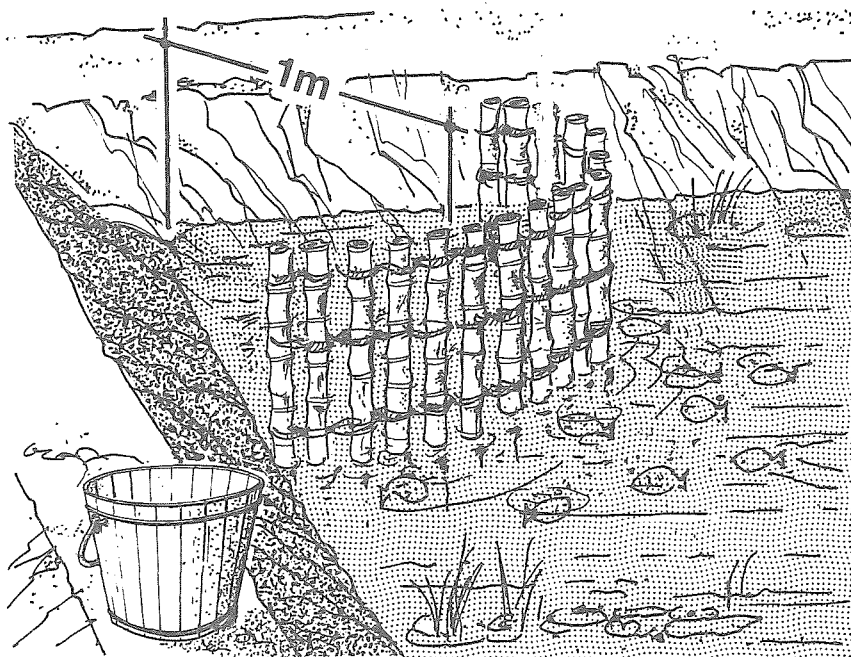


11. If your inlet pipe is about 10 centimetres in diameter, you will need about half a day to fill your pond.

12. When the water reaches the level of the overflow pipe it will be about 60 centimetres deep at the shallow upper part of the pond and about 90 centimetres deep at the deepest part.

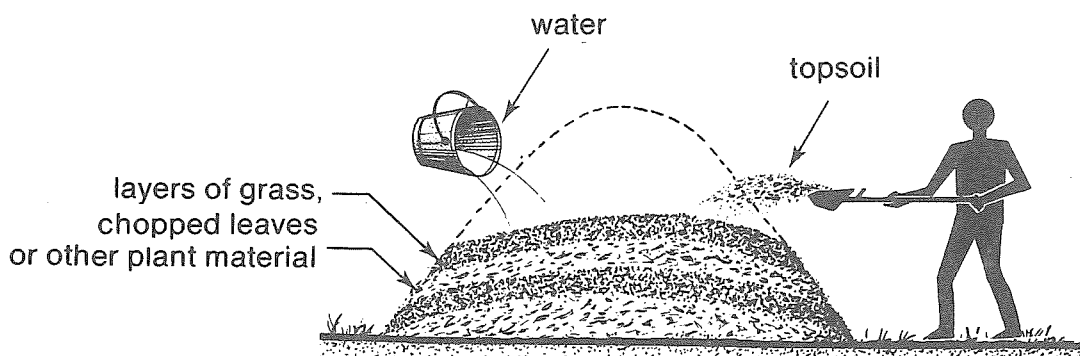


13. Now you are ready to fertilize the water in your pond.
14. Build a crib from bamboo or wood to hold the fertilizer as you did with your first small pond. Build it in one corner in the shallow part of the pond. The drawing below will show you how.

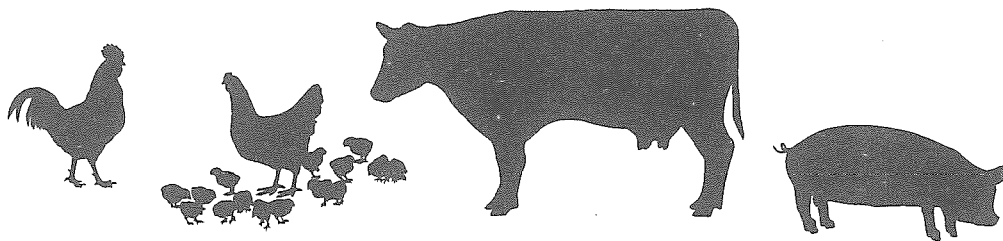


## Fertilizing the water in your pond

15. You can fertilize the water in your new pond with
  - compost made with animal manure
  - compost made with plant material
  - animal manure
  - plant material.
16. You can fertilize your new pond with animal or plant compost in the same way as you did with your old small pond.
17. Items 56 to 66, in Booklet No. 27, tell you how to make animal compost. If you do not have animal manure, you can fertilize your pond with compost made with plant material.
18. To make compost with plant material make a compost pile using layers of grass, chopped leaves or other plant material mixed with a little topsoil and damp it with water to make it rot faster.



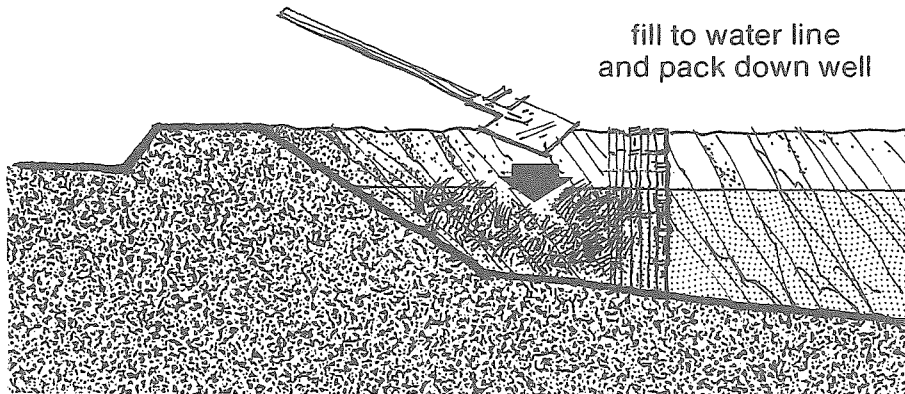
19. But to make compost takes a lot of time and work. It takes about a month to make it.
20. If you want to save time and work and you have plenty of animal manure, instead of fertilizing with compost fertilize with fresh animal manure mixed with fresh plant material. This is easier and quicker.
21. You can use the manure of chickens, pigs and cows to fertilize your pond or you can make a mixture of two or more kinds of manure.



22. Your fish will grow better if you fertilize your pond with compost made with animal manure or with fresh animal manure mixed with fresh plant material.
23. If you do not want to take time to make compost with plant material, you can also put fresh plant material in the crib to fertilize your pond. But if you do this, it will take longer for your pond to be ready.

## Putting fertilizer into the crib

24. When you first put fertilizer into your crib, pack it down well and fill the crib to the water line. This will be about 60 centimetres deep in the shallow part of the pond.

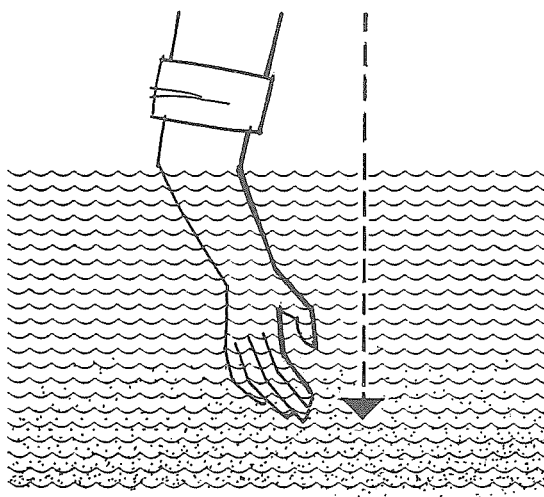


25. If you are going to use compost, you will need enough to fill your crib at the beginning and later you will need enough compost to add about a bucket each week.
26. If you are going to use animal manure, you will need about two buckets to put in your crib at the beginning. Mix the two buckets of animal manure with enough fresh plant material to fill your crib to the water line. Later, you will need enough animal manure to add about a bucket each week.
27. If you are going to use plant material or compost made with plant material, you will need enough to fill your crib at the beginning and later you will need enough to keep the crib full to the water line.



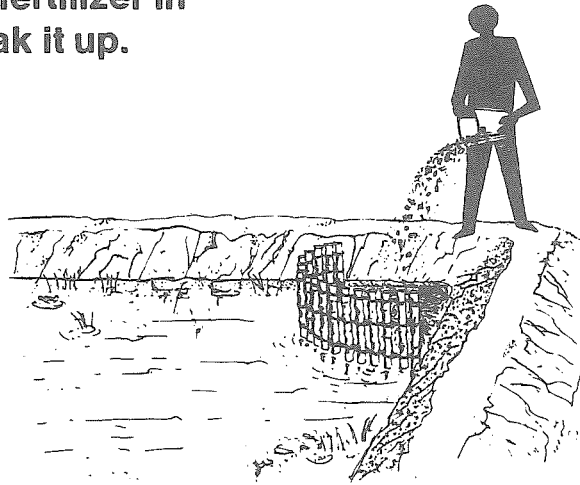
## When is your pond ready?

28. If you fertilize your pond with animal compost or animal manure, the water will start to turn green in two or three days.  
If you fertilize your pond with plant compost or plant material, it will take one week or longer.
29. When the water begins to turn green, you will know that natural food is growing in your pond.  
It will take about a week to become green enough.
30. You can make a simple test to be sure that the water is green enough.  
Put your arm in the water up to your elbow.  
If you are just able to see the ends of your fingers, the water is green enough.



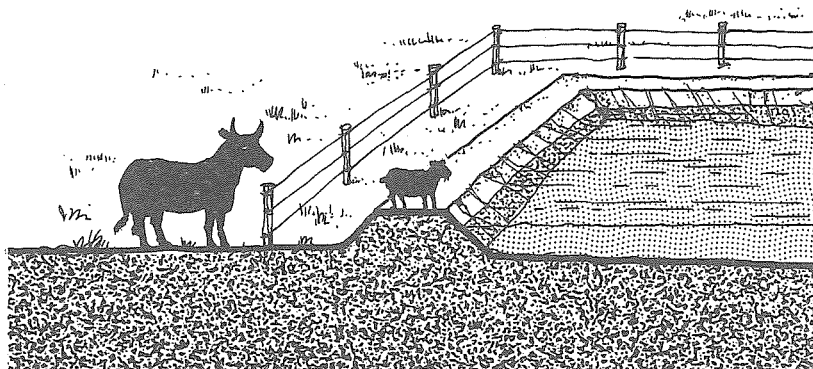
31. To keep the water green, put fertilizer in the crib every week. If you see that the water is losing its green colour, put a little more fertilizer in and stir it to break it up.

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



### Taking care of your pond

32. You must take very good care of your pond. Items 84 to 90, in Booklet No. 27, will tell you some important ways to care for your pond.
33. Here are some more ways to take care of your pond.
34. Do not let large animals such as cows, buffalo, horses or donkeys graze on the banks of your pond. They are too heavy and may break the banks down.

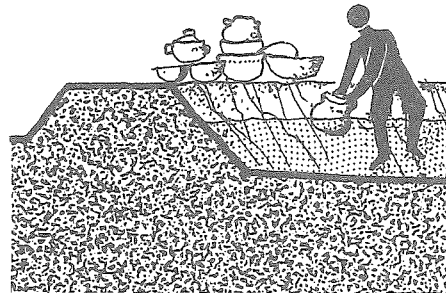


35. You may let small animals such as goats and sheep graze on the banks.
36. Do not use your pond, your pond water source or your water supply ditch for bathing, or washing clothes, dishes or cooking pots.

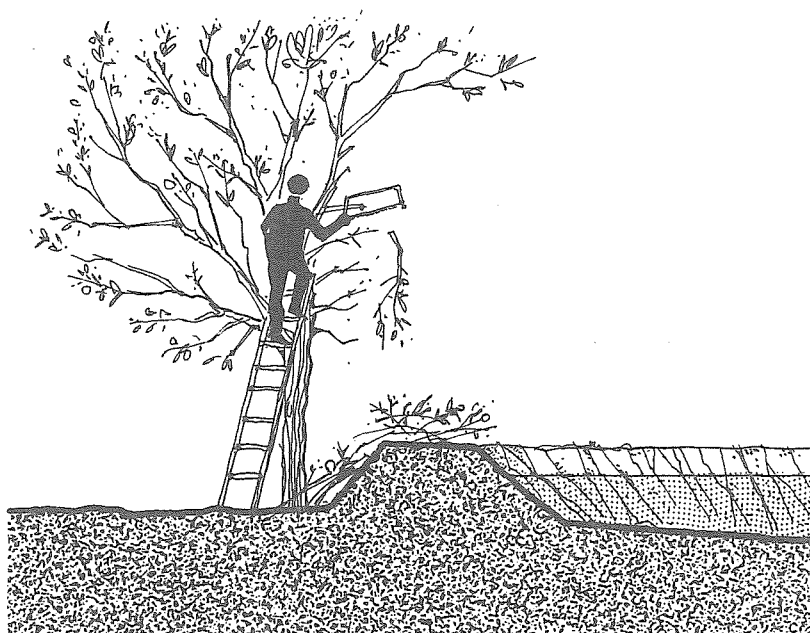
no



no



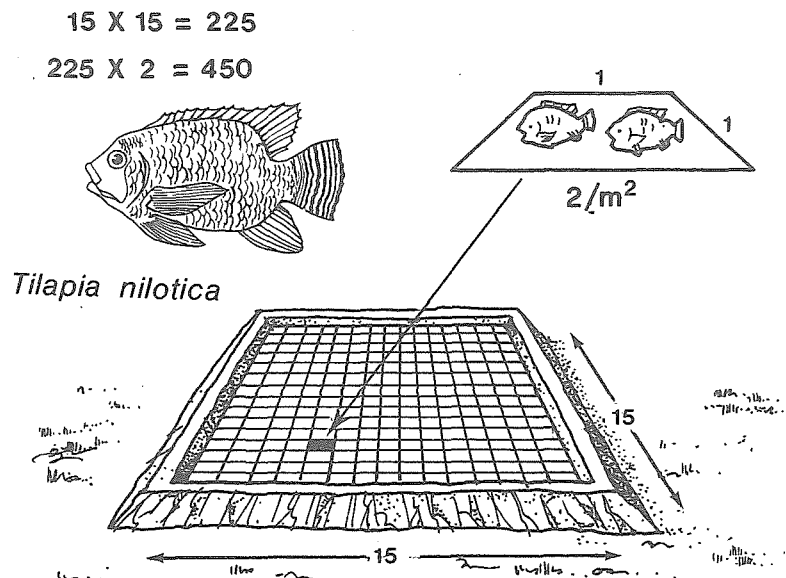
37. Do not plant big trees near your pond.  
If there are already big trees there,  
cut any branches that hang over the pond.  
The water in your pond  
may not turn green enough  
if your pond is in the shade.



# THE FISH

---

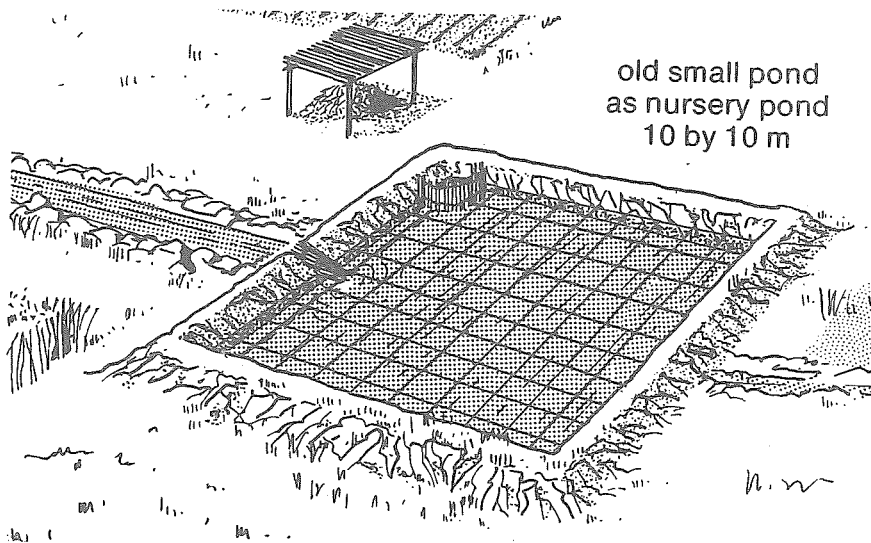
38. When you grew fish in your first small pond, you may have got the baby fish from a fish culture station or from another fish farmer.
39. Now you have improved your fish farm. It is bigger than it was before, and you will need more baby fish than you did before.
40. If you are using *Tilapia nilotica* as you did with your first pond, you will need two baby fish for each square metre of pond.
41. If your new pond is 15 by 15 metres or 225 square metres, you will need 450 baby fish. This is more than twice as many as you needed for your first pond.



42. You may have some baby fish from your first small pond but there may not be enough.

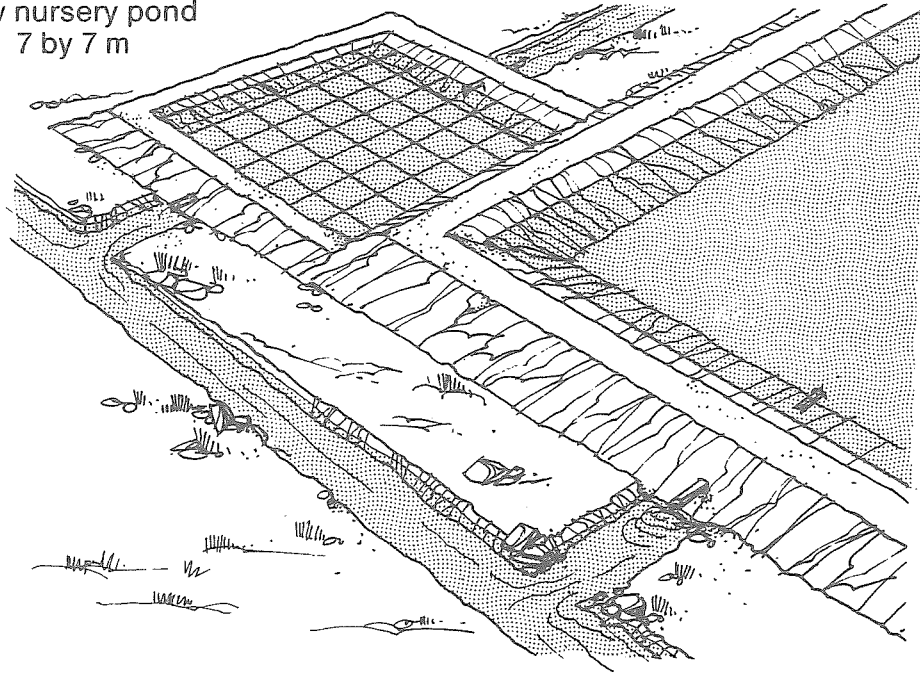
## Growing your own baby fish

43. Since you will need more baby fish than you did before, you may find that it is best to grow your own baby fish. It is easier and cheaper than getting them from a fish culture station or another fish farmer.
44. Also, if you are going to improve your fish farm even more by building your own ponds, it is better to have your own supply of baby fish.
45. When you grow your own baby fish, you will be sure to always have enough of them when you need them for your big pond.
46. To grow your own baby fish, you will need a nursery pond. You can use your old small pond as a nursery pond or you can build a new nursery pond.



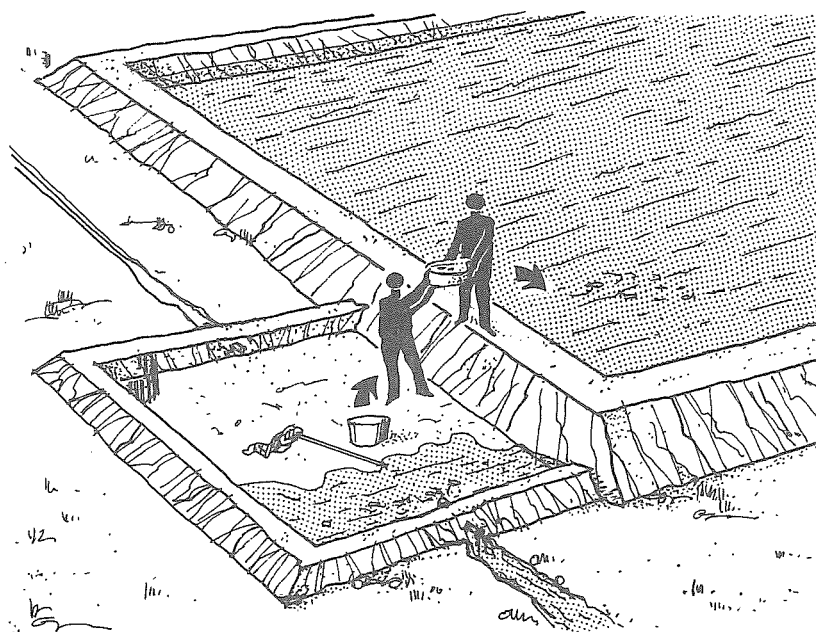
47. A new nursery pond of about 7 by 7 metres, or about 50 square metres, will be large enough to grow the baby fish you will need.

new nursery pond  
7 by 7 m



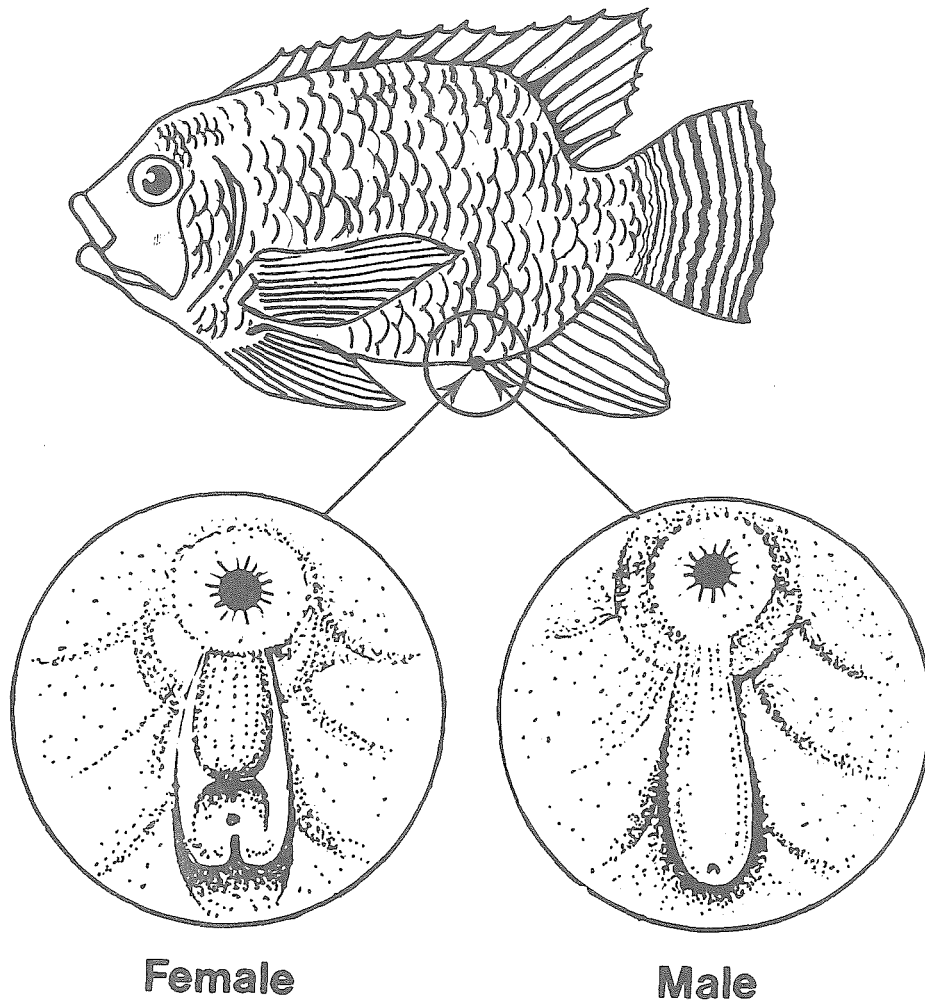
48. A nursery pond can be built just like a big pond but since the nursery pond is smaller the banks need not be as high or as wide.
49. You can build your nursery pond with an inlet, outlet and overflow like those you used in your big pond.
50. You can also use a shallow trench to let water into your nursery pond (see Booklet No. 29, Items 84 and 85), and use a siphon to drain the water out (see Booklet No. 29, Items 114 to 123), but you will still need an overflow to control the water level in the nursery pond.

51. You will also need a crib to hold the fertilizer in your new nursery pond.
52. If you build your new nursery pond next to your big pond so that they share a bank, you will only need to build three new banks for it.
53. If you grow baby fish near your pond, you will not have to carry them far and they will not be hurt when you are carrying them.



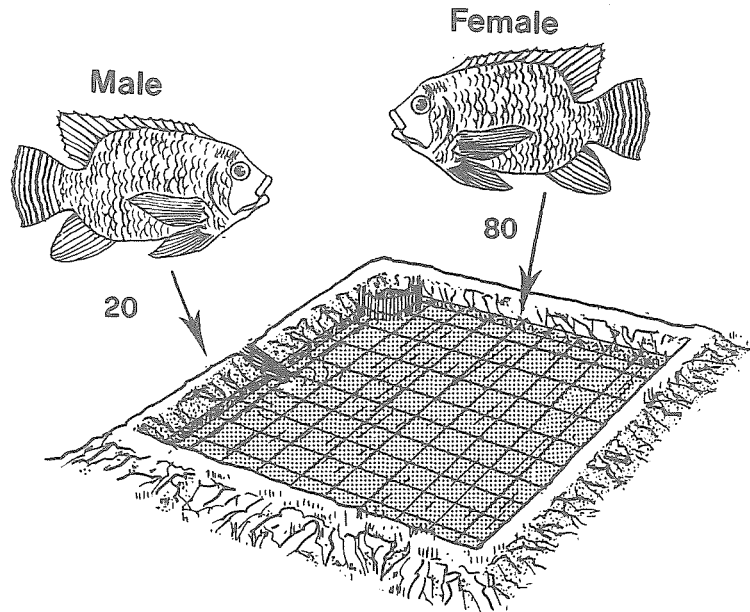
54. Fill your nursery pond with water and fertilize it with compost, animal manure or plant material as you did with your big pond. Wait for the water to turn green.

55. Now you are ready to put fully grown male and female fish into your nursery pond. A fully grown *Tilapia nilotica* is about 20 centimetres long.
56. Be careful to put the right number of male fish and female fish into your nursery pond. The drawing shows you how to see the difference between male fish and female fish.

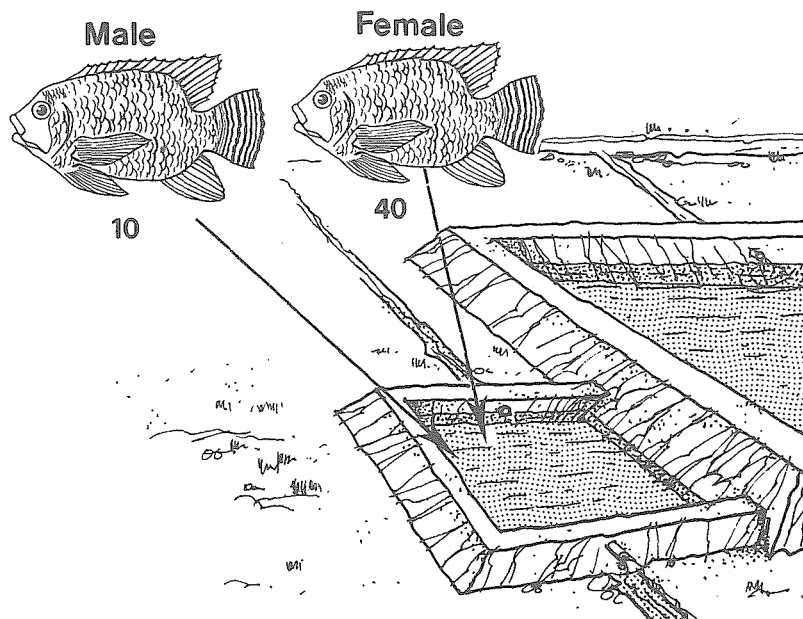




57. If you are using your old smaller pond of 10 by 10 metres as a nursery pond and you are using *Tilapia nilotica*, you will need to put 20 fully grown male fish and 80 fully grown female fish into the pond.



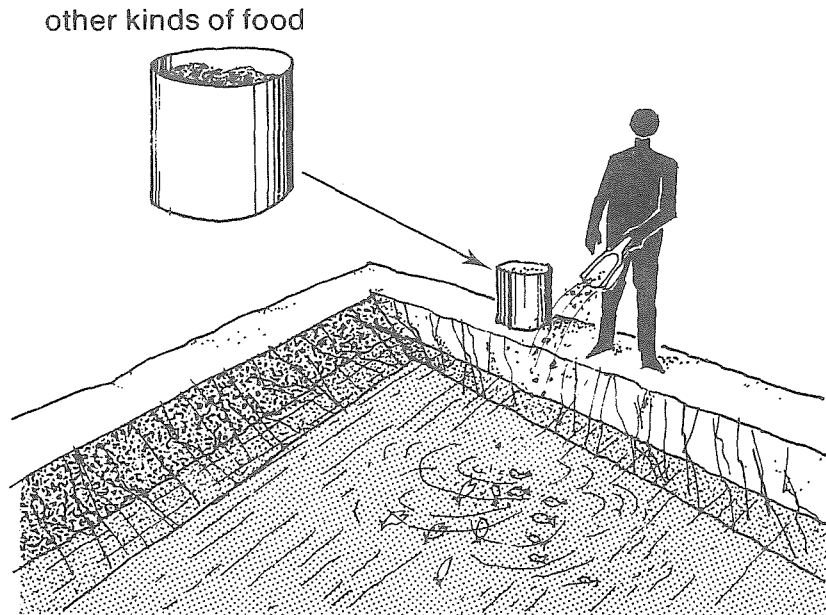
58. If you have built a new nursery pond of 7 by 7 metres and you are using *Tilapia nilotica*, you will need to put 10 fully grown male fish and 40 fully grown female fish into the pond.



## Feeding the fish in your nursery pond

59. The fully grown fish  
in your nursery pond  
will get much of their food  
from small plants and animals  
which grow in the green water.
60. When the baby fish are born  
they will be very, very small  
and at first  
they will get all of their food  
from small plants and animals  
which grow in the green water.
61. These plants and animals are so small  
that they can hardly be seen  
or they cannot be seen at all.  
But if the water is green  
in your nursery pond,  
you can be sure that they are there.
62. So in your nursery pond  
you must always be very careful  
that the water stays green  
so that your baby fish  
will have enough to eat.
63. To keep the water green,  
do not forget  
to put a bucket of fertilizer  
in the crib  
in your nursery pond each week.  
If you are using  
plant compost or plant material,  
keep the crib filled to the water line.

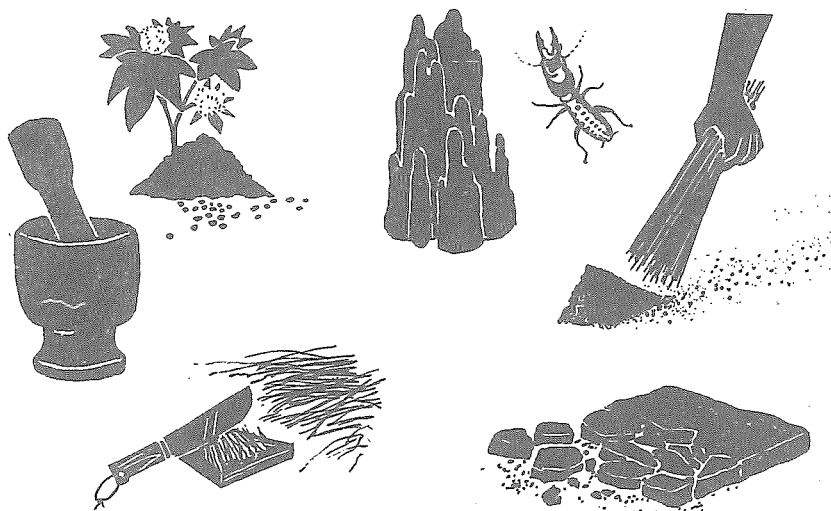
64. To keep the full-grown fish in your nursery pond healthy, you must also feed them other kinds of food.



65. When the baby fish begin to grow, they, too, will eat the other kinds of food.
66. You can give the fish in your nursery pond many things to eat. But you must be sure that this food is ground or cut very small so that the baby fish can swallow it.

67. You can give the fish in your nursery pond termites or finely ground or cut

- grain mill sweepings
- rice bran
- beer wastes
- cottonseed or groundnut cake.



68. The bigger your baby fish grow, the more food they will need. Feed the fish in your nursery pond

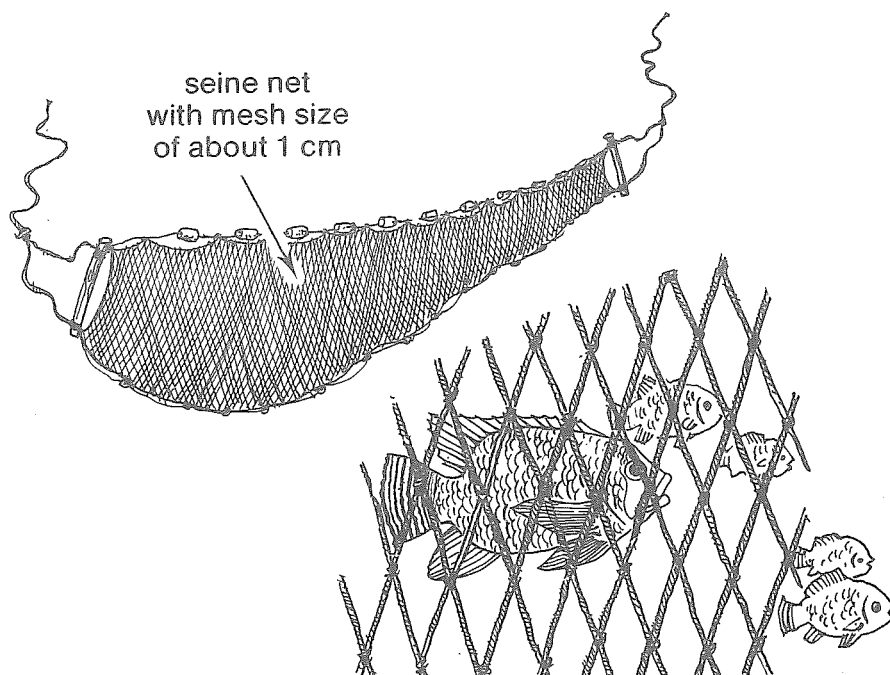
- 500 grams of food every day during the first month
- 1 000 grams of food every day during the second month
- 1 500 grams of food every day during the next months.

69. If you see that the fish do not eat all of their food, give them a little less the next day.

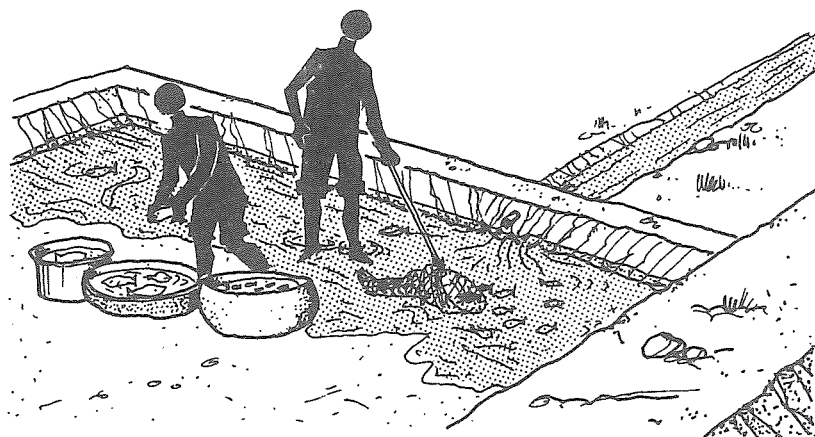
70. If you see that the fish eat all of their food very quickly, give them a little more the next day.

## Moving your baby fish

71. After about three months, there will be many baby fish of different sizes in your pond. Then you can begin to take baby fish out of your nursery pond to put into your big pond.
72. Use baby fish which are 5 centimetres or longer to put into your big pond. If there are many baby fish which are 5 centimetres or longer, choose the biggest ones to put into your big pond.
73. The easiest way to take out your baby fish is to use a seine net. If you use a seine net with a mesh size of about 1 centimetre the smaller fish will swim through and you will catch the fish of 5 centimetres or longer. **But be sure to put the fully grown fish back in your nursery pond.**

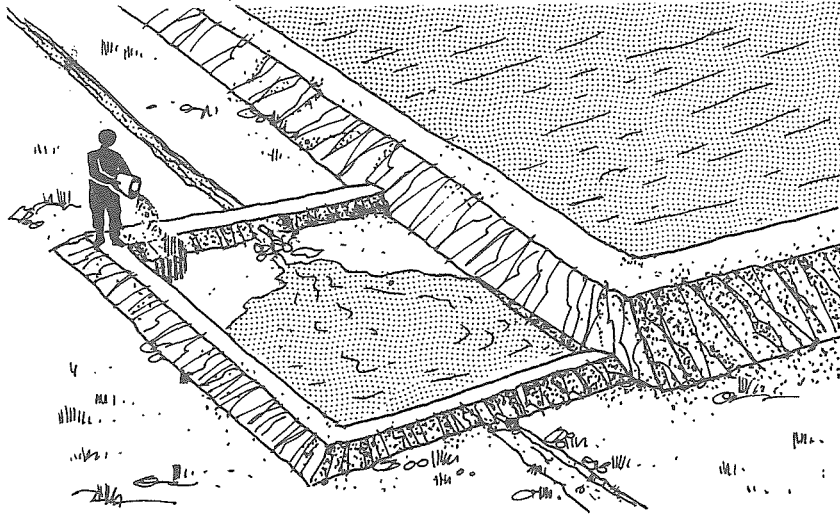


74. From now on,  
you can take baby fish  
out of your nursery pond each month  
for your own use or to sell.
75. Be careful that your nursery pond  
does not become too full of fish.  
If there are too many fish,  
they will not grow well  
and your baby fish  
will not be strong and healthy.
76. To keep your nursery pond  
from becoming too full of fish,  
drain all of the water  
out of the pond each year  
and collect all of the fish.



77. You can eat the big fish  
that were in the nursery pond.  
Item 144 in this booklet  
will tell you what to do  
with the baby fish.
78. Wait until the bottom  
of the nursery pond is dry,  
then clean and repair  
the bottom and the banks.  
Items 145 to 148 in this booklet  
will tell you how.

79. Now fill the nursery pond with water and fertilize it as you did before. When the water is green, put in the right number of fully grown female fish and male fish. Items 56 to 58 in this booklet will tell you how many fully grown fish to use.



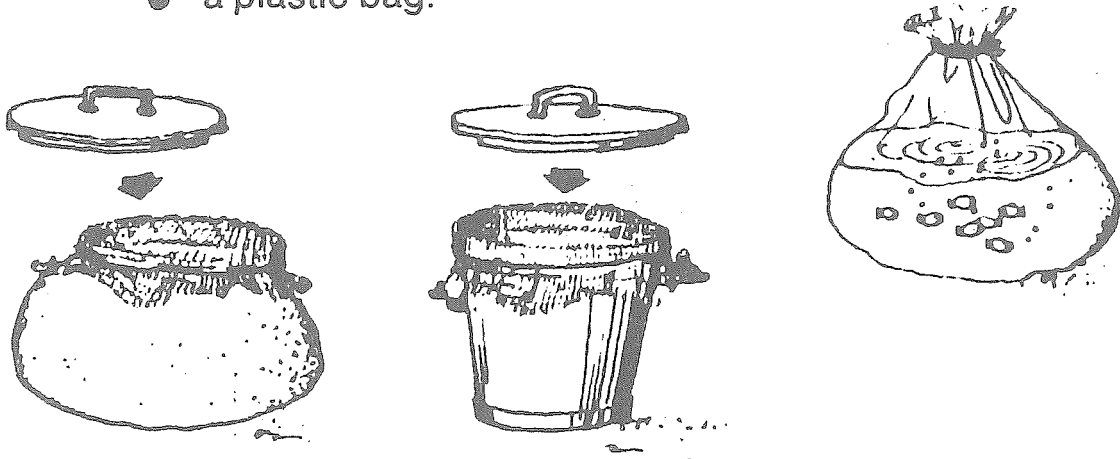
80. In about three months, you will be able to take more baby fish out of your nursery pond.

### **Carrying your baby fish**

81. You must be very careful when you carry your baby fish from one place to another. Baby fish can be hurt easily.

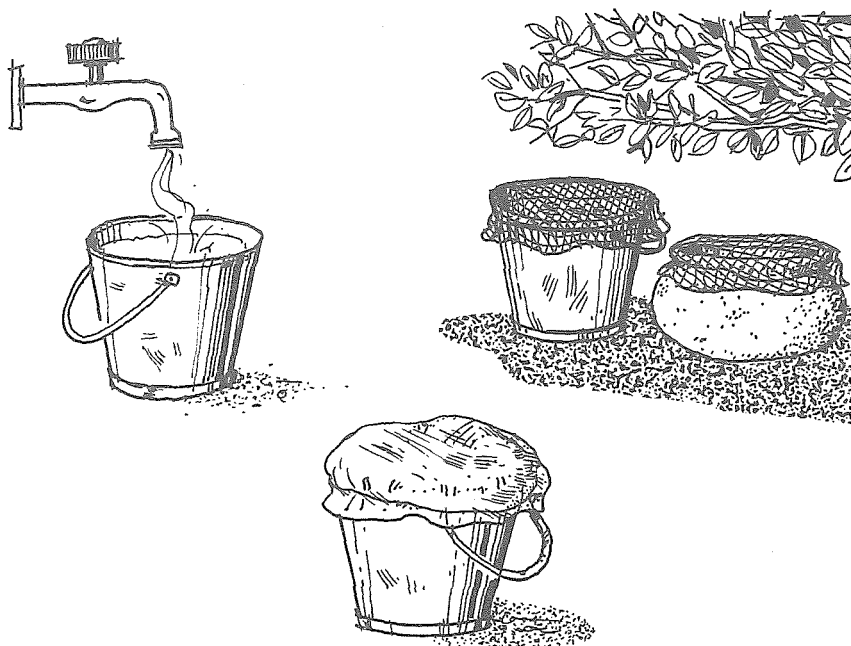
82. When you take the baby fish out of your nursery pond using a seine net, do not carry them in the seine net. Carry them in a container such as

- a clay pot with a cover
- a bucket with a lid
- a plastic bag.



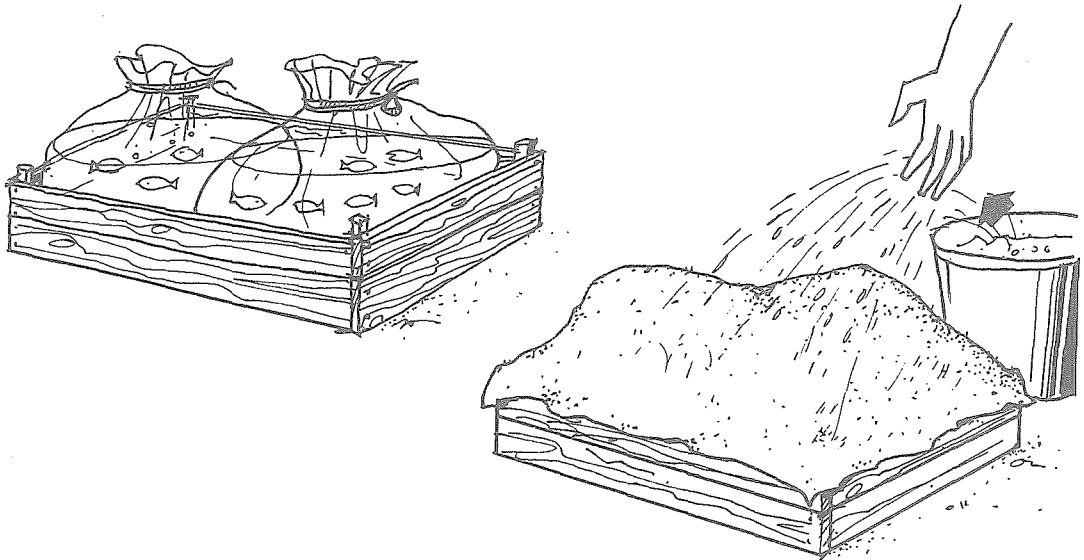
83. When you carry baby fish, you must be careful to

- use only clean water
- keep the fish out of the sun or cover the container with a wet cloth to keep it cool.



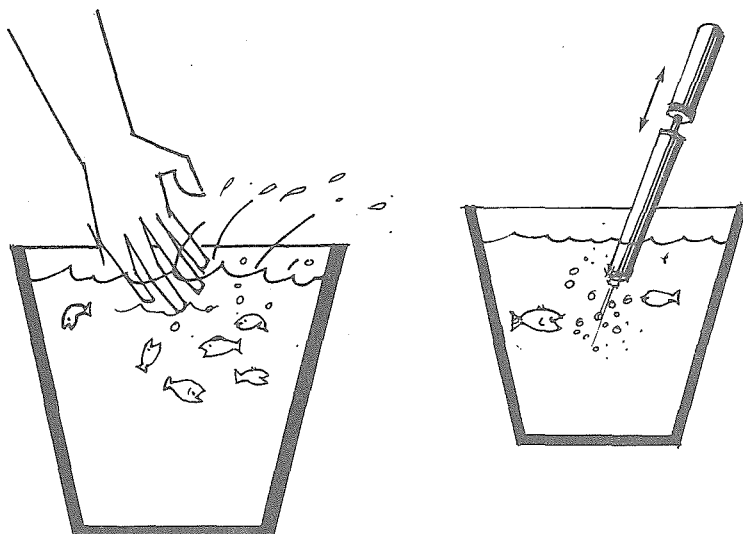


84. If you carry your baby fish in plastic bags, carry the bags in a box so that they will not break. Cover the box and the plastic bags with a wet cloth to keep them cool.



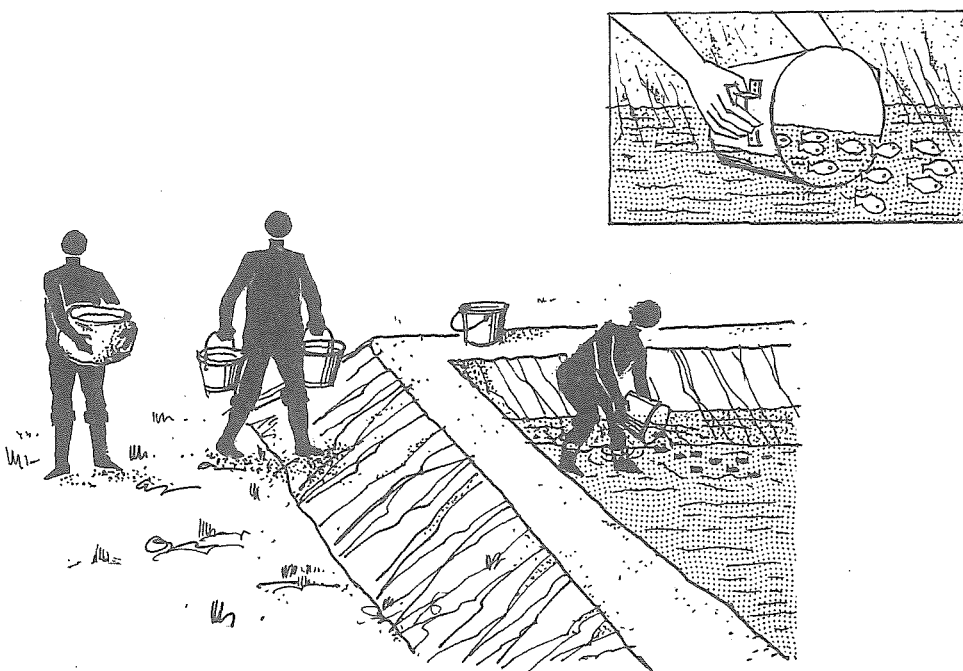
85. If you see that the baby fish are gasping for air, put some air into the water from time to time by

- splashing the water gently with your hand
- forcing air into the water with a bicycle tire pump.



## Putting baby fish into your big pond

86. When your new big pond is full of water, you have fertilized it and the water has become green enough, you are ready to put in the baby fish.
87. You already know that if you use *Tilapia nilotica* in a pond 15 by 15 metres, you will need 450 baby fish which are 5 centimetres or longer.
88. Put the baby fish gently into your big pond as you did with your first small pond. Items 70 to 76, in Booklet No. 27, will tell you how.

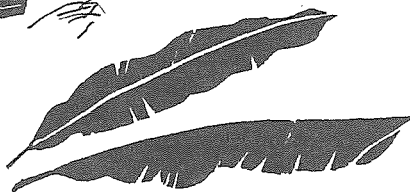
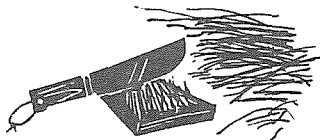
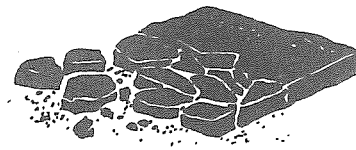
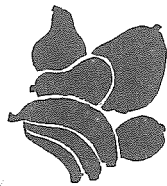
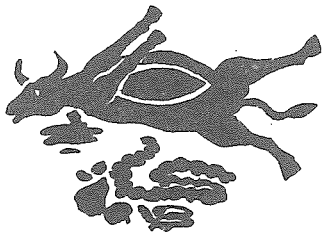
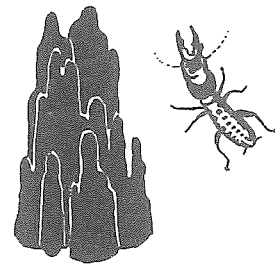


## Feeding your big fish

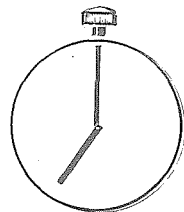
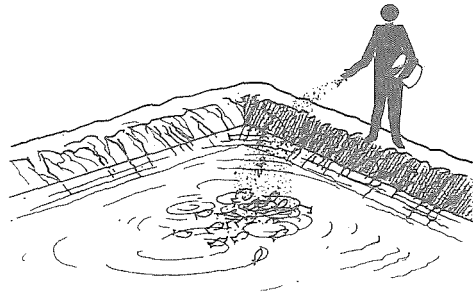
89. You already have learned that the big fish in your pond will get much of their food from small plants and animals which grow in the green water.

90. To keep the water green,  
do not forget  
to put a bucket of fertilizer  
in the crib  
in your pond each week.  
If you are using  
plant compost or plant material,  
keep the crib filled to the water line.
91. To make your big fish grow more quickly,  
you must also feed them  
other kinds of food.  
You can feed them

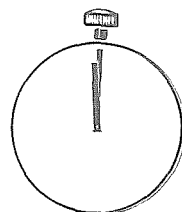
- termites
- tender leaves and waste  
of banana and cassava
- grain mill sweepings
- rice bran
- beer wastes
- cottonseed or groundnut cake
- slaughterhouse wastes
- animal wastes
- kitchen wastes
- spoiled fruit and vegetables
- left-over food
- chopped grass.



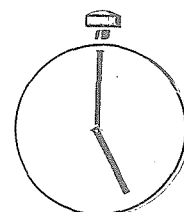
92. With your old small pond,  
you fed your fish only once a day.  
But your fish will eat better  
and grow faster if you feed them  
two or three times during the day.
93. Prepare all the food  
for one day's feeding  
at the same time  
and give the fish part of the food  
at two or three different times  
during the day.
94. Always try to feed your fish  
at the same times every day.



7



12



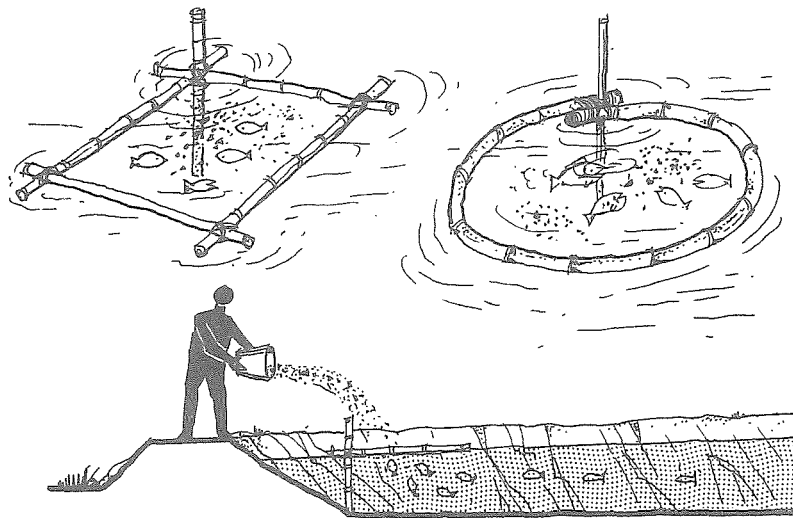
17

95. The bigger your fish grow,  
the more food they will need.  
If your pond has 450 fish in it,  
feed them
- 500 to 900 grams of food every day  
during the first month
  - 900 to 1 200 grams of food every day  
during the second month
  - 1 200 to 1 600 grams of food every day  
during the third month

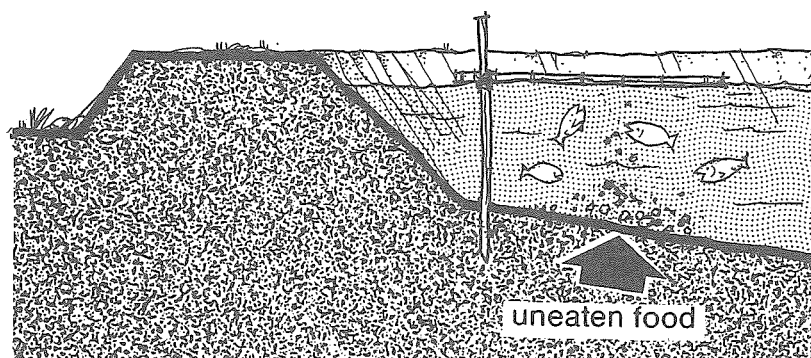
- 1 600 to 2 000 grams of food every day during the fourth month
- 2 000 to 2 700 grams of food every day during the fifth month
- 2 700 to 3 500 grams of food every day during the sixth month and until the time that you harvest your fish.

96. It is not easy to know exactly how much food to feed your fish. You must watch them when they eat to learn how much food they need.
97. Feed your fish in the shallow part of the pond so that you can see them eat.
98. If you see that the fish do not eat all of their food, give them a little less the next day.
99. If you see that the fish eat all of their food quickly, give them a little more the next day.
100. If you feed your fish at the same place every day, you will see whether the fish are eating well. If you give them too much, the food which is not eaten will stay on the bottom.
101. **Too much uneaten food on the bottom of the pond will take the air out of the water.**

102. To make it easier to see if your fish are eating well, mark several places in your pond to feed them.
103. Mark each place by making a square or a ring of light wood or bamboo. Drive a pole into the pond bottom and attach the square or ring, as shown in the drawing.



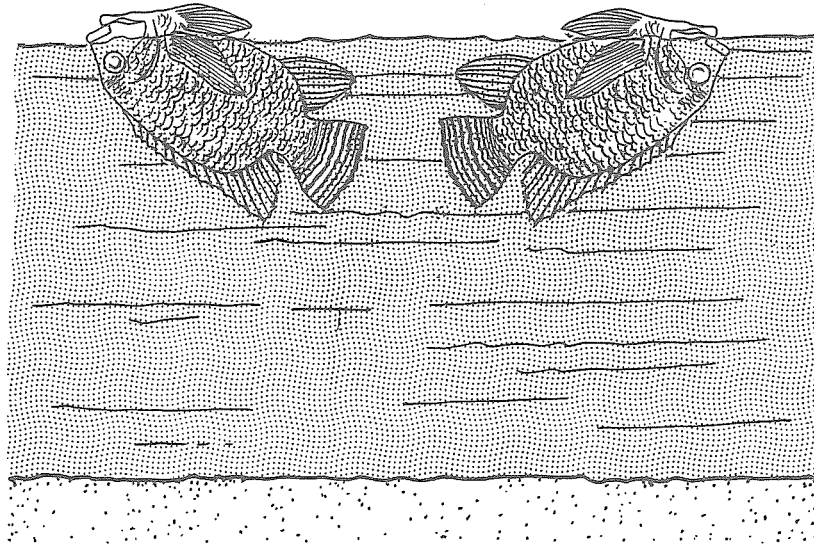
104. When you feed the fish, put the food inside the square or ring. You may be able to see any uneaten food on the bottom under the square or ring. If you cannot see the bottom, feel with your hands to find any uneaten food that may be there.



## TAKING CARE OF YOUR FISH

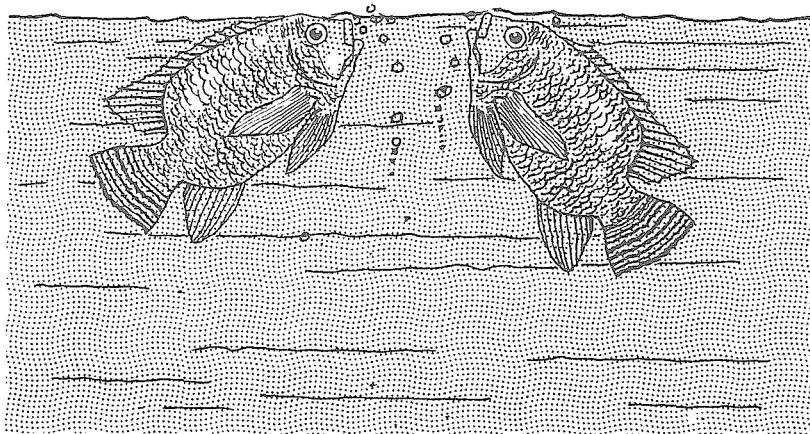
---

105. You must take very good care of your fish.  
Watch them carefully to see that they are healthy and swimming strongly.
106. If you find any dead fish floating in your pond, take them out right away and change some of the water in your pond.



107. To do this, open the inlet and let in some new clean water. The old water will drain out of the pond at the overflow. Do this for 2 or 3 hours each day for several days until you see that your fish are well.

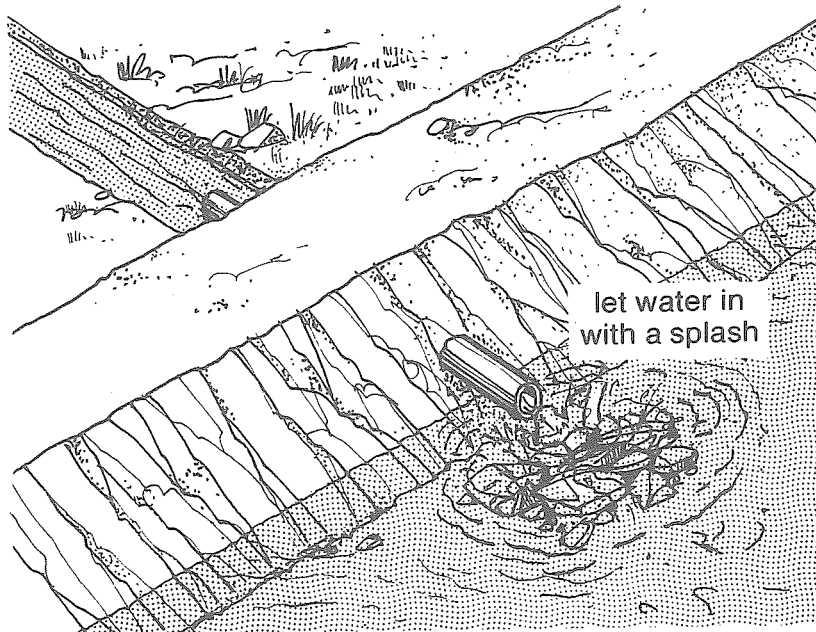
108. If the weather is too hot,  
if you feed your fish too much,  
or if you put too much fertilizer  
into the pond,  
there may be too little air  
in the water  
for your fish to breathe.
109. If you see your fish  
coming to the surface  
gaspng for air,  
give them less food  
and do not put any fertilizer  
into your pond for several weeks.



110. Put more air  
into the water of your pond  
by changing some of the water  
for several days,  
as you did in Item 107  
in this booklet.



111. When you let new water into the pond,  
let it in quickly  
so that it will come with a splash  
and bring more air into the water.  
This will help your fish to breathe easily.



112. If you see any other things wrong  
with your fish  
that you do not understand,  
stop feeding them  
and stop putting fertilizer  
into the pond.  
Then change some of the water  
in your pond  
every day for several days,  
as you did in Item 107  
in this booklet.
113. After several days  
if your fish are still not well,  
if they are not eating well  
or gasping for air  
or are not swimming strongly,  
ask your extension agent  
or your fish culture station for help.

# HARVESTING YOUR FISH

---

114. When you harvested the fish in your first small pond, you first drained all of the water out of the pond. Then you collected the fish. Items 91 to 98, in Booklet No. 27, tell you when and how to do this.

115. But there are several ways to harvest your fish. You can harvest them

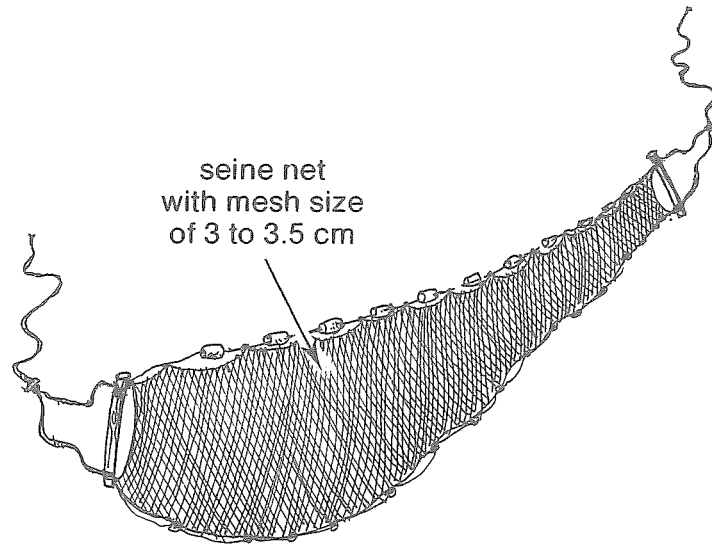
- without draining the water
- by draining all of the water
- by draining part of the water.

116. Here are some things that you should know about these different ways of harvesting your fish.

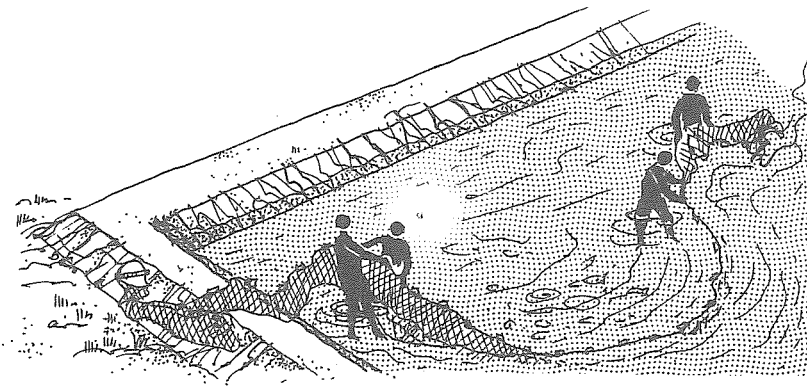
## **Harvest without draining the water**

117. If you do not have enough water to fill your pond again and you want to harvest only part of your fish, you can use a seine net to gather them without draining the water.

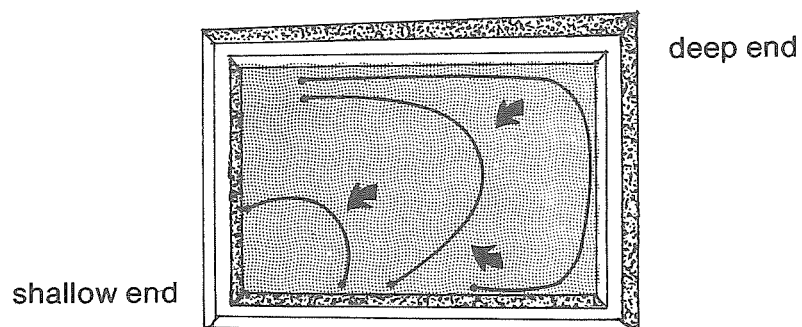
118. A seine net with a mesh of 3 to 3.5 centimetres will catch the biggest fish and allow the small fish to escape through the net.



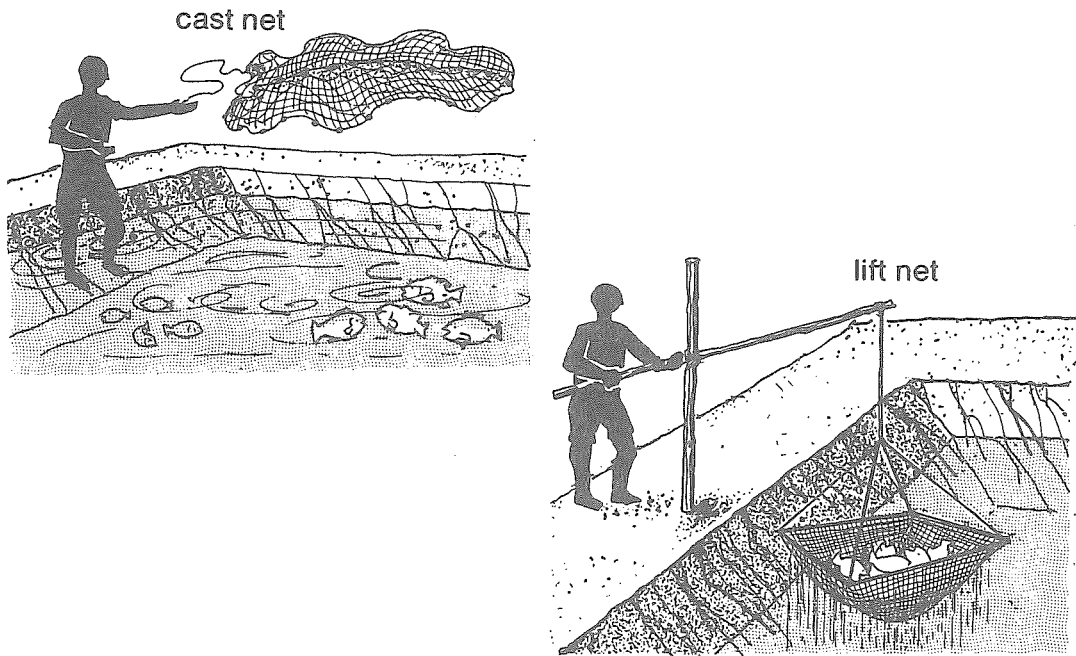
119. You will need several people to harvest with a seine net. Perhaps your family can help you. Perhaps you can ask your neighbours for help, and later help them with their work or give them some fish to pay them for their help.



120. Start at the deep end of the pond and pull the seine net slowly toward the shallow end. The drawing shows you how.



121. You can also use a cast net or a lift net to harvest some of the fish from your pond without draining the water.

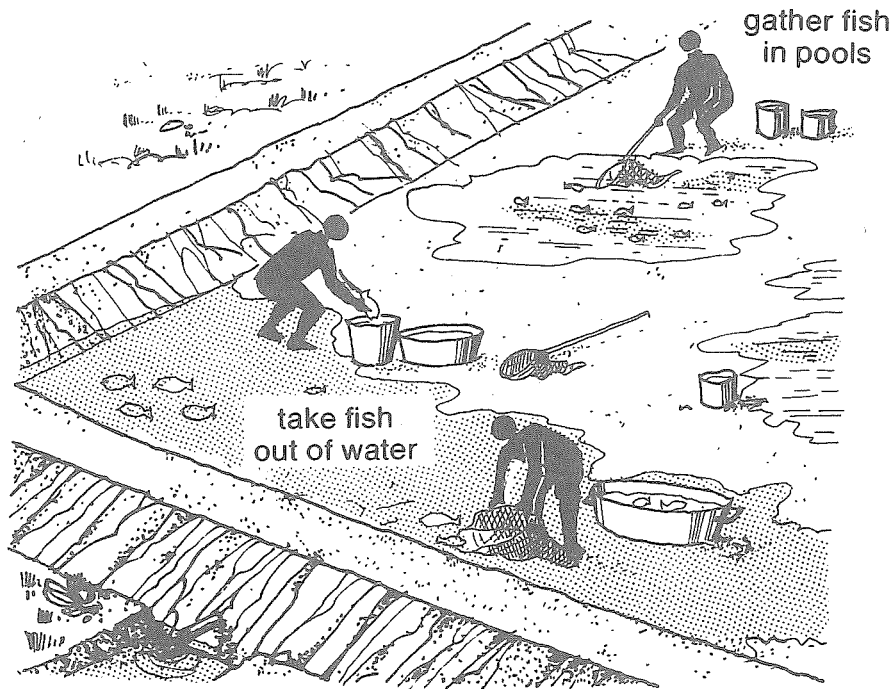


122. With a cast net or a lift net, it is easier to catch the fish while they are eating and they are all together. Keep the biggest fish and put the smaller fish back into the pond.

### Harvest by draining all of the water

123. If you have enough good water to fill the pond again, it is best to drain all of the water. If you drain all of the water, you will be sure to catch all of the fish and you can clean the bottom of your pond.

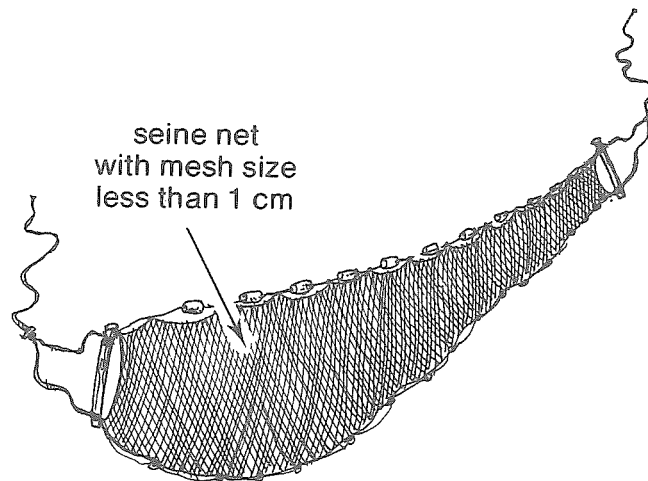
124. While the pond is being drained, use baskets or hand-nets to take the fish out of the water. After all of the water has been drained from the pond, you may still find small pools here and there on the bottom. Be careful to gather all of the fish in the pools.



### Harvest by draining part of the water

125. If you have only enough water to fill part of your pond, do not drain out all of the water. Drain only part of it out.
126. Pull the wood plug closing the outlet, or, if you are using a siphon, put the siphon in place and begin to let the water out.
127. Let half the water flow out through the outlet or siphon. Then put the plug back in the outlet or remove the siphon.

128. Now you can begin to harvest your fish with a seine net.  
Do it the same way as you did in Item 119 in this booklet.  
If you have a seine net with a mesh size of less than 1 centimetre, you will be able to catch all of your fish.



129. Take all the big fish and put the small fish back.  
If you have too many baby fish, Item 144 in this booklet will tell you what to do with them.
130. When you are finished harvesting, let water flow back into the pond until it reaches the level of the overflow pipe.

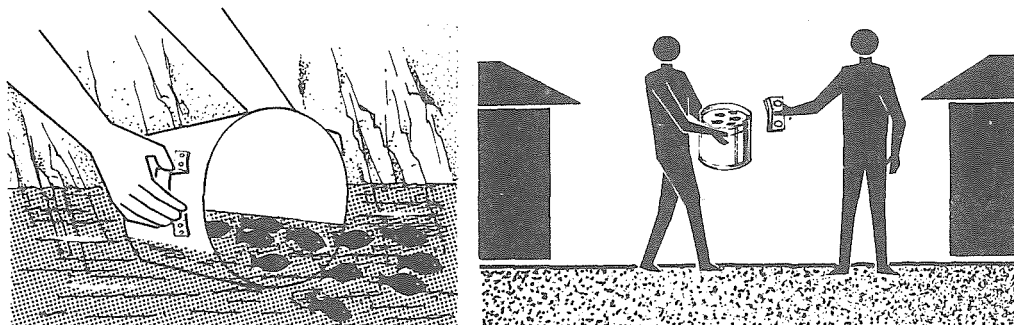
### **What to do with your big fish**

131. You will harvest more than twice as many big fish from your new big pond as you did from your old smaller pond.

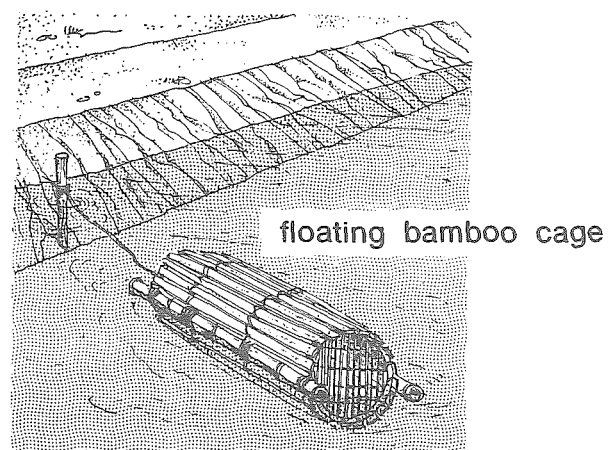
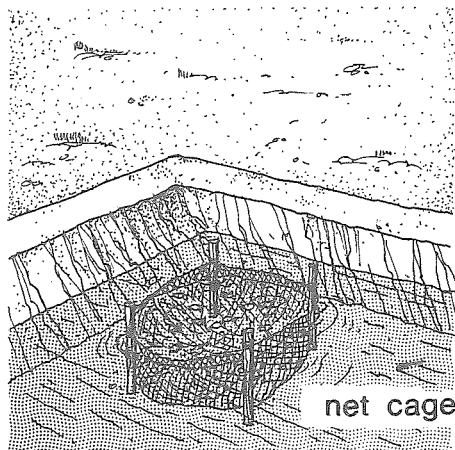
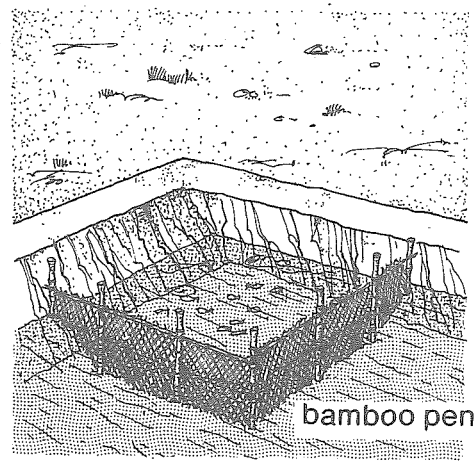
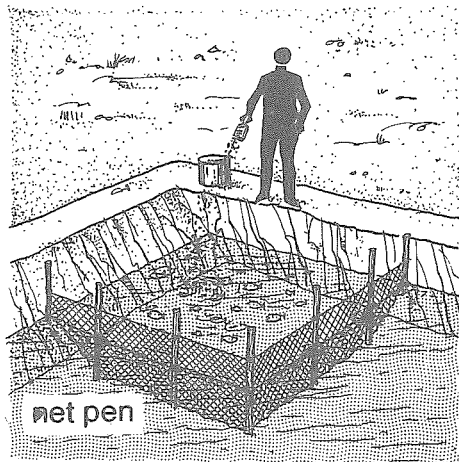
132. When you harvest your big fish, you must be ready to eat them or sell them or preserve them the same day.  
Items 105 to 112, in Booklet No. 27, will tell you what to do.

### What to do with your baby fish

133. When you harvest your pond, you will also catch many fish that are too small to eat or to be sold at the market.
134. If you have not built a nursery pond, you may need some of these baby fish to put back into the big pond you are harvesting.  
You may also be able to sell some to another fish farmer.  
But you must take good care of the baby fish until you are ready to use them or sell them.



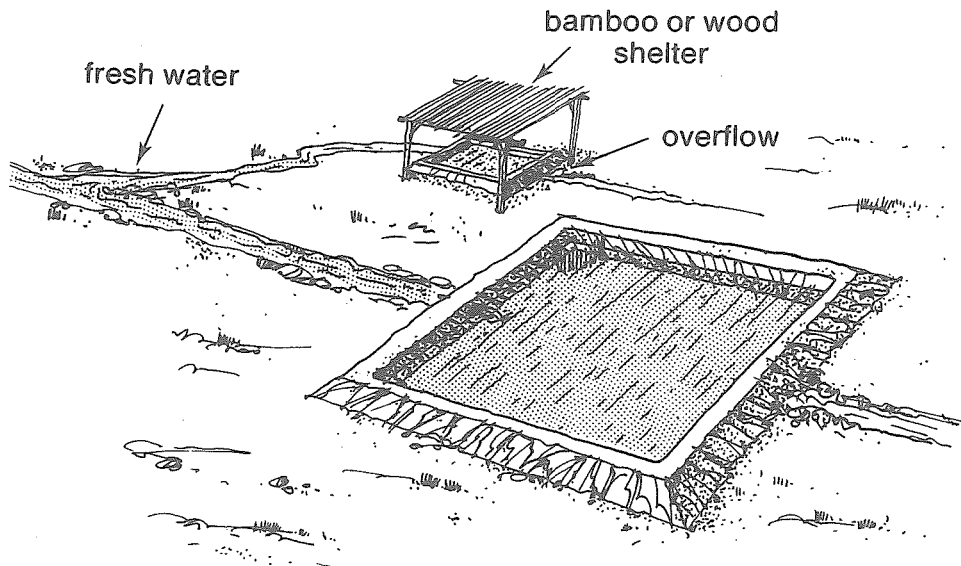
135. If you have another pond that is full of water, you can put these baby fish in a pen of split bamboo or net in the corner of the other pond. You can also keep these baby fish in a net pen or in a floating cage of split bamboo.



136. If you do not have another pond, you should keep the baby fish alive in a special small pond nearby, until you are ready to use them, as you did when you harvested your first small pond (see Booklet No. 27).

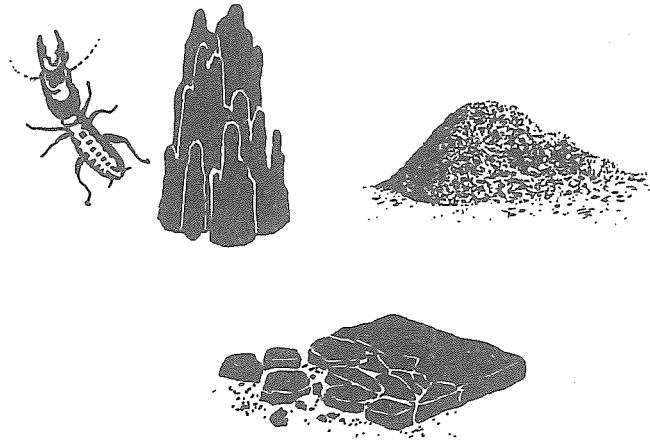


137. The smallpond can be a simple hole in the ground about 3 by 3 metres and about 40 centimetres deep. You should have it ready before you begin to harvest.
138. Your baby fish will stay alive longer if they are out of the sun. Build the small pond in the shade, under a tree or put a shelter over it. You can build a simple shelter using bamboo or wood.



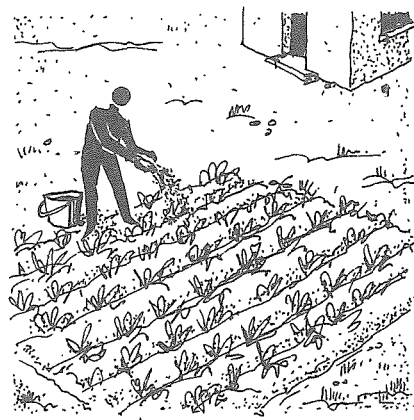
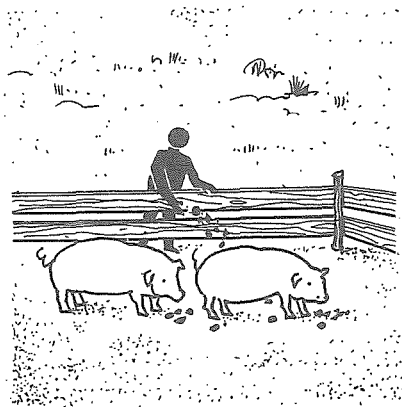
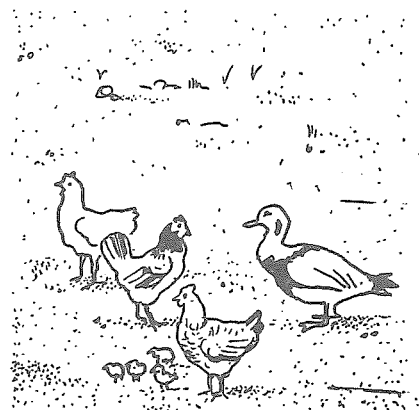
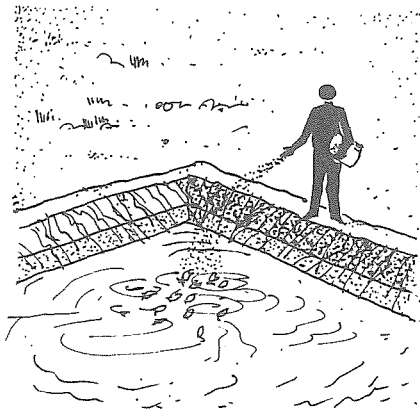
139. Your baby fish will stay alive longer if they have fresh water. Build the small pond with an overflow and put the small pond near the ditch which brings water to your big pond. That way you can have fresh water running through your small pond.
140. You can also let fresh water into your small pond with a small ditch or a siphon.

141. Your baby fish will stay alive longer if you feed them a little food each day. Feed your baby fish termites or finely ground rice bran, cottonseed cake or groundnut cake when they are in the small pond.



142. If you keep your baby fish in a small pond out of the sun in fresh water and if you feed them each day, they will stay alive for about 5 days. This is enough time to dry and clean and repair the bottom of your big pond, to fill it with water and begin to fertilize it, and to put the baby fish back into your big pond.
143. If you have built your own nursery pond, you will not need these baby fish.

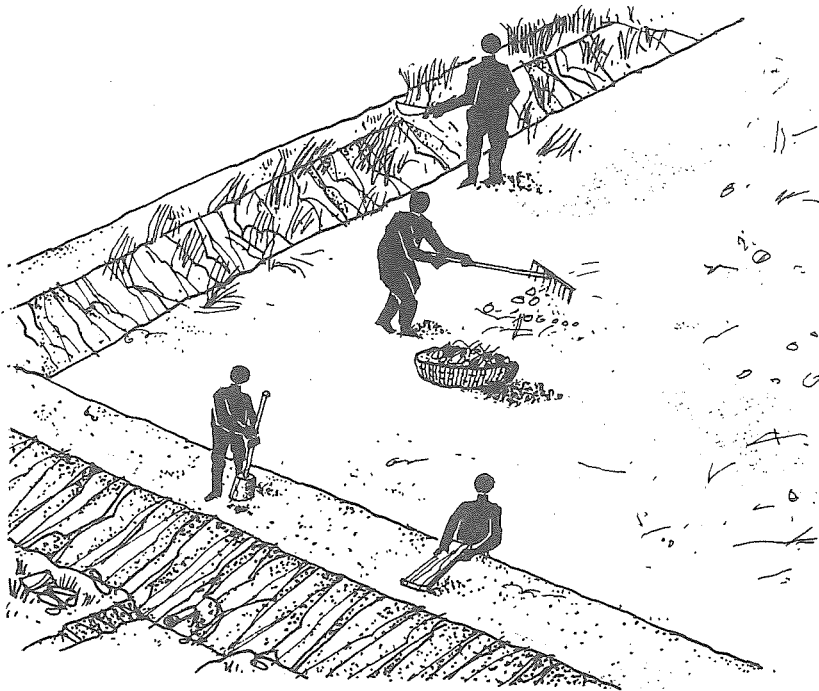
144. If you have more baby fish then you can use or sell, you can dry them in the sun. After you have dried the baby fish, grind or pound them and mix them with crushed cottonseed or groundnut cake or with rice bran to feed your big fish, your poultry or your pigs. You can also use the baby fish to fertilize your farm garden.



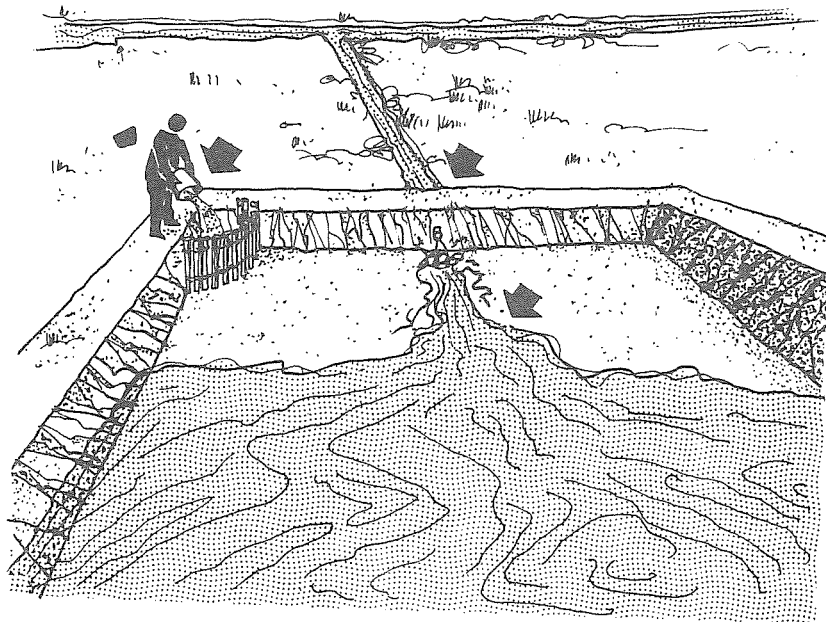
## NOW YOU MUST BEGIN AGAIN

---

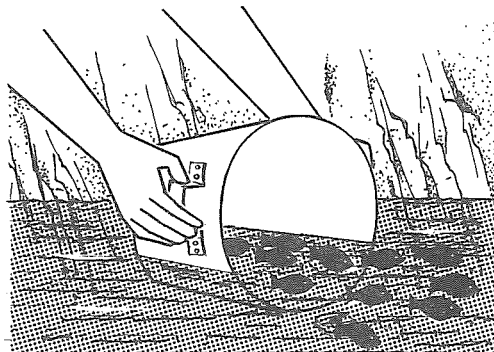
145. If you have drained all of the water from your pond, you can clean the bottom of the pond.
146. But do not let your pond bottom become too dry. If the bottom of your pond becomes too dry, it may crack and will not hold water well when you are ready to fill the pond with water again.
147. Repair the banks and cut the weeds and grass on the banks around the pond.
148. If there are any water leaks in the banks or around the inlet, outlet or overflow, stop them by packing them with good clay soil.



149. When you are finished, let water into the pond and fertilize the water with animal compost, plant compost, animal manure or plant material, as you did before.



150. When the pond is green again, put 450 baby fish into the pond. Use only healthy fish which are 5 centimetres or longer.



151. In about 6 months  
you will be able  
to harvest another crop of fish.
152. This booklet has told you  
how to grow more fish  
and how to grow them better.
153. Now that you have built  
your first big pond  
and you have used it  
to grow more fish better,  
you may decide that you would like  
to improve your fish farming even more.
154. Booklet No. 29 has told you  
how to build a bigger pond  
and how to build it better.
155. But there are still more ways  
to improve your fish farming.  
You can
- build still bigger ponds
  - build more than one pond
  - build new and better kinds  
of inlets and outlets
  - grow fish in several ponds  
in such a way  
that you can harvest fish  
all year round
  - grow fish in pens and cages
  - manage your fish farming  
together with your farm animals  
and gardens and fields  
so that they will be better  
and produce more.
156. You will learn more about these ways  
in a later booklet.

## FAO SALES AGENTS AND BOOKSELLERS

<b>Algeria</b>	Société nationale d'édition et de diffusion, 92, rue Didouche Mourad, Algiers.
<b>Argentina</b>	Librería Agropecuaria S.A., Pasteur 743, 1028 Buenos Aires.
<b>Australia</b>	Hunter Publications, 58A Gipps Street, Collingwood, Vic. 3066; Australian Government Publishing Service, P.O. Box 84, Canberra, A.C.T. 2600; and Australian Government Service Bookshops at 12 Pirie Street, Adelaide, S.A.; 70 Alinga Street, Canberra, A.C.T.; 162 Macquarie Street, Hobart, Tas.; 347 Swanson Street, Melbourne, Vic.; 200 St. Georges Terrace, Perth, W.A.; 309 Pitt Street, Sydney, N.S.W.; 294 Adelaide Street, Brisbane, Qld.
<b>Austria</b>	Gerold & Co., Buchhandlung und Verlag, Graben 31, 1011 Vienna.
<b>Bangladesh</b>	ADAB, 79 Road 11A, P.O. Box 5045, Dhanmondi, Dacca.
<b>Belgium</b>	Service des publications de la FAO, M.J. de Lannoy, 202, avenue du Roi, 1060 Brussels. CCP 000-0808993-13.
<b>Bolivia</b>	Los Amigos del Libro, Perú 3712, Casilla 450, Cochabamba; Mercado 1315, La Paz; René Moreno 26, Santa Cruz; Junín esq. 6 de Octubre, Oruro.
<b>Brazil</b>	Livraria Mestre Jou, Rua Guaipá 518, São Paulo 05089; Rua Senador Dantas 19-S205/206, 20.031 Rio de Janeiro; PRODIL, Promoção e Dist. de Livros Ltda., Av. Venâncio Aires 196, Caixa Postal 4005, 90.000 Porto Alegre; A NOSSA LIVRARIA, CLS 104, Bloco C, Lojas 18/19, 70.000 Brasília, D.F.
<b>Brunei</b>	SST Trading Sdn. Bhd., Bangunan Tekno No. 385, Jln 5/59, P.O. Box 227, Petaling Jaya, Selangor.
<b>Canada</b>	Renouf Publishing Co. Ltd, 2182 St Catherine West, Montreal, Que. H3H 1M7
<b>Chile</b>	Tecnolibro S.A., Merced 753, entresuelo 15, Santiago.
<b>China</b>	China National Publications Import Corporation, P.O. Box 88, Beijing.
<b>Colombia</b>	Editorial Blume de Colombia Ltda., Calle 65 N° 16-65, Apartado Aéreo 51340, Bogotá D.E.
<b>Congo</b>	Office national des librairies populaires, B.P. 577, Brazzaville.
<b>Costa Rica</b>	Librería, Imprenta y Litografía Lehmann S.A., Apartado 10011, San José.
<b>Cuba</b>	Empresa de Comercio Exterior de Publicaciones, O'Reilly 407 Bajos entre Aguacate y Compostela, Havana.
<b>Cyprus</b>	MAM, P.O. Box 1722, Nicosia.
<b>Czechoslovakia</b>	ARTIA, Ve Smeckach 30, P.O. Box 790, 111 27 Prague 1.
<b>Denmark</b>	Munksgaard Export and Subscription Service, 35 Nørre Søgade, DK 1370 Copenhagen K; telephone: (01)128570.
<b>Dominican Rep.</b>	Fundación Dominicana de Desarrollo, Casa de las Gárgolas, Mercedes 4, Apartado 857, Zona Postal 1, Santo Domingo.
<b>Ecuador</b>	Su Librería Cía. Ltda., García Moreno 1172 y Mejía, Apartado 2556, Quito; Chimborazo 416, Apartado 3565, Guayaquil.
<b>El Salvador</b>	Librería Cultural Salvadoreña S.A. de C.V., Calle Arce 423, Apartado Postal 2296, San Salvador.
<b>Finland</b>	Akateeminen Kirjakauppa, 1 Keskuskatu, P.O. Box 128, 00101 Helsinki 10.
<b>France</b>	Editions A. Pedone, 13, rue Soufflot, 75005 Paris.
<b>Germany, Fed. Rep. of</b>	Alexander Horn Internationale Buchhandlung, Spiegelgasse 9, Postfach 3340, 6200 Wiesbaden.
<b>Ghana</b>	Fides Enterprises, P.O. Box 14129, Accra; Ghana Publishing Corporation, P.O. Box 3632, Accra.
<b>Greece</b>	G.C. Eleftheroudakis S.A., International Bookstore, 4 Nikis Street, Athens (T-126); John Mihalopoulos & Son S.A., International Booksellers, 75 Hermou Street, P.O. Box 73, Thessaloniki.
<b>Guatemala</b>	Distribuciones Culturales y Técnicas "Artemis", 5a. Avenida 12-11, Zona 1, Apartado Postal 2923, Guatemala.
<b>Guinea-Bissau</b>	Conselho Nacional da Cultura, Avenida da Unidade Africana, C.P. 294, Bissau.
<b>Guyana</b>	Guyana National Trading Corporation Ltd, 45-47 Water Street, P.O. Box 308, Georgetown.
<b>Haiti</b>	Librairie "A la Caravelle", 26, rue Bonne Foi, B.P. 111, Port-au-Prince.
<b>Hong Kong</b>	Swindon Book Co., 13-15 Lock Road, Kowloon.
<b>Hungary</b>	Kultura, P.O. Box 149, 1389 Budapest 62.
<b>Iceland</b>	Snaebjörn Jónsson and Co. h.f., Hafnarstraeti 9, P.O. Box 1131, 101 Reykjavik.
<b>India</b>	Oxford Book and Stationery Co., Scindia House, New Delhi 110001; 17 Park Street, Calcutta 700016.
<b>Indonesia</b>	Inti Buku Agung Ltd, 13 Kwitang, Jakarta.
<b>Iraq</b>	National House for Publishing, Distributing and Advertising, Jamhuriya Street, Baghdad.
<b>Ireland</b>	The Controller, Stationery Office, Dublin 4.
<b>Italy</b>	Distribution and Sales Section, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, 00100 Rome; Libreria Scientifica Dott. Lucio de Biasio "Aeiou", Via Meravigli 16, 20123 Milan; Libreria Commissionaria Sansoni S.p.A. "Licosa", Via Lamarmora 45, C.P. 552, 50121 Florence.
<b>Japan</b>	Maruzen Company Ltd, P.O. Box 5050, Tokyo International 100-31.
<b>Kenya</b>	Text Book Centre Ltd, Kijabe Street, P.O. Box 47540, Nairobi.
<b>Kuwait</b>	Saeed & Samir Bookstore Co. Ltd, P.O. Box 5445, Kuwait.

## FAO SALES AGENTS AND BOOKSELLERS

<b>Luxembourg</b>	Service des publications de la FAO. M.J. de Lannoy, 202, avenue du Roi, 1060 Brussels (Belgium).
<b>Malaysia</b>	SST Trading Sdn. Bhd., Bangunan Tekno No. 385, Jln 5/59, P.O. Box 227, Petaling Jaya, Selangor.
<b>Mauritius</b>	Nalanda Company Limited, 30 Bourbon Street, Port Louis.
<b>Mexico</b>	Dilitsa S.A., Puebla 182-D, Apartado 24-448, Mexico 7, D.F.
<b>Morocco</b>	Librairie "Aux Belles Images", 281, avenue Mohammed V, Rabat.
<b>Netherlands</b>	Keesing Boeken V.B., Joan Muyskenweg 22, 1096 CJ Amsterdam.
<b>New Zealand</b>	Government Printing Office. Government Printing Office Bookshops: Retail Bookshop, 25 Rutland Street, Mail Orders, 85 Beach Road, Private Bag C.P.O., Auckland; Retail, Ward Street, Mail Orders, P.O. Box 857, Hamilton; Retail, Mulgrave Street (Head Office), Mail Orders, Cubacade World Trade Centre, Private Bag, Wellington; Retail, 159 Hereford Street, Mail Orders, Private Bag, Christchurch; Retail, Princes Street, Mail Orders, P.O. Box 1104, Dunedin.
<b>Nigeria</b>	University Bookshop (Nigeria) Limited, University of Ibadan, Ibadan.
<b>Norway</b>	Johan Grundt Tanum Bokhandel, Karl Johansgate 41-43, P.O. Box 1177 Sentrum, Oslo 1.
<b>Pakistan</b>	Mirza Book Agency, 65 Shahrah-e-Quaid-e-Azam, P.O. Box 729, Lahore 3; Sasi Book Store, Zaibunnisa Street, Karachi.
<b>Panama</b>	Distribuidora Lewis S.A., Edificio Dorasol, Calle 25 y Avenida Balboa, Apartado 1634, Panama 1.
<b>Paraguay</b>	Agencia de Librerías Nizza S.A., Tacuarí 144, Asunción.
<b>Peru</b>	Librería Distribuidora "Santa Rosa", Jirón Apurímac 375, Casilla 4937, Lima 6.
<b>Philippines</b>	The Modern Book Company Inc., 922 Rizal Avenue, P.O. Box 632, Manila.
<b>Poland</b>	Ars Polona, Krakowskie Przedmiescie 7, 00-068 Warsaw.
<b>Portugal</b>	Livraria Bertrand, S.A.R.L., Rua João de Deus, Venda Nova, Apartado 37, 2701 Amadora Codex; Livraria Portugal, Dias y Andrade Ltda., Rua do Carmo 70-74, Apartado 2681, 1117 Lisbon Codex; Edições ITAU, Avda. da República 46/A-ric Esqdo., Lisbon 1.
<b>Republic of Korea</b>	Eul-Yoo Publishing Co. Ltd, 46-1 Susong-Dong, Jongro-Gu, P.O. Box Kwang-Wha-Moon 362, Seoul 110.
<b>Romania</b>	Ilexim, Calea Grivitei N° 64-66, B.P. 2001, Bucharest.
<b>Saudi Arabia</b>	The Modern Commercial University Bookshop, P.O. Box 394, Riyadh.
<b>Sierra Leone</b>	Provincial Enterprises, 26 Garrison Street, P.O. Box 1228, Freetown.
<b>Singapore</b>	MPH Distributors (S) Pte. Ltd, 71/77 Stamford Road, Singapore 6; Select Books Pte. Ltd, 215 Tanglin Shopping Centre, 19 Tanglin Road, Singapore 1024; SST Trading Sdn. Bhd., Bangunan Tekno No. 385, Jln 5/59, P.O. Box 227, Petaling Jaya, Selangor.
<b>Somalia</b>	"Samater's", P.O. Box 936, Mogadishu.
<b>Spain</b>	Mundi Prensa Libros S.A., Castelló 37, Madrid 1; Librería Agrícola, Fernando VI 2, Madrid 4.
<b>Sri Lanka</b>	M.D. Gunasena & Co. Ltd, 217 Olcott Mawatha, P.O. Box 246, Colombo 11.
<b>Sudan</b>	University Bookshop, University of Khartoum, P.O. Box 321, Khartoum.
<b>Suriname</b>	VACO n.v. in Suriname, Dominee Straat 26, P.O. Box 1841, Paramaribo.
<b>Sweden</b>	C.E. Fritzes Kungl. Hovbokhandel, Regeringsgatan 12, P.O. Box 16356, 103 27 Stockholm.
<b>Switzerland</b>	Librairie Payot S.A., Lausanne and Geneva; Buchhandlung und Antiquariat Heinemann & Co., Kirchgasse 17, 8001 Zurich.
<b>Thailand</b>	Suksapan Panit, Mansion 9, Rajadamnern Avenue, Bangkok.
<b>Togo</b>	Librairie du Bon Pasteur, B.P. 1164, Lomé.
<b>Tunisia</b>	Société tunisienne de diffusion, 5, avenue de Carthage, Tunis.
<b>United Kingdom</b>	Her Majesty's Stationery Office, 49 High Holborn, London WC1V 6HB (callers only); P.O. Box 569, London SE1 9NH (trade and London area mail orders); 13a Castle Street, Edinburgh EH2 3AR; 41 The Hayes, Cardiff CF1 1JW; 80 Chichester Street, Belfast BT1 4JY; Brazenose Street, Manchester M60 8AS; 258 Broad Street, Birmingham B1 2HE; Southey House, Wine Street, Bristol BS1 2BQ.
<b>United Rep. of Tanzania</b>	Dar-es-Salaam Bookshop, P.O. Box 9030, Dar-es-Salaam; Bookshop, University of Dar-es-Salaam, P.O. Box 893, Morogoro.
<b>United States of America</b>	UNIPUB, 1180 Avenue of the Americas, New York, N.Y. 10036.
<b>Uruguay</b>	Librería Agropecuaria S.R.L., Alzaibar 1328, Casilla de Correos 1755, Montevideo.
<b>Venezuela</b>	Blume Distribuidora S.A., Gran Avenida de Sabana Grande, Residencias Caroni, Local 5, Apartado 50.339, 1050-A Caracas.
<b>Yugoslavia</b>	Jugoslovenska Knjiga, Trg. Republike 5/8, P.O. Box 36, 11001 Belgrade; Cankarjeva Založba, P.O. Box 201-IV, 61001 Ljubljana; Prosveta, Terazije 16, P.O. Box 555, 11001 Belgrade.
<b>Zambia</b>	Kingstons (Zambia) Ltd, Kingstons Building, President Avenue, P.O. Box 139, Ndola.
<b>Other countries</b>	Requests from countries where sales agents have not yet been appointed may be sent to: Distribution and Sales Section, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, 00100 Rome, Italy.