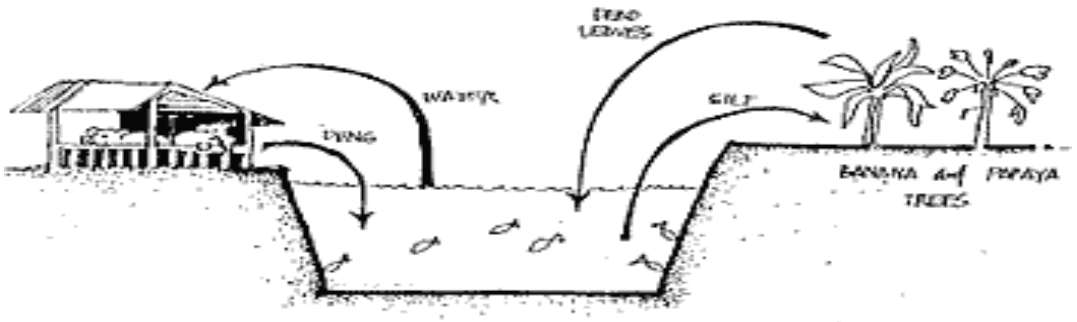
Integrated fish-pig farming in India

Fish-pig farming material flow

The raising of pigs can fruit-fully be combined with fish culture by constructing animal housing units on the pond embankment or over the pond in such a way that the wastes are directly drained into the pond. The system has obvious advantages:

- The pig dung acts as excellent pond fertilizer and raises the biological productivity of the pond and consequently increases fish production.
- Some of the fishes feed directly on the pig excrete which contains 70 percent digestible food for the fish.
- No supplementary feed is required for the fish culture, which normally accounts for 60 percent of the total input cost in conventional fish culture.
- The pond dikes provide space for erection of animal housing units.
- Pond water is used for cleaning the pigsties and for bathing the pigs.
- The system cannot be adopted in all parts of India due to religious consideration but it has special significance in certain areas as it can improve the socioeconomic status of weaker rural communities, especially the tribals who traditionally raise pigs and can take up fish-pig farming easily.

Fish-pig farming material flow



FISH-PIG FARMING MATERIAL FLOW

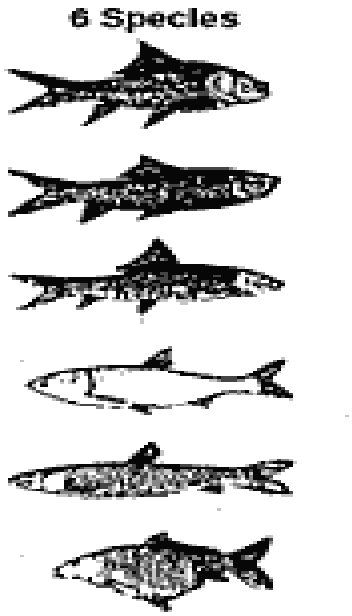
Culture practices

The ponds measuring about 1 000 m² may be located near your house, so that you can take care of the fish and pigs and can discourage poaching.

Check and repair the dikes. The pond should be deep enough so as to retain more than 1 m water depth during the dry period.

Pond preparation

Drain and dry the pond to remove all the weeds and fish fauna remaining in the pond. If it is not possible to drain the pond, all the fish can be killed by applying 15 kg of both bleaching powder and urea for a 1 000 m² pond. Alternatively, 250 kg Mahua oil cake can be applied which kills all the fishes and also acts as organic pond fertilizer.



6 Species		
Catla	-	160
Rohu	-	160
Mrigal	-	120
Silver carp	-	160
Grass carp	-	90
Common carp	-	120
TOTAL		800

3 Species		
Catla	-	320
Rohu	-	240
Mrigal	-	240
TOTAL		800

Pigs are brought to the pond before stocking the fish, so no basal application of manure is required.

Stocking

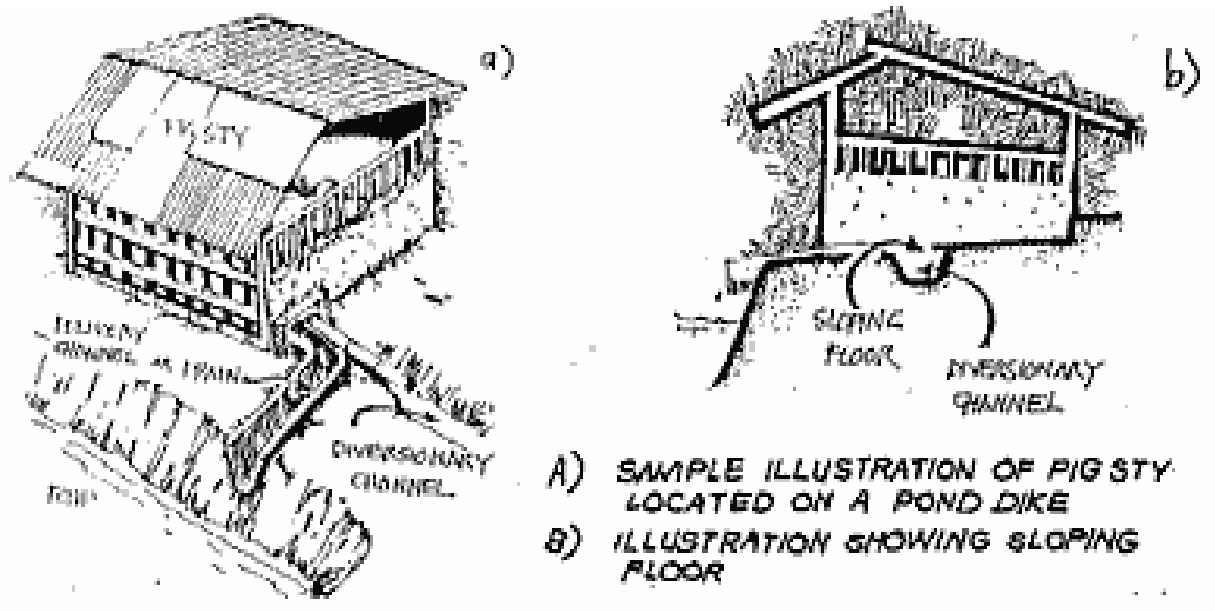
Stock the pond with fingerlings 7 days after poisoning with bleaching powder.

Alterations can be made on stocking density and species ratio, depending on the local conditions.

Grass carp should be fed regularly with aquatic or terrestrial vegetation. Liming of the pond is done at regular intervals. It helps in stabilization of organic matter. About 25 kg lime shall be required for one year.

Harvesting

Due to abundance of natural food in the fish-pig pond, the fish attains marketable size within a few months. Partial harvesting, therefore, should be done three times, depending upon the growth of fish. Final harvesting may be done after 10-12 months.



A) SAMPLE ILLUSTRATION OF PIG STY LOCATED ON A POND DIKE

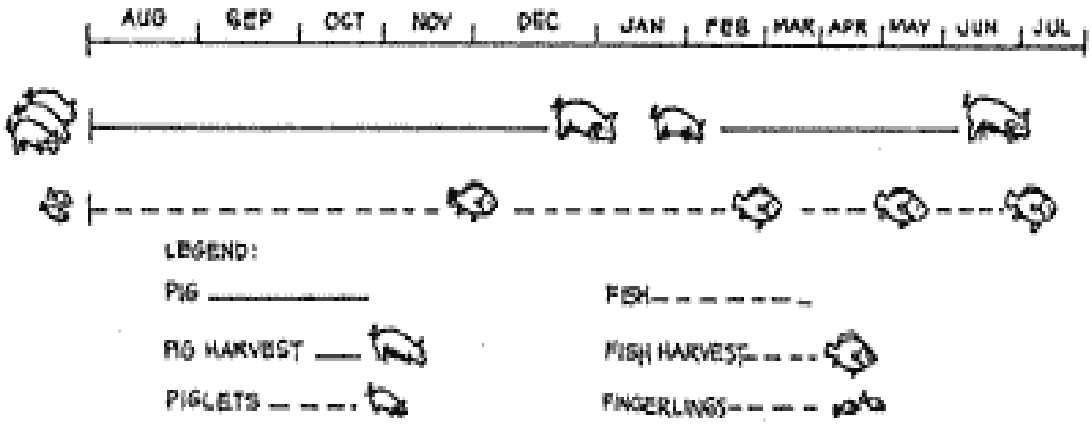
B) ILLUSTRATION SHOWING SLOPING FLOOR

Pig raising

The number of pigs required will depend upon the pond area. The excreta of three pigs are sufficient to fertilize a pond of 1 000 m². So three pigs may be raised on a pond of 0.1 ha. As pigs attain slaughter size within 5-6 months and fish raising of Indian exotic carp is done for 10-12 months, two lots of pigs can be raised along with one lot of fish.

The pigsties are constructed on the pond embankments in such a way that the washings are drained to the pond through a delivery channel. A diversion channel is always provided to divert the excreta away from the ponds as these develop algal bloom or any other abnormality. Washings of pigsties are drained into the pond after sunrise to avoid oxygen depletion.

The pigsties can be constructed from any available cheap materials but the floor must be cemented with a slope towards the pond. Each pig is provided with a floor space of 1-1.5 m².



Calendar of activities for fish-pig farming

August	Pond preparation, creation of pigsties, raising of piglets
September	Stocking of fingerlings, fattening and care of pigs
October	Fattening and care of pigs and fish
November	Fattening and care of pigs and fish
December	First partial harvesting of fish
January	Harvesting of first lot of pigs
February	Fattening of second lot of pigs
March	Second partial harvesting of fish
April	Fattening of pigs and fish
May	Third partial harvesting of fish
June	Preparation for final harvesting
July	Final harvesting of fish and second lot of pigs

Budget (in rupees) for fish-pig farming in 0.1 ha pond

Cost	
Fishery	
Pond preparation with bleaching powder and 15 kg urea	124.00
850 Fingerlings @ `250/- per 1000 fingerlings	213.00
2.5 kgs of Lime @ `24/- per kg	60.00
Nets and labour for harvesting	400.00
Fish culture equipment	20.00
Pond rental	300.00

	1113.00
Piggery	
Pigsties	1000.00
Fattening of two lots of piglets for 6 months each	
First Lot	
Piglets	30.00
Pig feed (540 kg)	1989.00
Second Lot	
Medicine	40.00
Total cost	3320.00
Interest on the Working Capital	440.00
Total Operational Cost	3824.00
Income	
Sale of fish	12000.00
Sale of meat	17100.00
Balance	**13276.00**

Cash flow for integrated fish-pig farming for 0.1 ha pond

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Inflow	0	0	0	0	+2 000	+2 550	0	+2 000	0	+2 000	0	+8 550
Outflow	-1 402	-375	-162	-172	-252	-262	-272	-262	-262	-262	-162	-111
Netflow	-1 402	-1 777	-1 939	-2 111	-363	+1 905	+1 633	+3 371	+3109	+4 847	4 687	+13 106

Notes:
1.Cash inflow starts in December when the partial harvesting of fish is done.
2.Harvesting of first lot of pigs increases the cash flow in January.
3.Cash inflow in March- May is due to second and third partial harvesting of fish.

Issues for further considerations

Extremely resource-poor households may find it difficult to adopt the technology, as this requires the pigs to be penned up. In small-scale rural farms, pigs are typically permitted to roam and scavenge for their feed as this avoids the investment and effort of penning and then providing feed. On the other hand, in farming systems where pigs are penned, this technology will be more applicable.

In constructing the pig pen adjacent to the pond, it should be considered that urine contains a high proportion of the waste value, and water-resistant flooring would be required, but this may be expensive or unaffordable. Plastic sheeting under wooden slatted floors has been used successfully to allow collection of animal urine for use in ponds.

Another country for which an example of this technology can be given is northern Viet Nam where the potential of backyard pig-fish rearing is even more successful. This system has been well studied and analysed.