

## Survival Surveys

### Description

Survival surveys count and record live and dead fish for example, after they have been handled during aquaculture operations. Some factors that have a bearing on survival are: species, site, spacing, weather, handling methods, protection, feeding and management. Length, weight and general condition can be recorded for live and dead fish. Possible reasons for mortality can be recorded.



### Purpose

- Provides information about correct site/species selections
- Adjusts stocking rates based on local survival expectations
- Determines reasons for fish mortality

### Benefits

- Serves as an "early warning indicator" for both technical and social problems.
- The stocking rates can be adjusted to maintain optimal stocking targets.
- Indicates community interest (protection, management, feeding) in fishponds.

## The Tools and How to Use Them

### *Using the Survival Survey Tool*

1. Determine (through discussions with insiders) WHY a survival survey may be useful to them, HOW they may benefit from the information and WHICH information they need.
2. Design the survival survey considering the specific information needs identified by insiders. There may be many considerations: different configurations (specific fishponds, integrated fishponds), variation in species, possible reasons for mortality (weather, bird attack, poaching), different sites (swamp, coastal, river).
3. In the design, decide HOW the survey will be conducted. There are a number of options:
  - a) Survival information can be a part of Tool 15, Fisherman's Own Records. If this is the case, a representative sample of these records can be used to establish overall survival rates.
  - b) If micro fish pond planning is done, a representative sample of the fish ponds can be taken, and a survival survey can be done on a few fish ponds.
  - c) If there is no record of fingerling distribution, an "as is" inventory can be made and a survival survey designed from this information.
  - d) For small communities where there are several ponds, maps which record species growth, survival and yield can be created and completed over time.
  - e) Demonstration fishponds can provide "benchmarks" of performance when fish are given optimum growth conditions.
4. When determining the size of the sample for the survey, a rule of thumb sample size is:

Total Number	Sample Size	%
100	15	15
200	20	10
500	50	10
1000	50	5

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5. When determining how to establish a sample there are a number of options. Some of these options are: a representative sample, a random sample, a stratified sample, or a blend of these. Sampling methods are discussed at the beginning of Chapter Eight.

If sample accuracy is of concern, basic statistics may be required. Get help before beginning the survey if a high level of confidence in the data is required or/and if unsure about the process of statistical analysis.

6. It is important to decide WHEN to sample for survival in order to get a true record of survival and to be able to compare results. For example, in a fish farming situation:

- a) An initial check is made when stocking the pond, to evaluate the quality of fingerlings on arrival at the pond, the mortality during transport and to determine the hardiness of fish and the effectiveness of the method of transport.
- b) A survival survey during the growing-out period, noting any mortality including the conditions which may have caused it. i.e. pests, drought, rain, pollution food type. Sampling during this period can provide good information on how things are going, and whether there are any problems likely to disrupt production.
- c) A survival survey when harvesting the fish ponds (for grading stock, or for slaughter), to assess the survival rate over the growing period. These results can be compared with the information given in relation to point (b) to determine the accuracy of the overall results.
- d) A survival survey during and just after grading will give a good indication of the affect of any mortality resulting handling methods employed.

### Precautions

Some sampling methods will give a "pretty good" estimate of survival, but may not be statistically valid. What is important is that the survey provide useful and fairly reliable information.

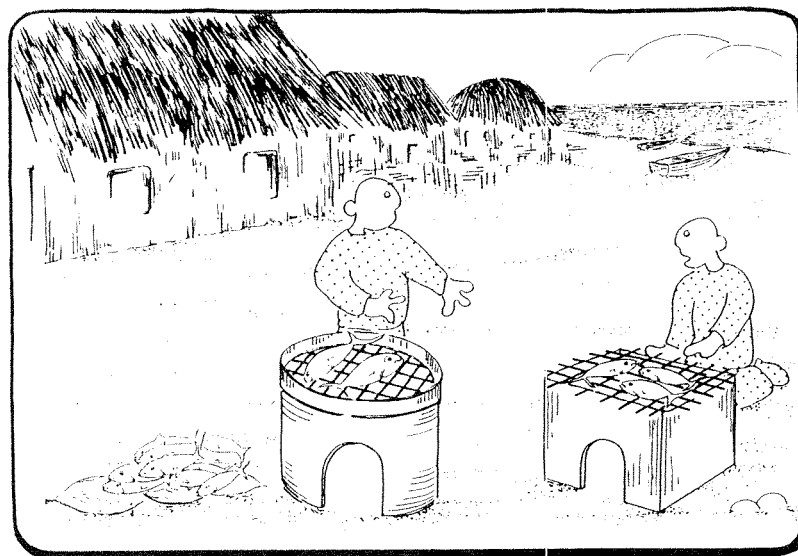
Be consistent and systematic in conducting survival surveys as this will give useful information over time. Stick to the pre-selected sample and sampling methods so that bias is limited and results reliable.

### Participatory Action Research

#### Description

Participatory Action Research is a continuous cycle in which insiders and outsiders together decide what needs to be researched, design the research (determine what will be measured and how) and collect the necessary information. This information is then put into practical applications or used to identify new research ideas.

Examples of applications of this research method are: comparing catches between established fishing methods and new fishing methods; comparing fuel used between traditional fish smoking equipment and new improved fish smoking equipment; comparing the product from fertilised and non-fertilised ponds.



#### Purpose

- Locally test new technologies (species, management practices, conservation measures etc.)
- Determine the effectiveness of changes suggested by intervention.
- Supports and strengthens existing local research.

#### Benefits

- Research relevant to the real needs of fish farmers is identified and can be further developed by outside research agencies.
- Supports and strengthens existing local research.
- Fish farmers are aware of the positive or negative changes brought about by a change in former practices.
- Lowers the risks associated with large scale promotion and adoption of new, locally untested technologies.

### *Using the Participatory Action Research Tool*

1. Arrange a meeting with relevant community members to discuss: which interventions and management practices they wish to test;
  - what methods they wish to employ; (i.e.: whether it will be a test/control pond, or yields before and after treatments);
  - the terms of measurement;
  - and the method of measurement.
2. Insiders and outsiders design the monitoring format for this tool. The monitoring record could be a separate booklet or card, or an insert to the Fisher folk's Own Records (fish farming, capture fishing and fish processing can all use this tool).
3. Information from Participatory Action Research is shared and analysed by insiders and outsiders together and the results are used either to change existing practices, not change existing practices, and/or call for further research.

### **Precautions**

The attention that is paid to the selected fishers, whether fish farmers, fishers or fish processors, may induce them to apply more effort and attention to the test ponds, capture methods or processing techniques being tested than to the controls or traditional methods being compared with the new ideas. Such a situation will bias the information being collected and not result in a fair evaluation of the techniques.

Other factors that might influence the results of the research must be considered i.e.:

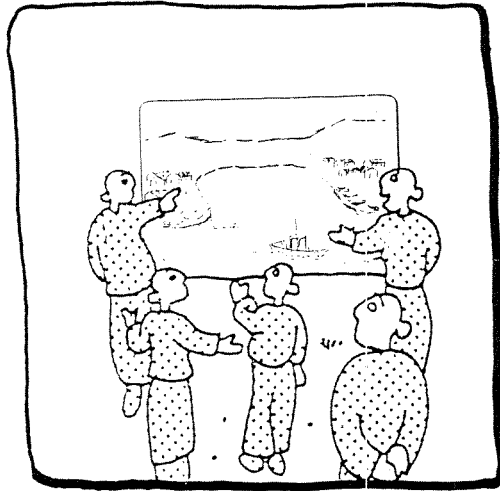
- unusually heavy rains over one year might cause flooding or pond damage;
- the number of years a pond has been in use could affect productivity;
- when similar types of fishing gear are being researched, they should be fished in the same area on the same resource;
- market fluctuations may negatively effect processing output.

Information resulting from long-term research will increase the accuracy of that information. Depending on the type of investigations being carried out, efforts should be made to maintain the observations for as long as is practical; this could range from months to years depending on the type of observations being performed and the resources available to support the programme.

## Maps and Mapping

### Description

This tool can use purchased maps or charts, maps produced by the group and/or aerial photographs to assist with community planning and monitoring changes in resources.



### Purpose

- Monitor changes in resources and environment
- Assist insiders with planning and designing
- Evaluate changes in resources and the environment through comparison

### Benefits

- This tool can give a broad overview of the evolution of a community resource and is thus useful for planning and monitoring.
- It is less time consuming than other information gathering tools as many different interventions can be identified using the one tool.
- Communities, some for the first time, can analyse the linkages, patterns and inter-relationships between natural resources.
- Maps and mapping can be a multipurpose tool, useful for extension, assessment, planning, monitoring, base lines and evaluation.

### *Using the Maps and Mapping Tool*

1. Introduce both the concept of maps, mapping and/or aerial photographs and the purpose of the exercise to groups of 5 - 7 persons. These small groups can be composed of representatives of different groups within the community, or each small group can be composed of a different interest groups. Each group will do the mapping separately and then compare their results with that of the other groups.

Aerial photographs may be expensive if they are not readily available. Local maps may be used or the community can draw the maps themselves (see the Drawing and Discussion tool), in which case the expenses are minimal.

When this tool is used for monitoring, changes can be recorded on the maps/photographs, or on overlays, periodically. When this tool is used for evaluation, a comparison of maps and/or photographs at different times will be most useful.

2. If using aerial photographs or maps, common landmarks are first identified (local names for harbours, lakes, rivers, roads, buildings) and other areas are then identified relative to these. An overlay can be used on a aerial photograph to sketch in the areas of importance (fishing grounds, reefs, landing facilities.)

3. There are a number of different ways mapping can be organised. For example people can (separately or in groups) draw their own maps of the community and these can be compared and synthesised into one large map. This may be especially useful if different interest groups in the community are involved, as they will have different perceptions of resources. If activities affect the different interest groups, each of their perceptions should be recognised in order to begin successful negotiations.

### **Precautions**

Aerial photographs may be difficult to obtain and/or expensive to buy. They may also be difficult to read and interpret.

A comparison of individual maps may bring out feelings of inadequacy, or unwillingness to acknowledge specific fishing grounds.

Conflicts may result if inequities become apparent and old hostilities may be rekindled.

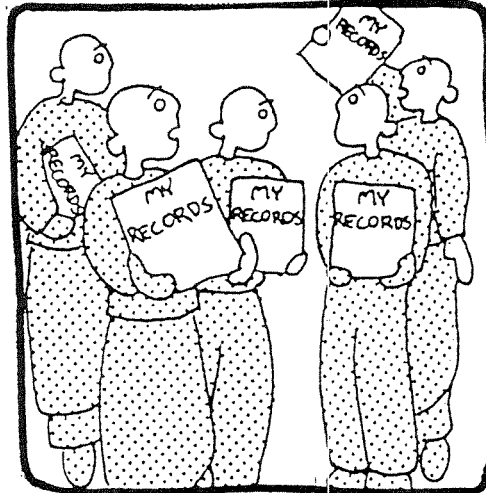
A cross section of the community is required to validate the overall community perceptions.

One person may dominate or direct the process of drawing if mapping is done by the group as a whole.

### Fisherfolk's Own Records

#### Description

An individual or community record booklet containing simple procedures to monitor information can be designed by insiders and outsiders to suit a specific area and situation. Monitoring indicators and terms of measurement are chosen by insiders. The recorded information is useful to individual fisherfolk and when synthesised is valuable to others.



#### Purpose

- Test and compare old practices with new practices
- Define future research and development priorities for improving the technology
- Provide an early warning system for new, locally untested technologies

#### Benefits

- Fisherfolk can see and judge for themselves, from their own information sources, the benefits or disadvantages of activities.
- The tool can be modified for use in all types of fishery activities such as fishing, fish farming, fish processing and marketing.
- The tool can monitor inputs (nets, boats, labour, fuel, fingerlings) and outputs (fish landed, fish sold, fish processed).
- The tool monitors what the fisherfolks perceive as important inputs/ outputs.
- The tool provides "local" research information which can be compared between fisherfolk and help to identify future research priorities.
- Provides site and situation specific information in a consistent format.



## Chapter Eight

### *Using the Fisherfolks Own Records Tool*

1. Insiders identify in order:

- their reason for keeping track of information;
- the overall method that will be appropriate for the purpose and the situation;
- what will be measured;
- and, the terms of measurement (for example, weight, number or container, labour measured by half day or by the hour).

2. Insiders and outsiders design a record keeping booklet (this may be only one page, or a number of pages, depending on the situation) that will meet their information needs. After being drafted, the booklet can be reproduced on sturdy paper, with strong binding.

If literacy is low, drawings can be substituted for writing, and pencil strokes for measures as shown below, where time spent working in various activities was recorded. By marking the number of saleable processed fish, fish processors could compare old and new methods of fish processing.

MAY 1996	OLD BOAT	NEW BOAT
MAINTENANCE DAYS	<del>TH</del> III	<del>TH</del>
DAYS FISHING	<del>TH</del> <del>TH</del> II	<del>TH</del> <del>TH</del> <del>TH</del>
NUMBER OF FISH CAUGHT (x10)	<del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del>	<del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del> <del>TH</del> II

3. The appropriate number of record keeping booklets can be produced and distributed to beneficiaries with a short explanation.

4. Consistent follow up and evaluation of the utility of the tool is necessary to encourage its continued and systematic use over time.

5. Periodic meetings can be held to synthesise, compare and discuss the results.

### **Precautions**

The results may be somewhat general if the tool is used to assess activities and/or technologies which are being used over a wide area as it will be difficult to identify and monitor all of the variables.

There should be space in the booklet for recording unexpected factors.

The booklet should be designed, analysed and produced by insiders. There is a danger that outsiders will control the situation.