



## **National Fisheries Development Board**

### **Guidelines for Fisheries Development in Reservoirs (RFD)**

#### **1.0 Introduction**

Reservoirs form an important source of fish production in India. Presently, the area under reservoir fisheries in the country has been estimated at about 3.0 million hectares and with the constant addition of new reservoirs/ impoundments, this area is likely to further increase in the coming years. In spite of the huge water area available under reservoirs, the utilization of these water bodies from the fisheries point of view is poor. The average productivity from all categories of reservoirs is estimated at about 15 kg/ ha/ year, although potential exists for manifold increase as demonstrated in some small, medium and large reservoirs in the country. Poor appreciation of the biological and limnological functions governing the production regimes of reservoirs and lack of stocking programmes have rendered below-optimal utilization of the fisheries potential of the reservoirs. It is expected that through sustained supplementary stocking of quality fingerlings, augmenting the fish stocks through auto stocking, adoption of appropriate mesh sizes, optimum fishing effort and enforcement of closed areas and closed seasons (mainly in medium and large reservoirs where auto stocking takes place), the average productivity could be increased to a level of 500 kg/ha/yr from small reservoirs; 200 kg/ ha/ yr from medium reservoirs; and 100-150 kg/ ha/ yr from the large reservoirs.

The best management practices evolved over the years for different categories of reservoirs entail 'stocking-cum-capture practices' for large and medium reservoirs and 'put and take practices' for small reservoirs. However, the success of these management practices would necessitate formulation of appropriate reservoir policies by the State Governments, which should take into consideration the intended beneficiaries; socio-economic benefits that would accrue to the beneficiaries, especially the poorest of poor segments of the society; human resource development; fisheries management rights; conservation and protection of breeding areas; lease policy, forward and backward linkages, etc. Further, the policy should also provide clear and unfettered access to the Department of Fisheries to carry out fish production activities in the reservoir.

Considering the fish production potentiality of the reservoirs in India, moderate investments can yield larger quantities of fish besides increasing the employment opportunities for the rural population. However, the success of fisheries development in reservoirs will be largely dictated by the formulation of appropriate lease policies, selection of reservoirs and commitment of the implementing agencies, including the beneficiaries to adopt scientific norms for both stocking and harvesting. The National Fisheries Development Board (NFDB) proposes that out of the 3.0 million hectares of reservoir area in the country, at least 50 percent would be taken up under its Reservoir Fisheries Development Programme within a span of five years.

## 2.0 Classification of reservoirs

The size of the reservoirs would be an important determinant of type and amount of financial investments to be made, likely increments in fish production, generation of employment, etc. Based on the understanding of the fish production potentiality of different sizes of reservoirs and their productivity in the country, these water bodies have been classified into the following size groups:

**Categorisation of reservoirs as per water spread area**

| SI No. | Category                 | Water spread area (in hectare) |
|--------|--------------------------|--------------------------------|
| 1.0    | <b>Small reservoirs</b>  |                                |
|        | <i>Category A</i>        | <b>40 - 200</b>                |
|        | <i>Category B</i>        | <b>201 – 1 000</b>             |
| 2.0    | <b>Medium reservoirs</b> | <b>1 001 – 5 000</b>           |
| 3.0    | <b>Large reservoirs</b>  | <b>5 001 and above</b>         |

## 3.0 Implementation of Reservoir Fisheries Development Programme

The State Government (Department of Fisheries) shall be the main agency for implementation of the Reservoir Fisheries Development Programme. They will be responsible for selection of the reservoirs to be developed under the NFDB programme, leasing of the water body to the beneficiary *i.e.* the lessee, monitoring and evaluation of the stocking and harvesting activities, assisting the beneficiaries in establishing sound forward and backward linkages, providing technical support and in capacity building of the beneficiaries from time to time. These Guidelines have been developed for the benefit of the States so that the proposals formulated for assistance under this program adequately reflect the concept of the Board on the various parameters of reservoir fisheries development in the country.

## 4.0 Norms for leasing of reservoirs

The lease period and the lease amount is a pre-requisite for sustainable development of fisheries in the reservoirs. To allow the beneficiaries to develop and sustain fisheries in the reservoirs, especially those under medium and large categories, a minimum lease period of five (5) years is necessary. However, a longer lease period of 10-15 years would be preferable as the beneficiary will have larger stakes in the development of the reservoir and would not look for short-term gains at the cost of sustainability. Further, the leasing should be carried out on a competitive basis with only reasonable incentives to cooperative societies. The State Government, as the recipient of the lease amount, shall also be required to share 25 percent of the actual lease income or actual license amount or actual auction amount received on the reservoir in question with the NFDB.

Presently, the lease value for reservoirs is largely determined on historical data of fish production from the said water body. In most cases this data pertains to the first few years of impoundment, when the water body generally undergoes a 'trophic burst' *i.e.* sudden increase in biological productivity leading to greater fish biomass. However, in the absence of a sustained stocking programme, this 'trophic burst' seldom lasts for more than a couple of years and the long-term 'trophic depression' starts and the fish biomass

drops considerably. Any attempt to consider the lease value on the basis of the initial production (fish biomass) or productivity can be unrealistic and will be a disincentive for the beneficiary, often leading to failure of repayment, etc. To allow for a more realistic assessment of the lease value, the following parameters may be taken into consideration:

- (i) Water retention time and effective storage level of the reservoirs.
- (ii) Fishing obstacles in the reservoir.
- (iii) Spillover problems, especially in the case of small reservoirs.
- (iv) Conflicting uses with other user agencies of the reservoir water.
- (v) Existing fish fauna of the reservoir, with special focus on the availability of predator species.
- (vi) Extent of auto stocking in the reservoir.
- (vii) Average of the last 5-7 years fish production from the reservoir.

## **5.0 Components of Assistance**

The NFDB will assist the following two components to support fisheries development in the reservoirs:

- Stocking of reservoirs with fingerlings of > 100 mm size.
- Training of beneficiaries

## **6.0 Norms for stocking of reservoirs**

Stocking will be the mainstay of reservoir fisheries development and will facilitate fish production on sustainable basis. Generally, the Indian major carps comprising fish species such as *Catla catla* (catla), *Labeo rohita* (rohu), *Cirrhinus mrigala* (mrigal) will form the core species for stocking of the reservoirs across the country. The implementing agencies in consultation with the beneficiary may also consider need-based stocking of additional species such as *L. bata*, *L. calbasu* and *Ctenopharyngodon idella* (grass carp).

As a thumb rule, the small reservoirs and those under medium category where autostocking is not possible will require a regular stocking programme to use the productive potential of the water body. In the absence of autostocking, this annual stocking is essential, otherwise the production potential of the water body shall remain un/underutilized. The large reservoirs will necessitate supplementary stocking until a critical mass of breeding population is established in the water body to ensure replenishment of the stocks that are harvested annually. This category will also include medium reservoirs where autostocking takes place.

The NFDB programme envisages stocking of the reservoirs with a standard stocking rate of 1 000 fingerlings. Based on the size of the reservoir, water retention capacity, prevalence of predators and productive water area, the implementing agency shall have the flexibility. However, it shall be ensured that this deviation from the standard stocking rate (1 000 fingerlings per hectare) does not fall below 500 fingerlings per hectare in case of medium and large reservoirs and above 2 000 fingerlings per hectare in case of small reservoirs. However the stocking rate shall be limited to 250 fingerlings/ha in large reservoirs in which the cat fish species are dominating.

## **7.0 Financial assistance for stocking**

The financial assistance to be provided by the NFDB towards stocking of IMC, minor carps and grass carp fingerlings, of not less than 100 mm, shall be Rupee one (Re 1) per fingerling. The total number of fingerlings for which funds shall be provided will be determined on the basis of the effective water area of the reservoir. This cost shall include all inputs that would go towards the production of the fingerlings on a commercial basis, whether *ex-situ* (in land-based nurseries) or *in-situ* (in pens and cages) and its transportation to the reservoir site for stocking. The lessee or the Implementing Agency shall carry out this activity with adequate monitoring and supervision at each stage to ensure that fingerlings of right size and numbers are stocked in the reservoir.

## **8.0 Training of beneficiaries**

### **8.1 Introduction**

Skill upgradation is an important component of any production-oriented activity. It assumes more importance when the inherent technical skills/ capacity of the intended beneficiary is low and thus can be an important attribute of success or failure of the activity. The NFDB's objectives of developing fisheries in the reservoirs can be adversely impacted if the technical skills of the fishermen are inadequate. Therefore, to meet this important requirement of human resource development in reservoir fisheries development, the Board envisages training to fishermen who constitute the lessees to whom the water body is leased for fishing purposes. As it is a training programme linked with the reservoirs funded by the NFDB, five day training programme is sufficient and dispensed with the demonstration.

### **8.2 Unit cost (training)**

The unit cost includes a standard training period of five (5) days and the following activities shall be funded under the programme:

**(i) Assistance to fishermen:** The fishermen shall be eligible for a daily allowance of Rs 125/ day and reimbursement of to and fro travel (train/ bus/ auto rickshaw) shall be reimbursed as per actuals, subject to a maximum of Rs 500.

**(ii) Honorarium to resource person:** For conduct of training, the Implementing Agency may engage the services of one resource person per training programme. The resource person may be given an honorarium of Rs 1 250 and to and fro travel expenses (train/ bus/ auto rickshaw) shall be reimbursed as per actuals, subject to a maximum of Rs 1 000.

**(iii) Assistance to Implementing Agencies:** The implementing agency shall be eligible to receive Rs 75/ trainee/ day for a maximum period of 5 days for organizing the training. This cost shall cover expenses towards identification and mobilization of the trainee and course material/ training kits, etc.

## **9.0 Submission of proposals**

The Implementing Agency shall be required to submit a detailed project proposal to the NFDB, which shall also incorporate the feasibility of the proposed activity. The proposal shall be submitted as per **Form I** (RFD) attached to these Guidelines. To ensure

systematic and orderly evaluation of proposals and their approval from the Board, the Implementing Agencies shall submit the proposal at the beginning of each quarter *i.e.* April, July, October and January.

## **10.0 Release of funds**

Generally, funds shall be released in two equal installments. The first installment, not exceeding 50 percent of the total project cost, shall be released on approval of the proposal by the NFDB. The second installment shall be released on successful completion of the stocking of the reservoir and certification by the monitoring committee set up for each reservoir.

## **11.0 Monitoring and Evaluation**

Since the ultimate success of fisheries development in the reservoirs would be determined by the stocking programme, it is essential to constitute a committee to monitor the activities and oversee the stocking of fingerlings in the water body. The said committee may be constituted involving representatives of the following organizations/ agencies:

- (i) Representative of the District Revenue Department
- (ii) Representative of the Irrigation/ Power Department
- (iii) Representative of the Local Body
- (iv) Representative of the Lessee
- (v) Representative of the Department of Fisheries

The Implementing Agency shall also furnish a progress report at the beginning of each quarter *i.e.* April, July, October and January on the physical and financial progress of the activity. The progress report shall provide critical evaluation of the performance, highlighting the achievements, constraints in implementation, etc.

## **12.0 Submission of utilization certificates**

The Implementing Agencies shall submit utilization certificate in respect of the funds released to them by the NFDB. Such certificates shall be submitted in **Form III (RFD)** on half-yearly basis *i.e.* during July and January of each year. The utilization certificates can also be submitted in between if activities for which funds were released earlier have been completed and the next dose of subsidy is required to complete the remaining works by the farmer.

## **13.0 General norms**

- (i) As a pre-requisite, scheme proposed for development of reservoir fisheries should be financially viable, socially acceptable, environmentally sound- The technical parameters proposed in the scheme should be in conformity with the scientific norms developed for reservoir fisheries. The scheme should be robust to generate adequate surplus to meet the repaying capacity of the borrower.
- (iii) The Department of Fisheries shall register all fishing boats and gear and shall maintain a registry of such boats and gear to estimate the effort deployed in the reservoir.

- (iv) The beneficiary shall maintain full record of stocking of fish fingerlings and other inputs released into the reservoir and daily records of fish catch harvested for each unit of boat and the nets used thereof. This data shall be made available to the State Government and the NFDB at specified intervals.
- (vi) The beneficiaries, in consultation with the Implementing Agency, make suitable arrangements for marketing of fish harvested from the reservoir.
- (vii) The Implementing Agency must ensure that the beneficiaries are adequately trained in all aspects of reservoir fisheries such as seed raising and stocking, efficient use of fishing gear and post-harvest handling of fish.
- (viii) The Implementing Agency shall maintain a separate account for the funds released by NFDB under this activity.
- (ix) The implementing agency shall ensure that the stocking and harvesting activities are taken up as per scientific norms and any harvesting practice that may have adverse impact on the sustainability of the reservoir fisheries shall not be allowed by the Implementing Agency. The Implementing Agency shall also strictly enforce closed season and wherever necessary closed areas in reservoirs where autostocking takes place to protect the fish brood stock and the juveniles.

**FORM – I(RFD)**

**Application for submission of proposal for financial assistance from  
National Fisheries Development Board**

| <b>Sl. No.</b>                        | <b>Information sought from the<br/>Implementing Agency</b>  | <b>Information furnished by the<br/>Implementing Agency</b> |
|---------------------------------------|---|---|
| <b>(1)</b>                            | <b>(2)</b>  | <b>(3)</b>  |
| <b>1.0</b>                            | Name of the Reservoir:  |   |
| <b>2.0</b>                            | Name and address of the Lessee (telephone/<br>mobile numbers):  |   |
| <b>3.0</b>                            | If Lessee is a Cooperative Society, please<br>provide details of the Society:                                     |   |
| <b>4.0</b>                            | Details of the reservoir:   |   |
|                                       | a) State:   |   |
|                                       | b) District(s):   |   |
|                                       | c) Taluk(s)/ Mandal(s):   |   |
|                                       | d) Revenue village(s) located on the<br>reservoir:  |   |
|                                       | e) Ownership right (whether freehold<br>or lease hold):   |   |
|                                       | f) If on lease, duration of the lease:  |   |
|                                       | g) Reservoir water spread area (in ha):<br><br>Full Storage Level (FSL):<br><br>Dead Storage Level (DSL):         |   |
| h) Average water spread area (in ha): |   |   |
| <b>5.0</b>                            | Details of facilities for stocking of seed:   |   |
|                                       | a) Hatcheries:<br><br>b) Rearing facilities from spawn to<br>fingerling of 100 mm size, including<br>pen culture: |   |
| <b>6.0</b>                            | Whether the Lessee is in default of payment<br>any Financial Institution/ State Government:                       |   |

| (1)         | (2)  | (3) |
|-------------|--|-----|
| <b>7.0</b>  | Details of craft and gear and other facilities available with the Lessee:                        |     |
|             | a) Fish landing centres with facilities:   |     |
|             | b) Boats, their type and number:   |     |
|             | c) Net units, their type and number:   |     |
|             | d) Fish transport vehicle(s):  |     |
|             | e) Other facilities, if any at the reservoir site:   |     |
| <b>8.0</b>  | Existing production/ ha/ year from the reservoir:  |     |
| <b>9.0</b>  | Proposed stocking of fingerlings > 100 mm size during year 1-5 of the project implementation:    |     |
| <b>10.0</b> | Expected production/ ha/ year from year 2 - 6 as envisaged by the Implementing Agency/ Lessee:   |     |
| <b>11.0</b> | Marketing arrangements proposed by the Implementing Agency/ Lessee:                              |     |
| <b>12.0</b> | Annual lease rent fixed by the State Government:   |     |
| <b>13.0</b> | Mode of payment of annual lease amount by the lessee to the State Government:                    |     |
| <b>14.0</b> | Projected repayment by the State Government to NFDB during year 2 - 6 of project implementation: |     |
| <b>15.0</b> | Any other information which the Implementing Agency/ Lessee may like to furnish:                 |     |

**Date:**

**Place:**

**Signature and seal of the authorized  
representative  
of the Implementing Agency**

**Application for Training under Reservoir Fishery Development**

| Sl. No | Particulars sought from the Implementing Agency                      | Information furnished by the Implementing Agency |       |         |
|--------|--|--|-------|---------|
| (1)    | (2)  | (3)  |       |         |
| 1.0    | Name and address of the Implementing Agency:                         |  |       |         |
| 2.0    | Location of the Training Facility:                                   | District   | Block | Village |
| 3.0    | Facilities available or proposed for imparting training:             |  |       |         |
| 4.0    | Details of the reservoir:  |  |       |         |
|        | Name of the name of reservoir  |  |       |         |
|        | Water spread area of the reservoir                                   |  |       |         |
|        | Mode of fishing method (Licensing/lease/auction/others)              |  |       |         |
| 5.0    | Expected fish production from the reservoir                          |  |       |         |
|        | a) Existing fish production per (ha):                                |  |       |         |
|        | b) Expected fish production per ha area by fishermen after training  |  |       |         |
| 6.0    | Average fish production in the area (kg/ha/ annum):                  |  |       |         |
|        | No of fishermen depending on the reservoir                           |  |       |         |
|        | No of fishermen to be proposed for training                          |  |       |         |
|        | No of days of training   |  |       |         |
|        | Whether the trainees underwent any training program before 6 months. |  |       |         |

| <b>Financial Implications</b> |  |               |               |
|-------------------------------|--|---------------|---------------|
|                               | <b>Item</b>  | <b>Number</b> | <b>Amount</b> |
|                               | i) Assistance to farmer @ Rs 125/ day for 10 days:                                   |               |               |
|                               | (ii) Reimbursement of to and fro travel expenses to farmer:                          |               |               |
|                               | (iv) Honorarium to resource persons and reimbursement of to and fro travel expenses: |               |               |
|                               | (iii) Assistance to implementing agency @ Rs 75/ trainee/ day:                       |               |               |
|                               | Total of (a)   |               |               |
| 11.0                          | Technical capabilities of resource persons to be engaged in training:                |               |               |
| 12.0                          | Any other details in support of the proposal   |               |               |

Date:

Place:  
Agency

Signature of the Implementing

agency

Seal and address of the implementing

**Form for Submission of Utilization Certificate**

| Sl. No | Letter No and date | Amount |
|--------|--------------------|--------|
|        |                    |        |

Certified that out of Rs \_\_\_\_\_ sanctioned during the year \_\_\_\_\_ in favour of \_\_\_\_\_ under the National Fisheries Development Board's Letter No given in the margin and Rs \_\_\_\_\_ on account of unspent balance of the previous sanction, a sum of Rs \_\_\_\_\_ has been utilized for the purpose of \_\_\_\_\_ for which it was sanctioned and that the balance of Rs \_\_\_\_\_ remains unutilized. The same will be adjusted towards the next installment payable during the period \_\_\_\_\_.

**2.0** Certified that I have satisfied myself that the conditions on which the funds were sanctioned by the National Fisheries Development Board have been duly fulfilled/ are being fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned.

**Date:**

**Place:**

**Signature and seal of the  
authorized representative of the  
Implementing Agency**