सत्यमेव जयते

MODEL GUIDELINES

FOR

RESERVOIR FISHERIES MANAGEMENT

Department of Fisheries
Ministry of Fisheries, Animal Husbandry and Dairying
Government of India

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PREFACE

Transforming India's Reservoir Fisheries: A Vision for Sustainability and Growth

India is blessed with a vast network of reservoirs, truly the "sleeping giants" of our inland fisheries sector. With a colossal water spread area of approximately 3.46 million hectares, these reservoirs hold the key to significantly enhancing our national fish production, ensuring food security, and strengthening rural livelihoods.

Currently, we are utilizing only a fraction of this potential. The gap between the estimated annual production potential of 2 million tonnes and the current realization of about 0.45 million tonnes is a stark reminder of the urgent need for systemic and scientific intervention. This gap is attributable to diverse challenges, including inadequate seed stocking, fragmented governance, and a lack of standardized, science-based management protocols.

The release of these "Model Guidelines for Reservoir Fisheries and Aquaculture Management" by the Department of Fisheries, Ministry of

Fisheries, Animal Husbandry and Dairying, Government of India, marks a pivotal step toward harnessing of this untapped potential.

This document provides a cohesive, strategic, and scientifically informed blueprint for States and Union Territories (UTs) to formulate their own context-specific policies that transcend traditional silos and usher in an era of enhanced productivity and ecological sustainability.

Key Focus Areas of the Guideline:

- Scientific Management: Promoting regular stocking of native species and adopting scientific harvesting protocols, including the encouragement of cage and pen-based aquaculture in suitable zones.
- Governance and Rights: Establishing a robust governance framework, clearly defining Fisheries and Aquaculture Rights, and detailing a transparent leasing system to ensure sustainable and equitable resource use.
- Livelihoods and Inclusion: Prioritizing the engagement of local communities, Fisheries Cooperative Societies (FCS), and people displaced by dam construction, ensuring that the economic benefits reach the most vulnerable and dependent populations.
- Technology Integration: Encouraging the deployment of modern tools like GIS mapping, IoT-based monitoring, and Blockchain technology for efficient reservoir management and product traceability.

I urge all State and UT Fisheries Departments, along with relevant line departments like Water Resources, Environment, and Local Governance, to adopt and implement these guidelines with the spirit of inter-departmental

collaboration to sustainable harnessing of reservoir fisheries potential for the benefit of different stakeholders.

By working together, we can transform our reservoirs into highly productive, ecologically balanced, and economically vibrant assets, thereby boosting the livelihoods of millions of fisherfolk and making a significant contribution to the goals of Viksit Bharat inclusive growth and food and nutritional security for the nation.

(Sagar Mehra)

1. INTRODUCTION

India's vast reservoir resources, often called "sleeping giants," are one of the country's most extensive yet significantly underutilized assets for inland fisheries and aquaculture development. The nation is endowed with extensive reservoir resources, encompassing 3.46 million hectares of water spread area. These reservoirs are distributed across diverse climatic zones and account for 31% of total water resources. With the ongoing infrastructure development and the creation of new reservoirs and impoundments, this area is projected to expand in the coming years.

Of the total reservoir area, small reservoirs cover 1.27 million hectares, while medium-sized reservoirs account for 0.57 million hectares, and large reservoirs account for 1.61 million hectares. Despite their considerable production potential, estimated at 500 kg/ha for small reservoirs, 250 kg/ha for medium reservoirs, and 100 kg/ha for large reservoirs, the current average fish yield remains low at approximately 129 kg/ha. Based on these benchmarks, the total annual production potential is estimated at 2 million tonnes, yet only 0.45 million tonnes are currently being realized.

This substantial gap between potential and actual output underscores the pressing need for strategic interventions and enhanced management

practices to harness the full potential of reservoir ecosystems. Reservoirs serve as critical assets for fish production and the livelihoods of millions of people. With effective governance, they can make significant contributions to food security, rural employment, and economic growth while preserving ecological integrity.

Currently, reservoir fisheries management is grappling with several systemic challenges. These challenges include inadequate seed stocking, the absence of leasing policies in many States and Union Territories, a lack of cluster-based approaches, limited adoption of scientific management practices, and insufficient understanding of the complex dynamics of reservoir ecosystems. Furthermore, the absence of clearly defined fisheries rights often leads to stakeholder conflicts and discourages community stewardship and responsible resource utilization.

To effectively address these complex and multifaceted challenges, a robust, unified, and science-driven approach is essential. There is a critical need for sound policy by the States for reservoir fisheries development that transcends departmental silos and promotes a culture of sustainability and productivity. States and UTs require a clear, comprehensive, and scalable blueprint to formulate their own context-specific policies.

To address these gaps, a Model Guideline for reservoir fisheries and aquaculture management is imperative. Such a framework can catalyse transformation by promoting the regular stocking of suitable species, the adoption of scientific harvesting protocols, and the equitable allocation of leasing and access rights. These measures will enhance productivity, ensure sustainable resource utilization, and strengthen the socio-economic resilience of fishing communities. Sustainability is central to this effort, requiring the integration of strategies for conserving aquatic biodiversity,

regulating fishing pressure, and mitigating environmental impacts. Furthermore, successful implementation hinges on robust interdepartmental collaboration—synergy among the Departments of Fisheries, Environment, Water Resources, and Local Governance is crucial to align goals and effectively address cross-cutting issues, such as water quality management and habitat conservation.

Community participation through co-management models should be emphasized, enabling local stakeholders to engage in decision-making and benefit-sharing, thereby fostering ownership and long-term stewardship. By promoting synergy among stakeholders and prioritizing scientific interventions, a comprehensive guideline can unlock the full potential of reservoirs in India, ensuring enhanced productivity, sustainable resource use, and improved livelihoods for millions who depend on these vital water resources.

The drafting of these Model Guidelines is a cornerstone of the Central Government's multifaceted initiatives aimed at comprehensively developing and sustainably managing the reservoir fisheries sector across India. Recognizing the vast but underutilized potential, the Department of Fisheries, Government of India, is dedicated to transforming these water bodies into highly productive and ecologically balanced assets. These model guidelines aim to provide a cohesive, scientific, and strategic framework while serving as a blueprint for States and Union Territories, enabling them to develop tailored, region-specific policies. By doing so, they can unlock more than 2 million tonnes production potential, enhance livelihoods, and significantly contribute to the nation’s food and nutritional security.

2. OBJECTIVES OF THE MODEL GUIDELINES

The broad objectives are:

i) Enhance fish production and productivity through the application of scientific and sustainable practices.

ii) Promote ecological sustainability, biodiversity conservation, and climate resilience in reservoir ecosystems.

iii) Strengthen institutional frameworks and governance mechanisms for reservoir fisheries.

iv) Generate rural employment and promote entrepreneurship, particularly among displaced communities, including women and youth.

v) Facilitate market linkages, value chain integration, and branding of reservoir fisheries produce.

vi) Encourage the adoption and integration of modern technologies, including GIS mapping, IoT-based monitoring, and comprehensive digital reservoir management systems

3. ASSESSMENT OF RESERVOIR FISHERIES RESOURCES

States and UTs must assess reservoir resources and maintain a record of endemic, native, and introduced fish species in the reservoir, evaluating their abundance and distribution with the assistance of ICAR Fisheries Research Institutes. Water quality and fish production of each reservoir may be assessed, and records be maintained by the State/ UT governments. To better manage the fisheries and aquaculture in reservoirs, the States and UTs categorize them as Large, Medium, & Small reservoirs based on the area as recommended by the ICAR-Central Inland Fisheries Research Institute, Barrackpore, Kolkata.

4. CLASSIFICATION OF RESERVOIRS

The State/UT Fisheries Department may undertake surveys of reservoirs to identify suitable fishing areas, estimate fish stocks through a process involving cooperatives and the fishing community. Productivity assessments within the identified fishing zones may be done based on the reservoir's morphometric, hydrographical, and meteorological characteristics, along with other relevant data on fish production.

The classification of reservoirs is to be restricted based on average water holding area in the reservoir, as per the reservoir classification of the Government of India, as under:

i) Small reservoir - more than 10 hectares and less than 1000 hectares.

ii) Medium reservoir - more than 1,000 hectares and less than 5000 hectares.

iii) Large reservoir - 5000 hectares and above.

A district-wise list of all such water bodies having fishery rights as per the above classification may be maintained in a register verified by the District Fisheries Officer with the required information [such as name, location, water area (based on FRL), average depth, etc.]

5. FISHERIES AND AQUACULTURE RIGHTS AND GOVERNANCE FRAMEWORK

The 'Fisheries and Aquaculture Rights' in all reservoirs may be given to the Fisheries Department of the State/UT. The State/UT Fisheries Department may issue guidelines for fisheries development and proper management of all such reservoirs. In case of the reservoirs which to be built/developed by the Water Resources Department in the future, the transfer of fisheries rights to the State/UT Fisheries Department may be done after obtaining a no-objection certificate from the Water Resources Department. In the event of issues arising from Fisheries and aquaculture rights, the Department of Fisheries (DoF) of the respective State/Union Territory may engage in negotiations, prioritizing the broader interests of the fisher communities in the surrounding areas. After the transfer of 'Fisheries and Aquaculture Right', the responsibility of enhancing fish production and productivity through fisheries development in all such reservoirs will be the responsibility of the State/UT Fisheries Department as under:

a) Implementation of the fisheries development scheme and other fisheries activities, fish harvesting can be done in the reservoir without affecting the original objective of the reservoir's construction.

b) For stocking fish fingerlings in reservoirs, the Fisheries Department of States & UTs may establish necessary infrastructure, such as nurseries and rearing ponds, fish hatcheries, and sheds, etc., near the reservoir or follow a cluster approach by creating common facilities for a group of reservoirs.

c) For fisheries development, infrastructure facilities and structures such as link pathways/roads, electricity, common space, nursery/rearing units, fish hatchery, fish landing centre, sheds, etc., may be constructed in a manner that does not impede reservoir-related activities, including irrigation, drinking water supply, routine maintenance, and necessary repairs.

d) To support the effective management and fisheries development in reservoirs, a "Coordination Committee" may be formed at the district level, consisting of the representative from the line Department, such as Water Resource, Fisheries, Revenue, and Forest, etc., led by a senior-level officer from the Water Resource Department. The meeting of the said Committee may be convened every three months or as required.

Functions of the Coordinating Committee:

i) The Committee may be responsible for recommending the issuance of No Objection Certificates and the transfer of fisheries rights pertaining to other constructed or developing reservoirs under the ownership of the Water Resources Department.

ii) Take necessary initiatives to remove the interdepartmental bottlenecks in the implementation of the fisheries development schemes.

iii) May demarcate the suitable sites for the construction of fisheries infrastructure in the area near the Reservoir.

iv) May assist in the selection of suitable sites (notch, curve, and nose) for the installation of cages/pens in the Reservoir.

v) Appropriate recommendations/decisions can be taken as per the local situation to deal with the emergency (flood, drought, etc.).

6. RESERVOIR FISHERIES MANAGEMENT

a) Stocking of fingerlings, especially in the peripheral canals, as a nursery rearing unit of native species in reservoirs, as per the productivity of the reservoir.

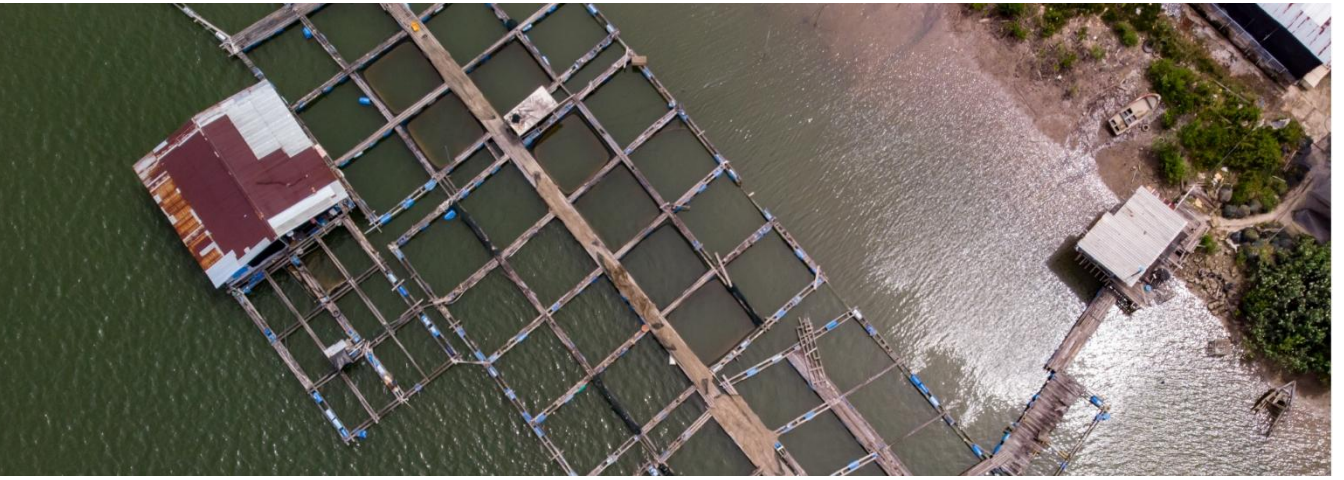
b) Cage and pen-based fisheries and aquaculture in the reservoir may be encouraged, subject to norms. Pen culture in shallow areas of large and medium reservoirs is a beneficial and cost-effective means to raise fingerlings for stocking.

c) Construction of required infrastructure for necessary inputs and smooth post-harvest operations (hatchery, rearing pond, landing centre, feed mill, shed, etc.) on suitable lands near reservoirs.

Technology, Innovation, and Digital Reservoir Management:

i) GIS-based mapping and IoT applications may be deployed to enhance the reservoir management through continuous water quality monitoring and fishery resources assessment.

ii) Blockchain use may be prioritized to improve traceability as well as monitoring of renewable energy integration and the aquaculture systems adopted in the reservoir.



7. CAGE AND PEN-BASED AQUACULTURE IN RESERVOIRS

Cage-based farming is well-suited for large, open-water systems like reservoirs and offers significant potential for augmenting fish production. Its implementation must strictly adhere to the SoPs/advisories issued from time to time by the Ministry of Fisheries, Government of India and ICAR Fisheries Institutes. These guidelines govern the selection of reservoirs suitable for cage culture and stipulates limits on the number of cages permissible per reservoir, with the objective of preventing eutrophication and other adverse environmental impacts. Only native species or exotic species explicitly approved by the Government of India may be used for cage culture. In cases where exotic species are introduced, all relevant Central Government protocols must be followed for species selection and management. Furthermore, all national guidelines concerning the use of chemicals, antibiotics and pharmaceuticals in aquaculture may be applicable to cage-based operations in reservoirs.

Despite regulatory restrictions, the vast expanse of reservoirs and the availability of aquatic resources across the country present significant opportunities for states to substantially enhance fish production.

Cooperatives/SHGs or FFPOs of SC/ST or the local and resident populations, who depend on the reservoir for their livelihood, may be encouraged to undertake cage farming under strict monitoring by the State Fisheries Department. Such management platforms involving stakeholder groups may be preferred to leasing cage culture rights to individuals.

Each state may delineate suitable zones or areas within the reservoirs and notify

a) the specific areas within water bodies designated for the installation of cages and pens, and

b) the permissible number of cages for each reservoir. Pen culture is especially suitable for raising fingerlings intended for stocking in the reservoirs that follow culture-based fisheries.

It would be necessary for the lessee/settler to carry out cage/pen-based fish farming in the reservoir so that the incorporation of new technology can enhance fish productivity and production of the reservoir. The following measures are suggested for adoption for cage culture and pen-based culture in reservoirs:

i) Depth is a critical parameter in selecting reservoirs and specific sites for cage culture. Reservoirs must have a minimum average depth of 10 metres, and designated cage sites may maintain a water depth of at least 10 metres throughout the year. Additionally, a vertical clearance of at least 6 metres must be maintained between the cage bottom and the reservoir floor to ensure optimal water circulation and environmental safety.

ii) For determining the maximum number of cages permissible in a reservoir, states may adhere to the SoPs/advisories issued from time to time by Department of Fisheries, GoI and ICAR-Fisheries Institutes.

iii) Pen installation may be undertaken in shallow and flat zones of reservoirs where water depth remains low, typically around 4–5 feet, in accordance with prescribed standards. Areas characterized by gentle slopes and soft bottoms are particularly suitable for pen culture. Installation is most feasible during summer months when water levels recede or the reservoir bed becomes exposed, facilitating structural setup and anchoring.

iv) The cage/pen may be installed in the curve, notch, or nose portion of the reservoir, away from the main water inlet/outlet channel of the reservoir.

v) The suitable place and number of cages and pens for installation in reservoirs may be determined by the District Fisheries Officer as per the decision and direction of the coordination committee constituted for reservoir management.

vi) For successful implementation of cage/pen-based fish farming, the lessee/settler of the reservoir can form separate cage and pen groups according to the reservoir's capacity.

vii) Cage and pen-based fisheries and aquaculture is a group-based fisheries activity in which as many groups (one or more) of willing and like-minded members/fishermen may be formed by the lessee so that the benefits of departmental schemes may reach the maximum beneficiaries through the group.

8. FISHERIES DEVELOPMENT AND LIVELIHOOD DIVERSIFICATION

i) Small reservoir fisheries enhancement and management to be governed by the Fisheries Cooperative Societies (FCS) cluster(s) involving the local people who were displaced by dam formation, fixing some revenues as imposed by the respective line Departments, targeting to derive more benefit for the beneficiaries as a token of socio-economic development, ensuring sustainable livelihoods.

ii) All large category reservoirs may be brought under the framework of robust management protocols, involving a strengthened cluster of Primary Fishery Co-operative Societies (PFCS) that have command over all FCS functioning in such reservoirs.

iii) Stocking of fish fingerlings, as well as cage and pen-based farming, may be carried out on a priority basis in the reservoir.

iv) The lessee or settler may undertake stocking of fish fingerlings in the open reservoir area under the supervision of an authorized representative designated by the District-Level Fisheries Officer and the concerned local departmental officer. Fingerlings from native broods of

respective reservoir systems may only be stocked, adhering to the recommended stocking rate of 1,000 fingerlings per hectare, with each fingerling measuring a minimum of 10 cm in length.

v) The frequency of fish stocking in the reservoir can be considered based on the assessed reservoir stocking density and the desired fish production level.

vi) To restore the fish species found in a particular reservoir, the lessee must undertake breeding and seed production, stocking of the specific species, and promotion of native species under the guidance of the District Fisheries Officer.

vii) The lessee may maintain a record of fisheries activities carried out in the reservoir and may produce the documents to the department official upon demand.

viii) Fishers engaged in reservoir fisheries need to be provided with microcredit, training, and marketing facilities to uplift the fishing community and increase the productivity of the reservoir.

ix) Rehabilitation programmes for livelihood enhancement of the local community may be incorporated into all reservoir fishery development schemes or models, as applicable.

x) Eco-tourism promotion in the reservoirs by the State/UTs may be encouraged to enhance the livelihood diversification of the reservoir department community.

xi) Being a multi-stakeholder domain, no fertilizer or manuring applications are to be practiced by any lessee in any reservoir while targeting fisheries enhancement in these ecosystems to avoid eutrophication.

9. MARKETING LINKAGE AND VALUE CHAIN DEVELOPMENT

i) The fish marketing and value addition network may be integrated with cold chains, Fish Farmers' Producers Organisations (FFPOs), or Self-Help Groups (SHGs)-led marketing networks for streamlining post-harvest reservoir fisheries management. For these, ICAR Fisheries Research Institutes may provide technological support for post-harvest management,

ii) Modern and Smart Fish Landing centres and fish kiosks may be developed for the integration of post-harvest management.

iii) Eco-labels may be incorporated into the marketing network to increase consumer trust and market value.

iv) Public-Private Partnership (PPP) approach may be prioritized for improving the infrastructure and marketing of fisheries produce.

v) Linking these networks to the community's nutritional programme may be prioritised to improve the health and economic outcomes of the fishers' community.

10. RESERVOIR FISHERIES OPERATIONS AND LEASING SYSTEM

i) Under the "Integrated Reservoir Management Model" of reservoir fisheries development, stocking of fish fingerlings in the open reservoir (main water spread area) and cage & pen-based fisheries are to be carried out in the marginal area ('curve', 'notch', and part of 'nose' water area) of the reservoir.

ii) The settlement of reservoirs may be conducted through open bidding or by granting a lease to the local community engaged in fishing, who are primarily landowners. The settler/lessee with whom the reservoirs have been settled through an open bid may stock fish fingerlings according to set standards and carry out cage/pen-based fish culture, through which fish production and productivity of the reservoirs can be enhanced.

   a. The amount of reserve deposit for small, medium, and large-sized reservoirs may be fixed by the concerned State Government through the committee constituted as mentioned in Para-11.

b. The reserve deposit may be reviewed periodically, based on the estimated fish stock, potential productivity, and the reasonable utilization of resources.

iii) The bid commences with the fixed reserve deposit, and the successful lessee will deposit the amount of the highest bid. The District Fisheries Officer will deposit this amount in the income head of the Water Resources Department.

iv) Preference may be given to the active Fisheries Cooperative Societies (FCS) or affected people in the area due to the inundation in the bid process in case of small reservoirs.

v) For medium and large reservoirs, lease out to lessee for fish harvesting and selling with a rider to be imposed on them as to take care of all the displaced persons suffered due to dam formation, take them into cognizance engaging all in harvesting fishes from the large water bodies with due remuneration on per kg of fish being caught/harvested by them on day-to-day basis.

vi) For medium and large reservoirs, the line Departments or Fisheries Federation may facilitate the lessee in a stock enhancement program on a regular basis as the mandatory activities enabling the lessee, the beneficiaries, and the reservoir authorities to benefit in a symbiotic manner. ICAR-CIFRI may be involved as a technical guiding force towards sustainable fisheries enhancement of such precious ecosystems.

vii) The responsibility of stocking fingerlings and other fisheries developments, such as cage/pen culture, in all reservoirs

leased/leased out through open bidding may be that of the concerned lessee.

viii) The action related to the bid of the reservoir may be executed by the concerned Assistant Director/District Level Fisheries Officer. After the recommendation of the Joint Director/Deputy Director of Fisheries (Zonal level), it may be necessary to obtain the approval of the Director of Fisheries before issuing the fishing license for the leasing out of reservoirs through an open bid.

ix) Lease values to be decided based on the accessible area for fishing, leaving the protected areas under forestry, if any.

x) The State/UT Fisheries Department may have the right to keep any such reservoir for the purpose of training, research, brood collection, and dissemination, etc. As required, the Department may also get these works done in coordination with the lessee of the settled reservoir. University/college and Fisheries Research Institute may be involved in training, research, and extension etc. in reservoirs.

xi) Fishing may be prohibited within a 500-meter radius upstream and downstream from the dam of large reservoirs. Similarly, in medium and small reservoirs, fishing may be banned within 100 meters upstream and downstream of the dam. This restriction can be altered in consultation with the local engineer of the Water Resources Department. But fishing may be prohibited in all the canals emanating from the reservoirs. The system of fishing being implemented in these canals by the Water Resources Department may remain the same.

xii) For integrated reservoir fisheries development, the Department may construct any permanent structure, other than a nursery/rearing pond,

fish hatchery, landing center, shed, etc., in consultation and after obtaining due permission from the Water Resources Department.

xiii) The fisheries activities, fish harvesting, and other related activities in the reservoir may be carried out in such a way that there is no obstruction or damage caused to the structure and operation of the dam.

xiv) To increase fish productivity and production in the reservoir, cages and pens may be installed in suitable areas of the reservoir. Depending on the availability of modern materials for constructing cages and pens, various shapes, sizes, and types of cages/pens are installed scientifically and securely. Usually, the shape of the cages is rectangular or circular.

xv) The primary objective of constructing reservoirs is to provide water for irrigation in the fields. In the event of a drought, if there is an insufficient quantity of water, even if fisheries are affected, water may be made available in the canals on a priority basis as needed. No dispute/obstruction whatsoever may be entertained by the lessee or the user Department on this matter.

xvi) In the event of excessive rainfall and water accumulation in the reservoir, water is released by opening the sluice gates. In this situation, in case the cages/pens get damaged and accumulate as a blockage in the sluice gates, there may be a possibility of obstruction of water flow. To deal with that emergency, it may be the lessee's responsibility to make arrangements as required and remove the cages/pens without delay.

xvii) For the inclusion of scientific fisheries technology in the State's reservoirs, conservation of fish-biodiversity, and proper fisheries

management, the State/UT Fisheries Department may establish a separate 'Reservoir Division'.

xviii) State/UT Fisheries Department may convene the meetings with stakeholders including lessee from time to time to resolve the issues relating to reservoir fisheries.

11. DETERMINATION OF SAFE DEPOSIT

i) State/UTs Fisheries Department may determine the safe deposit of particular reservoirs during the lease process. The States/UTs may determine the limit of the safe deposit for fisheries activities in different types of reservoirs through a committee constituted under the chairmanship of the senior-level fisheries technical officer, preferably the Director of Fisheries.

ii) The Assistant Director/District Fisheries Officer may prepare a proposal for reservoir-wise safe deposit along with information related to the status report of reservoirs under his jurisdiction (such as name of reservoir, address, water area, average depth, etc.) and submit it before the said committee and obtain its recommendation, which may be finally approved by the Director of Fisheries.

iii) The Reserve Deposit Fixation Committee may be constituted under the Chairmanship of the Deputy Director or an equivalent-level officer of the fisheries department, along with other members of appropriate level for transparency purposes.

iv) The quorum for the meeting of the Reserve Deposit Fixation Committee may be completed in the presence of at least three members.

v) The committee may make recommendations to the Director of Fisheries after determining the safe deposit for fisheries activities in the reservoir. This committee may review it every seven years and again determine a new safe deposit. Its appellate authority lies with the Director of Fisheries of the Concerned State and UT.

12. LEASE PERIOD

The settlement period of all types of water reservoirs may be seven fisheries year (1 July to 30 June), which may be extended up to 10 years after the satisfactory evaluation by the Co-ordination Committee. In the event of unsatisfactory work and violation of conditions by the lessee, if considered necessary, the settlement made may be cancelled, provided a prior notice is given with the approval of the Director, State Fisheries.

13. PROCESS OF CALLING BIDS IN THE SETTLEMENT OF RESERVOIRS

After determining the safe deposit for district-wise reservoirs, the following procedure may be adopted for settlement through open bidding after advertisement:

i) The District Fisheries Officer may publish advertisements through Traditional/Digital Advertising with the desired information for the settlement of water reservoirs. The bidding process may be completed in the presence of Deputy Director of Fisheries on the scheduled date.

ii) The bidding process may be conducted in the manner as prescribed by the State Government.

iii) Applicants participating in the auction may be required to submit a valid photo ID and a security deposit amount (as security) to the office at the start of the auction.

iv) In case the bid amount is double the security deposit, the bidders would be required to deposit an additional 50% of the bid amount (as security).

v) The reservoir may be allotted to the highest bidder. After the bid is over, half of the bid amount must be deposited at the same time, and the remaining amount within the next three days (working days).

vi) The District Fisheries Officer may have the power to cancel the bidding process without assigning any reason in case the bidding is less than the security deposit. The security amount deposited by the bidder to the other unsuccessful bidder may be refunded immediately after the bidding process.

vii) In the event of non-payment of the amount by the due date, the security amount of the successful bidder may be forfeited, and the bidding process may be restarted.

viii) During the bidding process, the security amount may be paid via a banker's cheque. Cash transactions may be prohibited. The remaining amount may be deposited in the District Fisheries Office as directed by the successful bidder.

ix) After the reservoir settlement, the settlement holder may get an agreement executed in the prescribed form, on which the expenses etc., may be borne by the concerned settlement holder.

14. CONSERVATION AND BIODIVERSITY SUSTAINABILITY IN RESERVOIR

i) In reservoirs where catch depends on capture fisheries, a two-month restriction on fishing activities in the reservoirs may be adopted following the first monsoon. The decisive power for the period of closure lies with the States, depending on the monsoon pattern, especially during the monsoon. However, such a ban is not necessarily applicable to small, shallow reservoirs, where culture-based fisheries is practiced. In culture-based fisheries, the catch comprises fish that are wholly or mostly stocked. It is managed based on annual stocking and recapture. In such reservoirs, stocked fish are not expected to breed as the water dries up or the water level goes critically low during the lean season, leaving no room for breeding.

ii) In large and medium reservoirs, it is important to ensure that the stocked fish are not caught before they attain the age of reproduction. For this, necessary mesh regulations and other restrictions on catching young fish using drag nets and other gears.

iii) In newly impounded reservoirs, it is a good practice to stock heavily during the first 2-3 years after impoundment, with a total ban on

catching the stocked fish. This may allow building up robust breeding populations for sustainable harvest for the years to come. Such stocking can also be resorted to rebuild fish stocks in order to correct stock loss to natural calamities like flooding and overflowing of the dam.

iv) Declaring the lotic part (where the reservoir water meets the stream/river) of the reservoir as a 'No Fishing Zone 'because the water current helps in the natural breeding of fish.

v) Strict surveillance may be maintained to protect the breeding grounds of the endemic fish during the monsoon season.

vi) Endangered fish species in the state's water resources, if any, can be conserved and reestablished in a particular reservoir.

vii) Catching, harvesting, and sale of Indian Major Carps less than 250 mm in length in reservoirs may be prohibited so that these fish get an opportunity to breed at least once.

viii) Operation of gill nets having a mesh size (stretch length) less than 100 mm may be prohibited in the reservoir.

ix) Operation of any form of drag net with zero mesh netting in the reservoir may be prohibited.

x) Fishing in the reservoir using poison, poisonous chemicals, dynamite, or other explosives may be prohibited.

xi) The water entry gate (head regulator) in the drainage system and the canals emanating from the reservoir may be prohibited from being covered with any type of fence, net-bamboo, gillnet, or similar material.

xii) State/UT Fisheries Department can declare any part of the reservoir as a protected area based on the scientific information after obtaining prior permission from the Water Resource Department.

xiii) Fishing and aquaculture activities in a reservoir without authorisation may be considered illegal.

xiv) Discharge of industrial wastewater and sewage water into the reservoir may be strictly prohibited, and if any such situation arises, it may be brought to the notice of the State Pollution Control Board for further action.

xv) No exotic fish may be reared or stocked in the reservoir without the permission of the Department of Fisheries of the concerned State, so that the purity of the native species is maintained.

xvi) Desilting interventions may be undertaken by the Fisheries Department of the State/UT in association with the relevant department to address the challenge in promoting cage culture, which requires a minimum water depth threshold.

xvii) The State/UT administration may take prompt and appropriate measures to prevent and address such prohibited activities and also enforce legal action as per the existing provisions of the State Inland Fisheries and Aquaculture Act of the respective States as required.

xviii) The State Department may encourage the use of Motorized engine boats for collecting harvested fish across the large and medium reservoirs, avoiding spoilage loss.

xix) The State Fisheries Department may take suitable measures to save the stocked fish from being swept away during monsoon floods from small reservoirs by making a net guard, especially in front of the sluice gates

or other waterways leaving from the reservoir, in consultation with the reservoir authority.

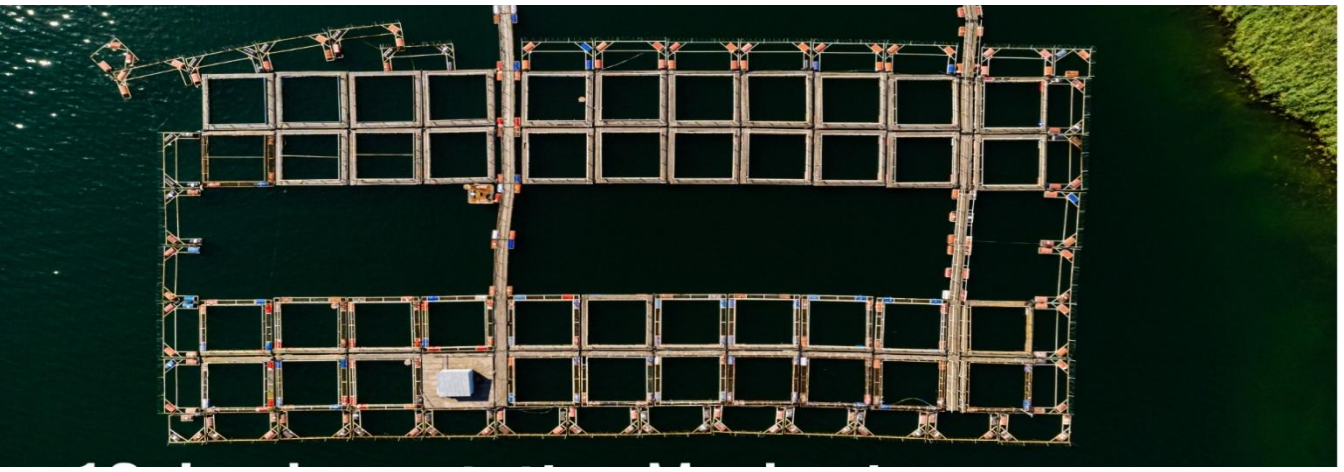
xx) Solar panel installation in reservoirs are been promoted to encourage use of renewable energy, thereby saving fossil fuels. While implementing such programs, beneficiaries may be made aware of these activities and assured that the installations may not negatively impact fisheries enhancement in these ecosystems. Instead, they may be beneficial in generating solar energy for daily use.

15. ASSESSMENT OF RESERVOIR FISHERIES DEVELOPMENT

i) The State/UT Fisheries Department may conduct the assessment of fisheries resources in relation to the development of reservoirs fisheries at regular intervals through ICAR Fisheries Research Institutes/Universities/Colleges.

ii) The State Directorate of Fisheries may prepare a detailed proposal including the details such as assessment fee, fisheries potential of reservoir and any other activities relating to fisheries and aquaculture, points of investigation, etc. and to ensure timely initiation of assessment process.

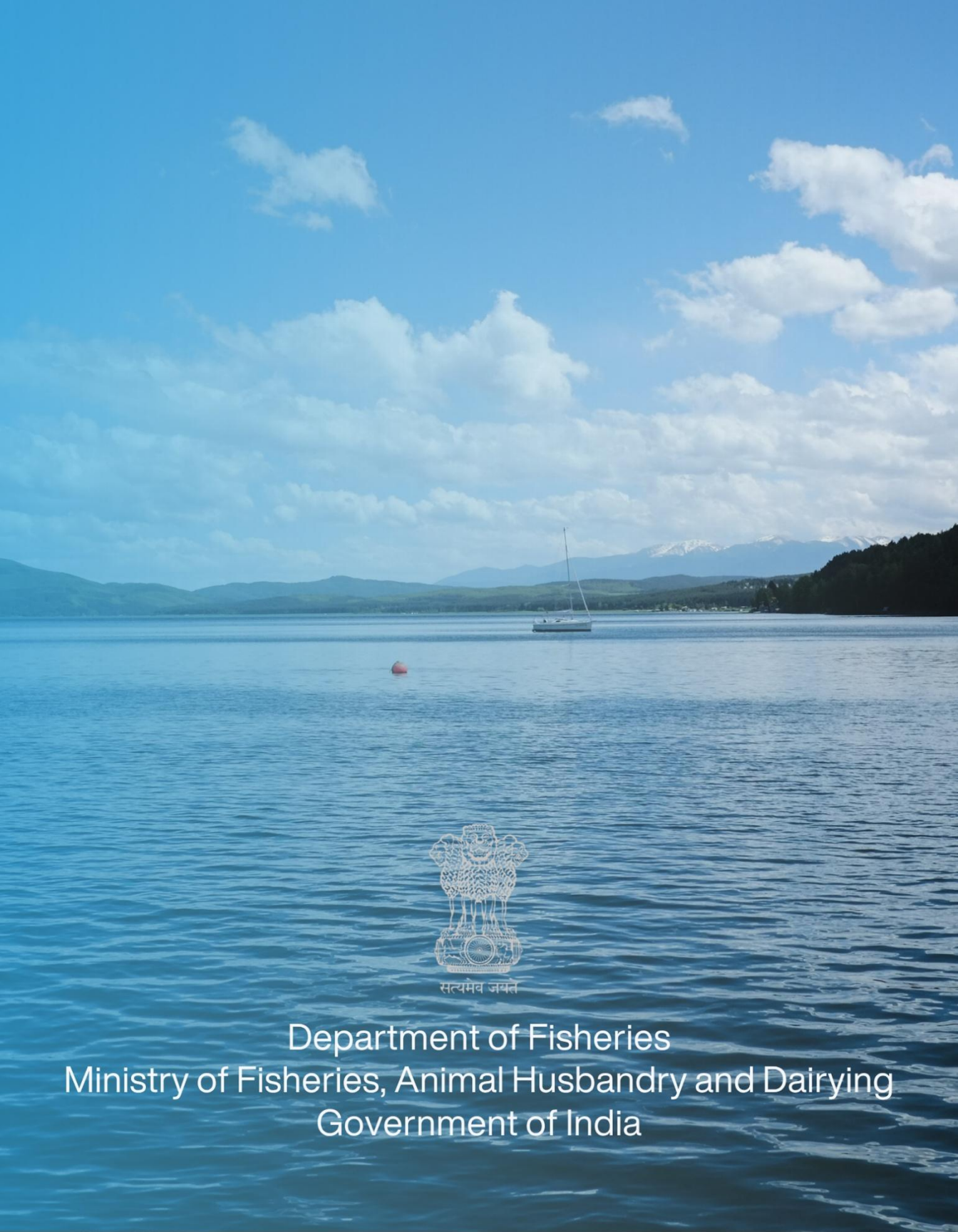
iii) Based on the assessment report, an action plan for development and management of reservoir fisheries may be prepared for seeking support under the Central and State Fisheries Development schemes and programs.



16. IMPLEMENTATION MECHANISMS

A dedicated Reservoir Fisheries Division/Unit/Cell may be constituted through inter-governmental coordination and collaboration with ICAR institutes or fisheries universities to effectively develop, manage reservoirs, and implement the above instructions.

Stakeholder meetings may be convened from time to time by the State Fisheries Department Departments for resolving any issues in functioning the respective FCS(s) or the lessee for fish harvesting, thereby production enhancement may not be hampered from these water resources, which are the only source of livelihoods of many rural people, including displaced ones.



सत्यमेव जयते

Department of Fisheries
Ministry of Fisheries, Animal Husbandry and Dairying
Government of India