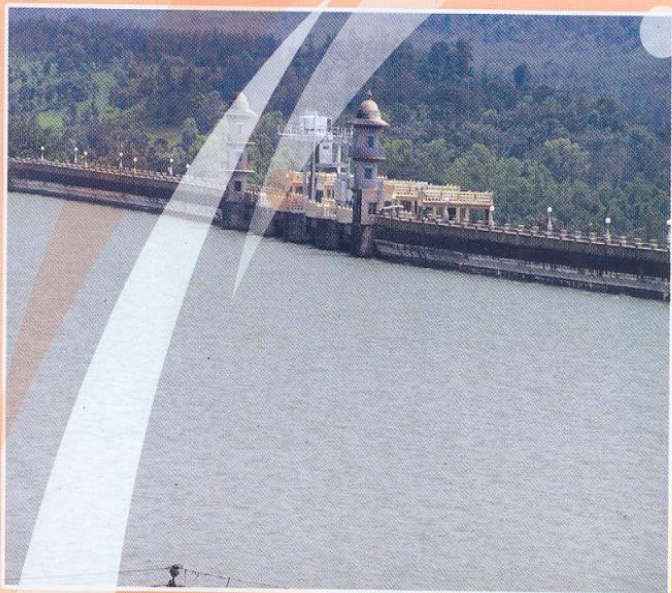


# MANAGEMENT OF LARGE RESERVOIRS



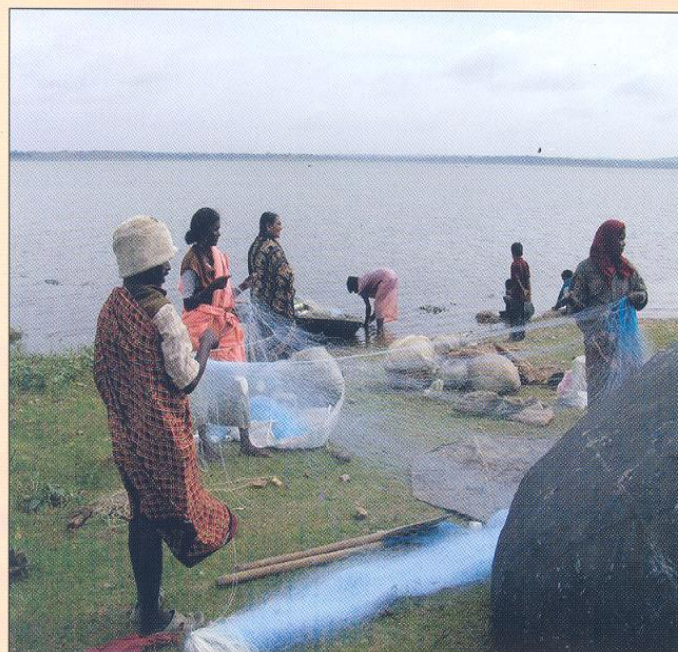
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## Reservoir resource

Reservoirs are defined as 'man-made impoundments created by erecting a dam of any description on a river, stream or any other water course to obstruct the surface flow'. Reservoir resource is vast, rich and diverse and under-exploited. In India, based on surface area, the reservoirs are classified as small (< 1000 ha), medium (1000-5000 ha) and large (> 5000 ha). The country has 3.1 million hectares of water spread area under reservoirs with 56 large reservoirs having a total water spread area of 11.4 lakh ha, 180 medium reservoirs covering 5.3 lakh ha and around 19,000 small reservoirs with area of 14.9 lakh ha.



## Potential fish production from reservoirs

The average fish yield from the reservoirs of the country is very low and is estimated at 20 kg/ha with small reservoirs yielding about 50 kg/ha and large reservoirs 12kg/ha. A moderate increase in yield up to 100, 75 and 50 kg/ha in respect of small, medium and large reservoirs would ensure production of 148,000, 39,500 and 57,000 t. This would boost the production by 2.5 folds i.e. from the present 93,000 to 244,500 t as depicted.



## Eco-friendly management of medium and large reservoirs

Large and medium reservoirs are to be developed on the principles of enhancement of capture fisheries, therefore, management is based on conservation of habitat in order to allow recruitment and growth of the target species. Stock monitoring is achieved through the maneuvering of fishing effort and following mesh size regulations.



### Stock enhancement

In large and medium reservoirs, stocking is done as a temporary measure to compensate for recruitment failure. The attempt is not successful unless the stocked fishes breed and propagate themselves in the new environment. However, stocking the large reservoirs with sufficient seeds is difficult due to lack of huge investments and large number of seeds. There are success stories of stock enhancements in reservoirs like Sathanur, Gandhisagar and Ukai (breeding success of *Catla catla*) whereas failures in reservoirs like Nagarjunasagar, Bhavanisagar, Malampuzha, Krishnagiri etc. Therefore, stocking of select large reservoirs may be done.

### Species enhancement

Introduction of new species is for correcting imbalances in species spectrum with a view to utilize all the diverse niches of the biotope for harvesting maximum sustainable crop. The Indian policy on stocking reservoirs disallows the introduction of exotic species into

reservoirs though Tilapia, *Oreochromis mossambicus* was stocked in south Indian reservoirs in 1960s which was not a preferred species elsewhere in India. Common carp which enjoys a favourable microclimate and a good market in the Northeast and the silver carp which recorded a spectacular performance in Gobindsagar (Himachal Pradesh) are part of the species spectrum of Indian reservoirs though not widely encouraged to be stocked in Indian reservoirs. Common carp competes for food with some indigenous carps.



### Diversification of species

In shallow and productive reservoirs introduction of high-value prawn, *Macrobrachium rosenbergii* is recommended.

### Closed season

In reservoirs with natural recruitment of fast growing carps, closed season may be observed from 15 June to 15 August of every year to prevent mass destruction of spawners.

### Control of predatory and weed fishes

Presence of predatory fishes and weed fishes results in reduced survival and growth rate of economic species. Judicious operation of shore seines in summer to remove the weed fishes is recommended. Operation of gillnets of appropriate mesh size,



use of long lines and traps are some of the ways to check the predatory fishes.

### **Regulation of fisheries**

In reservoirs with natural recruitment of major carps, the management of the fisheries centers round the optimum fishing effort and selection of right type of gear (e.g. gillnets of right mesh size). Operation of gillnets of 50 mm mesh bar and above is suggested to harvest table-size carps (> 1.0 kg) for good economic returns. In Bhanvanisagar, increase in effort resulted in three-fold increase in production. In Gobindsagar, enlarging the mesh size from < 65 mm to 100-180 mm bar coupled with increasing effort to 120% and sustained stocking of the common carp pushed up the production by about 200% in just five years.

### **Ban on destructive fishing**

Use of poisons and dynamiting must be prohibited as they may endanger the existence of the stock by indiscriminately killing fish of all species and sizes. Trawling as well as operation of giant shore seines with fine mesh should be restricted to prevent over-fishing of some of the species, in particular major carps.

### **Lease period**

The minimum period of lease should be 5 to 10 years as any benefits of the management will be visible from third year onwards.

### **Ownership**

Fishermen Co-operatives to be strengthened and community-based management to be encouraged

### **Introduction of motorized crafts**

Use of traditional crafts like coracle and non-motor boat must be replaced by motorized boats at community level to obviate the wastage of time and energy to reach the fishing sites and transporting the catch to the landing centres without much spoilage.

### **Prevention of escapement of fish**

To minimize escape of fish over the spill way and through canals, screens may be provided

### **Exploitation policy**

Fishing licenses are issued without regulation in many states which is found to be detrimental to the ecosystem. Community-based management of medium and large reservoirs, where fishers are owners, is the best option. The minimum lease/auction period should be 5 to 10 years to encourage capital investment.

### **Pen and Cage culture**

Enclosure culture like pen and cage culture for seed raising in reservoirs should be popularized for stocking open waters and are an ideal alternative for land-based nursery ponds which are cost intensive. Mortality of seeds during transport is a major problem in reservoir fisheries which can be solved by adopting *in situ* seed production in pens and cages.

