CHAPTER VI

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1. The present study was conducted to investigate the catching efficiency of designed, fabricated Eco-behundi jal and Conventional behundi jal in terms of minimizing the catch of juveniles, undersized fish resources and size selectivity. In order to study the benefits of Eco-behundi jal, using nets of same net dimensions, comparative fishing trails were conducted.

2. Fishing cruises were carried-out in the lower zone of Sunderban delta at the same depth range of 18-20m through the two-winter season using random sampling. A total fourty two samplings of six hours soaking duration were conducted during the period from October 2001 to February 2003. Alternative hauling technique was adopted to nullify the effect of speed and direction of water current and wind on soaking period. The jals were operated at same depth range and in same direction to maintain similarity between them.
3. Total weight of species groups caught in Eco-behundi jal (EBJ) and Conventional behundi jal (CBJ) were recorded and analyzed to determine the relative catching efficiency.

4. Length of individuals of different species groups were recorded and analyzed to determine the escapement of small, juveniles of commercially important finfishes and shellfishes, which helps in conservation.

5. The catch rates of Conventional behundi jal (CBJ) were 1.36 times more than Eco-behundi jal (EBJ) with average catch rates of 96.90 kg/haul in the year 2001–02 and 99.50 kg/haul in 2002–03. In other words, total catch per haul was apparently found to be poorer in Eco-behundi jal in both years of investigation with average catch rates of 71.76 kg/haul in the year 2001–02 and 72.58 kg/haul in 2002–03.

6. Results of Mann Whitney 'U' test to compare the average total catch per haul by two jals show that, there is no significant difference between the average catch obtained between Eco-behundi jal and Conventional behundi jal. Since the rank total for Eco-behundi jal is less than that of
Conventional behundi jal, it can be concluded that, the former has less catching efficiency than the latter. This is a clear indication that, the Eco-behundi jal facilitates easy escape of catch of smaller ones through its square mesh opening during operation.

7. The catch rates of commercially valuable species constituted a higher percentage of the total catch of 87.237% in Eco-behundi jal when compared to Conventional behundi jal (71.99%) during 2001-02. During the second year of study, the Eco-behundi jal again recorded higher percentage of the total catch with catch rate of 87.77% when compared to Conventional behundi jal (72.17%).

8. The Eco-behundi jal (EBJ) recorded higher percentage of commercial species to the tune of 121% compared to that of Conventional behundi jal (CBJ) in both years of investigation.

9. The catches of both jals comprised 12 and 4 commercially important finfishes and shellfishes species respectively. The finfishes include Herphodon neherus, Pama pama, Polynemus paradiseus, Ilisha megaloptera, Silago panijius, Trichiurus
spp., *Pampus argenteus*, *Chirocentrus dorab*, *Setipinna phasa*, *Coilia* spp., *Tachysurus jella* and *Osteogenious militoris* (all marine species) and *Pangasius pangasius* (freshwater species).

10. In shellfish group, two species, namely *Metapenaeus* spp. and *Peneaus* spp are marine shrimps and other two namely *Macrobrachium lamergi* and *M. mirable* are freshwater forms.

11. Percentage composition of finfish group was higher in Eco-behundi jal (61.31%) than of Conventional behundi jal (54.059%) during 2001–02. During second year of study, the percentage composition of finfish group showed again higher rate in Eco-behundi jal with 63.37% to the Conventional behundi jal with 54.214%. Hence, the percentage composition of finfish group catch in Eco-behundi jal was almost 1.13 to 1.16 times more than in Conventional behundi jal.

12. Eco-behundi jal (EBJ) had higher percentage composition of shellfish group than the Conventional behundi jal (CBJ)
even though the average catch rate of Eco-behundi jal was less than that of Conventional behundi jal.

13. Generally, catches obtained during entire period of fishing, Conventional behundi jal (CBJ) and Eco-behundi jal (EBJ) recorded higher catch in the month of December followed by January, February and November. Minimum catch was landed in October in both Conventional behundi jal and in Eco-behundi jal.

14. The Conventional behundi jal (CBJ) yield was higher in by-catches than Eco-behundi jal (EBJ) during entire period of study. The average By-catch rate of Conventional behundi jal was found to be 27.13 kg per haul which is almost 2.89 times higher than the Eco-behundi jal which has by-catch rate only 9.37 kg per haul during the first year of sampling. During the second year of sampling, the average rate of Eco-behundi jal was found to be 8.87 kg per haul, which is almost 3.12 times lesser than the Conventional behundi jal, which has by-catch rate of 27.68 kg per haul.
15. The statistical analysis shows that, the rank total of by-catches obtained from Eco-behundi jal is lower than that of Conventional behundi jal. Hence, it may be concluded that Eco-behundi jal (EBJ) lands comparatively lower quantities of by-catch than the Conventional behundi jal (CBJ), in both years of investigation.

16. The Eco-behundi jal invariably caught less number of juveniles, undersized finfishes and shellfishes when compared to Conventional behundi jal.

17. The Eco-behundi jal found to catch maximum number of fully grown Croakers and Threadfins than the Conventional behundi jal. Thus, developed Eco-behundi jal had better selection properties for Croakers and Threadfins.

18. The L50 of Eco-behundi jal was found to be better than Conventional behundi jal for Bombay duck, Indian Whitings, Ribbon fishes, Pomfrets and T. jella, but both jals were caught only younger fishes.
19. Both Eco-behundi and Conventional behundi jals were found to catch fully-grown shads with higher quantity in the former throughout the entire period of study.

20. The L_{50\%} (50\% of retention length) of Wolf herrings, *Setipinna phasa*, *Coilia Spp. Pangasius pangasius*, and *O. militoris* were more at Eco-behundi jal when compared to Conventional behundi jal.

21. Eco-behundi jal found to catch more number of larger size shrimps of *Metapenaeus* spp. and *Peneaus* spp than the Conventional behundi jal. Thus, developed Eco-behundi jal had better selection properties for *Metapenaeus* spp and *Peneaus* spp.

22. The L_{50\%} of Eco-behundi jal was found to be better than Conventional behundi jal for *Macrobrachium lamerri* and *M. mirabile*. Thus, Eco-behundi jal had better selection properties for *Macrobrachium lamerri* and *M. mirabile*.