Stock Enhancement for Sustainable Fishery: Experiences and Lessons from Black Sea Bream, Acanthopagrus schegelii (Bleeker) in Hiroshima Bay

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Stock enhancement programs are conducted worldwide to increase the stock biomass and sustainable fishery. More than 180 species have been released into coastal and marine environments in 64 different countries over the period 1984-1997. Traditionally in Japan, red sea bream has been the marine fin fish species accounting for the largest number of juveniles released in stock enhancement programs. In 1983, more than 16 million hatchery-reared red sea bream were released throughout the country. Recently, the program has stabilized at 25 million seed per year, while sea bream accounts for 20 million.

Hiroshima Bay is located in the western part of the Seto Inland Sea. After the intensive fishing pressure for black sea bream caused a drastic drop in catch since the 1970s. A stock enhancement program was conducted in its northern part since 1982 to restore the depleted stock. Almost 1.4 million of these juveniles were released over the last three decades in Hiroshima Bay.

As a result, black sea bream juveniles have confirmed their fast and good acclimatization to natural conditions within 2 weeks and could recover its landing after 3-4 years. As consequence, a drastic recovery of landings had led to several problems. The excessive supply was accompanied by a reduction in the market price since 1990. For example, in the period 1994-2000, the landing increased from 145 to 258 metric tons, however price declined from 1,048 to 432 JPY per kg in the same period. Another obstacle was the Pacific oyster (Crassostrea gigas) felt internally of socioeconomic in Hiroshima Bay. The farmer complained about the reduction the production of oysters because ate by black sea bream.

In context the scientific evidence of genetic conservation, the high survival and contribution of hatchery-reared fish numbers of breeders to produce offspring for release has resulted in a low effective population size and important genetic drift.
The high rate of inbreeding detected warrants the necessity to carefully preserve and not compromise the genetic diversity of the species in the bay.