

Ecology and Restoration Techniques for *Sargassum* Beds in Seto Inland Sea, Japan

Terawaki, Toshinobu

National research Institute of Fisheries and Environment of Inland sea, Fisheries,
Hiroshima, Japan

Brown macro alga *Sargassum* beds occupy 27 % of total amount area 201,200 ha. of sea grass and seaweed beds along Japanese sea coast. *Sargassum* beds are known to provide good habitats, spawning beds for a number of marine organisms and to form fishery grounds. *Sargassum* beds are distributed on the rocky bottom along the whole Japanese coast, especially, abundant along the southwestern region including Seto Inland Sea. *Sargassum* beds are formed on deeper and more stable rocky bottom than *Laminaria* beds and shallower and less stable rocky bottom than *Eisenia* and/or *Ecklonia* beds. The characteristics of phytal and benthic animal community in *Sargassum* beds shows much variety due to their morphological diversity and vegetative succession.

Unfortunately many sea grass and seaweed beds have been severely damaged or reduced due to land reclamation and water pollution in a number of coastal areas of Japan. *Sargassum* beds occupy 22 % of total decrease area 6,400 ha. of sea grass and seaweed beds along Japanese sea coast during from 1978 to 1991.

In order to achieve sustainable coastal development, *Sargassum* bed restoration is essential from a point of view on conservation of the coastal environment. New techniques for *Sargassum* bed restoration were summarized into three items of coastal engineering. 1) Periodic retransplanting of *Sargassum* plants supported by certain artificial production of seedlings is effective to form suitable seascapes in severely polluted and sparsely vegetated area. 2) Seeding or transplanting on artificially improved growing substratum is effective to extend of nursery and fishing grounds around natural *Sargassum* beds. 3) Restoration of shallow and gentle sloping bottom is effective to maintenance-free reestablishment of 'Sea grass and *Sargassum* combined beds' at developed coast. It is important to make clear the applicable limits and combinations of these three items for each actual sites of *Sargassum* bed restoration.

In this paper, two available results are presented for our *Sargassum* bed restoration techniques in Hiroshima Bay area, Seto Inland Sea. 1) Seedling production; Growth of *Sargassum* embryo stored for a long term under low temperature, and artificial seedlings of *Sargassum* plants developed from adventive embryos, 2) Field experiments and monitoring; Artificially improved substratum for transplanting of *Sargassum* plants, and naturally occurring *Sargassum* beds on the blocks 'Stair-Reef' designed for restoration of shallow and gentle sloping rocky bottom.