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Reclamation of Saline and Alkaline Soils through Aquaculture: A Review and Prospects for Future Research

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Abstract : Secondary salinization of agricultural lands in any command areas of the world is the major issue in the recent past. Currently, it is estimated that the 954 mh of saline and alkaline soil is present in the world. Thousands of hectares of land, getting added every year. Argentina, Bangladesh and Australia are most affected countries. In India, out of 142.80 million hectare (mh) cropped area, 56 mh is irrigated area. Of which, more than 9 mh (about 16.%) of land is found to be alkaline/saline. Due to continuous utilization of same land for same agricultural activities, excessive usage of fertilizers and water, most of the soils have become alkaline, saline or water logged. These lands are low productive and at times totally unfit for agricultural activities. These soils may or may not posses good physical condition, but plants may suffer from its inability to absorb water from salty solution. Plants suffer from dehydration and loose water to the soil, shrink, resulting death of plant. This process is called plasmolysis. It is the fact that soil is an independent, organic body of nature that acquires properties in accordance with forces which act upon it. Aquaculture is one of the solutions to utilize such problematic soils for food production. When the impoundments are constructed in an area 10-15% of the affected areas, the excess water along with the salts gets into impoundments and management of salt is easier in water than in the soil. Due to high organic input in aquaculture such as feed, manure and continuous deposition of fecal matter, pH of the soil gets reduced and over the period of time such soils can be put back into the original activity. Under National Agricultural Development Program (NADP), the project was implemented in 258 villages of Mandya District, Karnataka State, India and found that these lands can be effectively utilized for fish culture and increase the proteinacious food production by many folds while conserving the soils. The findings of the research can be adopted and up scaled in any country.

Keywords : saline and alkaline soils, Aquaculture, Problematic soils, Reclamation
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