Rice Cultivation in Major Wetlands of Kerala

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Abstract:
Biodiversity conserved in situ or ex situ is the most important treasure that humanity should protect without fail so that nature’s valuable genetic wealth will not become extinct. However, loss of biodiversity is taking place at a rate that threatens the very survival of mankind. To address these problems, the ability of the crops to tolerate unfavorable environmental conditions such as drought, salt, flooding or cold conditions has become a key research issue in the world. The global effort to collect, document and utilize the resources is enormous and the genetic diversity in the collections is critical for food security. A complex and ecologically responsive rice-fish farming system has evolved in the coastal wetland regions of India over centuries. One fifth area of Kerala state of India is wetland and there are about 217 wetland areas in Kerala which include the unique ecosystems like marshy and water logged areas, vast paddy cultivation areas associated with backwaters and lakes. The coastal saline soils of South India are highly underutilized because the use of ground water for normal crop production is not possible due to the poor water quality. At present, the entire coastal area is mostly monocropped during the monsoon period with rice as the only crop. The land remains fallow during the rest of the year due to lack of good quality irrigation water and high soil salinity. The major rice cultivating areas in Kerala include the lowland flooded areas like Kuttanad, Pokkali, Kole, Kaipad, etc. and the midland and high range areas. Thirty seven percent of rice production in the state is contributed by the lowland ecosystems.

Keywords: Wetland, saline rice tract, lowland ecosystem

Paddy cultivation in water logged fields in Kerala - An outline
Kerala state the southern-most state of India has a coastline of about 580km. This coastal belt has a unique popular system of rice cultivation in the saline soils [1]. But these areas are situated below the mean sea level and have serious problems of water logging. Rice forms the staple food of the people of Kerala and it is grown in a vast array of ecological niches ranging from regions situated 3 meters below MSL level as in Kuttanadu to an altitude of 1400 m in purely rainfed uplands with no standing water as in the high ranges like Wayanad. Probably nowhere else in the world, rice crop is cultivated under such a diversity of conditions [2,3]. Unique salinity tolerant rice farming systems have developed in the saline wetlands like Pokkali, Kole and Kaipad of Kerala. The farming system at Kuttanadu is also unique where rice is cultivated in wetlands at subsea level.

Kole lands
The Kole lands which form one of the rice granaries of Kerala are the part of the unique Vembanad-Kole wetland ecosystem. The brackish, humid tropical South west coast of India is one of the largest and the most important wetland of Kerala comprising of 151,250 ha, fed by 10 rivers and is exposed to diurnal tidal cycles. The name ‘Kole’ refers to the peculiar type of cultivation practice carried out from December to May and in the native language Malayalam, it indicates bumper yield or high returns in case floods did not damage the crop. The rice cultivation in Kole had been started as early as in 18th century by reclaiming the Thrissur ‘Kayal lands’ by erecting temporary earthen bunds. It spreads over Thrissur and Malappuram districts of the state, extending from the northern bank of Chalakkudy River in the south to the southern bank of Bharathapuzha River in the north. Karuvannur and Kecheri rivers drain the Kole land and finally discharge into the Arabian Sea [4].

The Kole lands are protected by bunds. When the flood water in the Kole fields starts subsiding by the end of south-west monsoon season, pumping out of water using petti and para which is an indigenous pumping device will be carried out in 10 to 15 days. After this, bunds around the fields (padavu) are raised and strengthened by means of locally available materials and laterite soil to a height of 1-1.5 m above the field level. Crop is directly sown or transplanted when water is around 10-15 cm. A few decades back a number of local varieties of paddy were cultivated in the Kole fields but presently improved varieties are used. Rice is the most important crop cultivated in the Kole land. Rice cultivation is mainly in the second and third crop seasons and varieties with short duration are widely cultivated. Fish farming is usually carried during March to September [5,6].

Kuttanad rice fields
Kuttanad is a low-lying area with backwaters known as the ‘Holland of Kerala’. It is interconnected with canals and stream networks extending over 874 km². There are garden lands of average elevation of 1 m above mean sea level covering an area of 304 km². Kuttanad, the deltaic formation of four major river systems, Pampa, Achancovil, Manimala and Meenachil, confluencing into the Vembanad Lake lies 0.6m to 2 m below MSL. The region extends from 9°17’ to 9°40’ N latitude and 76°19’ to 76°33’ E longitude. Rice is the important agricultural product, giving Kuttanad the moniker of “The Rice Bowl of Kerala”. The lake Vembanad extends from Alappuzha in the south to the harbor Cochin in the north where it opens out to the Arabian Sea [7]. It is a fertile tract of land replenished by the silt brought by the river systems. The area was found to be highly suited for rice cultivation from early days [8]. The cultivated land is broadly classified into three regions: (1) the upper Kuttanad consisting of fields relatively at higher levels, but still below mean sea level, (2) Kayal lands of backwaters and (3) the...
lower Kuttanad with lands lying between upper Kuttanad and Kayal lands.

In Kuttanad areas, the rice cultivation starts in the third crop season (puncha) by October. With the cessation of the North East monsoon during November-December, the fields are made ready for rice cultivation. After dewatering, three rounds of ploughing are done incorporating cattle manure and ash. Fields are then leveled and sprouted seeds of short duration varieties are broadcasted in January. The crop is harvested in April-May, soon after which the fields get flooded. Early duration varieties are widely cultivated in the Kuttanad area [6]. In some parts an additional crop is taken during autumn which is sown dry broadcast or wet sown just prior to the onset of monsoon. The agricultural practices and cropping methods used in Kuttanad are quite unique when compared to those in the rest of India.

Onattukara agro-ecosystem

Here two crops of paddy are raised followed by pulse crop or oil seeds. Both the paddy crops Virippu and Mundakan are purely rainfed crops. The soil is sandy textured. It extends in Alappuzha and Quilon districts.

Conclusion

The wetlands of India, particularly of Kerala are currently subjected to acute pressure owing to rapid developmental activities and indiscriminate utilization of land and water. The major issues faced are mainly related to pollution, eutrophication, encroachment, reclamation, mining and biodiversity loss. Besides, as wetlands of Kerala are under the threat of real estate mafia, there is every chance of intrusion of the elements of this undesirable social phenomenon to this bestowed ecosystem also.

References


