Rice Biodiversity and its social implication

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Today's world is facing serious environmental problems due to loss of biological diversity. Maintenance of biodiversity in any ecosystem is crucial to survival of life on earth. Loss of biodiversity is alarmingly high world wide. If the present rate of extinction of plant species continues, scientists believe that by 2025, 60,000 plant species could be lost. An estimation by the FAO has come to the conclusion that since 1900 almost three quarters of genetic diversity of domestic agricultural crops have already been lost.

Rice containing 20 wild species and 2 cultivated species of generous *Oryza* with more than 100,000 varieties of cultivated forms is threatened by loss of biodiversity in general. Developed modern high yielding varieties of rice and pressure of a growing population on the earth is the major cause of this eroding balanced biodiversity. The rice field ecosystem has developed over thousands of years. Being dynamic, stable and sustainable, it has adopted to different environmental conditions of different locations through out the world.

Traditional agriculture which has been practised for more than 10,000 years had a positive overall impact on biodiversity, creating huge amounts of novel and valuable biodiversity. The unproductive wild ancestor of crop plants could create new species and new forms much more appropriate than those produced by modern day genetic technologies. Those ancestors had many positive traits in the form of tolerance and resistance against biotic and abiotic stresses which led to stability of production.

In eastern Uttar Pradesh where rice is being cultivated in rainfed situations and harsh climatic conditions due to the vagaries of nature, maintained biodiversity has crucial importance in view of biophysical, social and economic considerations of rice producing farmers. Frequent droughts during the monsoon season became a common feature over the last few years. Similarly flood/submergence is a major constraint for low lying areas which in proportion are relatively very large. These unfavorable environmental threats also provide favorable conditions for the development of various kinds of pathogens. All the above mentioned environmental conditions have negatively influenced overall rice production.

Rice farmers are able to maintain production on their farms by using rice varietal diversity. For example, in one village of Basti district of eastern Uttar Pradesh, farmers cultivate 40 different rice varieties. Out of 40 varieties, 18 are modern and 22 traditional varieties including local land races. These different rice varieties have various kinds of specific traits which have been favorable for farmers' social, economic, biophysical and technological conditions. Few varieties have performed extremely well in low input environment while some are better for stress tolerance situations (poor quality soil, land types, flood, drought, suppress weed pressure, epidemic and climate etc.). Kalanamak and Bengal Juhi are local land races and famous for their quality and aroma; they are planted for better income but on a small area. Some of them are better for specific preparations and users' needs. Crop intensification and diversification are also influenced by planting of various maturity duration rice varieties in addition to staggering labour demand and employment opportunities during lean periods especially for landless laborers.

Finally we come to the conclusion that before the intervention of modern varieties, the balanced biodiversity maintained and developed through a much longer time period has been more farmer-friendly. Though biodiversity and productivity is not directly related, one finds it difficult to overlook the experiences of the longer past and its positive role in fulfilling the aspirations of different class, caste and categories of farmers. With the above observations, for farming communities' welfare it becomes essential among extension officers, agricultural scientists and policy makers to have an attitudinal change towards maintaining a balanced and healthy biodiversity, which will provide the base for a sustainable agriculture development and poverty reduction.

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