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Short Communication

# Growing Rice Under Looming Water Crises

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Population growth was and will be one of the main criteria to assess the requirements of crop commodity for life over the earth. It's the rice with its major contribution as staple food facing the threat of climate change impact in terms water scenario. It's not only an important crop to provide perpetuity to food and nutritional security, it's perspective lies in its historics where it is revered as gift of God, as divine creative, it's place in rituals and religious occasions and also as central element in both culinary and spiritual practices. It's also a major contributor of energy requirements accounting to more than 20% of all calories that mankind consumes.

With its ability to adapt itself to a wide range of geo-agro-ecological situations, rice enjoys a unique place among the field crops. Its adaptability ranges from rain fed upland to deep water paddy. Rice being a semi aquatic plant, is basically a kharif season crop though, it is also a part of cropping system in post kharif seasons where irrigation facilities are available and weather conditions are congenial.

Conventional transplanting under flooded puddle condition is the wide spread method of establishment where farmers adopt a practice of wild flooding with more depth of standing water ranging from shallow submergence of 5 cm to deep flooding up to 15 cm. Such water regime helped the farmers to get rid of weed menace. The fact was associated with the ability of rice plant to with stand submergence due to its typical morpho-bio-chemical behavior. Rice plants possess arenchymatous cells located in different plant parts which transports oxygen from tip of the leaf to the roots underground. Rice plant also has matted roots with air space, and also has the ability to get oxygen chemically through enzymatic process. This prompted the farmer to continue with practice of wild flooding with a belief that rice loves water.

But it might not be the real case. Water management researchers have shown through their extensive research in different parts that rice does not require submergence throughout its growing period, and developed several water saving techniques like phasic submergence, cyclic irrigation, alternate wetting and drying, system of rice intensification with equitable or comparable yield or even better. Was the rice tolerating water and not loving it?

However, in all these water management practices, the field is submerged in any of the period of crop growth, and off course the field is under puddle condition. The water requirement with new techniques though could be reduced. Conventionally grown rice requires about 0.90 cm to 1.05 cm of water during its post transplant phase. Thus, on an average it requires 1.0 cm water per day to satisfy its requirements. About 4000 to 5000 l of water is required to produce 1 kg of rice grain. On an average 2 to 3 ha of land can be cultivated with oilseeds and some cereals using same amount of water. Thus, un productive losses in rice needs to lessened. The water saving techniques could save about 25 to 30% of irrigation water.

It is not only the water component but also the practice of how the crop of rice is established, is important. Irrespective of the water regime maintained, the crop is grown under puddle condition. Continuous practices of such nature resulted in development of many negative externalities like rise in ground water table, forma-

tion of compact layer below the surface and the management problems in post harvest establishment of non rice crops. Such scenario is more visible and prominent under canal irrigated areas where rice is cultivated intensively under puddle soils with uncontrolled irrigation. Swaminathan (2005) opined that the ecological foundations essential for sustained advances in productivity such as soil, water and land are under anthropogenic pressure (The Hindu, Survey of India, 2005). The scenario with rice is also the same. The future of rice lies in addressing both the situations of saving water and also restoring the soil health.

In recent years, another water saving techniques of rice cultivation has come into force- The System of Aerobic Rice Production. As described by Bouman., *et al*. [1], Aerobic rice is an emerging technique designed to enhance water productivity in rice production. The system envisages the rice growing under un-puddle un flooded condition with irrigation. Thus, it is growing of rice like any other irrigated dry crops. The system can be an alternative under the situation where water is not sufficient to grow rice as transplant crop but sufficient enough to grow as irrigated dry crop. The extensive field studies are required to establish this system under different water availability scenario besides development of new genotypes to with stand temporary situation of deficit soil moisture.

The role and importance of rice in safeguarding the interest of human life is beyond doubt. We need to grow rice to keep pace with the demand of staple food of burgeoning population but with water economy and without compromising the soil health. To grow rice under looming water crises and deteriorating soil health, are the challenges the agricultural scientists needed to address.

## Bibliography

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