

Underutilized crops for food, nutrition security and environmental sustainability.

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The world population is expanding at an incremental rate. Global climate change, extreme weather conditions and decline of the fresh water resources are affecting the crop productivity. The diversion of the agricultural land and dwindling of land resources could pose challenge to the agricultural productivity. Natural resource management plays an important role in the supply of food in adequate quantities at affordable price. Research and development activities are underway to increase the agricultural productivity with minimum resources. Conventionally, the genetic resources, crop management strategies, improvement of the existing varieties, development of sustainable cropping system, yield forecasting based on the agro-ecological data and diversification of crop species are being adopted worldwide to increase food supply. Improvement of the farming practices and the novel tools has enabled meeting the increasing demand for food [1]. The green revolution has propelled the food production in a significant manner by production of several high yielding varieties particularly of cereal crops such as rice, wheat, maize, and these crops responded adequately to fertilizers.

However, these approaches have endangered the biodiversity and adaptability of crop species and nutritionally inadequate food production. Introduction of the new genetic improvements for disease and pest resistance has brought in corporate food regime. These modern food crops do not have resilience to counter the adverse climate changes. Intense farming practices have eroded the soil fertility as well. The occupation shift from farming to other sectors such as industry and factories and this has also contributed to the lesser agricultural productivity. The dietary pattern of people is changing with inclusion of processed and refined foods. Considering these factors, the global food and nutrition security needs to be reinforced for future generations.

Here comes the importance of underutilized indigenous and traditional crops which are often high yielding and resistant to diseases and adverse agro-ecological conditions [2]. Indigenous crops are defined as those having the cultivation history of minimum ten decades with natural selection. There are both natural and introduced crop species in the indigenous crop species. Another important advantage of the underutilized foods is the affordability and has potential to improve food accessibility and alleviate hunger and improves the diet diversity and pattern.

Search for additional food sources is emerging as new strategy to combat malnutrition and hunger. There are several crops that remain underutilized despite of their food and nutritional value and these crops survive under diverse agricultural ecosystems even under extreme conditions. These crops have immense potential to contribute to the economy. Researchers in the crop science and the agricultural policy makers need to look into the immense potential of underutilized crops to secure the food supply to the future generations. Such diversification of crop cultivation by the induction of the underutilized crop species will ensure the socio economic well-being of the farmers.

Underutilized indigenous and traditional crops have limited development opportunities and have less familiar value chains. Research on aspects that improve the adoption of the underutilized crops will hold key to the regularization of such crops into main stream agriculture. Consumption and the preference to the unconventional food sources however remains the main challenge. Here the role of the government and the policy makers come into play in promoting such food sources. The nutritional evaluation of the underutilized crops will reveal the potential of such crops in addressing malnutrition and thus will have a positive effect on promotion of their consumption [3].

Some of the potential underutilized food sources include Bambara groundnut, Sea fennel (*Crithmum maritimum* L.) and *Euryale ferox*. Bambara groundnut requires short photoperiod for pod filling and the nuts are hard to cook. However selective breeding has enabled the development of superior varieties. Another alternate food source is oilseed crop sacha inchi (*Plukenetia volubilis* L.). However, this crop needs to be developed for pest resistance.

In summary the mainstream agriculture and food production are not meeting the nutritional demand and the environmental concerns. Underutilized foods are certainly the alternative source of sufficient, health, nutritious and affordable food that can maintain the environmental sustainability. Mainstreaming the production and the consumption practices includes linking with school meal plans and public distribution and introduction of dietary guidelines that includes these alternate food sources.

References

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