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Nutritional security through bio-fortified zinc rice

**DR. MD. KHAIRUL BASHAR and
DR. M A HAMID MIAH**

Bangladesh agriculture has contributed to achieving food self sufficiency through production of about 38 million tons of food grain. Rice alone provides a major share of this with over 35 million tons. And this was possible through a strong role by far reaching policy of the government, dedicated research and extension activities, active participation of farmers and organised seed producers. We even exported 25,000 tons of rice to Sri Lanka last year.

But did we achieve nutrition security? The answer is NO. It is yet to be achieved particularly for rural and urban poor. They depend almost solely on rice, the staple food, through which they obtain nutrition, but partial

between 15 and 19, too short for their age, Bangladesh is home to the world's largest number of stunted adolescent girls after Guatemala, medical journal The Lancet says (bdnews24.com; July 2, 2013).

The issue of micronutrient like zinc is in a very preliminary stage of awareness and the availability to address the problems arising out of zinc deficiency was recognised in recent past in Bangladesh. Sea fish could be a good source, but poor people cannot afford to access that. It is not yet known to rural people that zinc deficiency causes dwarfing, reduced immunity, retarded growth, Hypogeusia (decreased sensitivity to taste) and acrodermatitis enteropathica (a kind of facial skin disease) in children. However, there is growing awareness among professional and policy levels about micronutrients leading to taking up projects on crop diversification.

The 7th Five Year Plan (2016-2020) of Bangladesh government underscored importance of attainment of self sufficiency in food grain production along with increased production of other nutritional and high value crops thus endorsing food based nutrition management through promotion of balanced diet containing adequate micronutrients. With regard to proper food and nutrition availability, government initiated many programs including "Health, Population, Nutrition Sector Development Program (HPNSDP)" recognising the importance of strengthening and expanding nutrient specific intervention among pregnant and lactating women, newborn babies, under-5 children and adolescent girls. With this in view, the 7th Five Year Plan approved strategies for development of iron and Vitamin A-rich staple crops through conventional breeding for Bio-fortification. Since all people in Bangladesh, irrespective of financial resources, consume rice, micronutrients incorporated in rice grains seems to be an immediate and

sustainable approach to make micronutrients available to consumers of all levels, particularly the poor.

Zinc deficiency in diet in Bangladesh has already been identified as a cause of concern for health, and some initiatives were taken in the past for food fortification through coating and extrusion technologies for Bangladeshi rice grain with imported fortified rice kernels. Some high level officials also visited China in 2013 for gathering experience on such approach and mainstreaming of the technology. Accordingly, government of Bangladesh took a project in partnership with WFP and funding from Dutch embassy to reach 500,000 beneficiaries within 2017. The adoption of such technology requires mandatory fortification, which is not possible under Bangladesh Socio-political situa-

tion. Philippines passed such a mandatory legislation and could fortify less than one percent only. Moreover, Bangladeshi rice millers were not encouraged because of increased cost of such products to face competition in market resulting from extra mechanical attachment in mills causing complicated processing jargon. The approach also has a rare benefit from nutrition point of view since such external supplementation is vulnerable to loss of zinc during washing prior to cooking and gruel removal. More detailed information is available in the document "Scaling up Rice Fortification in Asia" compiled by WFP and Sight and Life (Info@sightandlife.org; Bangkok.riceworkshop2014@wfp.org).

Under the circumstances, the worthwhile approach and easily available

zinc nutrition strategy would be to incorporate zinc in rice endosperm, the material we eat as cooked rice, through conventional breeding process i.e. through bio-fortification. In that case there will be little chance of loss of zinc during milling and gruel removal since zinc is embedded in entire part of endosperm. Thus poor people will have some access to zinc nutrition through their staple food, which is very much in line with strategy of the government, even if they do not have any supplementary source of zinc.

Works are being done in Bangladesh on methods of increasing zinc in grain using technologies like agronomic fortification through spraying zinc sulphate on plants, putting zinc

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supplementation is available through fruits, vegetables and animal resources which they can manage in their homesteads and lands they have. Their main target is to mitigate hunger, where nutrition is hardly considered as their target in their diet, although there are national programs for vitamin supplementation through tablets and edible oil enriched with vitamin A and D. Such edible oil is kept in transparent plastic containers, and according to scientists, stability of such vitamin in transparent container is about six months contrary to 18 months in dark containers. With 44% of the girls, aged



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