Consultation on Farming System for Nutrition Initiative

Bhubaneswar, 23 December 2013

Achieving a Malnutrition Free India

Prof M S Swaminathan, FNA, FRS

UNESCO Chair in Ecotechnology, MSSRF, Chennai

Launching the Zero Hunger Challenge

- Mr Ban Ki-moon, Secretary General of the UN launched the Zero Hunger Challenge at the Rio+20 Conference on Sustainable Development in Brazil in June 2012

- At a high level consultation held in Madrid, Spain, in April 2013, it was agreed that the world community should commit to a common vision that hunger, food insecurity and malnutrition should be ended by 2025.

Five Pillars of the Zero Hunger Challenge

- 100% access to adequate food all year round
- Zero stunted children less than 2 years of age
- All food systems are sustainable
- 100% increase in smallholder productivity and income
- Zero loss or waste of food

Food Losses and Food Waste

- One third of food production is lost or wasted globally, i.e., about 1.3 billion tonnes per year
- 1.3 billion tonnes can help to meet the food needs of about 3 billion people
- On per capita basis, much more food is wasted in developed countries
- Major data gaps exist in available knowledge of global food waste, especially with regard to the quantification of food losses by individual. Cause, and the cost of food loss prevention

Source : Jenny Gustavsson et al., Global Food Losses and Food Waste, FAO, 2011

2013 – A Significant Year in India's Struggle Against Hunger

Some Milestones

1943 : Bengal Famine; 3 million children, women and men died of hunger

1963 : Beginning of intensive research on raising the ceiling to yield

1966 : Increasing PL 480 wheat imports, going upto 10 million tonnes

1968 : Issue of the stamp "Wheat Revolution", depicting the role of science in agricultural transformation

2013 : Parliament approves the National Food Security Act, conferring the legal right to food on over 70% of India's population

Thus, 2013 marks the transition from 'ship to mouth' to 'right to food' with home grown food

Global Food Security Situation Today

- 12.5% of the world's population (868 million) are undernourished in terms of energy intake
- 26% of the world's children are stunted
- 2 billion suffer from 1 or more micronutrient deficiencies
- 1.4 billion are over-weight, of whom 5 million are obese
- Cost of under-nutrition and micronutrient deficiencies – 2 to 3 % of global GDP, equivalent to USD 1.4 to 2.1 trillion per year

Source : The State of Food and Agriculture, FAO 2013

Hunger and Human Development
India's Position in the World

- National Family Health Survey (2005-06) Malnourished Children under 5 – *above 40 %*
- Low Birth Weight Children – *21 %*
- Union Planning Commission (2012) – *About 217 Million are undernourished*
- Global Hunger Index (IFPRI, 2013) – *63rd position among 79 countries*
- UNDP Human Development Report (2013) – *136th position among 187 countries*
- Nutrition Barometer (Save the Children, 2012) - *Very Low Position*

Food Insecurity: Challenge and Response

Challenge	Response
1. Calorie Deprivation	National Food Security Act 2013
2. Protein Hunger	Pulses Villages and Panchayats
3. Hidden Hunger (i.e. Micronutrient deficiencies)	National Dairy Mission; Nutri-Farm Fortified Salt

National Food Security Bill of India, 2013

1. Goal : To provide food and nutritional security **in human life cycle approach**, by ensuring access to adequate quantity of quality food at affordable prices
2. Enlargement of the Food Basket : Foodgrains mean rice, wheat or coarse grains (i.e. nutri-cereals)
3. Life Cycle approach with emphasis on the first 1000 days of a child's life.
4. Women as custodians of household food security. The eldest woman, over 18 years of age, as head of household for the purpose of issue of ration cards

The world's largest social protection measure against hunger

Pathways to Overcoming Micronutrient Malnutrition

- Biofortification
- Multiple fortified salt
- Home Fortification with Micronutrient Powders
- Food Fortification

Home Fortification with Micronutrient Powders (MNP)

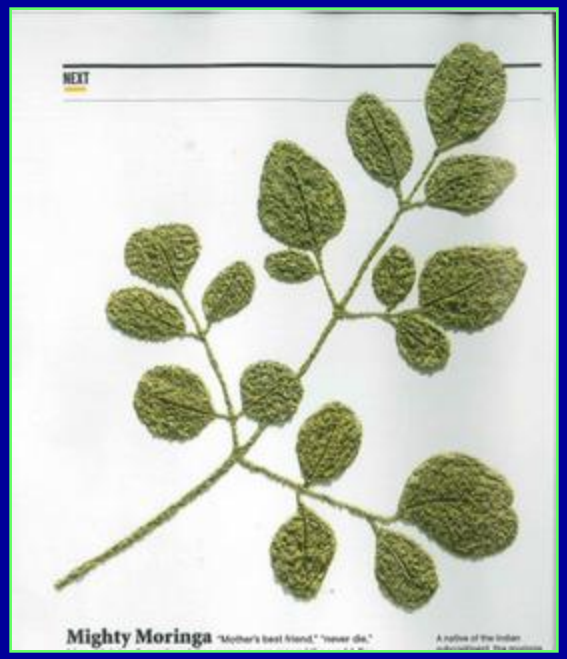
A crisis is also an opportunity

HarvestPlus : Biofortification Challenge Programme

- Inter-disciplinary, global alliance of research and implementing institutions
- Six staple food crops
- Iron, zinc, pro-vitamin A
- Conventional breeding and exploratory research in developing transgenic varieties
- $95 million over 10 years; $50 in the first four years

Horticultural Remedy for Nutritional Malady

Moringa Oleifera



25 x iron in spinach
17 x calcium in milk
15 x potassium in bananas
10 x vitamin A in carrots
9 x protein in yogurt

National Geographic, November 2012

Botanists Spread the Gospel That Breadfruit Can Be Manna

- The Breadfruit Institute has found that the perennial trees produce more food in dry weight per hectare than corn, rice, or wheat

- A fruit rich in iron, potassium, and Vitamin A precursors

Source: Science Vol 342 18 October 2013

Orange-fleshed Sweet Potato Rich in Beta carotene

Biofortification: High-iron Pearl Millet

86M86
Pioneer hybrid (54-64 ppm Fe)

ICTP 8203
ICRISAT-bred OPV
(70-74 ppm Fe)
With 10% Higher Yield

Marketed by NIRMAL SEEDS

MAS Products in Maize

Vivek Hybrid - 9

QPM version of
Vivek Hybrid - 9

VPKPS, Almora

Launching a Nutri-Farm Movement

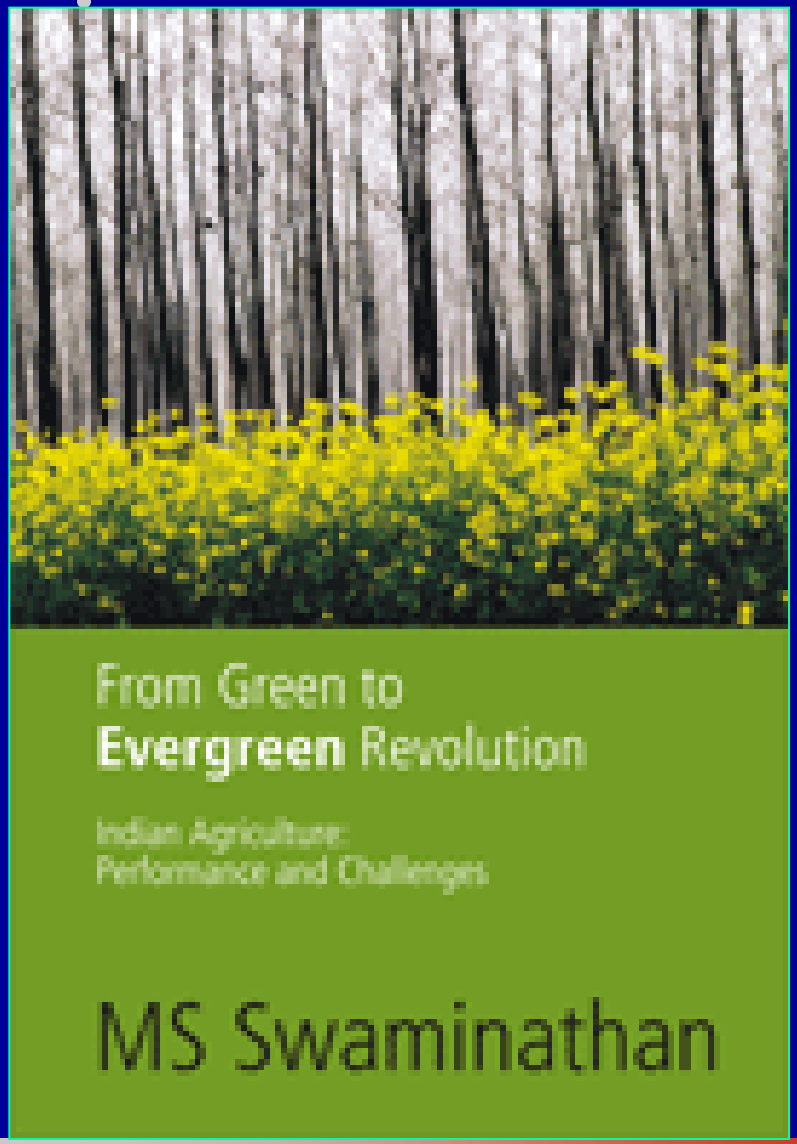
In the Union Budget 2013-14, the Finance Minister Mr P Chidambaram announced a pilot programme on Nutri-Farms for introducing new crop varieties that are rich in micro-nutrients such as iron-rich bajra, protein-rich maize and zinc-rich wheat. For this purpose he has provided a sum of `. 200 crore in the Budget.

Farming System for Nutrition (FSN)

Five Steps

1. Survey the area for identifying the nutritional problems (under-nutrition, hidden hunger, etc)
2. Identify agricultural remedies for nutritional maladies (crop-livestock integration, cultivation of pulses and biofortified crops)
3. Mainstream nutritional criteria in the design of the farming system
4. Improve small farm productivity and profitability in order to enhance cash income
5. Introduce monitoring systems for assessing impact, based on well defined and measurable criteria

Evergreen Revolution is the Pathway

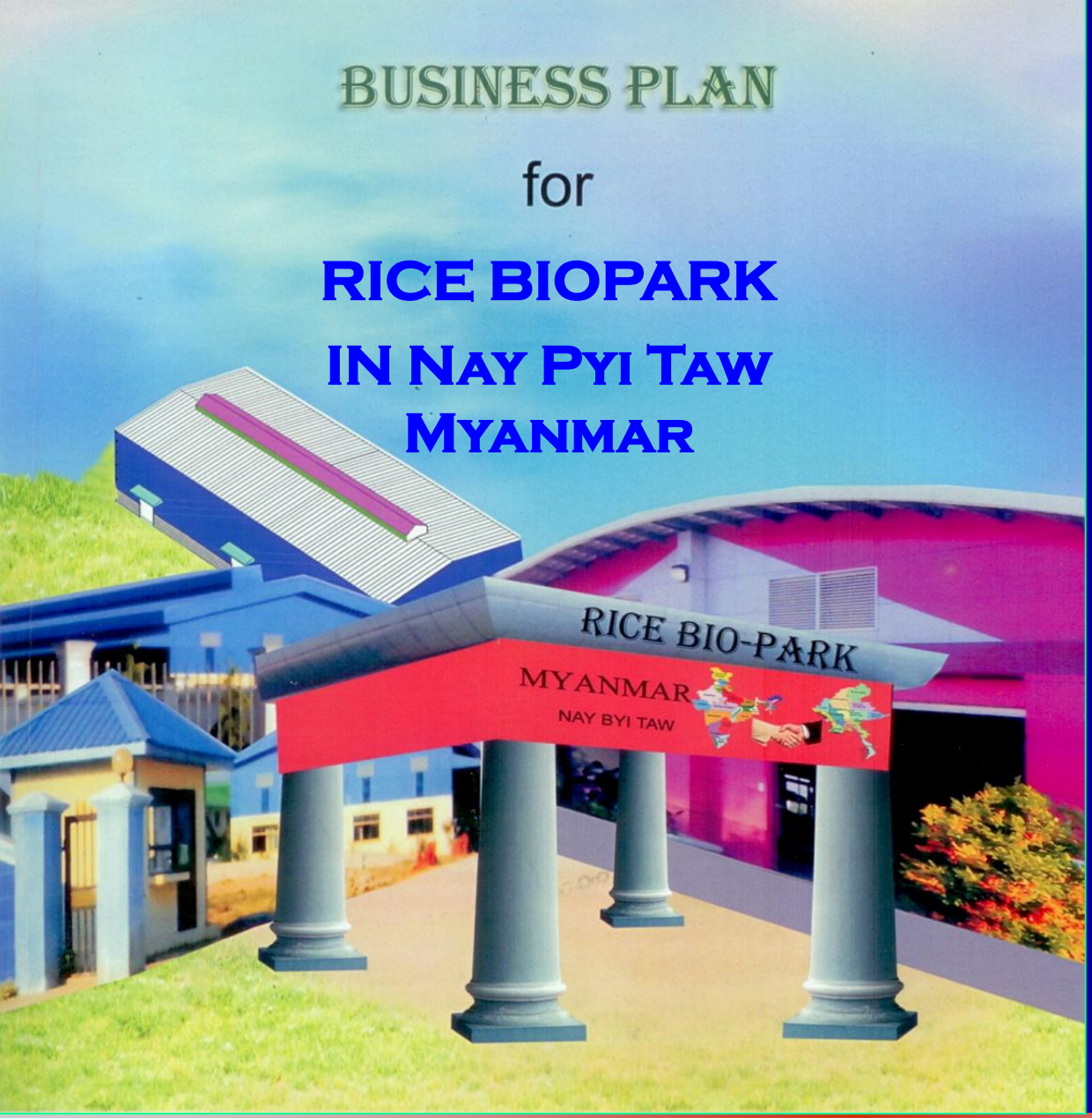


- World requires 50% more rice in 2030 than in 2004 with approximately 30% less arable land of today
- Mainstreaming ecology in technology development and dissemination is the road to sustainable agriculture

From Green to an Ever-green Revolution Pathways

Green Revolution : Commodity-centred increase in productivity ⬇ Change In plant architecture, and harvest index Change in the physiological rhythm-insensitive to photoperiodism Lodging resistance	Evergreen Revolution : increasing productivity in perpetuity without associated ecological harm ⬇ Organic agriculture : cultivation without any use of chemical inputs like mineral fertilizers and chemical pesticides Green Agriculture : conservation farming with the help of integrated pest management, integrated nutrient supply and integrated natural resource management

If farm ecology and economics go wrong, nothing else will go right



Designed to save and add value to each part of the rice biomass, such as rice straw, husk and bran

Neglected Crops: Genes for Coping with Climate Change

- Time-Tested production and income stability under marginal and high-risk farming
- Contribution to local and regional food and income security
- Many crops are nutritionally rich to redress 'hidden hunger'
- Neglect leading to loss of genetic diversity and associated traditional knowledge
- Opportunity to enhance sustainable income, food and nutritional security

Declare one year as International Year for Underutilised Crops

Revive Dying Wisdom

Mixed Cropping - Kolli Hills, Tamil Nadu