



**The Issue of Sustainability
and
Role of Bio-fertilizers
An Indian Perspective**

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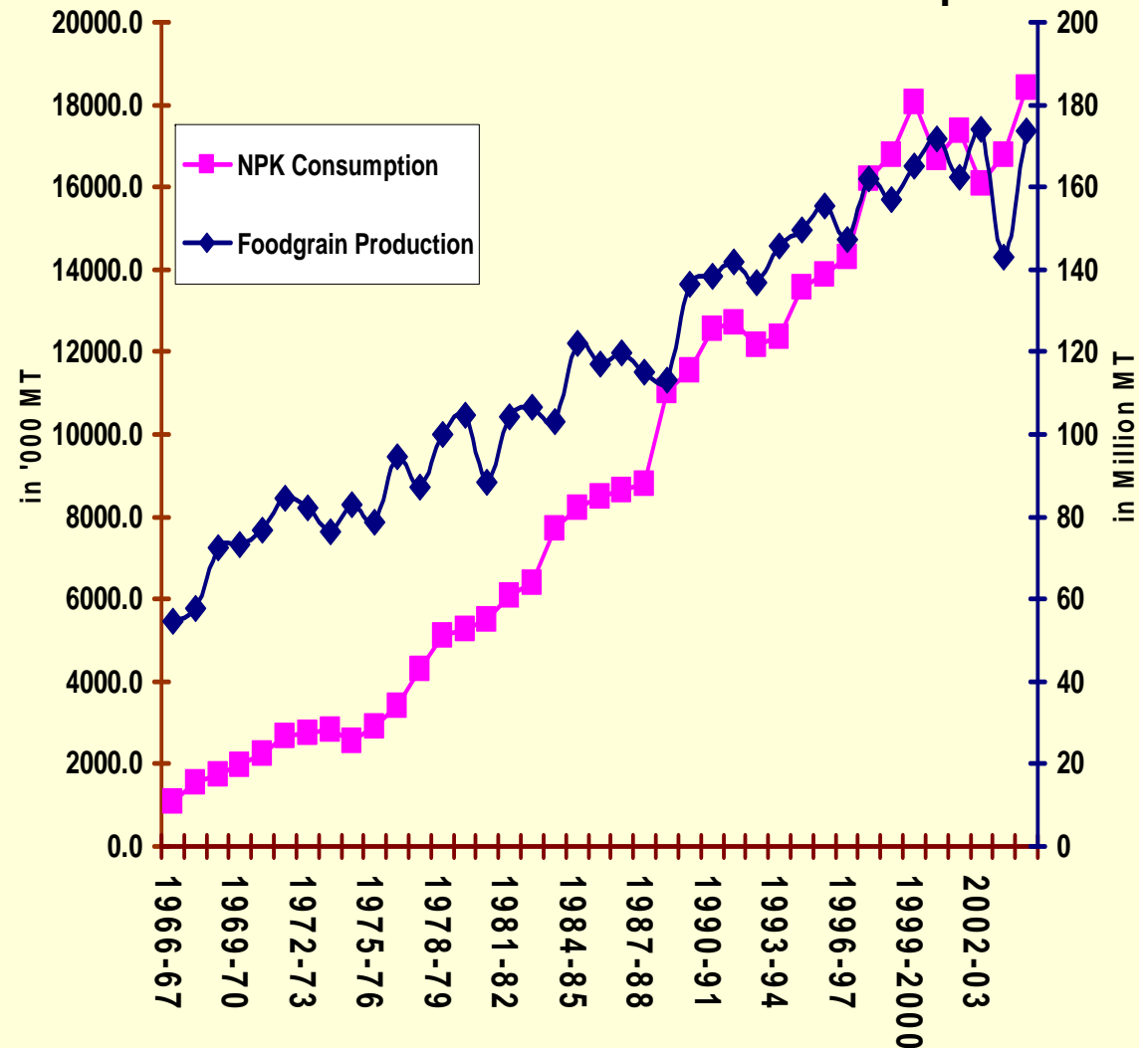
The Presentation Focuses On

- Fertiliser Consumption and Food Grains Production Scenario in India;
- Causes of Declining Crop Productivity;
- Sustainability of Farmers;
- Deficiency of Nutrients in Soil;
- Use Of Balanced Fertilisers and Biofertilisers;
- Comparison to other Countries; and
- IFFCO's efforts to increase Crop Productivity.

Stagnation in Food grains Production in India

- Till 1997-98 strong correlation is found between Fertilizer consumption and food grains production
- After 1997-98, this relationship distorted
- ✓ Most of States are experiencing increase in fertilizer consumption with slower pace of crop productivity
- ✓ Some states witness consumption of fertilizer picking up without any conspicuous gain on agricultural crop productivity

Exploring Relationship Between Foodgrain Production & Fertilizer Consumption



The Role of Fertilisers

- Increase productivity
- Therefore, there has to be a positive correlation between use of fertilisers and crop yield
- The crop yield is falling and not in proportionate to fertilizer consumption



Causes Of Declining Crop Productivity

- Imbalanced and indiscriminate use of chemical fertilisers
- Occurrence of multi-nutrients deficiency such as Zinc, boron, sulphur etc. besides NPK
- Rain dependent agriculture - About 2/3 area
- Inadequate irrigation facilities
- Continuous fragmentation of land, unfavourable for adoption of technology
- Land holding pattern and Predominance of marginal and small farmers

Land Holding Pattern And Sustainability

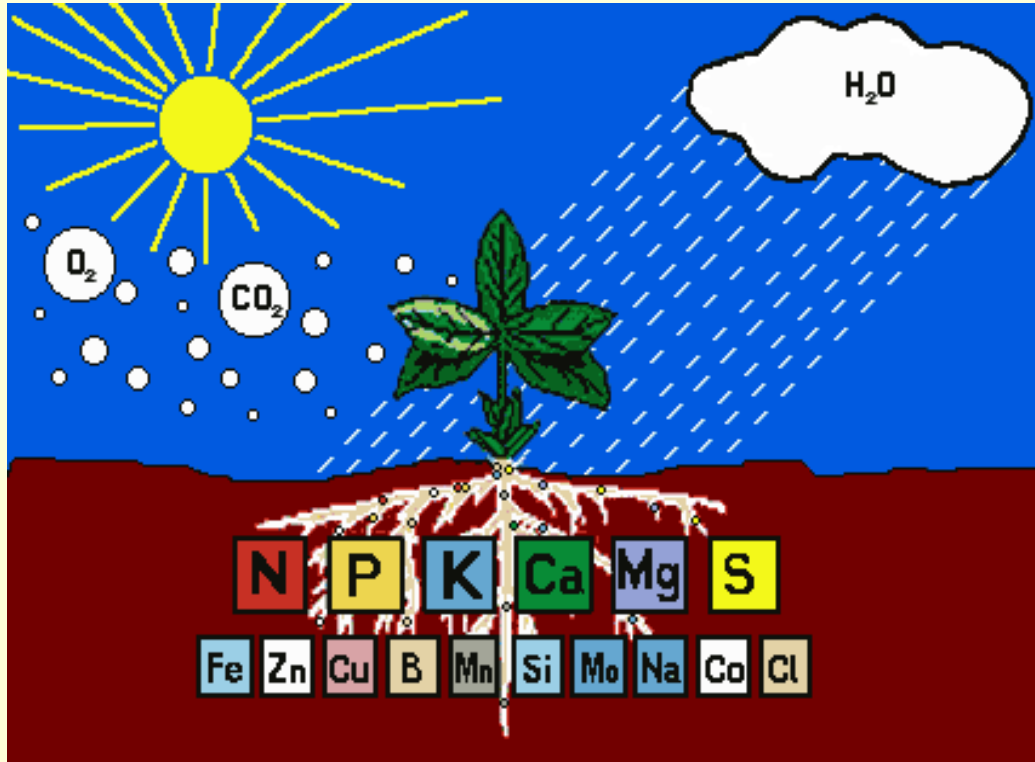
- ✦ 80 % of Indian Farmers are Small and Marginal with operational holding of less than 1.4 hectares
- ✦ Wheat and Rice are the two Major crops grown in India
 - The average yield for Wheat is 2617 Kg / Hectare and
 - The average yield for Rice is 2101 Kg / Hectare
- ✦ “Minimum Support Price” (MSP) is not favourable and viable compare to net costs to farmers

Factors For Sustainability

- ✓ Raise Farm Income
- ✓ Increase crop productivity through balanced use of Fertilizers
- ✓ Managing Cost of Inputs
- ✓ Increase fertilizer use efficiency
- ✓ Generation of Additional Income to Farmers through allied activities

Major Cause: Nutrient Deficiency In Soil

Photosynthesis: $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{carbohydrates (CHO)} + \text{O}_2$



Nutrients are taken up primarily by the roots in the form of an aqueous solution in the soil

- Besides NPK, Sulphur, Zinc And Calcium are also required in good quantity.
- Other nutrients such as Iron, Boron etc. though required in small quantities, but their deficiency significantly impacts plant growth & life.
- Micronutrient deficiency (Zn, Boron, Iron & Sulphur) in Indian Soil is increasing

Innumerable experiments prove there is Significant increase in Yields by application of secondary & micronutrients along with NPK nutrients

Use Of Balanced Fertilisers

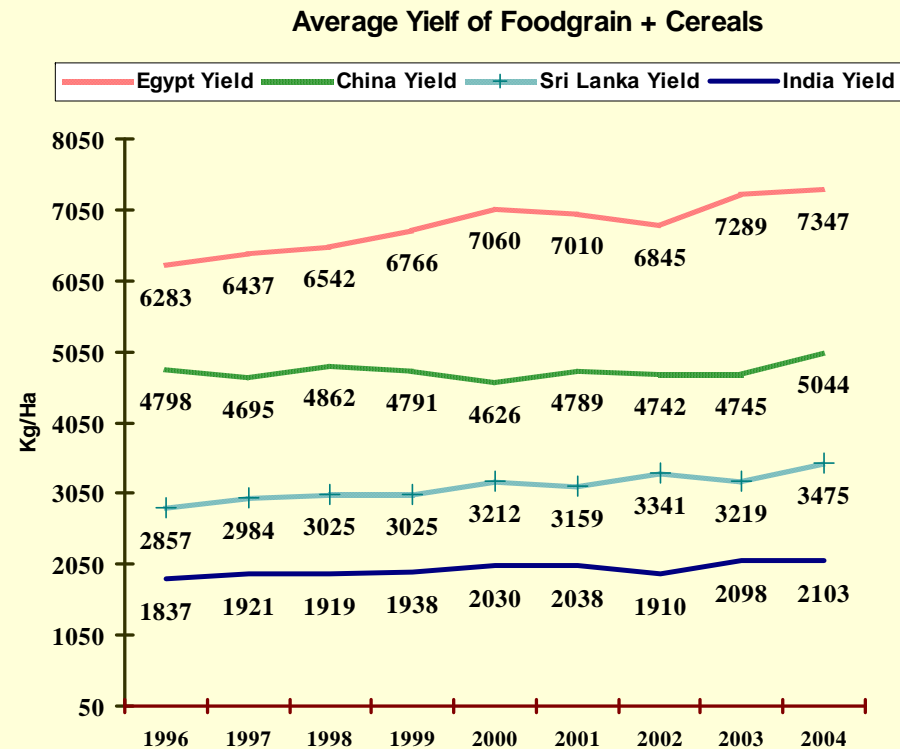
- Use of Balanced Fertilisers, Organic fertilisers and Bio-fertilisers can provide viable leverage to increase crop productivity
- It enrich the soil with important nutrients
- Bio-fertilisers has potential to generate additional income to farmers from the same size of land
- Types of Bio-fertilisers
 - Rhizobium,
 - Azotobactor,
 - Azospirillum



COMPARISON TO OTHER COUNTRIES

	Country	Fertiliser Uses Kg/Ha
1	India	104.7
2	Pakistan	164.1
3	Bangladesh	188.6
4	France	215.9
5	Sri Lanka	271.8
6	China	275.1
7	United Kingdom	315.1
8	Egypt	471.5
9	N. Zealand	668.5

Due to higher level of consumption, productivity is on rise in Egypt, China, Srilanka



Country	2003 Kg/ha	2004 Kg/ha	Increase in Yield Kg/ha
Egypt	7209	7347	138
China	4745	5044	299
Srilanka	3219	3475	256
India	2098	2103	5

IFFCO's Efforts to Increase Agricultural Productivity

- Soil testing
 - 5 Mobile soil testing vans with a annual capacity to analyze 30000 soil samples free of cost
 - Free Soil testing facility at Phulpur and Kalol
- Production of bio-fertilizers at CORDET Phulpur and Kalol Producing :
 - Rhizobium, Azotobactor, Azospirillum, PSB as an integral part of integrated nutrient management
- Proposal to set-up a bio-fertilizer plant is in pipeline
- Provided KIOSKS to cooperatives to disseminate information related to agriculture in 10 Indian languages



IFFCO's Efforts to Increase Agricultural Productivity

- Organizing various promotional and educational programmes for the benefit of cooperatives and farmers to increase productivity of crops
- Linkages with State Agriculture Research Universities / Research Institutions
 - Through 17 IFFCO chairs in the disciplines of:
 - Agronomy,
 - Soil Science,
 - Extension and Cooperation,
 - Agro Economics and Fertilizer Technology
- Various Cooperative development and Welfare Programmes:





Thank You

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