



Addressing malnutrition and improving public health in India



HarvestPlus
Better Crops • Better Nutrition

HarvestPlus presence in India

HarvestPlus has operated in India for nearly nine years, in close collaboration with partners in the public and private sector, to improve nutrition and public health by developing and promoting biofortified crops and building out biofortified seed and crop value chains. Biofortification is endorsed at the highest levels of government as a strategy to address widespread micronutrient deficiencies and their serious health impacts.



The cost of iron and zinc deficiency in India

Nearly every third child in India is undernourished, causing widespread micronutrient deficiency.

Iron deficiency is a leading cause of anemia. **58 percent** of children under five are anemic.¹

53 percent of women ages 15-49 years are anemic.

India loses over \$12 billion in GDP annually to vitamin and mineral deficiencies.³

43.8 percent of children under five are estimated to be zinc deficient.²

Zinc deficiency can cause stunting, which affects more than **38 percent of children under five**.

1. NNS-Gov of India 2. WHO 3. World Bank

Biofortified Crops in India



IRON PEARL MILLET:

- *Nutritional benefits:* Provides up to 80% of daily iron needs
- *Farmer Benefits:* High yielding, mildew resistant, short duration, drought tolerant
- *Focus states:* Maharashtra, Karnataka, Rajasthan, Uttar Pradesh



ZINC WHEAT:

- *Nutritional Benefits:* Provides up to 50% of daily zinc needs
- *Farmer Benefits:* High yielding, adapted to the target area of eastern gangetic plains, disease resistant
- *Focus states:* Uttar Pradesh, Bihar, Punjab



ZINC RICE:

- *Nutritional Benefits:* Provides up to 60% of daily zinc needs
- *Farmer Benefits:* Early maturation, high yields and strong agronomic performance.
- *Focus states:* Odisha, Bihar, Chhattisgarh, Jharkhand

Services and support offered by HarvestPlus

In addition to reaching and empowering farmers, HarvestPlus provides technical, logistical, training, and marketing support to a wide array of partners in seed and food value chains to build strong biofortified food systems.



Crop Development: HarvestPlus supports the Indian Council of Agricultural Research-National Agricultural Research System (NARS), state agricultural universities (SAUs), and international agricultural research organisations such as ICRISAT, CIMMYT, and IRRI in breeding, testing and release of zinc wheat, zinc rice and iron pearl millet.



Seed Production and Commercialisation: HarvestPlus works with private seed companies, farmers, non-governmental organizations, farmer producer organisations, state seed corporations such as the Karnataka State Seed Corporation (KSSC) & Maharashtra State Seed Corporation (MSSC), and national seed corporations to develop quality-controlled seeds.



Seed Distribution: HarvestPlus India collaborates with key stakeholders for the distribution of seeds. Mini-Kit trial packs are provided to farmers for the initial testing and evaluation.



Value Addition: HarvestPlus is engaging with key food companies and processors to create value-added products and build supply chains for biofortified crops. The plan is to support commercialisation of different value-added products to increase the consumption of biofortified food and combat micronutrient deficiencies.



Policy Engagement: HarvestPlus India is working on the inclusion of biofortified grains in government schemes to reach communities with nutritious crops.

Projects and Programmes

Bihar-Odisha Project

Focus: To establish a sustainable system of production and consumption of nutrient rich, biofortified zinc wheat, zinc rice, and iron lentils to improve the nutritional status of the people of Bihar and Odisha.

Funder: The Bill & Melinda Gates Foundation (BMGF)

HarvestPlus Role: Technical partner on biofortification. Biofortified crop promotion and distribution is being piloted in 33 districts of Bihar.

The Government of Bihar has also partnered with Rural Development Council and HarvestPlus to make Kukribigah village in Bihar a model “nutritional village,” where the 475 rural households will only cultivate biofortified crops using organic methods.

Commercialisation of Biofortified Crops Programme

Focus: This partnership programme with the Global Alliance for Improved Nutrition (GAIN) provides targeted support and addresses challenges and constraints of commercialization. The overall vision of this program is to scale up the commercialisation of biofortified foods. To realize this vision the program aims to improve access to inputs and markets for biofortified seeds and food products, generate demand for these nutrient-rich staple crops, and provide advocacy, catalytic financing, and technology licensing services.

Focus Crops: Zinc wheat, iron pearl millet

HarvestPlus Role: Provide technical, commercial and strategic leadership to scale commercialization of biofortified crops.



Prime Minister Shri Narendra Modi endorses biofortification

Hon'ble Prime Minister, Shri Narendra Modi, on World Food Day 2020, during a ceremony to mark the 75th anniversary of the United Nations Food and Agriculture Organization (FAO), dedicated 17 new biofortified varieties of eight crops to the nation. This is an important step in strengthening the government's campaign to improve nutrition and to scale-up production of biofortified crop varieties and integrate them in government support programs, such as midday meals for school children, to reach the most vulnerable population groups.



Partner with us to make food systems more nutritious, inclusive, and sustainable.

“I am very happy with the performance of high zinc wheat crop of last year. The grain is bold and golden, the wheat quality is great. It is well adapted to our soil and climate. Seeing it grow brings great joy to me as a farmer.”

— Rameswar Rajwar, Village - Ruknadih Village, Buxar District, Bihar

CURRENT PARTNERS IN INDIA

NARS & National Research Institutes: Banaras Hindu University (BHU), Bihar Agricultural University (BAU), CCS Haryana Agricultural University, GB Pant University of Agriculture and Technology (GBPUAT), ICAR - AICRP - All India Coordinated Research Project on Pearl Millet, ICAR - Indian Agricultural Research Institute (IARI), ICAR - Indian Institute of Wheat and Barely Research Institute (IIWBRI), ICAR - RCER-Patna & KVKs, India Biofortification Program, ICAR - Indian Institute of Rice Research (IIRR), Indian Agricultural Research Institute (ICAR), International Rice Research Institute (IRRI), Indira Gandhi Krishi Vishwavidyalaya (IGKV), Orissa University of Agriculture and Technology (OUAT), Prof. Jayashankar Telangana State Agricultural University (PJTSAU), Punjab Agricultural University (PAU), Junagadh Agricultural University, Sri Karan Narendranath Agricultural University, Swami Keshwanand Rajasthan Agricultural University, Rajendra Prasad Central Agricultural University - RPCAU, Mahatma Phule Krishi Vidyapeeth (MPKV), Vasant Naik Marathwada Krishi Vidyapeeth Parbhani (VNMKV), Tamil Nadu Agricultural University (TNAU), Dhule College of Agriculture, Ministries of Agriculture, Health, and Education National Institute of Nutrition (NIN), Marathwada Agricultural University (MAU), JEEViKA, **CGIAR:** Borlaug Institute for South Asia – BISA Cereal System Initiative for South Asia (CSISA), CIMMYT, International Center for Agricultural Research in the Dry Areas (ICARDA) International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Rice Research Institute (IRRI) **Seed Companies:** Ajeet Seeds Limited, Ankur Seeds, Basant Agrotech (I) Limited Bayer Bio Science Pvt Ltd, Bioseed Research India Pvt Ltd, Bombay Super Hybrid Seeds, Bihar Rashtriya Beej Nigam (BRBN), Daftari Agro Biotech Pvt Ltd, Delta Agri Genetics, Ganga Kaveri Seeds Private Limited,

Hytech Seed India Pvt Ltd, Indo Gulf, JK Agri Genetics Limited, Karnataka State Seeds Corporation Limited (KSSC), Kaveri Seeds Co Ltd, Maharashtra State Seeds Corporation Ltd (MSSC), Mahyco, Metahelix Lifesciences Pvt Ltd, Moti Seeds, Nath Biogene Pvt Ltd, Nirmal Seeds Pvt Ltd, Nu Genes Private Limited, Nuziveedu Seeds Pvt Ltd, Corteva, Rasi Seeds, Ratnagiri Seeds & Farm, Shiv Shakti Seeds, Sone Ganga Seeds, Sood Seeds, Sri Sai Seeds, Sunagro Seeds Private Limited, Wheat Berry Agro Tech (WBAT) **FPOs and NGOs:** Action for Social Advancement - ASA, Annadata Farmer Producer Company Limited, Atmanirvar Farmer Producer Company, Bagaha Krishak Agro Producer Co, Bankedham Agro producer Company, Bapudham Smridhi Agro Producer Co, Dumraon Agro Producer Company, Gandhar Agro Tech Farmer Producer Company, Gramin Development Services (GDS), Green Agrevolution Private Limited, GUEVVS - Gramin Uthan Evam Vaikalpik Vikas Samiti, Gurua Agro Producer Company, Bhartiya Lok Vikash Evam Shodh Sansthan (BLVSS), BIOECO Farmer Producer Company, Buxar FPC Limited, Kausalya foundation, Nidan, Patliputra Farmer Producer Company, Pradan, PRAN, Khistiz Agro Tech Private Limited, Koshi Agro biotech Private Limited, Maa Annapurna Farmer Producer Company, Maa Gayatri Farmer Producer Company, Reliance Foundation, Sahyogi Agro Producer Company, Sustainable Human Development Association (SHDA), Syngenta Foundation, Taal Farmer Producer Company, TCL - Trust Community Livelihood, Maner Sangam Farmer Producer Company, Masourhi Farmer Producer Company, **Food Companies:** Aarti Flour Mill, ITC Limited, **Industry Bodies:** Protein Food and Nutrition Development Association of India (PFNDIAI), The Coalition for Food and Nutrition Security (CFNS), National Seed Association of India (NSAI)

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HarvestPlus improves nutrition and public health by developing and promoting biofortified food crops that are rich in vitamins and minerals, and providing global leadership on biofortification evidence and technology. HarvestPlus is part of the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH) and is based at the International Food Policy Research Institute (IFPRI).

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**RESEARCH
PROGRAM ON
Agriculture for
Nutrition
and Health**

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