*Research Paper*
*Impact Factor - **2.262***
*Peer Reviewed Journal*

*IJMDRR*
*E- ISSN –2395-1885*
*ISSN -2395-1877*

# FACETS OF FOOD SECURITY IN INDIA

**Dr. Sasmita Behera**
*Faculty, P.G Department of Home Science, Rama Devi Women's University, Odisha.*

***Abstract***
*In this study we explore causes of the widespread food insecurity that prevails in India. It has been observed that even though the proportion of the malnourished fell by about 1 per cent (FAO, 2002) through the nineties in India, their absolute number increased by about 18 million. Thus the problem of food insecurity in India is not of general systemic failure that arises due to a supply shortage. It is in fact more a problem where certain sectors (mainly the rural agrarian population and the urban informal sector) suffer from a shortage of food in a general climate of increasing production. Delving deeper, we observe that the main determinants of food insecurity in India today are the shrinking of agrarian and informal sector incomes and failures (both due to policy framing as well as implementation) of support led measures to combat poverty. This study uses existing scholarly work in the area as well as conventional data sources in order to show the extent of food insecurity in India today and the logic of the different patterns of its causality.*

## The Food Security Challenge

Over the next several decades, the world faces a grand challenge-and opportunity-at the nexus of food security, economic development, and the environment. First, the world needs to be food secure. Second, the world needs agriculture to contribute to inclusive economic development. Although agriculture directly accounts for approximately 3 per cent of global gross domestic product (GDP), it employs more than 2 billion people around the world.

Third, the world needs to reduce agriculture's impact on the environment and natural resources. Agriculture is a major contributor of greenhouse gas emissions, the largest consumer of freshwater among economic sectors, and the largest cause of conversion of natural ecosystems. Going forward, agriculture will need to adapt to a changing climate in order to ensure adequate food production.

The convergence of these three needs poses one of the paramount challenges of the next several decades: How can the world adequately and fairly feed a growing population in a manner that alleviates poverty and advances economic development while reducing pressure on natural resources?

This Background Paper focuses on the sustainability dimensions of food given their significant importance in underpinning long-term food security.

## Projections of Food Demand and Food Supply

Demand projections in general are estimated on the basis of assumptions about the base year demand, population, expenditure elasticity and economic growth.

Supply projections have been computed using the yield growth for the most recent period 1993-2003 and taking 2003-04 as the base year for area and production and also assumed that further area expansion will take place.

The demand and supply projection given below was developed at Indian Council for Research on International Economic Relations.

**Table 1: Projected Domestic Demand for Food Items in India**
**(million metric tones)**

| Food Items | Base Year | Scenario 1 | | | Scenario 2 | | |
|---|---|---|---|---|---|---|---|
| | 1990-00 | 2011 | 2021 | 2026 | 2011 | 2021 | 2026 |
| **Rice** | 66.0 | 94.5 | 96.9 | 102.2 | 94.4 | 96.8 | 102.1 |
| **Wheat** | 44.9 | 60.1 | 66.8 | 69.1 | 59.0 | 64.3 | 65.9 |
| **Total Cereals** | 119.0 | 187.8 | 242.8 | 273.5 | 188.5 | 245.1 | 277.2 |
| **Pulses** | 10.4 | 23.0 | 38.7 | 51.0 | 24.1 | 42.5 | 57.7 |
| **Edible Oil** | 8.6 | 15.7 | 26.7 | 35.3 | 16.8 | 30.2 | 40.9 |
| **Sugar** | 11.9 | 26.7 | 55.0 | 81.1 | 29.3 | 65.7 | 100.7 |

**Note:** Scenario 1: GDP is 8% per annum
Scenario 2: GDP is 9% per annum

**Table 2: Projected Domestic Supply of Food Items in India**

| Food Items | Base Year 2003-04 | Supply Projections | | |
|---|---|---|---|---|
| | | 2011 | 2021 | 2026 |
| **Rice** | 88.3 | 95.7 | 105.8 | 111.2 |
| **Wheat** | 72.1 | 80.2 | 91.6 | 97.9 |
| **Total cereals** | 186.9 | 209.1 | 242.2 | 260.2 |
| **Pulses** | 14.9 | 16.1 | 17.6 | 18.4 |
| **Edible oil** | 8.6 | 10.1 | 12.5 | 13.9 |
| **Sugar** | 24.2 | 25.0 | 26.0 | 26.6 |

**Note:** figures in the parentheses are the supply projections for oilseeds and sugarcane in respective columns.

**Food Gap**

Increase in total demand is mainly due to growth in population and per capita income and as far as supply in concerned, production is constrained by low yield growth. A negative gap indicates that the demand of the commodity is more than its supply and this implies a deficit of the community in future(table 3).The gap between supply and demand is narrowing down over the years for all food items.

**Table 3: Supply-Demand Gap for Selected Food Items (million metric tones)**

| Food items | Gap (supply-demand) | | |
|---|---|---|---|
| | 2011 | 2021 | 2026 |
| **Rice** | 1.26 | 8.98 | 9.13 |
| **Wheat** | 21.21 | 27.33 | 32.04 |
| **Total cereals** | 21.19 | -2.94 | -16.97 |
| **Pulses** | -8.05 | -24.92 | -39.31 |
| **Edible oil** | -6.66 | -17.68 | -26.99 |
| **Sugar** | -4.31 | -39.67 | -74.13 |

**Note:** demand scenario of GDP growth at 9% is considered here.

**Meeting the Food Security Challenge - Six Core Propositions**

**1. Food Security is Multi-Dimensional**

According to the United Nations Food and Agriculture Organization (FAO), "food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."

**Food Security Identified Four Main Dimensions or "Pillars"**

- ***Availability*** is ensured if adequate amounts of food are produced and are ready to have at people's disposal.
- ***Access*** is ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods (through production, purchase, or donation) for a nutritious diet.
- ***Utilization i***s ensured when the human body is able to ingest and metabolize food. Nutritious and safe diets, an adequate biological and social environment, and a proper health care to avoid diseases help achieve adequate utilization of food.
- ***Stability*** is ensured when the three other pillars are maintained over time.
- Several experts have noted the need for a pillar on ***environmental sustainability***, where food production and consumption patterns do not deplete natural resources or the ability of the agricultural system to provide sufficient food for future generations. Therefore, for the purposes of this Background Paper, we identify five pillars of food security.

**2. Achieving Food Security Will Require Increasing not Only Food Access but Also Food Supply**

Yet even if all of the food available in the world today were equally distributed on a caloric basis across the entire projected population of 2050, those calories would still fall short of the FAO's "average daily energy requirements" by more than 200 kilocalories (kcal) per person per day, assuming none of those food calories were lost or wasted between the farm and fork.

The shortfall would be more than 900 kcal per person per day if the current rate of food loss and waste-24 per cent of all produced calories per year-were to remain unchanged in 2050. The world will need to increase food supply as part of the solution to food security.

**3. Food Supply is Dependent on Environmental Sustainability**

The sustainability dimension is an oft overlooked but important pillar, particularly since it underpins many of the others. For instance, food availability is dependent on the state of the environment and the natural resource base.

Production of rain-fed and irrigated crops is dependent on supplies of freshwater at appropriate levels at the appropriate times during the growing season. Natural ecosystems located in or around farmland underpin agricultural productivity by providing soil formation, erosion control, nutrient cycling, pollination, wild foods, genetic material, regulation of the timing and flow of water, and more. Furthermore, oceans and inland water bodies currently contribute 16 per cent of global animal-based protein supply and are the primary source of such protein for nearly 1.3 billion people.

In turn, ***access is partly dependent on availability***. For example, food supplies in a region can become constrained when crop yields decline due to extended heat waves or lack of sufficient water to irrigate crops. As a result, the price of food can increase or access to locally produced food can become constrained, thereby increasing dependence of local populations on food imports. And when this occurs in regions where people do not have sufficient income, economic access becomes an acute food security issue. Likewise, ***sustainability by definition underpins long-term stability***. If food production is not sustainable from an environmental perspective, then it is not stable over time.

**4. But Many of the Environmental Underpinnings of Food Supply are Being Degraded or are Facing Limits, Making Attaining Food Security More Difficult**

Many of the environmental foundations of food supply currently face challenges of resource scarcity and degradation:

- **Climate Change:** It is projected to lead to changes in precipitation patterns, in the amount and duration of extended heat waves and droughts, and in sea levels, which in turn will impact cropland productivity and viable cropland area.
- **Terrestrial Ecosystems:** The conversion of natural ecosystems has led to a decline over the past half century in the quantity and quality of 60 per cent of ecosystem. Many of the ecosystem services, such as soil formation, aquifer recharge, flood control, and more, are important for farmland productivity. Furthermore, land degradation affects approximately 20 per cent of the world's cultivated areas.
- **Water:** Many crop-generating regions currently face significant water stress, where near-term demand outstrips supply. Over the coming decades, water stress is projected to increase due to growing demand for water and poor water management, coupled with the impacts of climate change.
- **Oceans:** Wild fish landings from marine and inland water bodies have stagnated over the past 20 years, gradually declining from a peak of 95 million tons in the mid-1990s to roughly 90 million tons by 2010. Failure to address these environmental and natural resource impacts will likely hamper food supply and therefore food security.

**5. The Food Production System Itself is Contributing to this Degradation**

The global food production system itself contributes to this environmental degradation in several ways.

- **Climate Change:** About 14 per cent of emissions are from the food production process including methane from livestock, nitrous oxide emissions from fertilizer use, and energy used for fertilizer manufacturing and tractors.
- **Terrestrial Ecosystems:** Since the dawn of the first agricultural revolution 8,000-10,000 years ago, growing crops and raising livestock have been the primary cause of loss and degradation of natural ecosystems. Today, 38 per cent of the planet's landmass outside of Antarctica is already dedicated to growing food; 12 per cent is in croplands and 26 per cent is in grazing lands.
- **Water:** Agriculture is responsible for approximately 70 per cent of the world's freshwater withdrawals and up to 85 per cent of its freshwater consumption. Agriculture also has a major impact on water quality; nutrient runoff from farm fields plays a major role in creating "dead zones" and otherwise degrading coastal waters globally.
- **Oceans:** While the global wild fish catch has stagnated over the past 20 years, the percentage of stocks that are overfished continues to rise. Fishing now occurs across one-third of the world's ocean surface, leaving only the most inaccessible waters at the two poles and the unproductive waters of the high seas unexploited.

**6. Food consumption patterns also are impacting the sustainability of food security**

Three consumption-side issues of particular relevance are *food loss and waste, overconsumption, and competing uses of food.*

- **Food Loss and Waste:** Measured in caloric content, 24 per cent of all food produced is lost or wasted between the farm and the fork. In terms of share of harvested crop by commodity, roots and tubers experience the greatest amount of loss and waste, followed by fruits and vegetables, and about a quarter of cereals and seafood are lost and wasted. Food loss and waste equates to food-insecure people and communities having to grow or pay for even more food to meet their energy and nutritional needs. Economically, it equates to wasted financial and labor investments that reduce the income of actors in the food value chain. Environmentally, it equates to wasted water, land, and energy, and unnecessary greenhouse gas emissions.
- **Over-Consumption:** More people in the world today consume too much food than consume too little. Besides impacting resource consumption, Obesity is a human health and personal finance problem.
- **Competing Uses of Food Crops:** Take bio-fuels for example, producing 10 percent of the world's liquid transportation fuel by 2050 would require 36 percent of all the world's crops produced in 2010, as measured by their energy content. Indeed, all of the chemical energy contained in 100 per cent of all the world's crops in 2011 equaled just 14 per cent of the world's primary energy consumption. Such additional demands would make achieving food security even more difficult.

**Strategies to Increase Food Production and Productivity**

It is clear that India will remain a predominantly agricultural country during most of the 21 century, particularly with reference to livelihood opportunities. Therefore, there is a need for both vision and appropriate action in the area of shaping our agricultural destiny.

Our major agricultural strengths are our large population of hard working farm women and men, our varied climatic and soil resources, abundant sunshine throughout the year, reasonable rainfall and water resources, a long coast line and rich agro-bio-diversity. Converting these into jobs and income is the challenge.

An evergreen revolution (i.e. increase in productivity in perpetuity without associated ecological harm), focused on rain fed farming areas and crops suited to these areas is what is called for.

**The Technology Strategy for an Evergreen Revolution should have the Following Three Components.**

**1. Defending the Gains**

The Punjab-Haryana belt is regarded as the bread basket of the nation. However, in recent years there is stagnation in productivity improvement due to declining farm size and income, depleting natural resources base, increasing input costs, deficiency of micro-nutrients in the soil and deteriorating soil health, inadequate harnessing of post harvest technology, high indebtedness of farmers, uncertain market prospects except for wheat and rice.

Thus, the heartland of the green revolution is in grave trouble.

- **Eternal vigilance** is the price of stable agriculture.
- **'National Bio-security System'** will safeguard the country from invasive alien species; this could cause potential harm to crop and animal husbandry, fisheries and forestry.
- **Pest surveillance and management and gene deployment** for checkmating the spread of pathogens.
- **Good Weather Code** to maximize the benefits of adequate moisture availability.
- **Drought Code** to minimize the adverse impact of drought.
- **Flood Code** both to prevent excessive distress and damage, and to promote a post-flood production plan.
- **Contingency Plans and Compensatory Production Programmes** have to be prepared.
- **Seed reserves** for crop security just like grain **reserves** for food security.
- **States with an unutilized ,untapped production reservoir** should be encouraged immediately to initiate action with the guidance of experienced farmers and scientists to utilize the yield reserve wisely to improve production and productivity.
- **Use of seed drill** to capture soil moisture, adopt proper seeding depth and complete sowing in time should be recommended.
- **Balanced use of fertilizers** including zinc should be promoted and overuse of urea should be curtailed.
- **Pre-emergence weed control or a post-emergence chemical weed control** should be recommended across the Indo-Gangetic plain.

**2. Extending the Gains**

Eastern India (eastern UP, Bihar, Chhattisgarh, Odisha, West Bengal, Assam and North Eastern States) have a large untapped production reservoir with the technologies now available.

**3. Making New Gains**

The immediate prospect for making new gains lies in the areas of post-harvest technology, agro-processing and value addition to primary produce. In the long term, there is a need for new yield and quality breakthroughs in major crops through genomics and gene pyramiding.

**Road Ahead**

The agriculture sector in India is expected to generate better momentum in the next few years due to increased investments in agricultural infrastructure such as irrigation facilities, warehousing and cold storage. Factors such as reduced transaction costs and time, improved port gate management and better fiscal incentives would contribute to the sector's growth. Furthermore, the growing use of genetically modified crops will likely improve the yield for Indian farmers.

The 12th Five-Year Plan estimates the food grains storage capacity to expand to 35 MT. Also, a 4 per cent growth would help restructure the agriculture sector in India in the next few years.

**Reference**

1. United Nations (UN), Department of Economic and Social Affairs, Population Division, and World Population Prospects: The 2010 Revision, Highlights and Advance Tables, Working Paper No. ESA/P/WP.220, United Nations, New York, 2011. 9.3 billion People in 2050 reflect the medium growth scenario.
2. Food and Agriculture Organization of the United Nations (FAO), World Food Programme (WFP) and International Fund for Agricultural Development (IFAD), The State of Food Insecurity in the World 2012: Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition, FAO, Rome, 2012.
3. Millennium Ecosystem Assessment (MEA), Ecosystems and Human Well-being: Synthesis, Island Press, Washington, DC, 2005.
4. Houghton, R.A., "Carbon Flux to the Atmosphere from Land-Use Changes: 1850-2005." In TRENDS: A Compendium of Data on Global Change. Oak Ridge, TN: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, 2008.
5. FAO, The State of World Fisheries and Aquaculture, FAO, Rome, 2012c.
6. M S Swaminathan Research Foundation (MSSRF). Report on the state of food insecurity in rural India. Chennai: M.S.Swaminathan Research Foundation; December 2008.
7. International Food Policy Research Institute (IFPRI). Millions Fed - Proven successes in agricultural development, David J. Spielman, Rajul Pandya-Lorch, editors. Washington DC:
8. IFPRI; 2009.