

GREEN REVOLUTION TO EVER-GREEN REVOLUTION: IMPACT ON FOOD SECURITY



**PREMA RAMACHANDRAN
DIRECTOR , NUTRITION FOUNDATION OF INDIA**

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Evolution of concept of food security

Green revolution - self-sufficiency in food grain production

Ever-green revolution to providing diverse food stuffs to all

Food insecurity indicators

Way forward to SDG targets

EVOLUTION OF CONCEPT OF FOOD SECURITY

EVOLUTION OF GLOBAL CONCEPTS OF FOOD SECURITY

The term "food security" was first used in the international development literature of the 1960s, and referred to the ability of a country or region to assure adequate food supply for its current and projected population.

During this era, Malthusian theory that if the population growth exceeded the growth in food production, there will be disastrous consequences was widely accepted.

The focus of international and national efforts was to grow more food and reduce population growth rates to sustainable levels.

Food security was measured by food grain production to ward off famine, improving availability and access to food at affordable cost, to meet the energy requirements and prevent chronic under nutrition among the ever growing population

FOOD SECURITY: ACCESS TO FOOD

From the early 1980's, the importance of food access was increasingly recognized as a key determinant of household food security.

Concerns about insufficient food access have resulted in a greater policy focus on incomes and expenditure in achieving household food security objectives.

Employment guarantee programmes to improve purchasing power and food for work programmes to improve household food security were initiated. These brought household food security closer to the poverty reduction agenda.

Access to subsidised food and food supplementation programmes for vulnerable groups were other initiatives for addressing the access to food dimension

WORLD FOOD SUMMIT (1996): REDEFINING FOOD SECURITY

Food Security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food, that meets their dietary needs and food preferences, for an active and healthy life.

This definition introduces four main dimensions of food security:

Physical AVAILABILITY of food

Economic and physical ACCESS to food

Food UTILIZATION

STABILITY of the other three dimensions over time

INDIA'S PROGRESS TOWARDS FOOD SECURITY

SEVENTY YEARS AGO

When India became independent the country was not self-sufficient in food grain production.

80% of Indians were poor, food insecure and under-nourished.

The country faced two major nutritional problems:

- ✿ threat of famine and the resultant acute starvation due to low food production and the lack of an appropriate food distribution system
- ✿ Prevalence of macro- & micro-nutrient deficiencies were high
- ✚ Famine and starvation hit the headlines because they are acute, localised, caused profound suffering and deaths
- ✚ Chronic low food intake was a wide-spread but silent problem leading to under-nutrition and many more deaths than starvation.

India accorded very high priority to becoming self-sufficient in food grain production

GREEN REVOLUTION
FROM SHIP-TO-MOUTH TO SELF-SUFFICIENCY IN A DECADE

GREEN REVOLUTION

FROM SHIP-TO-MOUTH TO SELF-SUFFICIENCY IN A DECADE

➤ Policy and programme interventions:

- Investment in irrigation
- Land reforms
- Fertilizer production and subsidy
- Minimum support price
- Farm level procurement

R&D: support for development of high yielding strains

- Lab-to-land extension education

All these programmes were well implemented

PERHAPS THIS IS A GOOD EXAMPLE OF WHAT INDIANS CAN DO WHEN THEY WORK TOGETHER - A MISSION MODE PUBLIC PRIVATE PARTNERSHIP TO ACHIEVE A NATIONAL GOAL IN RECORD TIME

NUTRITION & HEALTH STATUS OF INDIANS IN SEVENTIES

India was self sufficient in food production.

But

- ✿ Over 70% of India's population were poor
- ✿ They spent over 70% of their income on food
- ✿ Despite this expenditure, over 70% of were under-nourished




Mere self-sufficiency in food grain production at national level will not improve household food security or nutritional status of individuals

Better access to subsidised food grains, nutrition, health and family welfare services are essential

Multi-pronged interventions for improving food security at national , household and individual level were initiated

MULTI-PRONGED INTERVENTIONS FOR FOOD SECURITY

To improve National Food security:

-  Increase food production to meet needs of population growth**
-  Build buffer stocks**
-  Build Public Distribution System (PDS).**

To improve Household Food Security:

-  Improve purchasing power: employment programme**
-  Direct or indirect food subsidy.**

To improve food intake in vulnerable groups:

-  Food supplementation programmes.**

To monitor progress in efforts to improve food security and nutrition, several independent national surveys were established.

India invested in comprehensive multi-sectoral interventions to improve food security, nutritional and health status of its citizens in mid 1970s

India's comprehensive intervention to achieve holistic food security preceded the redefinition of food security by World Food Summit in 1996 by two decades

GREEN REVOLUTION TO EVER GREEN REVOLUTION

PARADIGM SHIFT IN THE TENTH FIVE YEAR PLAN

- from mere self-sufficiency in food grains production *to providing food items needed for meeting all the nutritional needs;*
- from production alone to *reduction in post-harvest losses and value addition through appropriate processing;*
- from food security at the state level *to optimal nutrition at the individual level.*

While achieving this the country should ensure that:

- **employment in agriculture and allied sectors does not dwindle**
- **farmers get adequate returns for their work**
- **there is price stability of food commodities so that consumer gets food stuffs at affordable cost**

GREEN REVOLUTION TO EVER GREEN REVOLUTION

Green Revolution: problems

Commodity-centred increase in productivity led to mono cropping

Excessive water use

Excessive use of chemicals, fertilisers and pesticides

All these have led to deterioration in soil health and green revolution fatigue

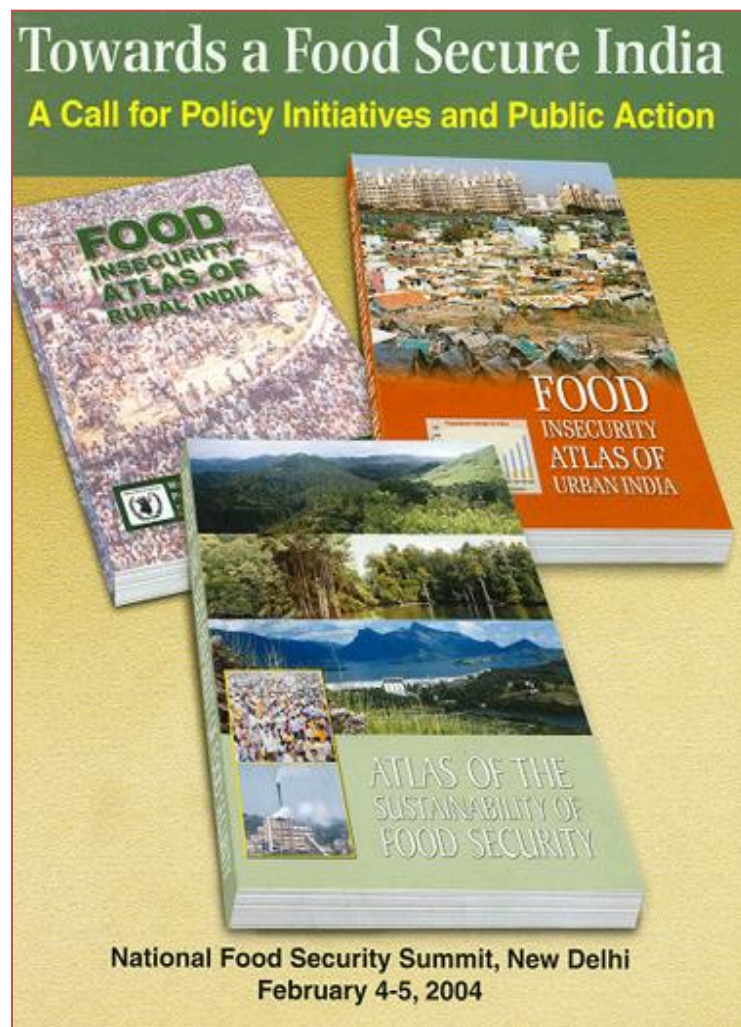
Evergreen Revolution aims at increasing productivity in perpetuity without any ecological harm

Crop diversification and rotation to ensure optimal use of water and improve soil nutrition and health

Conservation farming with the integrated pest management, integrated nutrient supply and integrated natural resource management systems

Eliminate Hunger

- Chronic
- Hidden
- Transient



Ensure Food Security

- Availability
- Access
- Absorption

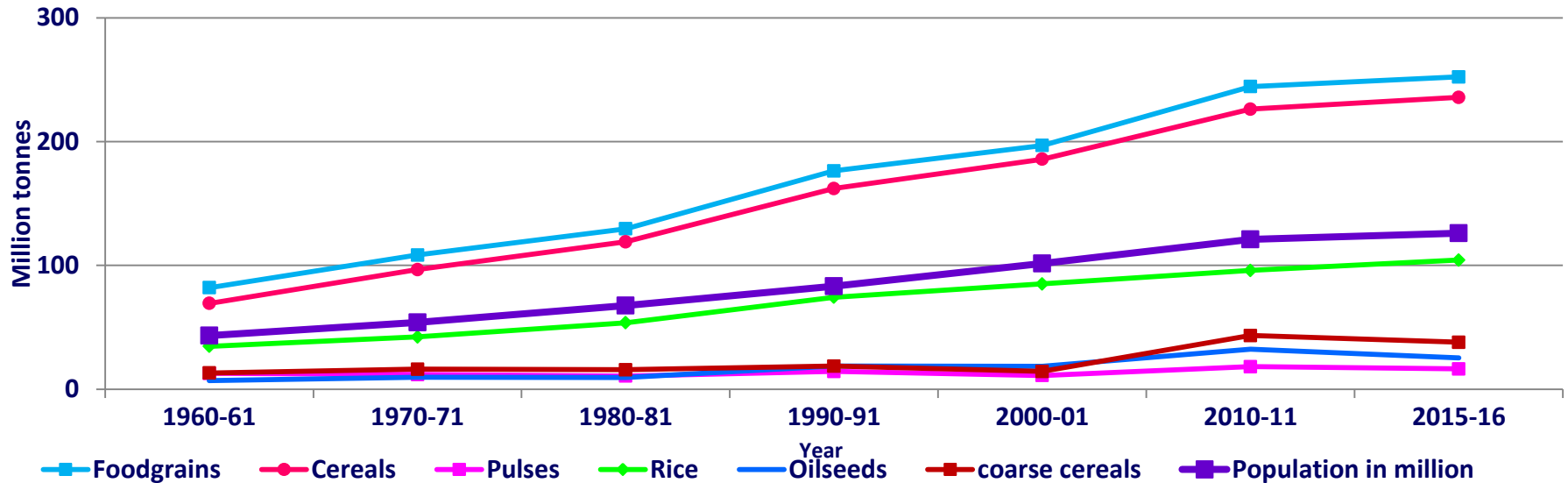
The National Food Security Mission and National Horticultural Mission were set up to achieve Tenth Five Year Plan goal of providing all food stuffs needed for optimal nutrition at individual level

NATIONAL FOOD SECURITY MISSION

National Food Security Mission (NFSM) was launched in August 2007 with the objectives to:

- increase production of rice, wheat through productivity increase**
- increase in pulses production through area expansion & productivity enhancement in a sustainable manner;**
- restore soil fertility and productivity at individual farm level;**
- enhance farm level economy (i.e. farm profits) to restore confidence of farmers for improving food production in selected districts.**

FOOD PRODUCTION TO MEET REQUIREMENTS FOR GROWING POPULATION



Food grain production quadrupled and met the needs of the growing population. India will remain self-sufficient in food grain production till 2030

India became a net exporter of rice and wheat.

BUT

Pulse production has been stagnant for 3 decades at 13 million tonnes

Gap between demand and supply necessitated import of pulses. The cost of pulses soared. In spite of continued expenditure on pulses, household consumption of pulses has come down.

Reduction in pulse consumption will have adverse effect on nutrient intake & nutritional status of the population.

FOOD SECURITY MISSION & PULSE PRODUCTION

Agricultural Production of Principal Crops

Production in Million Tonnes

Crop	2000-01	2006-07	2009-10	2010-11	2011-12	2012-13
Coarse Cereals	31.1	33.9	33.5	43.7	42.04	38.47
Cereals	185.7	203.1	203.4	226.5	242.23	232.57
Pulses	11.1	14.2	14.7	18.2	17.09	17.58
Foodgrains	196.8	217.3	218.1	244.8	259.32	250.14
Oilseeds	18.44	24.29	24.88	32.48	29.8	29.5

Pulse production improved from 2009-10 and was expected to reach 19 million tonnes by 2018.

However in the last two years there has been some stagnation in production; pulse imports increased.

Availability and affordability of pulses had become major problems.

The situation is improving in the current year.

NUTRITION ORIENTATION OF FOOD PRODUCTION: VEGETABLES

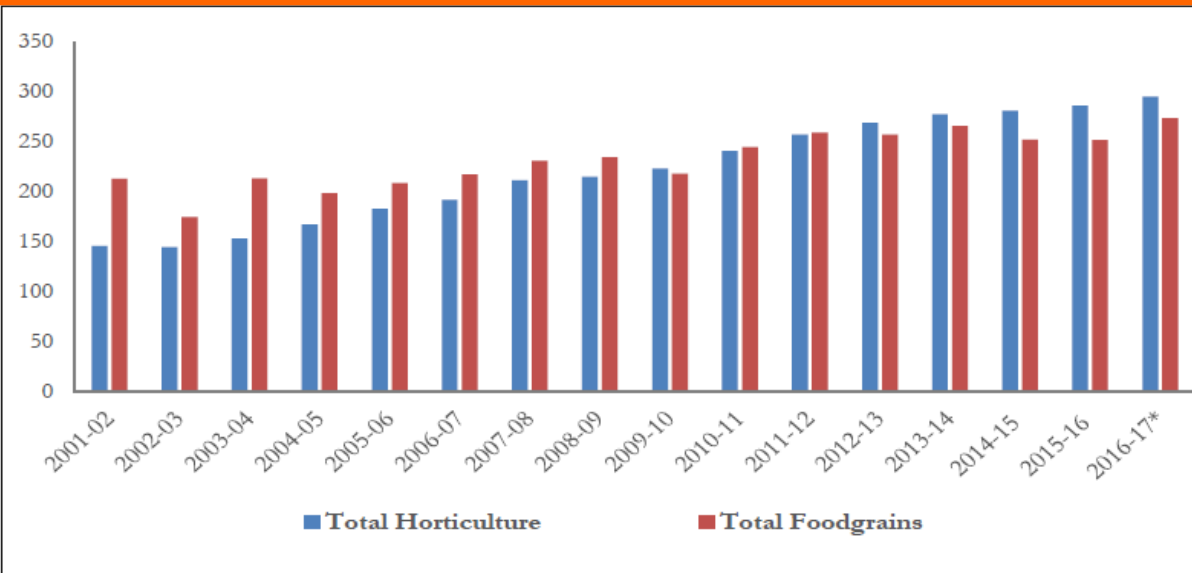
Fruits and vegetables provide essential micro-nutrients vital for nutrition and health.

Low vegetable intake is the major factor responsible for widespread anaemia and micro-nutrient deficiencies in the population.

Nutrition education for increase in vegetable consumption to improve micro-nutrient status and reduce NCD will succeed only when vegetables are available throughout the year at affordable cost.

India's National Horticultural Mission was established a decade ago to address this.

IMPACT ON VEGETABLE AND FRUIT PRODUCTION

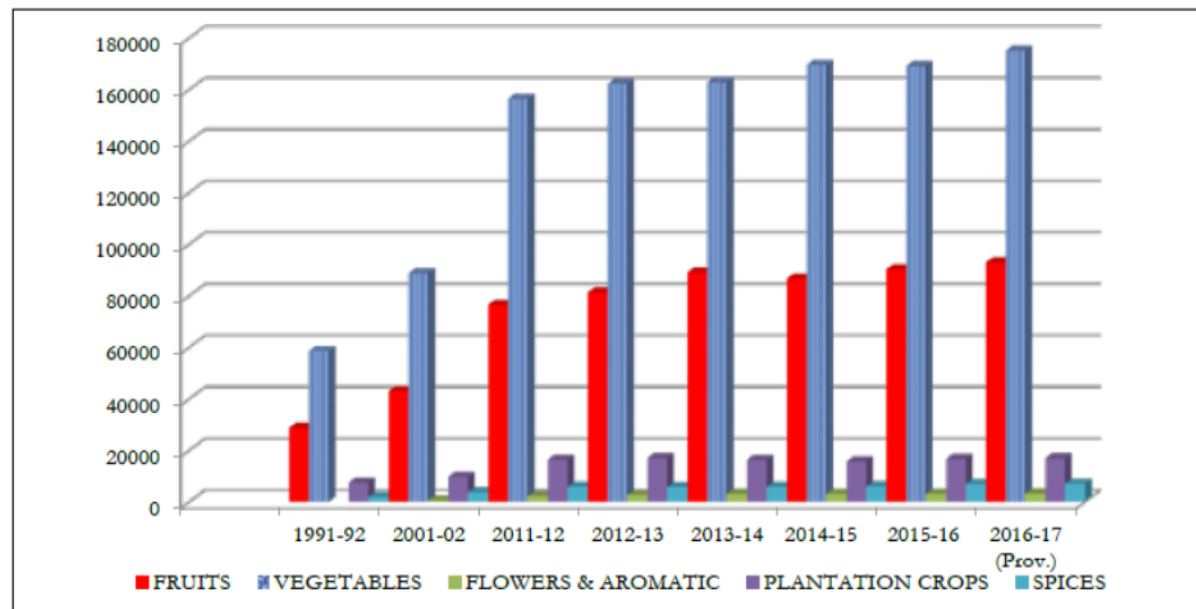


Since 2001 there has been massive increase in the production of horticultural products. Currently total horticultural products exceed total food grain production.

Source: Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmers Welfare

The increase in horticultural products is mainly due to increase in production of vegetables.

There has been substantial increase in the production of fruits also.



Source: Department of Agriculture, Cooperation and Farmers Welfare.

COLOURFUL VEGETABLES & FRUITS IN A SMALL STALL



WITH SUCH RICH VEGETABLE & FRUIT AVAILABILITY WE CAN SURELY COMBAT MICRO-NUTRIENT DEFICIENCIES

Currently FAO is advocating nutrition sensitive agriculture for improving human health and nutrition.

India had promoted and operationalised nutrition orientation of food production policies and programmes a decade earlier.

The ever-green revolution took roots because it is a win win situation both for the farmers and the population.

NATIONAL FOOD SECURITY ACT

NATIONAL FOOD SECURITY ACT

Aims to improve household food security by providing subsidised food grains as a legal entitlement to over 67% of Indian citizens.

Priority households are entitled to 5 kgs of foodgrains/person/month.

The poorest of the poor (Antyodaya) households are entitled to 35 kgs/household/month.

The combined coverage of Priority and Antyodaya households (called “eligible households”) is upto 75% of the rural population and upto 50% of the urban population.

Provisions are made for the food supplementation programmes under ICDS and MDM.

Food grains alone cannot provide a balanced meal needed for nutrition security. States like Chattisgarh and Tamil Nadu provide pulses at subsidized cost through PDS.

There has been attempts to provide oil, iodised and iron and iodine fortified salt through PDS at subsidized cost.

However it will never be possible to provide all the food stuffs at a subsidised cost to all the needy.

There is an urgent need for a nutrition awareness campaign with focus on women (who are head of the household for the ration card) on how the money saved because of subsidised food grains (approximately Rs 15-20 kg) can be used for purchasing the other food stuffs such as vegetables pulses etc so that the family can have balanced food.

FOOD INSECURITY OUTCOME INDICATORS

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The impact of gaps in availability, access and absorption of food is assessed by 'Food insecurity outcome' indicators.

The parameters used to assess the food insecurity outcome are:

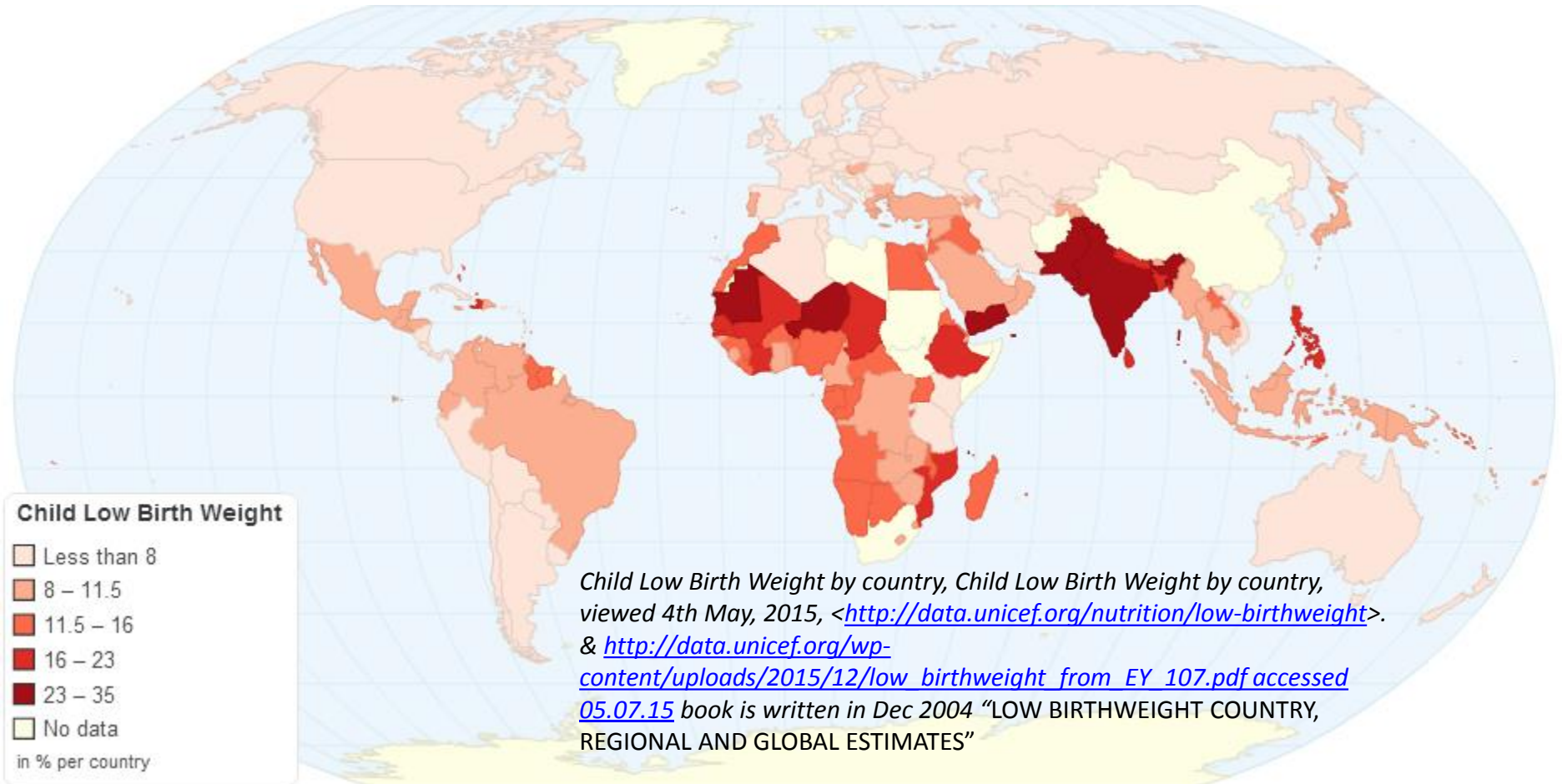
- Low birth weight,
- Under five mortality
- Under-nutrition and micro-nutrient deficiencies in all age groups, especially, in pre-school children.

The cause-effect relationship between low dietary intake/under-nutrition, infection and under five mortality has been well established.

Whenever these indices are used for comparisons within the same country - between income groups, or between those living in rural and urban areas, the relationships among food insecurity, under-nutrition, and high under-5 mortality are clear and consistent.

However, when the comparisons are made between countries and regions, there are inconsistencies.

CHILD LOW BIRTH WEIGHT BY COUNTRY



Low birth weight rates in India are the highest in the world.

But it is not due to food insecurity.

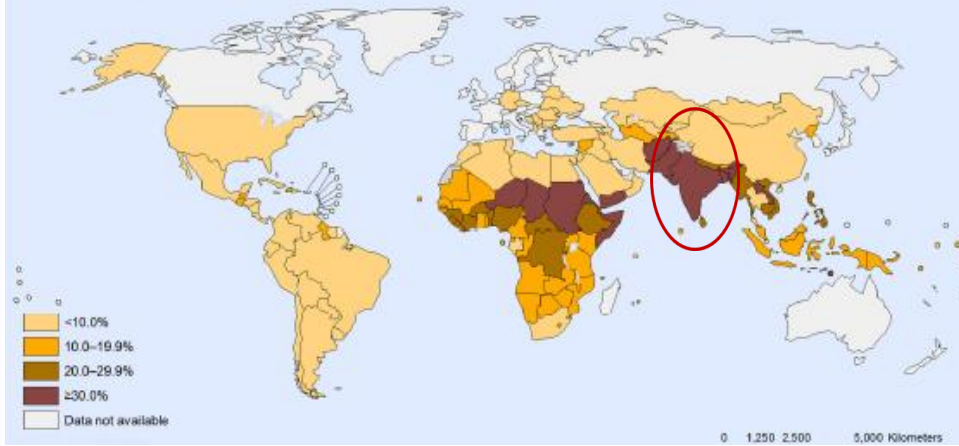
Low parental height, low maternal weight gain in pregnancy and anaemia are major factors responsible for high low birth weight rates.

UNDER-NUTRITION RATES

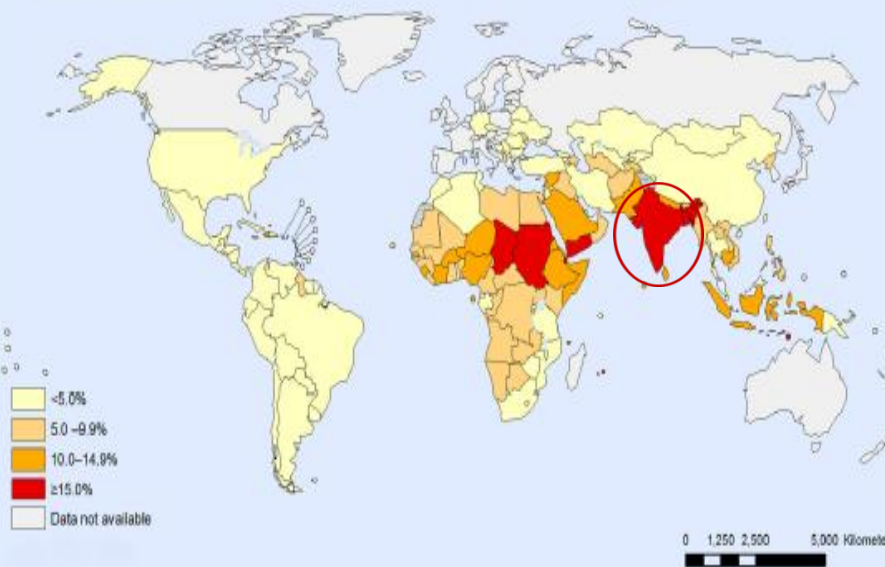
STUNTING



UNDERWEIGHT



WASTING



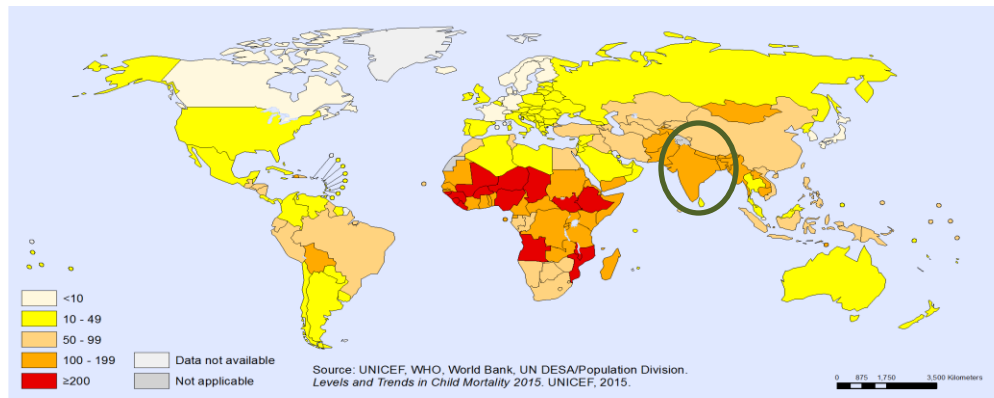
Stunting, underweight & wasting rates in Indian pre-school children are among the highest in the world. But this is not due to food insecurity.

SOFI 2013 acknowledged the dichotomy between food insecurity and child under-nutrition in South Asia.

Low birth weight and poor IYCF are major determinants of high under-nutrition rates in India.

UNDER FIVE MORTALITY

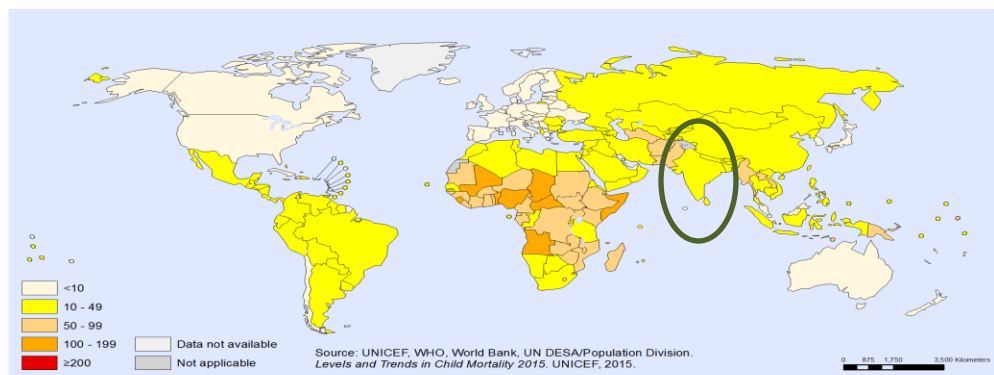
UNDER FIVE MORTALITY 1990



Despite high LBW rates (30%) and under-nutrition rates (>40%) NNMR, IMR and U5MR in India both in 1990 and in 2015 are comparable to other countries (South Asian enigma).

Mature but small Indian neonate survives if provided essential neonatal care, and grows along a lower trajectory as compared to neonates with higher birth-weight.

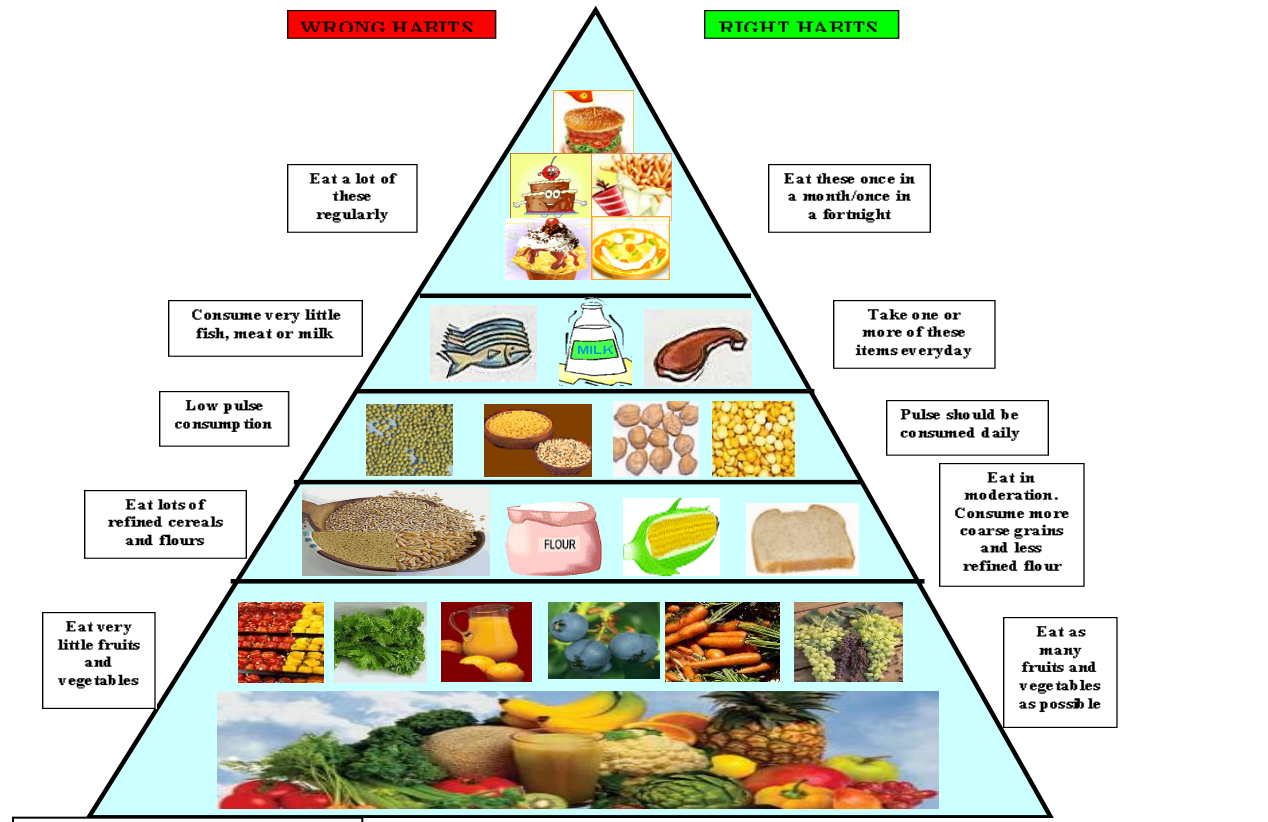
UNDER FIVE MORTALITY 2015



In Indian context neither under-nutrition rates in pre-school child nor U5MR can be used as impact indicators of household food insecurity.

WAY FORWARD TO SDG TARGETS

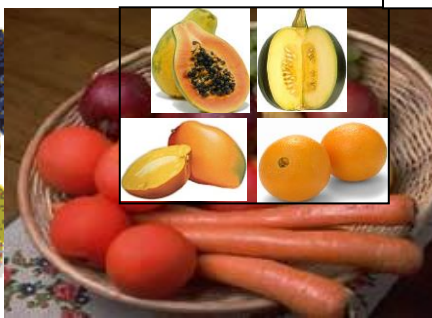
EAT ADEQUATE AMOUNTS OF BALANCED MEAL



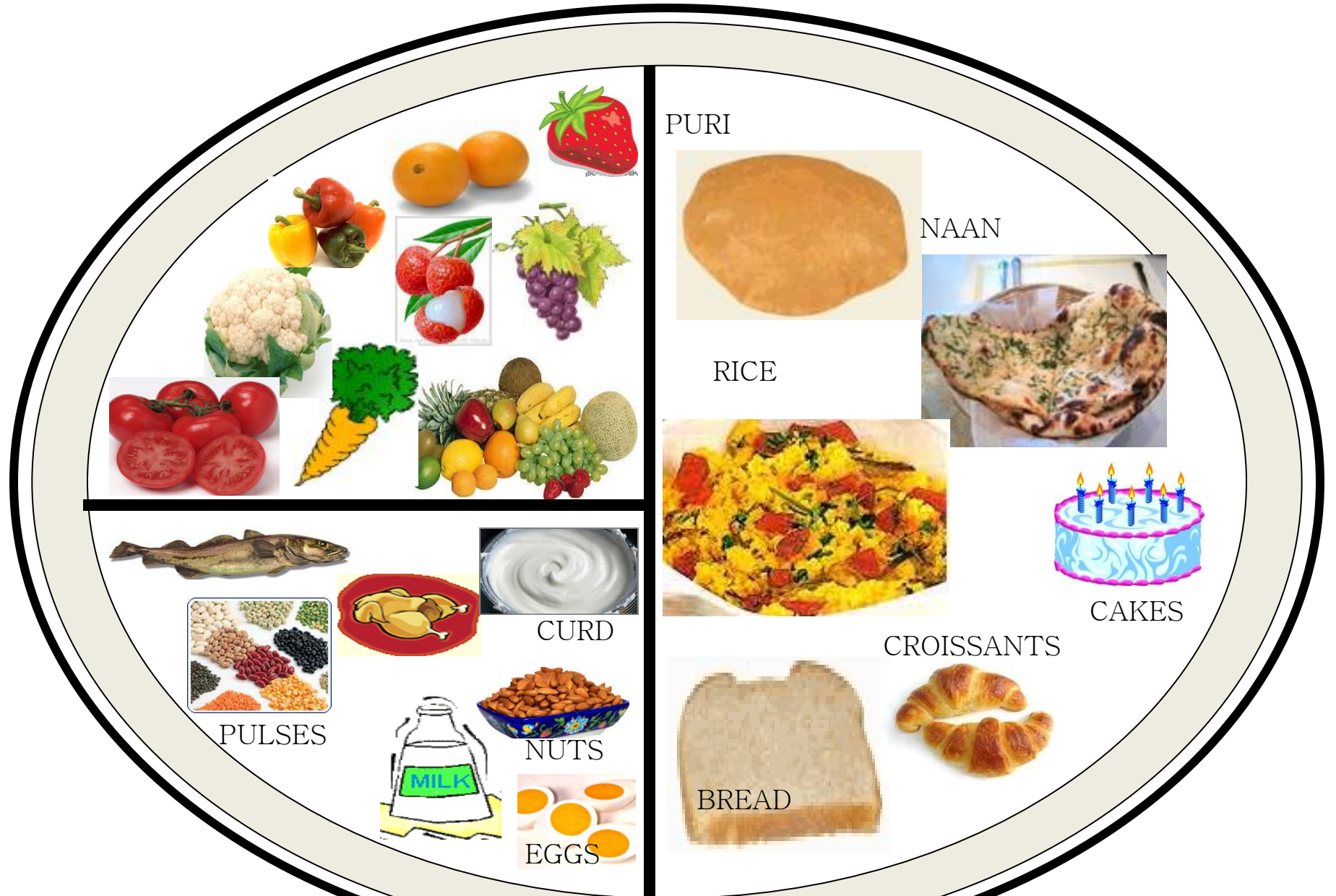
Rich in vitamins

Rich in iron & vitamins

Iodine & iron fortified salt



Balanced diet - High Income Group



PURI

NAAN

RICE

CAKES

CROISSANTS

BREAD

CURD

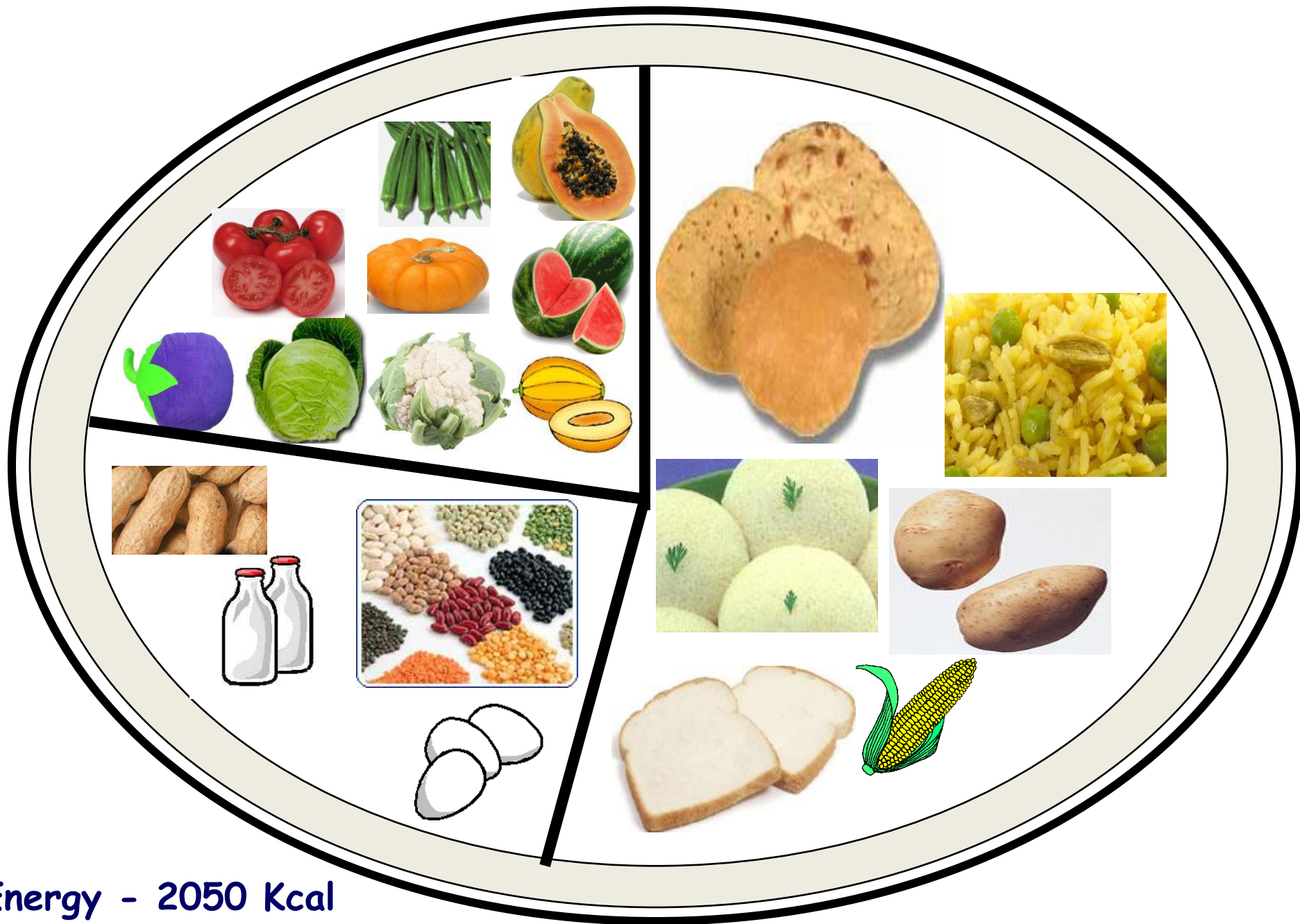
PULSES

NUTS

EGGS

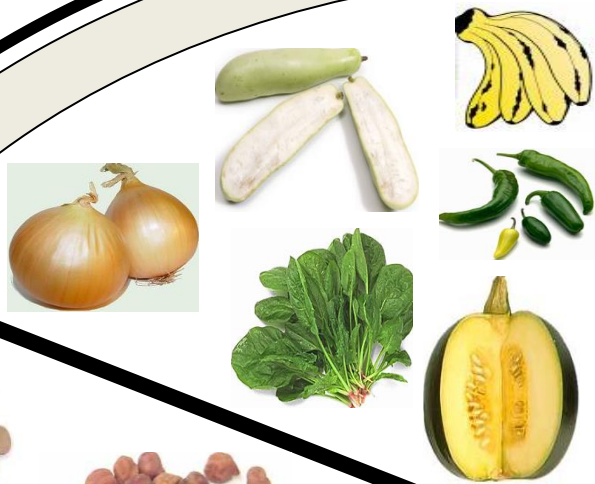
Energy - 2000 Kcal

Balanced diet - Middle Income Group



Energy - 2050 Kcal

Balanced diet - Low Income Group



ATTA ROTI



COARSE GRAINS



COARSE GRAIN ROTI

Energy - 2050 Kcal



**SUSTAINABLE
DEVELOPMENT**

GOALS

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

2.1 Target 1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.

Ambitious goal and targets but India can achieve them:

- with projected economic growth and food production,**
- with subsidised food grains under National Food security Act and**
- food supplementation programmes for vulnerable groups under ICDS and MDM.**

Thank You

The image features the words "Thank You" in a bold, sans-serif font. Each letter is filled with a different color from a rainbow spectrum, creating a vibrant, multi-colored effect. The letters are slightly raised, giving them a 3D appearance, and they cast soft, grey shadows onto the white background below them. The overall composition is clean and celebratory.