REVIEW OF LITERATIRE

Following sections discuss the review of literature: 10_chapter 2

- Food and Nutrition Security (FNS)
- Household Dietary Diversity (HDD)
- Infant and Young Child Nutrition (IYCN)
- Hygiene and sanitation
- Maternal and child nutrition
- Programs and policies to improve food and nutrition security
- Behavior Change Communication (BCC)
- Positive Deviance Approach (PDA)
- Public-Private Partnership (PPP) in improving food and nutrition security
- Summary statement

World leaders adopted 17 Sustainable Development Goals (SDGs), in 2015 set by the United Nations General Assembly to guide future global efforts for social, economic and environmental development, so that all people will live in a safer, cleaner, more equal and more prosperous world by the year 2030. The last or 17th goal of SDG fully recognized the multi-stakeholder's importance and called for the private sector to increase its role in development efforts and in improving food and nutrition security (ECDPM, 2017).

FOOD AND NUTRITION SECURITY

"Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life." It has four components-availability, accessibility, utilization and stability (FAO, 2006).

Domestic production, import capacity, food stocks and food aid come under food availability; Poverty/ purchasing power, transport and market infrastructure, food distribution come under food accessibility; Weather variability, price fluctuations, political factors and economic factors come under food stability and food safety & quality, clean water, health & sanitation, care and feeding come under food utilization (WHO/FAO, 1996)**.**

Food and Nutrition security (FNS) is an integrated way to combine food security (Food production, Food systems, Socio-economic aspects and nutrition security (Biological approach, Sociological aspects, Health and sanitation concerns) concept and emphasize to achieve both (WHO/FAO, 1996).

There is a changing concept of food security. Apart from food availability and food stability, food utilization became a major considering factor for food security in last few decades. India achieved food availability by increasing its food production and stability by coping with year to year fluctuations in food production. But it could not solve the problem of chronic household food insecurity among vulnerable population which means more than avoidance of chronic starvation (Radhakrishna &Reddy, 2002). Therefore, food security continues to be one of the critical policy objectives in India as food utilization could not be achieved in India till now (Swaminathan, 2006).

At the macro level, Food and nutrition security refers to the capacity of a country or region to provide food and nutrition for its population. At this scale, FNS is a combined interaction between demographic, socioeconomic, biophysical, and political factors and the international environment (Pinstrup-Andersen & Watson II, 2011). Food security along with the changing climate, trends in bioenergy production, population predictions, and the evolution of food preferences (Rosegrant et al., 2001). Price changes due to the global bio-fuels expansion will also change the world agricultural production and trade (Huang et al., 2012), as food and biofuels compete for a constrained input base. Finally, food aid both for emergency relief or addressing food deficits is one of the major components of food security strategies in developing countries (del Ninno et al., 2007).

There is voluminous evidence proving FNS status is positively linked with economic prosperity (Hoddinott et al., 2008). The nutritional status as represented by height and body mass index (BMI) is found to be a significant covariate of economic success (Thomas & Frankenberg, 2002).

The global economic crisis, commodity price hikes, and climate change have worsened the position of the poorest and most vulnerable people. These crises are compromising the diet and health of up to 80% of the population in most developing countries and threaten the development of almost an entire generation of children (~250 million), because the damage associated with undernutrition accumulated during the first 2 y of life can include increased susceptibility to infections; slowed cognitive development and growth; reduced school performance, including later enrolment and earlier drop-out; affected girls being at higher risk themselves later in life of having low birth weight babies, perpetuating the problem into another generation; and reduced productivity and lifelong earning potential (de Pee et al., 2010). Thus, investment in early childhood nutrition protects health, prevents disability, boosts economic productivity, and saves lives (Hoddinott et al., 2008).

Ensuring food and nutrition security is a challenge for India, given its huge population and high levels of poverty and malnutrition. However, food availability is threatened by the effects of climate change and declining water resources on agriculture output. Economic access to food by about a fourth of the population living below the poverty

line is problematic, despite impressive economic growth in the recent years (Nandakumar et al., 2010).

The history of thinking about food security since the World Food Conference can be conceptualized as consisting of three important and overlapping paradigm shifts, which have brought theory and policy progressively closer to "real" food insecurity (Hewitt de Alcantara, 1993). The three shifts are (a) from the global and the national to the household and the individual, (b) from a food first perspective to a livelihood perspective, and (c) from objective indicators to subjective perception (Maxwell, 1996).

From the global and the national to the household and the individual: Those early concerns live on today in the preoccupation of many governments, African in particular, with national food self-sufficiency (Harsch, 1992). Yet, it was clear from the outset that widespread hunger could and did co-exist with the presence of adequate food supply at the national and international level. Amartya Sen (1981) has been credited with initiating the paradigm shift that moved this issue of access to food to centre-stage. However, the idea was already commonplace in nutrition planning and had been amply demonstrated in field studies (Joy, 1973; Berg, 1973; Levinson, 1974; Keilman et al., 1983). Sen's contribution, then, was to codify and theorize the access question, give it a new name, "food entitlement", and demonstrate its relevance even in famine situations (Devereux, 1993). The shift from macro to micro has been reflected in policy initiatives, especially at international level: from the wider concept of food security adopted by FAO in 1983 (Huddleston, 1990), to the Bellagio and Cairo Declarations of 1989, and the International Conference on Nutrition in 1992 (FAO/WHO, 1992). While one school of thought has focused on the household as the unit of analysis for food security (Sahn, 1989; Swift, 1989; Eide, 1990; Frakenberger & Goldstein, 1990; Jonsson and Toole, 1991), another has placed intra-household power and resource-allocation issues in the front of analysis and focused instead on individual food security (Reutlinger, 1985; Gittinger et al., 1990). The first school certainly recognizes the importance of intra-household issues: indeed, its concern is often specifically with mother and child health. However, the difference lies in whether intra-household issues are treated as within the domain of food security or as more appropriate to a discussion of caring capacity and health conditions (Jonsson & Toole, 1991). Recent research favors the view that access to food by individuals in a household is pervasively linked to the

control they have over household resources and the access they have to household income (Hart, 1986; Evans, 1991; Kabeer, 1991). The implications for food security can be substantial: in urban Brazil, for example, unearned income has twenty times the effect on child survival if it is controlled by mothers (Thomas, 1991).

From a food first perspective to a livelihood perspective: Hopkins argued that food security stands as a fundamental need, basic to all human needs and the organization of social life (Hopkins, 1986). In recent years, however, the assumptions underlying this view have been questioned. It has been recognized that food, especially short-term nutritional intake, is only one of the objectives people pursue. Thus, de Waal (1989) found in the 1984/85 famine in Darfur, Sudan, that people chose to go hungry to preserve assets and future livelihood (de Waal, 1991). Others have similar findings, particularly in the context of analyzing the sequence of coping or adaptive strategies people follow in times of drought (Corbett, 1988; Frankenberger & Goldstein, 1990). In part, these findings reflect an issue of time preference: people going hungry now, in order to avoid going (more) hungry later. However, there is a broader issue of livelihood at stake, in which objectives other than nutritional adequacy are pursued (Chambers, 1988; Davies, 1996). Time preference remains important, nevertheless: not just livelihood, but secure and sustainable livelihood (Chambers, 1988). In this connection, Oshaug has argued that a society which can be said to enjoy food security is not only one which has reached food norm, but which has also developed the internal structures that will enable it to sustain the norm in the face of crises threatening to lower the achieved level of food consumption (Oshaug, 1985).

Oshaug identified three kinds of households, "enduring households", which maintain household food security on a continuous basis, "resilient households", which suffer shocks but recover quickly and "fragile households", which become increasingly insecure in response to shocks. Similar approaches are found else- where (Benson et al., 1986; Barraclough & Utting, 1987) and have recently been extended with the addition of "sensitivity", a measure of the extent of change following a shock (Blaikie & Brookfield, 1987; Bayliss-Smith, 1991). The upshot of these ideas is a view of food security which identifies livelihood security as a necessary and often sufficient condition for food security (Maxwell, 1988, 1991) and which focuses on the long-term

viability of the household as a productive and reproductive unit (Frankenberger & Goldstein, 1990).

From objective indicators to subjective perception: The third shift is from an objective to a subjective approach. In the poverty literature, there has been a long-standing distinction between "the conditions of deprivation", referring to objective analysis, and "feelings of deprivation", related to the subjective (Townsend, 1974). Conventional approaches to food security have relied on objective measurement: "target" levels of consumption (Siamwalla & Valdes, 1980); consumption of less than 80% of WHO average required daily calorie intake (Reardon & Matlon, 1989); or, more generally, a timely, reliable and nutritionally adequate supply of food (Staatz, 1990). For any individual, nutritional requirement is a function of age, health, size, workload, environment and behaviour (Payne & Lipton, 1994). Estimates of calorie requirements for average adults and children with average activity patterns in average years are subject to constant revision (Payne, 1990). A country and people are food secure when their food system operates in such a way as to remove the fear that there will not be enough to eat. In particular, food security will be achieved when the poor and vulnerable, particularly women and children and those living in marginal areas, have secure access to the food they want (Maxwell, 1988). The emphasis here on subjective assessment is only beginning to be seen in data collection and evaluation (Frankenberger, 1992). However, questions about perceptions of food problems have been asked in the Indian National Sample Survey, and research in the US has attempted to develop indicators for subjective aspects of food insecurity, including lack of choice, feelings of deprivation and food acquisition in socially unacceptable ways (Radimer et al., 1992). Flexibility, adaptability, diversification and resilience are key words. Perceptions matter. Intra-household issues are central. Importantly, food security must be treated as a multi-objective phenomenon, where the identification and weighting of objectives can only be decided by the food insecure themselves (Maxwell & Smith, 1992).

Food and nutrition security can be improved by increasing the availability of food by sustainably increasing agricultural production and productivity, improving access to food by meeting immediate food needs and addressing longer term accessibility through sustainable livelihoods, increasing availability and access to quality nutritious

food by diversifying diets, fortifying or bio-fortifying staple crops and increasing nutritional supplements, while integrating nutrition and food safety considerations and increasing stability of food security by strengthening sustainable management of the food value chain (FAO, 2006).

International Medical Corps' food security programs include providing support for home gardens to increase diversity and micronutrient content of available foods for families; designing and piloting household food storage systems so that harvested food is properly stored; decreasing food losses and ensuring that families have lasting food supplies; distributing seeds and tools to help families produce their own food; implementing water projects that assist families in irrigating their gardens; and distributing emergency food supplies to poor families so they do not have to sell assets to purchase food to empower communities especially women to provide nutritious food for their families (International medical corps, 2017).

To address food insecurity, the government of Ethiopia is taking a strong leadership role through its Productive Safety Net Program (PSNP), which is one of the largest safety net programs in the world and works with vulnerable households through cash or food for work programs. Its objective is to prevent families from having to deplete household assets in times of shortage. The program also stimulates markets, improves access to services, and builds community assets through the work households engage in. (Care learning tour, 2014).

HOUSEHOLD DIETARY DIVERSITY

A major challenge to food security comes from dietary diversification of the poor (McDonald et al., 2015). At the household level, research has revealed the effects of intra-household bias on food distribution (Haddad et al., 1994) and pro-male and pro-adult biases have been found to affect food intake (Senauer et al., 1988, Quisumbing & Maluccio, 2003). Also, there are differences in food consumption pattern across social groups and regions in rural India. (Gupta & Mishra, 2014). Dietary diversity has long been recognized by nutritionists as a key element of high-quality diets. Increasing the variety of foods across and within food groups is recommended by most dietary guidelines, in the United States (U.S. Department of Agriculture Human Nutrition Information Service, 1992) as well as internationally (WHO/FAO, 1996), because it is

thought to ensure adequate intake of essential nutrients and thus to promote good health. Lack of dietary diversity is a particularly severe problem among poor populations in the developing world, because their diets are predominantly based on starchy staples and often include little or no animal products and few fresh fruits and vegetables. These plant-based diets tend to be low in a number of micronutrients, and the micronutrients they contain are often in a form that is not easily absorbed (FAO, 2006). A 1996 WHO/FAO report recommended that developing countries also start implementing measures of dietary quality that capture both problems of nutrient deficiency and dietary excess and overnutrition (WHO/FAO 1996). Pioneer efforts in China to address this double burden are highlighted in the Dietary Guidelines for Chinese Residents. These guidelines specifically include concepts of nutrient adequacy, dietary diversity, and promotion of intake of fruits, vegetables, dairy products, and foods of animal origin, while also recommending moderation in consumption of selected nutrients and foods thought to be associated with increased chronic disease (Chinese Nutrition Society 1990).

There is a positive association between diversity measures and nutrient adequacy as proved by various studies in developing countries. The study in Viet Nam, which included adult women, used a similar methodology to validate the same diversity measures against nutrient intake and nutrient density (Ogle et al., 2001). The findings confirm a positive association between diversity and intake of a variety of nutrients. Two other studies that have looked at the association between diversity measures and nutrient intakes confirm the positive association between dietary diversity and intake of a variety of nutrients (Onyango et al., 1998; Tarini et al., 1999).

A study in Mali also documents a strong association between dietary diversity and children's growth (Hatloy et al., 2000). In urban areas of Mali, lower food variety or dietary diversity scores were associated with twice the risk of being stunted or underweight, controlling for socioeconomic factors. In Kenya, diversity measured by the number of individual foods consumed in 24 hours (average of three, 24-hour recalls) was significantly associated with five nutritional status indicators (HAZ, WAZ, WHZ, triceps skinfolds, and mid-upper arm circumference) among 12-36 months old children (Onyango et al., 1998). An interesting finding of this study is that diversity greater than five was more important for growth among children who were no longer breastfed

compared to those who were still breastfed at this age (Onyango et al., 1998). Again, showing a positive association between dietary diversity and nutritional status young children. Therefore, dietary diversity can be considered as a means of measuring household food security or food utilization.

Using data from Mali, Hatloy et al. (2000) also tested the association between dietary diversity and socioeconomic status. The results show that dietary diversity increases with socioeconomic status both in urban and in rural areas, and irrespective of the diversity indicator used. The association between dietary diversity and socioeconomic factors is also suggested in a few other studies. In the Southern Andes, dietary diversity was found to be higher in urban compared to rural areas (Leatherman, 1994). Within urban areas, poorer households also consumed less diverse diets compared to wealthier households, and the differences were mainly due to their significantly lower intake of meals containing meat, dairy products, and vegetables. Ferguson and colleagues also make reference to differences in dietary diversity between households from different socioeconomic status in their study among preschool Ghanaian and Malawian children (Ferguson et al., 1993). The strong association between dietary diversity and household socioeconomic characteristics documented here confirms the need to control for socioeconomic factors when assessing the relationship between dietary diversity and child nutrition and health outcomes. Failure to do so could lead to gross overestimations of the magnitude of this association and of the real potential of dietary diversification interventions to improve child nutrition and growth (Ruel, 2004).

INFANT AND YOUNG CHILD NUTRITION (IYCN)

Optimal IYCN practices include initiating breastfeeding within one hour of birth, exclusive breastfeeding for the first six months of life and continued breastfeeding up to the age of 2 and beyond, together with safe, age-appropriate feeding of solid, semi-solid and soft food starting at 6 months of age (UNICEF, 2013). Two practices together – ensuring optimal breastfeeding in the first year and complementary feeding practices – could prevent almost one fifth of deaths of children under 5 years of age (Jones et al., 2003). Studies suggest that optimal breastfeeding improves brain development (Kramer et al., 2008). Breastfeeding may also protect against cardiovascular risk factors, although it is not yet clear whether this is the case in low- and middle-income settings (Fall et al., 2011).

Several studies have demonstrated that early initiation of breastfeeding reduces the risk of neonatal mortality (Mullany et al., 2006). Colostrum, the rich milk produced by the mother during the first few days after delivery, provides essential nutrients as well as antibodies to boost the baby's immune system, thus reducing the likelihood of death in the neonatal period. Beyond saving lives, early initiation of breastfeeding promotes stronger uterine contractions, reducing the likelihood of uterine bleeding. It also reduces the risk of hypothermia, improves bonding between mother and child and promotes early milk production (Mullany et al, 2006).

Children's feeding frequency, dietary diversity, protein, and energy intake-Such elements of feeding practices are essential in improving children's nutrition status (Roy et al., 2005). Breastfeeding and appropriate complementary feeding are essential to ensure healthy growth of infants and young children (LéonCarva et al., 2002). Appropriate Complementary Feeding has the potential to prevent 6% of all under 5 deaths, particularly in the developing world (Lutter, 2003). Infant feeding choices are embedded in the context of ethnic and cultural beliefs (Choudhry & Wallace, 2012). Cultural knowledge encompasses all the necessary information such as beliefs, rules, ideas and concepts needed to interpret experience and generate behaviour (Monterrosa et al., 2012).

Exclusive breastfeeding in the first six months of life saves lives (Black et al., 2008). During this period, an infant who is not breastfed is more than 14 times more likely to die from all causes than an exclusively breastfed infant (Black et al., 2008). Infants who are exclusively breastfed are less likely to die from diarrhoea and pneumonia, and prevent of growth faltering (Dewey et al., 2005).

Complementary feeding Studies have shown that feeding with appropriate, adequate and safe complementary foods from the age of 6 months onwards leads to better health and growth outcomes (Bhutta et al., 2008). However, children may not receive safe and appropriate complementary foods at the right age, may not be fed at the right frequency or may receive food of inadequate quality (UNICEF, 2012) The problem of poor quality of complementary food has been underemphasized in nutrition programming for quite some time (Dewey et al., 2005).

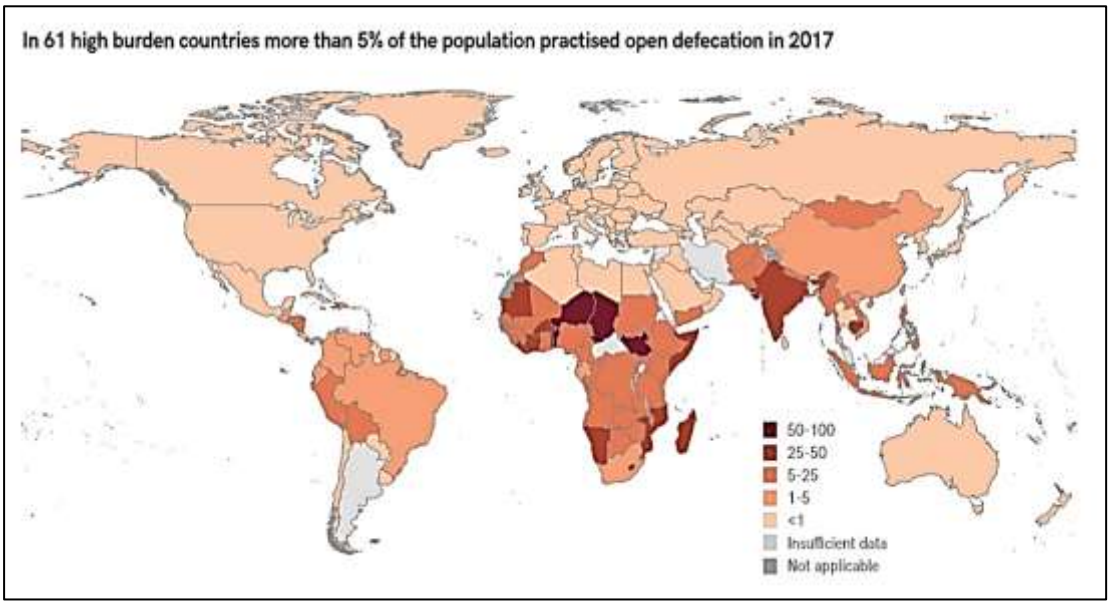
In India 44.2% 0-23months children were breastfed within 1hr of birth, 65.1% 0-5months were exclusively breastfed, 47.1% 6-8months were fed complementary food, only 18.6% 6-23months children had a minimum dietary diversity (4 or more food groups) (RSOC, 2013-14)**.**

HYGIENE AND SANITATION

Repeated episodes of diarrhea and intestinal infestation can prevent nutrient absorption and diminish appetite, resulting in stunting and other forms of undernutrition (Humphrey, 2011). Improving water, sanitation and hygiene as well as access to and use of health services including immunization, creating environments free of open defecation, hand washing with soap, access to clean drinking water, use of oral rehydration salts and therapeutic zinc to treat diarrhoea, prevention (with insecticide-treated mosquito nets) and treatment of malaria, and treatment of pneumonia with antibiotics can promote healthy environments and reduce the prevalence of infectious diseases and key interventions implemented at scale can reduce undernutrition (Guerrant et al., 2008).

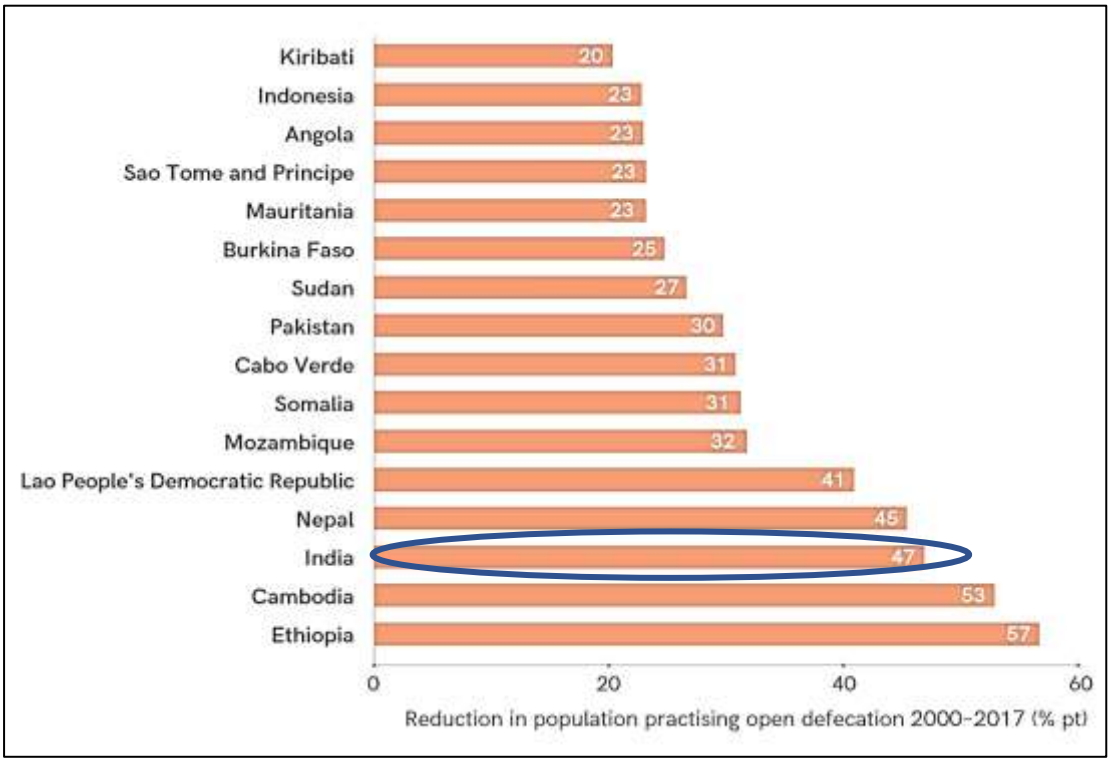
Ending open defecation has been identified as a top priority for reducing global inequalities in WASH. It is explicitly referenced in SDG target 6 and closely associated with wider efforts to end extreme poverty by 2030. Since 2000, the global rate of open defecation has decreased from 21% to 9% (0.7 percentage points per year). The 673 million people still practicing open defecation in 2017 were increasingly concentrated in a small number of countries, and these will need to be the primary focus of efforts to end open defecation by 2030. Figure 2.1 shows high burden countries where more than 5% of the population practiced open defecation in 2017. Figure 2.2 shows 16 countries, which have reduced open defecation by more than 20 percentage points (JMP, 2019).

Figure 2.1: Open defecation practice in 2017 among global population



Source: JMP, 2019

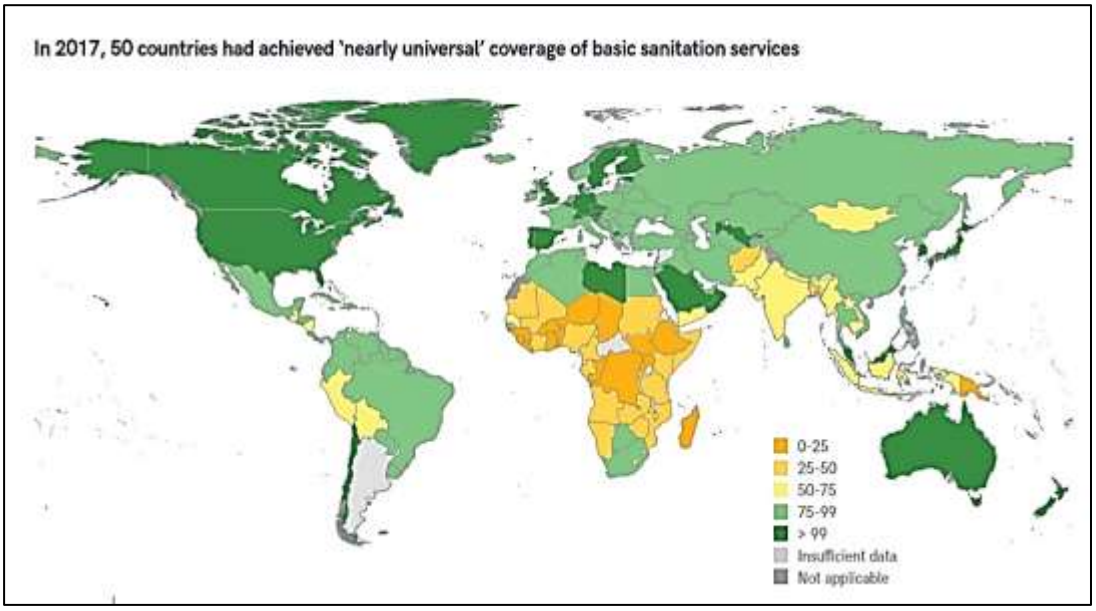
Figure 2.2: Countries which have reduced open defecation by more than 20%



Source: JMP, 2019

In 2017, 74% of the world's population (5.5 billion people) used at least basic sanitation services, compared with 56% (3.4 billion people) in 2000. Achieving universal coverage by 2030 will require a doubling of the current annual rate of increase (Figure 2.3) (JMP, 2019).

Figure 2.3: Basic sanitation services in 2017 among global population



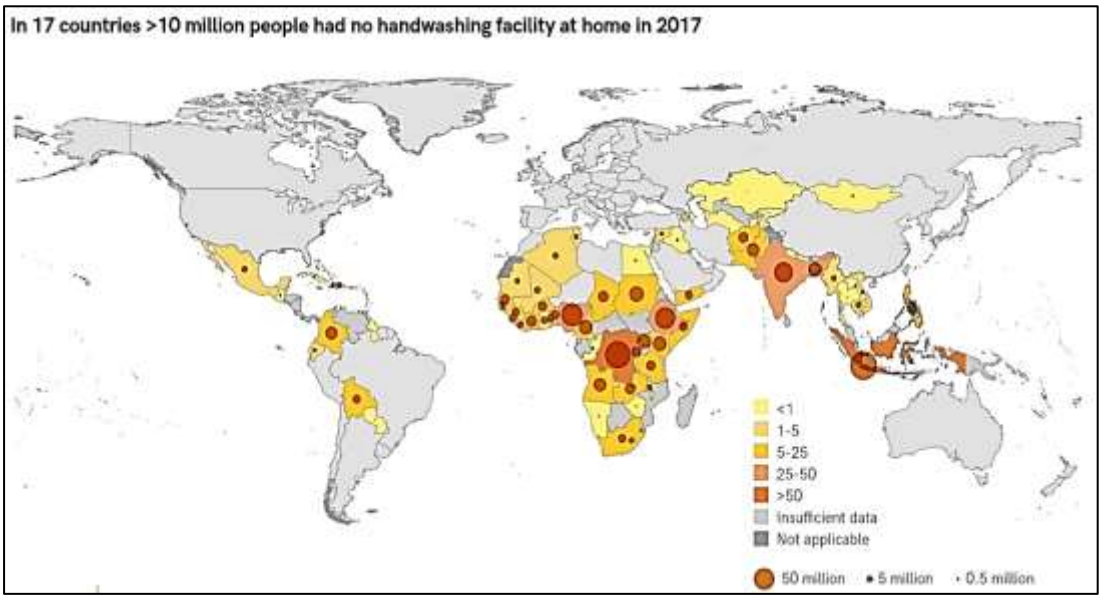
Source: JMP, 2019

The indicator selected for global monitoring of SDG 6.2 is the proportion of the population with a handwashing facility with soap and water available at home.

In 2017, 60% of the global population (4.5 billion people) had a basic handwashing facility with soap and water available at home. A further 22% (1.6 billion people) had handwashing facilities that lacked water or soap at the time of the survey, and 18% (1.4 billion people) had no handwashing facility at all (JMP, 2019).

Figure 2.4 (source: JMP, 2019) shows both the proportion of the population and the total number of people with no handwashing facility among the 78 countries with data available. It shows that 17 countries had at least 10 million people and 30 countries had at least 5 million people with no facility in 2017. The largest numbers with no facility were found in populous countries, such as Indonesia (78 million), Democratic Republic of the Congo (69 million), Nigeria (49 million), Ethiopia (43 million) and India (37 million).

Figure 2.4: People with no handwashing facility at home in 2017 globally



Source: JMP, 2019

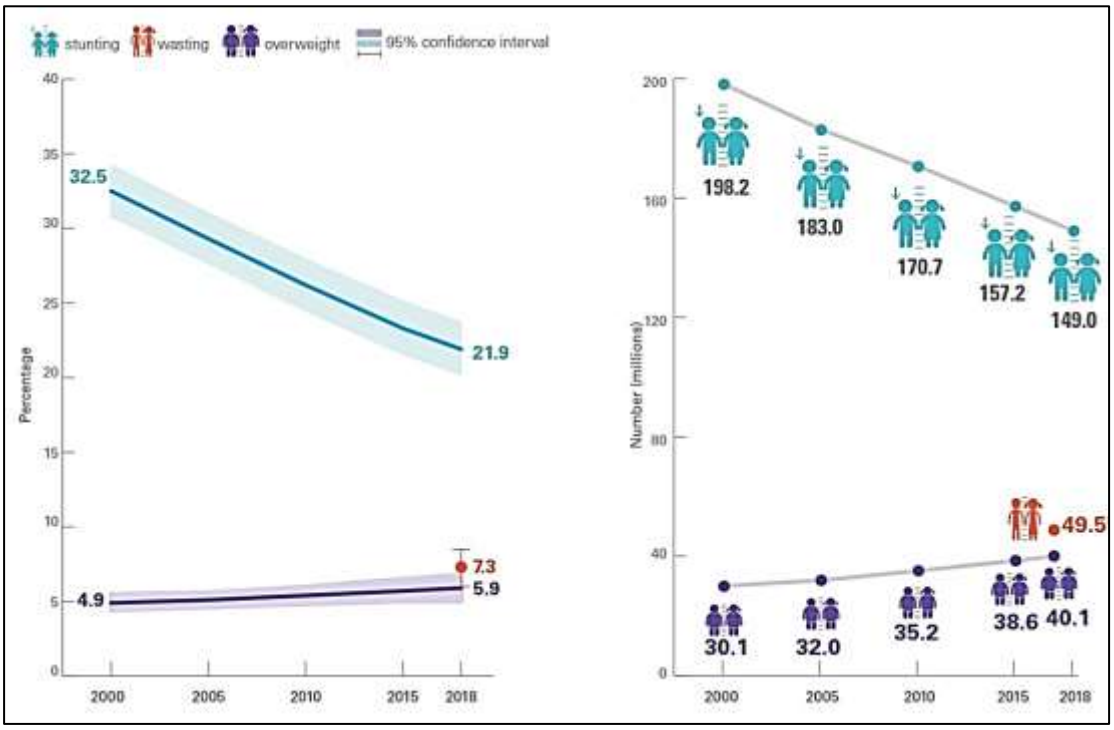
According to RSOC 2013-14, only 29.9% rural people use improved sanitation facility, 61.6% households practice open defecation and 61.3% households use adequately iodized salt in rural area (RSOC, 2013-14).

MATERNAL AND CHILD HEALTH NUTRITION

UNICEF, WHO, World Bank global and regional child malnutrition estimates reveal that we are still far from a world without malnutrition. The joint estimates, published in March 2019, cover indicators of stunting, wasting, severe wasting and overweight among children under 5, and reveal insufficient progress (Figure 2.5) to reach the World Health Assembly targets set for 2025 and the Sustainable Development Goals set for 2030. (JME, 2019).

In terms of absolute numbers of people, an estimated 821 million people were suffering from undernourishment in 2017, up slightly from 2016 and not much improved from 2000 (IFPRI, 2019). Global progress in reducing child stunting (low height-for-age) has been substantial, with reductions in prevalence from 39 percent in 1990 to 22 percent in 2017 (JME, 2018). But 151 million children under the age of five are classified as stunted, with limited progress since 2000 (WHO, 2018).

Figure 2.5: Global Malnutrition trends



Source: UNICEF, WHO, World Bank Group joint malnutrition estimates (JME), 2019 edition

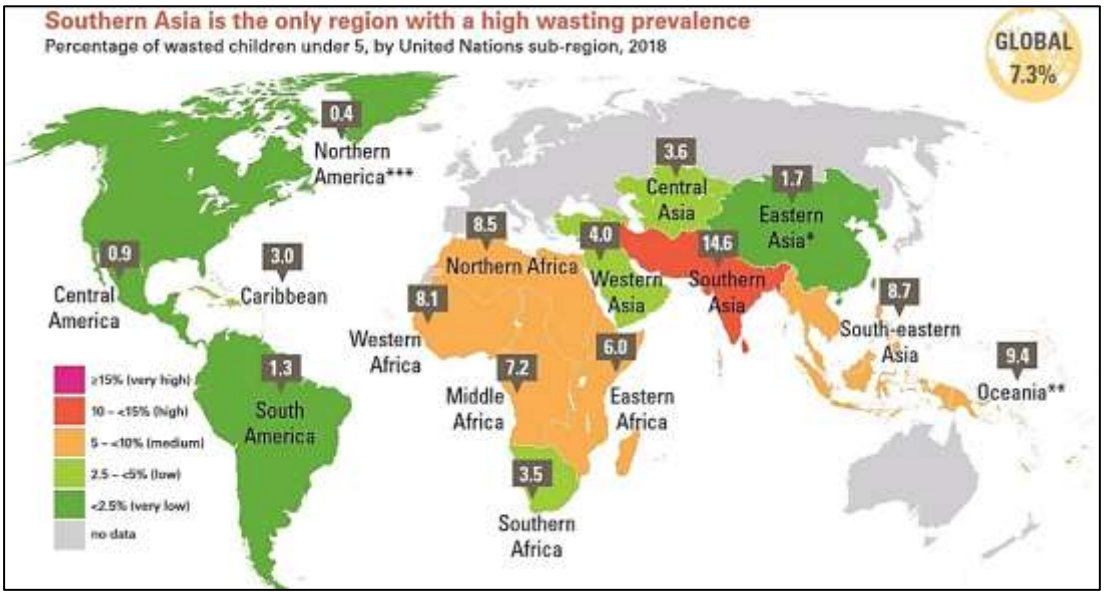
Stunting is the devastating result of poor nutrition in-utero and early childhood. Children suffering from stunting may never attain their full possible height and their brains may never develop to their full cognitive potential. Globally, approximately 149 million children under 5 suffer from stunting. These children begin their lives at a marked disadvantage: they face learning difficulties in school, earn less as adults, and face barriers to participation in their communities (JME, 2019). South Asia is still the biggest contributor to malnutrition in the world. Figure 2.6 is indicating the same. More than one-third of children (about 60 million) under five years of age are stunted in South Asia, accounting for about 35 percent of the world's stunted children, and stunting rates are higher in rural areas than in cities. Globally, the number of stunted children declined by 9 percent from 2012 to 2017 (FAO, 2018). Stunting is indicative of inadequate nutrition and poor health, and the interactions between the two. For rural areas specifically, the picture is less clear, due to the lack of systematic data. National-level demographic and health surveys show that, for countries with disaggregated data, rural areas lag behind urban areas in reducing stunting rates (ICF, 2018).

Figure 2.6: Global prevalence of stunting

Source: UNICEF, WHO, World Bank Group joint malnutrition estimates (JME), 2019 edition

Wasting in children is the life-threatening result of poor nutrient intake and/or disease. Children suffering from wasting have weakened immunity, are susceptible to long term developmental delays, and face an increased risk of death, particularly when wasting is severe. These children require urgent feeding, treatment and care to survive. In 2018, over 49 million children under 5 were wasted and nearly 17 million were severely wasted (JMP, 2019). More than 15% of children under age 5 in South Asian countries were wasted in 2016 (27.6 million) as well (Global nutrition report, 2017). Figure 2.7 in indicating the same.

Figure2.7: Global prevalence of wasting



Source: UNICEF, WHO, World Bank Group joint malnutrition estimates (JME), 2019 edition

India has made progress towards the international hunger targets but it still has the second highest estimated number (194.6millions) of undernourished people in the world (FAO, 2015). There is an urgent need to integrate actions on global nutrition if India hopes to meet its Sustainable Development Goals of Agenda 2030 as About 38 per cent of the children under five are affected by stunting and about 21 per cent of children under 5 have been defined as 'wasted' or 'severely wasted'. Moreover, 51 per cent of the women of reproductive age suffer from anemia (Global nutrition report, 2017). In Gujarat, according to RSOC (Rapid Survey of Children) 2013-14 report, 33.5% under 5 children were underweight, 41.8% were stunted and 18.7% were wasted. According to NFHS 4 report, 38.5% under 5 children were stunted, 26.4% were wasted and 39.3% were underweight (NFHS-4, 2015-16 report).

Nutritional status before and during pregnancy influences maternal and child outcomes. Optimal child development requires adequate nutrient intake, provision of supplements as needed and prevention of disease. It also requires protection from stress factors such as cigarette smoke, narcotic substances, environmental pollutants and psychological stress (Walker et al, 2011). Interventions to improve maternal nutrient intake include supplementation with iron, folic acid or multiple micronutrients and provision of food and other supplements where necessary. Compared to iron-folic acid supplementation

alone, supplementation with multiple micronutrients during pregnancy has been found to reduce low birthweight by about 10 per cent in low-income countries (Fall et al, 2009). Among undernourished women, balanced protein-energy supplementation has been found effective in reducing the prevalence of low birthweight (Imdad et al, 2012). The use of lipid-based supplements for pregnant women in emergency settings is being studied as a way to improve child growth and development (Chaparro et al, 2010).

PROGRAMS AND POLICIES TO IMPROVE FOOD AND NUTRITION SECURITY

A community-based intervention known as Safe Motherhood Action Groups (SMAGs) was implemented to increase coverage of maternal and neonatal health (MNH) services among the poorest and most remote populations in Zambia (Jacobs, 2018). To improve the maternal and child health and nutrition status the Government of India also had launched various programs to help the needy people of the country Some of the programs that focus on the health, nutrition and provision of services for women and child care are (https://nhm.gov.in/rch-ii.htm):

- Integrated Child Development Scheme (ICDS)
- National Nutrition Mission (NNM)
- Pradhan Mantri Matru Vandana Yojana (PMMVY)
- Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)
- Janani Shishu Suraksha Karyakram (JSSK)
- Janani Suraksha Yojana (JSY)
- Mothers Absolute Affection (MAA)
- National Iron Plus Initiative (NIPI)

In Gujarat level other than the national level schemes the state government have also implemented schemes (https://nhm.gujarat.gov.in/rch-ii.htm):

- Chiranjeevi Yojana
- Bal Bhog Yojana
- Nutritious food with vitamins Yojana (Vitamin Yukta Poshan Ahar)
- Mission Balam Sukham and Bal Sakha Scheme
- Mamta Doli, mamta Abhiyan

Integrated Child Development Scheme (ICDS)

The Integrated Child Development Services (ICDS) Scheme, launched on 2nd October,1975, is India's response to the challenge of breaking a vicious cycle of malnutrition, impaired development, morbidity and mortality in young children. It responds to the inter related needs of children below 6 years, pregnant women, lactating mother and adolescent girls in a comprehensive manner to improve the nutritional and health status as well as psychological, physical and social development of the child, to reduce the incidence of mortality, morbidity and malnutrition and school drop-out, to achieve effective coordination of the policy and implementation among various Departments to promote child development and to enhance the capability of the mother to look after normal health and nutritional needs of the child through proper nutrition and health education. Towards achieving the above objectives, a package of integrated services comprising Supplementary Nutrition, Immunization, Health Check-up, Referral Services, Nutrition and Health Education and Non-formal Education is provided in a comprehensive and cost-effective manner to meet the multi-dimensional and interrelated needs of children. Anganwadi Centre is the focal point for delivery of services. Immunization and health-checkup are provided at the Anganwadi through the network of health services in the project area. Under the Integrated Child Development Services (ICDS) Scheme, supplementary nutrition is provided to pregnant and lactating women at the rate of Rs.5 per day per woman. This is meant to provide 600 Kcal and 18–20 grams of protein. The aim is to bridge the gap between the recommended dietary allowance (RDA) and the average daily intake (ADI) of beneficiaries. The other services provided through the Anganwadi Centre are early registration of pregnancy, counseling on diet, rest and IFA compliance during Home visits, monitoring of weight gain pattern, examination for pallor and edema and any danger signs and home-based counseling which is essential for newborn care, lactation support & counseling on spacing (https://darpg.gov.in/sites/default/files/ICDS.pdf). The beneficiaries under the program are children below 6 years, pregnant and lactating women, adolescent Girls and other women in the age group 15-45 years. According to RSOC 2013-14 report, only 9% mothers of 0-3yrs old children are aware of all the ICDS services; Majority (87.2%) know about supplementary food, but only 16.7% are aware of nutrition and health education at ICDS center; only 7.2% pregnant mothers are aware of all the ICDS services; and 15.7% are aware of nutrition and health education. Though 63.4% AWCs

provide nutrition and health education majority of mothers and pregnant women are not aware of that. Only 21.3% of children under 3 years of age have received supplementary food recommended by ICDS for 21 days a month (RSOC 2013-14).

In Gujarat, Weekly recipes for the AWC charted out and followed. Fortified Take home rations or premixes are available as Bal Bhog, sukhadi, upma, sheera for preparing around 77 recipes. Rasoi shows are organized for orientation on benefit and preparation of premixes (WCD 2013). To address the needs of socially and geographically excluded population mostly in the remote interior areas, Government of Gujarat has started Mobile Anganwadi Vans to provide services to the beneficiaries in these areas using the State's Budget. In order to provide freshly prepared supplementary nutrition every day at the AWC and in order to save the AWW and AWH from harmful exposure of the smoke from 'Chulha', the States of Andhra Pradesh, Gujarat and Haryana are providing Gas Connection from the flexi funds. In the state of Gujarat, Stove and an 'Idli' cooker have also been provided at each AWC (https://icds-wcd.nic.in/icdsimg/icds_english_03-12-2013.pdf).

National Nutrition Mission

Poshan Abhiyaan (National Nutrition Mission) is a flagship program of the Ministry of Women and Child Development (MWCD), Government of India, to improve the nutritional status of mother and child. It is a multi-ministerial convergence mission with the vision to ensure attainment of malnutrition free India by 2022. The objective of Poshan Abhiyaan is to reduce stunting by improving utilization of key Anganwadi Services and improving the quality of Anganwadi Services delivery. It aims to ensure holistic development and adequate nutrition for pregnant women, mothers and children (https://www.india.gov.in/spotlight/poshan-abhiyaan-pms-overarching-schemeholistic-nourishment).

The Ministry of Women and Child Development (MWCD) is implementing POSHAN Abhiyaan in 315 Districts in first year, 235 Districts in second year and remaining districts will be covered in the third year (https://icds-wcd.nic.in/nnm/NNM-Web-Contents/UPPER-MENU/AboutNNM/PIB_release_NationalNutritionMission.pdf).

Pradhan Mantri Matru Vandana Yojana (PMMVY)

Pradhan Mantri Surakshit Matrutava Abhiyan (PMSMA) is been implemented since 09th June 2016 across state to ensure early identification & prompt treatment of high risk pregnant women of 2nd / 3rd trimesters under guidance of specialist (http://www.wcd.nic.in/sites/default/files/PMMVY%20Scheme%20Implemetation%20Guidelines%20._0.pdf).

Janani Shishu Suraksha Karyakram (JSSK)

It was launched by Government of India on 1st June, 2011.The scheme is estimated to benefit more than 12 million pregnant women who access Government health facilities for their delivery. The following are the Free Entitlements for pregnant women: Free and cashless delivery, Free C-Section, Free drugs and consumables, Free diagnostics, Free diet during stay in the health institutions, Free provision of blood, Exemption from user charges, Free transport from home to health institutions, Free transport between facilities in case of referral, Free drop back from Institutions to home after 48hrs stay (http://nhm.gov.in/janani-shishu-suraksha-karyakram.html).

Janani Suraksha Yojana (JSY)

Janani Suraksha Yojana (JSY) is a safe motherhood intervention under the overall umbrella of National Rural Health Mission (NRHM) being implemented by the objective of reducing maternal and neonatal mortality by promoting institutional deliveries among BPL families. JSY integrates the cash assistance with antenatal care during the pregnancy period, institutional care during delivery and immediate post-partum period in a health center by establishing a system of coordinated care by field level health worker. (http://www.ilo.org/dyn/travail/docs/683/JananiSurakshaYojanaGuidelines/MinistryofHealthandFamilyWelfare.pdf). The yojana has led to a sharp increase in institutional delivery (from 39% in 2005-06 to 79% in 2015-16) and near doubling of children breastfed within one hour of birth in the last 10 years (The Hindu,2017 https://www.thehindu.com/sci-tech/health/on-track-but-more-needed/article17449529.ece).

Mothers Absolute Affection (MAA)

MAA program was launched in the month of August 2016, in an attempt to bring focus on promotion of breast-feeding. The goal of the 'MAA' Program is to towards promotion, protection and support of breastfeeding practices through health systems to achieve higher breastfeeding rates. This can be done by building an enabling environment for breastfeeding through awareness generation activities, targeting pregnant and lactating mothers, family members and society in order to promote optimal breastfeeding practices, reinforce lactation support services at public health facilities through trained healthcare providers and to incentivize and recognize those health facilities that show high rates of breastfeeding along with processes in place for lactation management (https://www.nhp.gov.in/maa-(mothers%E2%80%99-absolute-affection)-programme-for-infant-and-young-child-feeding_pg).

National Iron Plus Initiative (NIPI)

NIPI is an initiative started in an attempt to reduce anemia among all staged of life including children, adolescent and women of reproductive age group. The national iron plus initiative focus on each age group and provide iron supplements to them. Iron and folic acid tablets are being distributed through sub-centers, primary health centers (PHCs), community health centers (CHCs) and district hospitals (DHs) to all pregnant women and lactating mothers (https://nhm.gujarat.gov.in/images/pdf/Nutrition/nipi-guidelines-eng.pdf).

Swachh Bharat Abhiyan (SBA) or Swachh Bharat Mission (SBM)

It is a nation-wide campaign in India for the period 2014 to 2019 that aims to clean up the streets, roads and infrastructure of India's cities, towns, and rural areas. The campaign's official name is in Hindi and translates to "Clean India Mission" in English. The objectives of Swachh Bharat include eliminating open defecation through the construction of household-owned and community-owned toilets and establishing an accountable mechanism of monitoring toilet use. Run by the Government of India, the mission aims to achieve an "open-defecation free" (ODF) India by 2 October 2019, the 150th anniversary of the birth of Mahatma Gandhi, by constructing 90 million toilets in rural India at a projected cost of ₹1.96 lakh crore (US$30 billion). The mission will

also contribute to India reaching Sustainable Development Goal 6 (SDG 6), established by the UN in 2015. The mission has two thrusts: Swachh Bharat Abhiyan (‘*gramin*’ or 'rural'), which operates under the Ministry of Drinking Water and Sanitation; and Swachh Bharat Abhiyan ('urban'), which operates under the Ministry of Housing and Urban Affairs (https://en.wikipedia.org/wiki/Swachh_Bharat_mission).

Swachhagraha

Inspired by Prime Minister Narendra Modi’s vision of a Swachh Bharat, Aquakraft Projects Pvt Ltd., and iTV Network launched Swachhagraha, an advocacy platform in association with the Children’s Film Society of India on August 15. The object of this sanitation movement was to protect the health of children and the nation as a whole. Swachhagraha is a platform to aggregate support, donors, partners, volunteers, ideas and innovations to make clean drinking water, safe toilets, adequate nutrition and hygiene across schools in India, thereby enabling a healthy and clean India. (https://latestpopularnewsonline.wordpress.com/2016/09/06/swachhagraha-by-the-children-for-the-children-of-the-children/)

According to the WHO’s estimates 1,17,000 children under five lost their lives in the country in 2015, primarily due to diarrheal diseases. Open defecation results in contamination of water because of which children cannot assimilate nutrients. The chief of UNICEF’s Water, Sanitation, and Hygiene (WASH) project claims that poor sanitation costs India more than 50 billion dollars a year — this includes the cost of treating water borne diseases. So, while launching the centenary celebration of the Mahatma’s Champaran Satyagraha, the prime minister also rekindled the sanitation drive and reframed it as “From Satyagraha to Swachagraha”. It has captured the imagination of every Indian and many villages have taken to sanitation on a mission mode. (https://indianexpress.com/article/opinion/columns/narendra-modi-swachh-bharat-abhiyan-clean-india-campaign-5132096/)

Swasth Vatsalya Yojana

The focus of the project will be to eliminate malnutrition among the mothers and children. This will be the first focused mission to ensure that pregnant women and infants get the required care. The infants will be monitored upto the age of 6 months.

(https://timesofindia.indiatimes.com/city/vadodara/Swasth-Vatsalya-Yojna-launched-to-fight-malnutrition-and-ensure-safe-deliveries/articleshow/48008989.cms)

Chiranjeevi Yojana

Chiranjeevi Yojana scheme main aim was to improve the access to Institutional deliveries for marginalized section of the society by reducing the maternal deaths. Under the scheme, the government would enter into a contract with the private provider to cater to institutional services for both normal and complicated delivery including C-Sections operation and blood transfusion to targeted group (https://gujhealth.gujarat.gov.in/chirnajivi-yojana-gujarat.htm).

Bal Sakha Scheme

This scheme was launched January 2009. Under this scheme, all babies born to BPL mothers in the State will be covered for neonatal care by partnering with pediatricians, including care in their Neonatal Intensive Care Unit at no cost to the beneficiary. The pediatrician attends all eligible newborns at the place of birth and has to ensure their survival by providing early neonatal care including immunizations at birth, nutrition advice, etc. The gynecologist has to ensure 2 days stay of mother and baby after delivery to cover dangers of immediate post partum period (https://gujhealth.gujarat.gov.in/bal-sakha-yojana.htm).

BEHAVIOUR CHANGE COMMUNICATION (BCC)

"BCC is an interactive process of any intervention with individuals, communities and/or societies (as integrated with an overall program) to develop communication strategies to promote positive behaviors which are appropriate to their settings**"** (United Nations children's Funds, 2012)**.**

Social factors including caregivers' poor knowledge on nutrition and lack of knowledge on food diversity in their environment may correlate with poor feeding practices. Such factors may result in low dietary diversity, low feeding frequency, and low food and energy intake for children (Saloojee et al., 2007). Caregivers' nutrition education can help to clear cultural and tradition-based misconceptions and improve their general nutrition knowledge (Shi & Zhang, 2011). Nutrition counselling also improved

caregivers' knowledge in food preparation and healthy feeding behaviors (Zaman et al., 2008). Nutrition knowledge among caregivers improved in turn when they were frequently counselled by health workers who received nutrition training (Pelto et al., 2004). Therefore, Behavior change communication regarding health care, Infant and young child nutrition (IYCN) practices and hygiene and sanitation practices can be effective in the improvement of overall nutritional status of the children.

POSITIVE DEVIANCE APPROACH (PDA)

The Positive Deviance Approach is based on the notion that even in poorest communities there are children with better nutritional status. These children are referred to as Positive Deviants (PD). The approach involves referring to Positive Deviants, in counselling parents of undernourished children for promoting positive behavior amongst the families of under nourished children. The approach was pioneered for reduction of under-nutrition through ICDS in West Bengal the program, and given a local name *Kano Parbo Na* (We Can Do It). Positive outcomes from pilot districts in West Bengal led to upscaling in West Bengal and its replication in Orissa. The state of Orissa adopted Positive Deviance Approach as Ami Bhi Paribhu (I Can Also Do It). Both the states have been able to reduce under-nutrition substantially and promote sustainable care practices at the family level. It enabled families to break the dependence on supplementary nutrition program by identifying cheap, locally available nutritious food which only some families (PD) used. Under this initiative, behavioral change is emphasized through participatory learning and hands-on training of caregivers on how to prepare and feed high protein and energy meals to their children (https://unicef.in/Story/764/Positive-Deviance-reaching-out-to-undernourished-children).

The positive deviance/Hearth methodology has been used by maternal and child health programs since 70s as a way of addressing childhood malnutrition by learning from and scaling up what is working rather than what is not working (Schooley & Morales, 2007). Household factors contributing to positive deviance in an urban slum environment were: smaller family size higher maternal literacy, lower parity of child, better environmental hygiene, fewer morbidity episodes (mainly diarrhea), and desirable IYCN practices such as frequent breast feeding, timely initiation of CF, active feeding, giving foods of thicker consistency (Kanani & Popat, 2012).

A study done in rural Bangalore stated that nutrition education based on positive deviance approach and supplementary nutrition helps to improve the nutritional status of the *anganwadi* children (Imran et al., 2014). PDA could be a community- based solution to improve child's nutritional status. Nutritional surveys are needed to identify most significant malnutrition determinants to see adoption of new behaviors and sustainability of outcomes mentioned by a study done in Indonesia (Hidayat, 2009). A study done in Uttar Pradesh suggested Using PD helps in promoting indigenous positive correlates of child growth by using community wisdom through people who promote positive practices in concern with technical interventions (Sethi et al., 2007).

A positive deviance inquiry implemented in Egypt was designed to identify factors associated with the achievement of good pregnancy outcomes and its seen that women who gained appropriate weight throughout their pregnancy were more likely than women with poor weight gain to report multiple ANC and increased rest during pregnancy as well as increased meat and vegetable consumption(Ahrari et al., 2002).

Another study done in Vietnam, using PDA stated the factors identified in the exclusively breastfeeding mothers who worked included the following:-a)they felt they had enough milk b)they all knew the appropriate time to introduce foods and liquids c) most were supported in their breastfeeding decisions by community health workers and family members (Dearden et al., 2002).

The PDA model has also been used to study newborn care practices among Afghan refugees and Pakistanis in Haripur district, Pakistan. This study found that the PDA for new born care is more complex than when used to assess pregnant women's health or infant and child nutrition (Marsh et al., 2002).

A previous study done in a slum of Delhi (India) with 25 infants aged 6-12 months on positive deviance approach stated that such field experiences help one understand the human psyche around adoption of appropriate behaviors by families living in resource poor conditions and determinants of the same. They also mentioned that a small sample of twenty-five does not represent a statistically significant evidence of results, however, it does help them to understand the psychosocial environment that effects behavior change and the valuable role of self-efficacious PD mothers/family members as counsellors. They suggested that more research initiatives with a larger sample size for

longer duration would be of utmost value to reveal the determinants behind adoption, maintenance, and dropout of the PD behaviors once tried (Sethi et al., 2003).

PUBLIC-PRIVATE PARTNERSHIP IN IMPROVING FOOD AND NUTRITION SECURITY

Known as the world's rice bowl, Southeast Asia faces mounting food security challenges because of increasing urbanization and a growing population amidst decreasing natural resources and climate change. The key to ensuring that the region's agriculture and aquaculture sectors produce enough food lies in public-private partnerships, said experts at the recently-held Responsible Business Forum on Food and Agriculture in Manila (https://www.eco-business.com/news/public-private-partnerships-key-ensuring-food-security/)

In Netherlands, public-private partnerships considered a major vehicle for development cooperation. GAIN's "Amsterdam Initiative Against Malnutrition" a key recipient of PPP facility specifically for food security established in 2012 at a value of Euro 60 Million, with matching private sector co-investments. In Germany, "German Food Partnership" launched in June 2012 with major German and European companies, German government and local SMEs to significantly increase productivity and nutrition in rice, potato and oilseed value chains in Asia and Africa. In UK, Ireland and Switzerland, exploring development of PPP platform to speed up innovation in nutritious products and their delivery to poor income. In US and EU, Strong emphasis has been made on private sector engagement in food security and nutrition (Gain, 2013).

The implementation of the UN Decade of Action on Nutrition offers a unique opportunity to all countries and stakeholders to increase the visibility, coordination, efficiency and effectiveness of nutrition action at all levels, with governments, intergovernmental organizations, civil society and private sector (ECDPM, 2017).

Increasing international cooperation, is seen as vital to achieving each of the 16 previous sustainable development goals. Goal 17 is included to assure that countries and organizations cooperate instead of compete (UNDP, 2018). The challenges encountered in 2018 will continue in 2019. Achieving SDG2—Zero Hunger by 2030 will require strong political will and both public and private investment. Policymakers,

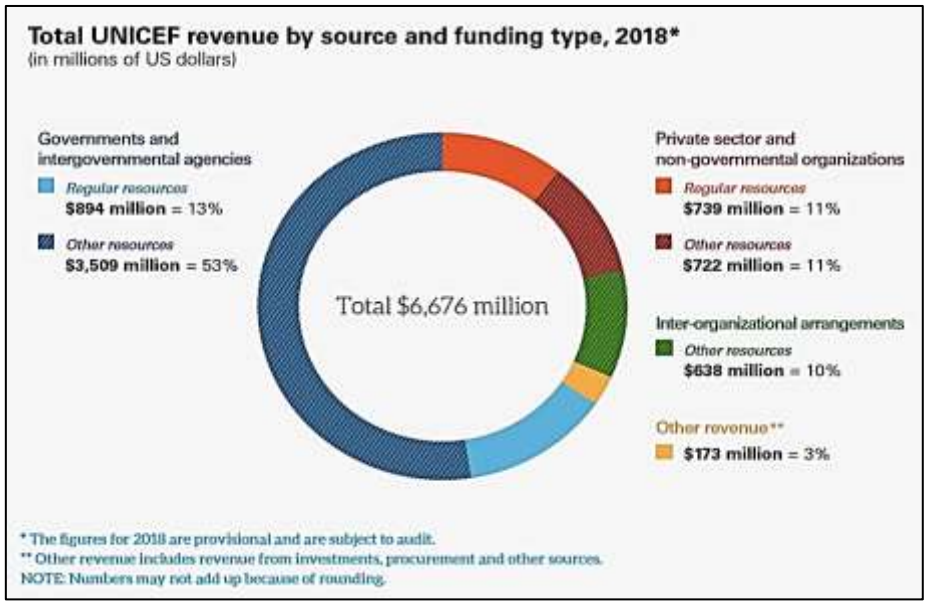
researchers, program implementers, and civil society are already crossing sectoral boundaries to learn from past experiences and scale up successes, as they did at the recent IFPRI/FAO Global Event on Accelerating the End of Hunger and Malnutrition (IFPRI, 2019).

In promoting partnerships marginalized groups such as poor rural women and ethnic minorities are empowered through the formation of self-help groups (PPP, 2012). When we partner with the private sector we have more certainty that enterprises will become economically viable and that they will be sustained beyond the life of a project (IFAD & PPP, 2013). The announcement by the Group of Eight (G8) of the New Alliance for Food Security and Nutrition, in which private companies committed to invest $3 billion over ten years, was hailed by the Obama administration as a major step forward in advancing global food security and harnessing the energy and resources of the private sector for development (IFAD & PPP, 2013).

UNICEF worked to effect change for children worldwide using a variety of unique new funding mechanisms in 2018 (Figure 2.8). A total of 28 new mechanisms leveraged more than US$750 million. For example, an innovative financial arrangement with the social enterprise Conceptos Plásticos supported the construction of classrooms in Côte d'Ivoire, with a cost saving of 40 per cent through the use of bricks made from recycled plastic waste (UNICEF, 2018).

UNICEF also worked closely with the World Bank and other partners to develop public and private financing mechanisms for early action in humanitarian situations – which can prevent them from reaching crisis levels. In 2018, the Pandemic Emergency Financing Facility enabled a rapid response to the Ebola outbreak in the Democratic Republic of the Congo (UNICEF, 2018).

Figure 2.8: Total UNICEF revenue by source and funding type, 2018

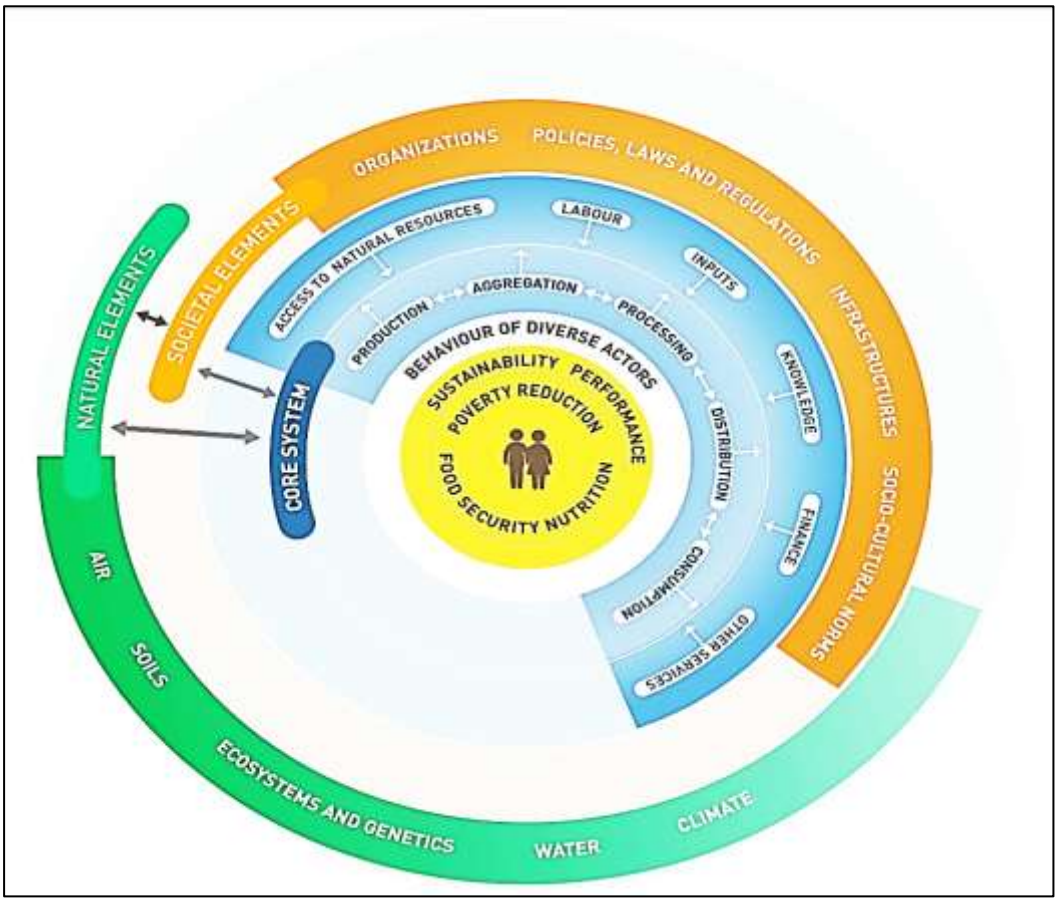


Source: UNICEF, WHO, World Bank Group joint malnutrition estimates (JME), 2019 edition

Reaching the Sustainable Development Goals of eliminating hunger and eradicating poverty has become a key development objective in most developing countries (IFPRI, 2018). However, the approach to implementing food security and nutrition interventions continues to be through nutrition-specific programs, rather than through those that integrate nutrition goals into the existing agricultural and rural development interventions and thereby result in a nutrition-sensitive food system (FAO, 2017).

The food system wheel framework is centered around FAO's main goals, which include poverty reduction, food security and nutrition (Figure 2.9). (FAO, 2018)

Figure 2.9: Food system wheel



Source: FAO, 2018

Community participatory methods have provided a key strategy to bridge technical knowledge of preparedness to community contexts and stakeholders (Maldonado, 2012; Eisenman, 2009; Mercer, 2010). All approaches to building community resilience emphasize the need for linking community members, community-based organizations (e.g., churches, schools, nursing homes), businesses, and government agencies across sectors (Bromley et al., 2017). In the U.S. National Health Security Strategy (NHSS), community resilience entails enhancing preparedness through improving social connectedness and coordination between health and human services agencies (Bromley et al., 2017).

In India, states like Tamil Nadu and Gujarat have made well designed *anganwadi centre* with all amenities to provide a joyful learning environment through Public Private Partnerships (PPP). In Tamil Nadu, Lufthansa Airways came up with a proposal. Similar Initiative has been taken up in Gujarat where 47 percent of AWCs are constructed through public private partnerships (PPP & IFAD, 2013).

Sustainability was a term used by governments and civil society organizations until it entered the private sector vocabulary in the 1990s during the era of "Corporate Social Responsibility (CSR). The private sector is often seen as a driver of exclusionary processes rather than a partner in improving the health and welfare of socially-excluded populations. However, private-sector initiatives and partnerships— collectively labelled corporate social responsibility (CSR) initiatives—may be able to positively impact social status, earning potential, and access to services and resources for populations (Werner, 2009). A study in Bangladesh found that CSR has potential for positive and lasting impact on developing countries, however, there is a need for additional monitoring and critical evaluation (Werner, 2009).

The Vadodara area has a large number of reputed corporate houses who are spending a sizeable amount of their funds in this area. So, the formation of CSR Committee for district Vadodara has become inevitable to lay a more scientific and professional emphasis for formulation of an approach to operationalize CSR activities effectively.

SUMMARY STATEMENT

Even after 43years of functioning, ICDS – the flagship intervention program of India failed to eradicate hunger and malnutrition among the vulnerable populations of mothers and children. Household food insecurity still a problem in India as high incidence of child undernutrition, maternal anemia, poor dietary diversity, less micronutrient rich food consumption, poor child feeding and hygiene and sanitation practices as well as poverty exist in a wide spectrum. Awareness regarding ICDS and utilization of its services are also minimal and sensitization is needed among both functionaries and beneficiaries. To combat this food insecurity and undernutrition scenario and to create enabling environment integrated strategy is the need of the hour. Positive deviance approach proved to be beneficial and can be replicated and as there is lack of implementation in government policies, Public-private partnership is recent trend in India and especially in Gujarat to combat the situation. With the help of CSR team of private companies and ICDS workers as well as village heads a public-private partnership can be formed and implemented for the improvement of food and nutrition security in India.