



# TRENDS OF FOOD SECURITY AND NUTRITION IN INDIA

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## ABSTRACT

*The present study analyse the food security and nutritional status in India. Food and nutrition security are the main indicators of a healthy, secure & prosperous human life. Zero hunger, good health, and well-being goals are the important indicators of Sustainable Development Goals. These goals will be achieve when we able to provide food security to every household and individual. Availability of cereals, pulses and food grains were increased 0.32 percent, 3.08 percent and 0.60 percent respectively during 2000 to 2018 in India. NFHS-4 has estimated 38.4 percent of children under age five years as stunted which signify chronic under-nutrition. The decreasing trends found in prevalence of stunting from 48.0 percent in 2005-06 to 38.4 percent in 2015-16. Similarly, prevalence of underweight was reduced by 0.68 percentage points from 2005-06 to 2015-16. The prevalence of obesity was higher among women than men. The decline trend of anaemia among women of reproductive age (15-49 years) from 53.3 percent to 51.4 percent between 2000 and 2016 respectively. The share of undernourished people in India decreased from 18.2 percent (191.2 million) in 2001 to 14.5 percent (194.4 million) in 2018. It means that, 1 in every 7 people in India still insufficient food for conducting an active and healthy life. Therefore, it is necessary to study the current status of food security and nutrition at the household and individual levels.*

**KEY WORDS:** Food Security, Nutrition, Sustainable Development, Zero Hunger

## I. INTRODUCTION

Food security means access the adequate quantity and quality food to individuals and or households for meet their daily energy requirement. Food security indicators are classified into four main dimension, such as availability, access, stability and utilization. These four indicator define the nutrition level of individuals (children and adults) and or households. Nutrition security shows the economic, physical, and social access of nutrient diet to household and individual. Nutritional status indicators refer to nutritional status of children and adult. There are three anthropometric indices for measure nutritional status of children under five years of age. Children's height, weight, and age were used to estimate nutritional indices: height-for-age, weight-for-height, and weight-for-age. The nutritional status of adults is calculated by using anthropometric data on the height and weight of adults (15-49 years). These data were used to calculate four measures such as thin, normal, overweight and obese by using body mass index. Body mass index (BMI) is defines as the ratio of weight (in kg) to the square of height (in meters).

The second goal of sustainable development goals is 'zero hunger- pledges to end hunger, achieve food security, improve nutrition and promote

sustainable agriculture'. The major objective of this goal is to improve food access to all, end malnutrition with childhood stunting and wasting and improve agricultural sustainability. In the world, India is first rank in largest producer in milk, pulses & jute, and second rank in the largest producer of rice, groundnut, wheat, sugarcane, fruit, cotton and vegetables in 2017-18. It is also one of the leading producers of spices, fish and livestock. India contributed nearly 25 percent in food production, 27 percent in consumption and 14 percent importer of pulses in the world (FAO, 2019). However, India is facing malnutrition among children (below 5 years age). India has the highest number of stunted and wasted children with 46.6 million and 25.5 million respectively in the world and nearly a third and half of all stunting and wasting children worldwide during 2018 (Claydon, 2018). Food and nutrition security is not only static analysis of availability, access, utilization and stability of food but also includes risk and vulnerability analysis. The present study focuses on the status of food security and nutritional level in the India.



## II. OBJECTIVES OF THE RESEARCH STUDY

1. To study the trends of food security in India.
2. To analyse the nutrition status of children and adults in India.

## III. RESEARCH METHODOLOGY AND DATA BASE

The present study is based on secondary data. Secondary data is collected from reports of food and agriculture organization, global nutritional reports, global hunger reports, national family health survey reports, economic survey of India, economic survey of Maharashtra, annual reports of ministry of agriculture and farmers welfare (GoI) and census India reports.

## VI. RESULTS AND DISCUSSION

### 1. Average Dietary Energy Supply Adequacy (ADESA)

ADESA indicator has expressed the dietary energy supply (DES) as a percentage of the average dietary energy requirement (ADER). The average supply of calories for food consumption has normalized by average dietary energy requirement estimated for peoples to provide an index of adequacy of the food supply in terms of calories. ADESA in India was considered in three year averages from 1999-01 to 2016-18 and show in table 1. In India, ADESA was increased from 106 percent in 1999-01 to 109 percent in 2017-19. The annual growth rate of ADESA was continuously decline during 2000-02 to 2004-06. The compound growth rate of average dietary energy supply adequacy was 0.37 percent and coefficient of variation was 2.60 percent in India during 2001-03 to 2017-19. The ADESA value indicate that, in India, prevalence of undernourishment mainly due to insufficiency of the food supply and or distribution. The world's ADESA level was higher than India during the period 2017-19.

**Table 1: Average dietary energy supply adequacy in India (%)**

Sr. No	Year	ADESA	Y-o-Y
1	2001-03	102	-
2	2002-04	101	-0.99
3	2003-05	100	-1.0
4	2004-06	101	0.99
5	2005-07	102	0.98
6	2006-08	104	1.92
7	2007-09	105	0.95
8	2008-10	105	0
9	2009-11	105	0
10	2010-12	105	0
11	2011-13	106	0.94
12	2012-14	106	0
13	2013-15	107	0.94
14	2014-16	108	0.93
15	2015-17	108	0
16	2016-18	109	0.92
17	2017-19	109	0
18	<b>CGR</b>	<b>0.37</b>	
19	<b>CV</b>	<b>2.60</b>	

Source: FAO- Food Security Report 2020

### 2. Share of Dietary Energy Supply Derived from Cereals, Roots and Tubers:

The present indicator explain the energy supply provided by cereals, roots and tubers as a percentage of the total DES (in kcal/capita/day). Table 2 reveals that, share of dietary energy supply was decreased at 58 percent in 2015-17 from 57

percent in 1999-01 in India. The compound growth rate and coefficient of variation of share of dietary energy supply was -0.71 percent and 3.63 percent respectively in India during the period 1999-01 to 2015-17. The proportion of dietary energy supply in the world was less than India in 2015-17.

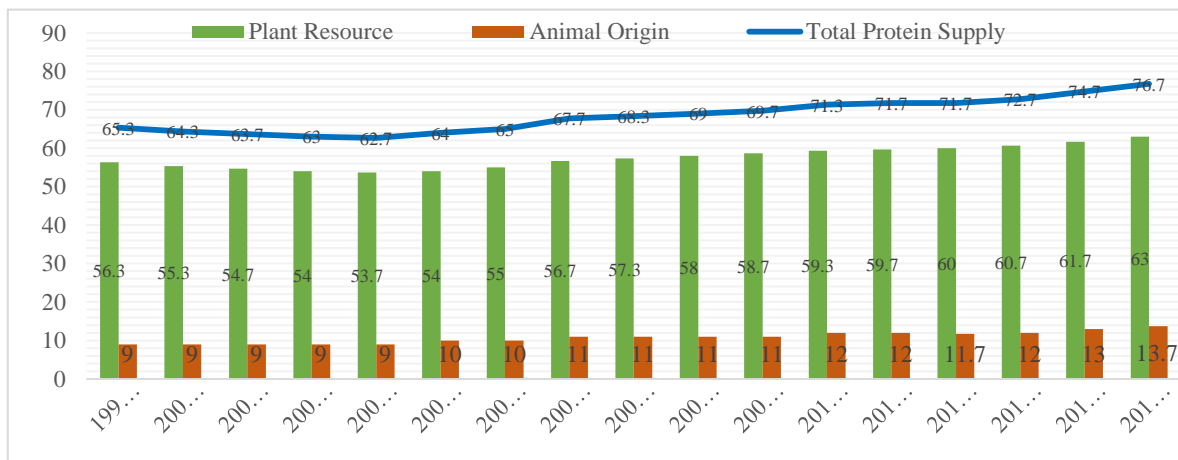
**Table 2: Dietary energy supply (cereals, roots & tubers) in India (percent)**

Sr. No	Year	India	Y-o-Y
1	1999-01	63	-
2	2000-02	63	0.0
3	2001-03	62	-1.6
4	2002-04	62	0.0
5	2003-05	62	0.0
6	2004-06	62	0.0
7	2005-07	61	-1.6
8	2006-08	60	-1.7
9	2007-09	60	0.0
10	2008-10	59	-1.7
11	2009-11	59	0.0
12	2010-12	58	-1.7
13	2011-13	58	0.0
14	2012-14	58	0.0
15	2013-15	57	-1.7
16	2014-16	57	0.0
17	2015-17	57	0.0
	<b>CGR</b>	<b>-0.71</b>	
	<b>CV</b>	<b>3.63</b>	

Source: FAO- Food Security Report 2020

### 3. Average Supply of Protein from Plant Resources:

**Figure 1: Trends of average protein supply in India (g/capita/day)**



The average protein supply indicator (plant resources) provides the information on the quality of the diet. In India, per capita supply of protein was increased from 56.3 g/capita/day in 1999-01 to 63.0 g/capita/day in 2015-17 (figure 1). The average supply of protein in India was grow slowly since 2005-07. The compound growth rate and coefficient of variation of average supply of protein was 0.90 percent and 5.03 percent during the period 1999 to 2017. It was found that supply of protein in India was lower (63.0 g/capita/day) than world's protein supply (79.9 g/capita/day).

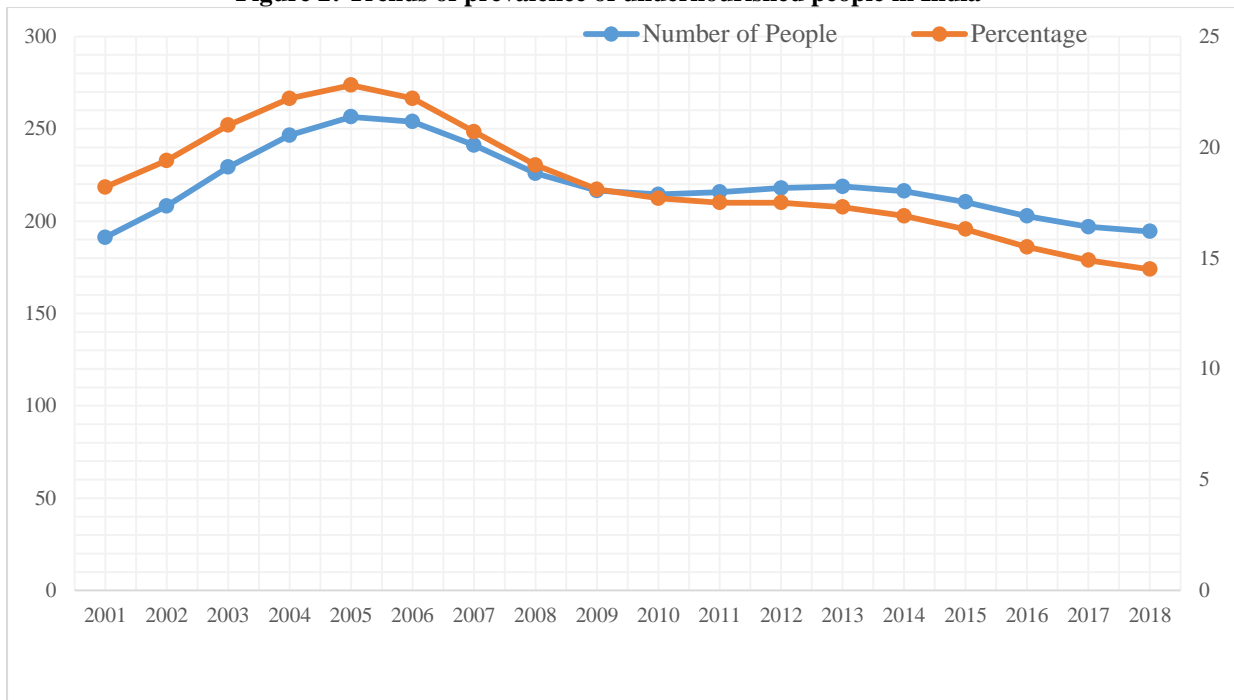
that is meat, milk & milk products, egg, fish, sea food, aquatic products etc. Figure 1 indicate that, in India, per capita supply of protein by animal origin was increased from 9 g/capita/day in 1999-01 to 13.7 g/capita/day in 2015-17. The compound growth rate of per capita average supply of protein of animal origin was 2.70 percent and coefficient of variation was 13.91 percent during same period. It was found that, in India, total protein supply was increased from 65.3 g/capita/day in 1999-01 to 76.7 g/capita/day in 2015-17. It was clear that, average supply of protein of animal was much lower (13.7 g/capita/day) than average supply of protein from plant resources (63.0 g/capita/day) during 2015-17 in India.

### 4. Average Supply of Protein by Animal Origin:

The average supply of protein from animal origin indicator was includes various animal product

### 5. Prevalence of Undernourishment

**Figure 2: Trends of prevalence of undernourished people in India**



The prevalence of undernourishment indicator shows the peoples’ inability to obtain adequate food to meet nutritional requirements. Figure 2 show that, despite the share of undernourished people in India decreased from 18.2 percent (191.2 million) in 2001 to 14.5 percent (194.4 million) in 2018. It means that, 1 in every 7 people in India still insufficient food for conducting an active and healthy life. The undernourished rate of reduction has slowed significantly since 2004-05. The compound growth rate of undernourished people in India was -0.73 percent and coefficient of variation was 8.81 percent during 2001-2018. The undernourished rate of India

(14.5) was higher than world’s undernourished rate (10.8) during 2018.

**6. Cereal Import Dependency Ratio:**

The cereal dependency ratio shows the measure of the dependence of a country from cereal imports. The negative values indicate that the country is a net exporter of cereals. The indicator was calculated in 3 year averages, from 1999-2001 to 2015-17 and show in table 3. The cereal import dependency ratio of India was -1.5 in 1999-01 and -5.5 during 2015-17. India’s cereal dependency ratio value was negative since 1999. It means that, India was net exporter country in the world.

**Table 3: Cereal import dependency ratio (percent) (3-year average)**

Sr. No	Year	Ratio (percent)
1	1999-2001	-1.5
2	2000-2002	-3.2
3	2001-2003	-4.3
4	2002-2004	-4.7
5	2003-2005	-4
6	2004-2006	-2.3
7	2005-2007	-2.1
8	2006-2008	-2.2
9	2007-2009	-3.1
10	2008-2010	-2.7
11	2009-2011	-3.2
12	2010-2012	-5.6
13	2011-2013	-8.6



14	2012-2014	-10.1
15	2013-2015	-9.2
16	2014-2016	-7.1
17	2015-2017	-5.5

Source: FAO- Food Security Report 2020

### 7. Per Capita Net Availability of Foodgrains in India

Net availability of food grains is estimated as total production (-) seed, feed & wastage (-) exports (+) imports (+/-) change in stocks. Table 3.34 indicate that, per capita net availability of food grain was 165.9 kg per annum and 454.4 gram per day in India during 2000. This availability an increase from the previous number of 180.3 kg per annum and 494.1 gram per day in 2018. The data of per capita

net availability of cereals data was reported at 154.3 kg/annum and 422.7 g/day in 2000 and it was increased up to 160 kg/annum and 438.2 g/per day in 2018. Similarly, per capita net availability of pulses was increased from 11.6 kg/annum and 31.8 g/day in 2000 to 20.4 kg/annum and 55.9 g/day in 2018. Availability of cereals, pulses and food grains were increased 0.32 percent, 3.08 percent and 0.60 percent respectively during 2000 to 2018 in India.

**Table 4: Per capita net availability of food grains in India**

Year	Cereals		Pulses		Food Grains	
	Per Annum (kg)	Per Day (g)	Per Annum (kg)	Per Day (g)	Per Annum (kg)	Per Day (g)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2000	154.3	422.7	11.6	31.8	165.9	454.4
2001	141.0	386.2	10.9	30	151.9	416.2
2002	167.4	458.7	12.9	35.4	180.4	494.1
2003	149.1	408.5	10.6	29.1	159.7	437.6
2004	155.8	426.9	13.1	35.8	168.9	462.7
2005	142.7	390.9	11.5	31.5	154.2	422.4
2006	150.7	412.8	11.8	32.5	162.5	445.3
2007	148.7	407.4	12.9	35.5	161.6	442.8
2008	143.9	394.2	15.3	41.8	159.2	436.0
2009	148.6	407.0	13.5	37.0	162.1	444.0
2010	146.6	401.7	12.9	35.4	159.5	437.1
2011	149.9	410.6	15.7	43.0	170.9	468.2
2012	149.1	408.6	15.2	41.7	169.3	463.8
2013	158.1	433.2	15.8	43.3	179.5	491.9
2014	161.6	442.9	16.9	46.4	178.6	489.3
2015	153.8	421.4	16.0	43.8	169.8	465.1
2016	162.0	443.7	15.7	43.0	177.7	486.8
2017	158.4	434.0	20.0	54.7	178.4	488.7
2018	160.0	438.2	20.4	55.9	180.3	494.1
<b>CGR</b>	<b>0.32</b>	<b>0.32</b>	<b>3.08</b>	<b>3.07</b>	<b>0.60</b>	<b>0.60</b>
<b>CV</b>	<b>4.71</b>	<b>4.72</b>	<b>19.56</b>	<b>19.46</b>	<b>5.52</b>	<b>5.52</b>

Source: Directorate of Economics and Statistics, 2019

### 8. Nutritional Status of Children in India

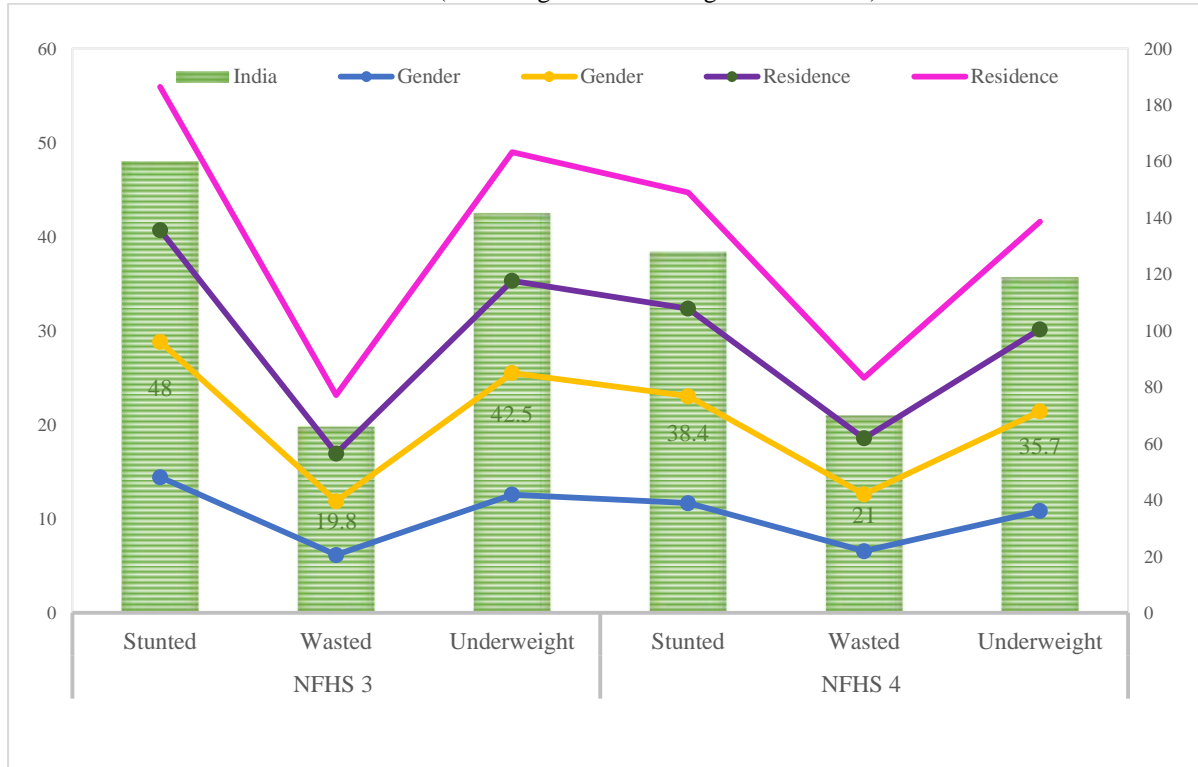
The nutritional status of children were classified as malnourished according to three indices stunted, wasted and underweight. Table 3.35 indicate that, decrease in stunting has been from 48 percent to 38.4 percent. Similarly, prevalence of underweight

was reduced by 0.68 percentage points from 2005-06 to 2015-16. NFHS-4 has estimated 38.4 percent of children under age five years as stunted which signify chronic under-nutrition. The decreasing trends found in prevalence of stunting from 48.0 percent in 2005-06 to 38.4 percent in 2015-16. Stunting was observed

to be higher among children in rural areas (41.2 percent) than urban areas (31 percent) during the period 2015-16. There were 21 percent of children (under age five years) in 2015-16 and 19.8 percent children in 2005-06 were wasted (too thin for their

height), which signify acute under-nutrition. In India, 35.7 percent and 42.5 percent of children under age five years are underweight during 2015-16 and 2005-06 respectively.

**Figure 4: Trend in Nutritional Status of Children in India**  
 (Percentage of children age 0-59 months)



Source: National Family Health Survey-4 Report, 2018

### 8.1 State/UT-wise Nutritional Status of Children in India:

The prevalence of stunting among children (under age five year) was highest in Bihar (48 percent), followed by Uttar Pradesh (46 percent), Jharkhand (45 percent) and lowest in Kerala and Goa state (20 percent each). Jharkhand state was highest in prevalence of wasting (29 percent), followed by Dadra & Nagar Haveli (27.6 percent) and Gujarat (26.4 percent) in India during the period 2015-16.

The lowest levels of wasting were observed in Mizoram (6.1 percent) and Manipur (6.8 percent). The prevalence of underweight was high in Jharkhand with 48 percent. The lowest level of underweight is observed in Mizoram (12 percent) and Manipur (14 percent). It was observed that, prevalence of wasting in children was increased from 19.8 percent in 2005-06 to 21.0 percent 2015-16 in India (table 5).

**Table 5: Nutritional status of children (< 5 year) by state in India (in percent)**

Sr. No	State/UT	Stunted		Wasted		Underweight	
		NFHS-3	NFHS-4	NFHS-3	NFHS-4	NFHS-3	NFHS-4
1	Andaman & Nicobar	N.A	23	N.A	18.9	N.A	21.5
2	Andhra Pradesh	42.7	31	12.2	17.2	32.5	31.9
3	Arunachal Pradesh	43.3	29	15.3	17.3	32.5	19.4
4	Assam	46.5	36	13.7	17	36.4	29.8
5	Bihar	55.6	48	27.1	20.8	55.9	43.9
6	Chadigarh	N.A	29	N.A	10.9	N.A	24.5
7	Chhattisgarh	52.9	38	19.5	23.1	47.1	37.7
8	Dadra & N. Haveli	N.A	42	N.A	27.6	N.A	38.8
9	Daman & Diu	N.A	23	N.A	24.1	N.A	26.7
10	Delhi	42.2	32	15.4	15.9	26.1	27





11	Goa	25.6	20	14.1	21.9	25.0	23.8
12	Gujarat	51.7	39	18.7	26.4	44.6	39.3
13	Haryana	45.7	34	19.1	21.2	39.6	29.4
14	Himachal Pradesh	38.6	26	19.3	13.7	36.5	21.2
15	Jammu & Kashmir	35	27	14.8	12.1	25.6	16.6
16	Jharkhand	49.8	45	32.3	29	56.5	47.8
17	Karnataka	43.7	36	17.6	26.1	37.6	35.2
18	Kerala	24.5	20	15.9	15.7	22.9	16.1
19	Lakshadweep	N.A	27	N.A	13.7	N.A	23.6
20	Madhya Pradesh	50	42	35.0	25.8	60.0	42.8
21	Maharashtra	46.3	34	16.5	25.6	37.0	36
22	Manipur	35.6	29	9.0	6.8	22.1	13.8
23	Meghalaya	55.1	44	30.7	15.3	48.8	28.9
24	Mizoram	39.8	28	9.0	6.1	19.9	12
25	Nagaland	38.8	29	13.3	11.3	25.2	16.7
26	Odisha	45	34	19.5	20.4	40.7	34.4
27	Puducherry	N.A	24	N.A	23.6	N.A	22
28	Punjab	36.7	26	9.2	15.6	24.9	21.6
29	Rajasthan	43.7	39	20.4	23	39.9	36.7
30	Sikkim	38.3	30	9.7	14.2	19.7	14.2
31	Tamil Nadu	30.9	27	22.2	19.7	29.8	23.8
32	Telangana	N.A	28	N.A	18	N.A	28.3
33	Tripura	35.7	24	24.6	16.8	39.6	24.1
34	Uttar Pradesh	56.8	46	14.8	17.9	42.4	39.5
35	Uttarakhand	44.4	34	18.8	19.5	38.0	26.6
36	West Bengal	44.6	33	16.9	20.3	38.7	31.5
37	<b>India</b>	<b>48.0</b>	<b>38.4</b>	<b>19.8</b>	<b>21.0</b>	<b>42.5</b>	<b>35.7</b>

Source: National Family Health Survey-4 Report, 2018

### 8.2 Prevalence of Anaemia in Children

Anemia is a situation that marked by low levels of hemoglobin in the blood. The prevalence of anemia among children age (6-59 months) declined from 69.5 percent to 58.4 percent in 2005-06 and 2015-16 respectively in India (table 6). The prevalence of anaemia in children was the highest in Dadra and Nagar Haveli (84.6 percent), followed by Daman and Diu (73.8 percent), Chandigarh (73.1 percent) and Haryana (71.7 percent) in 2015-16. The

lowest level of anaemia in children was found in Mizoram (17.7 percent) in same period. The prevalence of anaemia in children was increased in Goa and Delhi with 10.1 and 5.6 percent respectively during previous NFHS-3 to NFHS-4 survey. In Assam state, the percentage of anemic children was rapidly decreased from 69.7 percent in 2005-06 to 35.7 percent in 2015-16. It was found that, several union territories have even higher prevalence of anaemia in India during 2016-16 (table 6).

**Table 6: Prevalence of anaemia in children by state/ut in India (in percent)**

Sr. No	State/UT	Anemia in children (6-59 months age)		Variation
		NFHS-3	NFHS-4	
1	Andaman and Nicobar	N.A	49	-
2	Andhra Pradesh	N.A	58.6	-
3	Arunachal Pradesh	56.9	50.7	6.2
4	Assam	69.4	35.7	33.7
5	Bihar	78	63.5	14.5
6	Chandigarh	N.A	73.1	-
7	Chhattisgarh	71.2	41.6	29.6
8	Dadra and Nagar Haveli	N.A	84.6	-
9	Daman and Diu	N.A	73.8	-
10	Delhi	57	62.6	-5.6
11	Goa	38.2	48.3	-10.1
12	Gujarat	69.7	62.6	7.1
13	Haryana	72.3	71.7	0.6
14	Himachal Pradesh	54.4	53.7	0.7



15	Jammu & Kashmir	58.5	43.3	15.2
16	Jharkhand	70.3	69.9	0.4
17	Karnataka	70.3	60.9	9.4
18	Kerala	44.5	35.6	8.9
19	Lakshadweep	N.A	51.9	-
20	Madhya Pradesh	74	68.9	5.1
21	Maharashtra	63.4	53.8	9.6
22	Manipur	41.1	23.9	17.2
23	Meghalaya	63.8	48	15.8
24	Mizoram	43.8	17.7	26.1
25	Nagaland	N.A	21.6	-
26	Odisha	65	44.6	20.4
27	Puducherry	N.A	44.9	-
28	Punjab	66.4	56.6	9.8
29	Rajasthan	69.6	60.3	9.3
30	Sikkim	58.1	55.1	3
31	Tamil Nadu	64.2	50.7	13.5
32	Telangana	N.A	60.7	-
33	Tripura	62.9	48.3	14.6
34	Uttar Pradesh	73.9	63.2	10.7
35	Uttarakhand	60.7	59.8	0.9
36	West Bengal	61	54.2	6.8
	<b>India</b>	<b>69.5</b>	<b>58.4</b>	<b>11.1</b>

*Source: National Family Health Survey-4 Report, 2018*

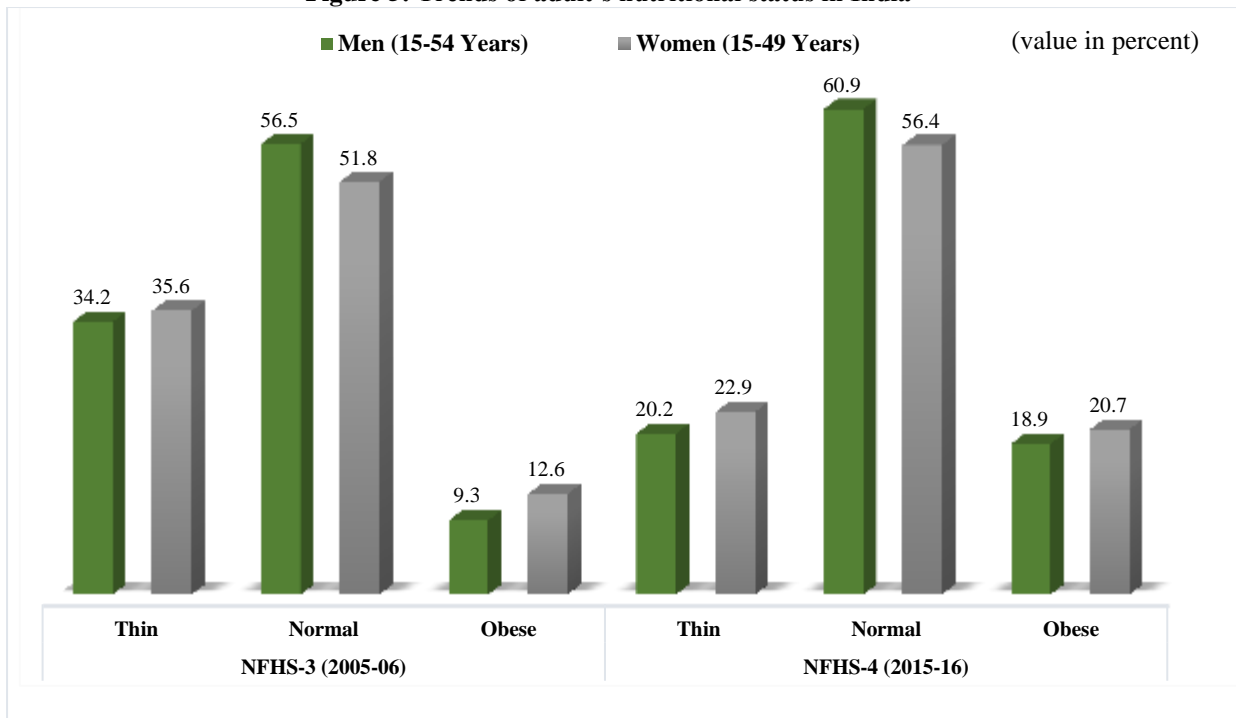
### 9. Nutritional Status of Adults in India

The nutritional indicators were used to estimate several measures of nutritional status of women (15-49 years) and men (15-54 years) with height and body mass index (BMI). There were 34.2 percent of men was thin in 2005-06; which was decreased to 20.2 percent in 2015-16. Total 56.5 percent of men in 2005-06 and 60.9 percent in 2015-16 was normal BMI level (table 3.38). There were 9.3 percent and 18.9 percent of men suffering to prevalence of overweigh in 2005-06 and 2015-16

respectively. The percentage of thin men decreases with age, whereas the proportion of overweight or obese men increases in India since 2005-06. The proportion of thin women age 15-49 declined from 35.6 percent in 2005-06 to 22.9 percent in 2015-16; at the same time the proportion of overweight or obese women increased from 12.6 percent to 20.7 percent. Overall, there has been an increase in the mean BMI from 20.5 in 2005-06 to 21.9 in 2015-16. It was found that, increasing trends in prevalence of overweight among both men and female in India.



**Figure 5: Trends of adult’s nutritional status in India**



Source: National Family Health Survey-4 Report, 2018

**9.1 State/UT wise Nutritional Status of Adults in India:**

Table 7 shows the state differentials in nutritional status for men and women in India during 2015-16. The percentage of thin men was highest in Madhya Pradesh with 28.4 percent, followed by Uttar

Pradesh 25.9 percent and Bihar 25.5 percent in 2015-16. Sikkim (34.8 percent), Andhra Pradesh (33.5 percent), Tamil Nadu (28.2 percent) and Kerala (28.5 percent) were the states with the highest level of obesity.

**Table 7: Nutritional status of adults by state/ut in India-2015-16 (percent)**

Sr. No	State/ Union Territory	Thin (BMI <18.5)		Normal (BMI 18.5-24.9)		Obese (BMI ≥25.0)	
		Men	Women	Men	Women	Men	Women
1	Andaman & Nicobar	8.8	53	55.1	13.1	38.2	31.8
2	Andhra Pradesh	14.8	51.7	49.2	17.6	33.5	33.2
3	Arunachal Pradesh	8.3	71.1	72.7	8.5	20.6	18.8
4	Assam	20.7	66.4	61.1	25.7	12.9	13.2
5	Bihar	25.5	62	57.8	30.5	12.6	11.7
6	Chandigarh	21.7	46.3	45.2	13.3	32	41.4
7	Chhattisgarh	24.2	65.7	61.4	26.7	10.2	11.9
8	Dadra & Nagar Haveli	19.7	57.3	52.2	28.7	22.9	19.2
9	Daman & Diu	12	57.4	55.4	12.9	30.7	31.7
10	Delhi	17.7	57.7	51.7	14.8	24.6	33.5
11	Goa	10.8	56.5	51.9	14.7	32.7	33.5
12	Gujarat	24.7	55.5	49	27.2	19.7	23.8
13	Haryana	11.3	68.7	63.2	15.8	20	21
14	Himachal Pradesh	18	60	55.2	16.2	22	28.7
15	Jammu & Kashmir	11.5	68	58.8	12.1	20.5	29.1
16	Jharkhand	23.8	65.1	58.1	31.6	11.1	10.3
17	Karnataka	16.5	61.3	56	20.8	22.1	23.3



18	Kerala	8.5	63	57.9	9.7	28.5	32.4
19	Lakshadweep	8.2	67.7	45.9	13.5	24.1	40.6
20	Madhya Pradesh	28.4	60.7	58	28.4	10.9	13.6
21	Maharashtra	19.1	57.1	53.1	23.5	23.8	23.4
22	Manipur	11.1	69.1	65.2	8.8	19.8	26
23	Meghalaya	11.6	78.4	75.7	12.1	10	12.2
24	Mizoram	7.3	71.9	70.6	8.4	20.9	21.1
25	Nagaland	11.4	74.7	71.6	12.3	13.9	16.2
26	Odisha	19.5	63.2	57	26.5	17.3	16.5
27	Puducherry	10.2	52.7	52	11.3	37.1	36.7
28	Punjab	10.9	61.2	57	11.7	27.8	31.3
29	Rajasthan	22.7	64.1	58.9	27	13.2	14.1
30	Sikkim	2.4	62.9	66.9	6.4	34.8	26.7
31	Tamil Nadu	12.4	59.3	54.4	14.6	28.2	30.9
32	Telangana	21.5	54.3	48.4	22.9	24.2	28.7
33	Tripura	15.7	68.4	65	19	15.9	16
34	Uttar Pradesh	25.9	61.5	58.2	25.3	12.5	16.5
35	Uttarakhand	16.1	66.2	61.1	18.4	17.7	20.5
36	West Bengal	19.9	65.9	58.9	21.3	14.2	19.9
	<b>India</b>	<b>20.2</b>	<b>60.9</b>	<b>56.4</b>	<b>22.9</b>	<b>18.9</b>	<b>20.7</b>

Source: National Family Health Survey-4 Report, 2018

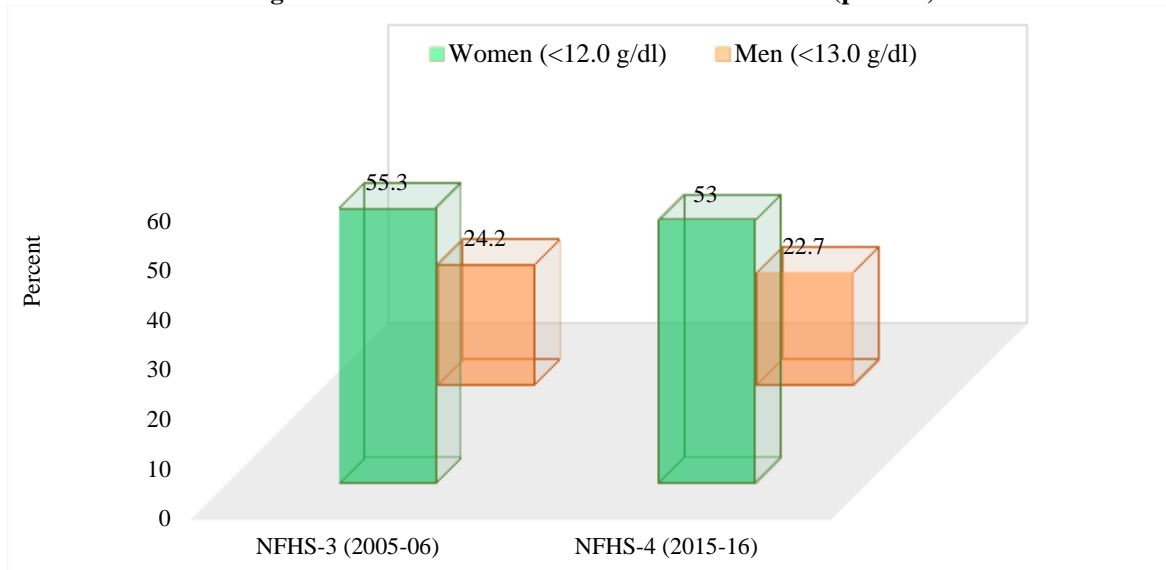
The proportion of men who are thin varies substantially among the states. The proportion of women who are thin was particularly high in Jharkhand (31.6 percent), followed by Bihar (30.5 percent) and Dadra & Nagar Haveli (28.7 percent). The percentage of women who are obese was highest Goa with 33.5 percent, 33.2 percent in Andhra Pradesh, 32.4 percent in Kerala, and 30.9 percent in Tamil Nadu. The highest number of men and women who have normal BMI (18.5- 24.9) found in Meghalaya with 78.4 percent and 75.7 percent respectively during the period 2015-16.

### 9.2 Prevalence of Anemia in Adults (15-49 years):

The minimum levels of haemoglobin for women is 12 grams per decilitre and men is 13 grams

per decilitre (g/dl). The prevalence of anaemia was barely changed in last decade between NFHS-3 and NFHS-4, decreasing from 55.3 percent in 2005-06 to 53.0 percent in 2015-16 among women and from 24.2 percent in 2005-06 to 22.7 percent in 2015-16 among men (figure 6). Accounting NFHS-4, total 40 percent of women were mildly anaemic, 12 percent were moderately anaemic, and 1 percent were severely anaemic. Similarly, 12 percent of men were classified as mildly anaemic, 10 percent as moderately anaemic, and 1 percent as severely anaemic during 2015-16 in India. It was observed that, the prevalence of anaemia was high in women than men in both urban area and rural area of India since last two decade.

**Figure 6: Trends of adult’s anaemia status in India (percent)**

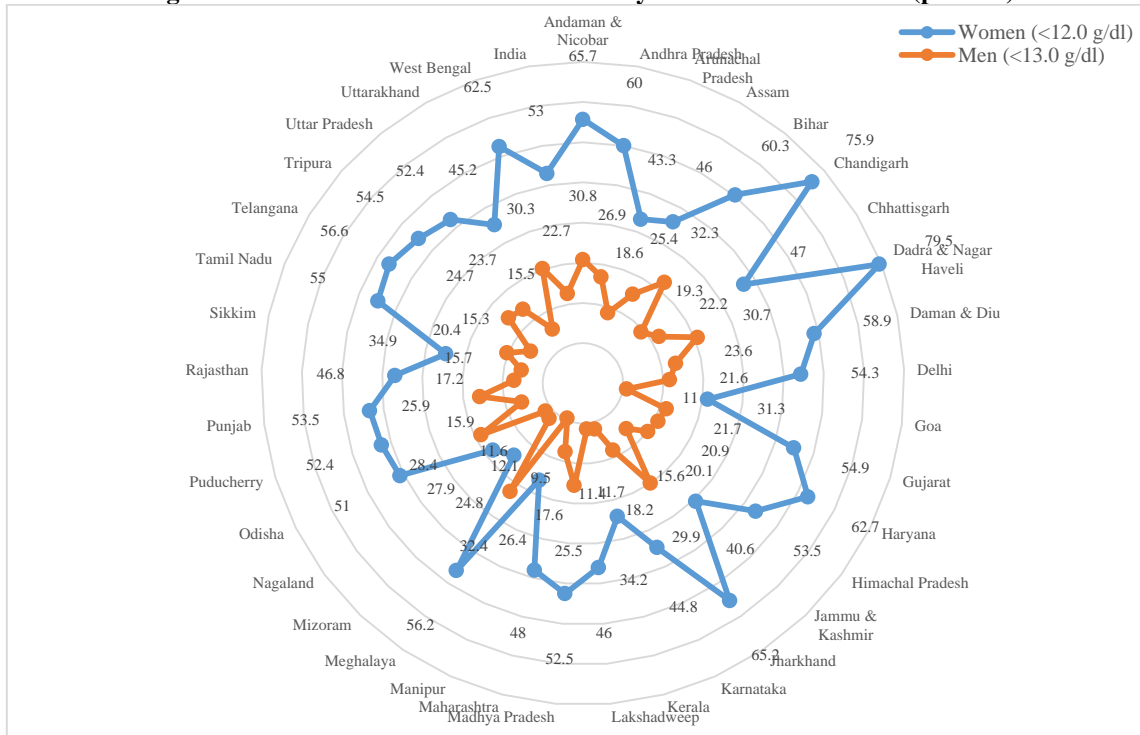


**9.3 Prevalence of Anemia in Adults by State/UT in India**

Figure 7 indicate the prevalence of anaemia in adults by state/ut in India during 2015-16. The prevalence of anaemia among women was very high in union territories Dadra & Nagar Haveli (79.5 percent) and Chandigarh (75.9 percent). The prevalence of anaemia was more than 60 percent in Jharkhand with 65.2 percent, followed by Haryana (62.7 percent), West Bengal (62.5 percent), Bihar (60.3 percent), and Andhra Pradesh (60.0 percent).

The prevalence of anaemia was less than one-third in Mizoram (24.8 percent), Manipur (26.4 percent), Nagaland (27.9 percent), and Goa (31.3 percent). Similarly, anaemia prevalence among men was high in Meghalaya (32.4 percent) and low in Manipur (9.5 percent). The state-wise distribution pattern of anaemia prevalence in men was similar to that in women, except that the prevalence among men in Haryana and Chandigarh was slightly below the national average whereas it was well above the national average in the case of women.

**Figure 7: Prevalence of anaemia in adults by state in India-2015-16 (percent)**



Source: National Family Health Survey-4 Report, 2018



## CONCLUSION

The zero hunger, better health, and well-being are major indicators of Sustainable Development Goals. These goals will be achieved when we are able to provide food security to every household and individual. Food and nutrition security in India has been achieving self-sufficiency in the food grain production after independence and in setting in the public distribution system. However, India still has high rates of malnutrition and starvation. In present situation, major challenge is not to improve the productivity of agriculture sector, but also making food grains accessible to poor and needy. The government needs to pay special attention to agriculture in order to provide quality of food as to make food security scheme a success. There is a need to increase in irrigation facilities, supply affordable agriculture inputs, uninterrupted supply of electricity, high yielding seeds, per capita availability of food grains, fair prices for agriculture commodities, enhanced efficient monitoring system, optimum warehouses for food storages, efficient public distribution system, control on manmade inflation and reduction of regional disparities in food grain. In addition there is a need for such number of studies in different views and areas because it has the vast scope and very significant from the measurement of livelihood point of view. Few important suggestions have been made on the basis of field work observations and interviewed of family members which has summarized as follows.

- Awareness about food and nutrition is necessary for a balanced diet and precautions against diseases. It's necessary to develop educational programs for increase public awareness about food security and nutrition. Government should introduce new subject of food and health in curriculum and start from school education. Therefore, awareness about food security and nutrition will develop in the students, farmers and consumers.
- Making food available through universal public distribution systems at affordable prices to below poverty line households. In addition, government should supply high quality and quantity of food through public distribution supply. It is necessary to increase food item in public distribution system for ration card holders.
- The current food production system is based on conventional/ artificial inputs method. It is necessary to apply organic farming techniques or residue free farming techniques for produce high nutrient food. The organic production must be increased by the use of high yielding native varieties of seeds, compost manures, organic fertiliser, pesticides and modern irrigation facilities.

- Government, non-governmental organizations and social organizations should propagate the food, diet plan and nutrition among society.
- Government should make new rules and regulations to maintain hygiene in public distribution centres.
- Promote personal and family hygiene, environmental awareness, sanitation, safe drinking water, food safety and basic health services.
- There is need to focus on certain specific food supplements for ensuring the nutrition security of individual, families and the community.
- It is need to provide real time data of weather condition and market prices of agriculture commodities to improve productivity and prosperity.
- Government should strictly implement the Food Security Act in the country.

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