



“Insights into Malnutrition Alleviation: A Case Study of the Integrated Child Development Scheme in Belagavi District”.

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Abstract

Efforts into job is to acquire a piece of cloth and a meal. Many have either cloth or meal but, few have both. Malnutrition is a big cause for the government, huge funding is reserved for providing nutrition and food security. The issue Malnutrition earlier was found only in poor children but rich class children are also contributing due to modern food culture. Malnutrition is found across the globe irrespective of developed or developing nation. India is the only country in the world to provide food security to the citizens of the country. In-spite of several reserve funds for alleviating malnutrition, Malnutrition still exists and impact on Social, Political, Psychological and Economic condition of any individual. The Govt. of India is trying to alleviate malnutrition by providing food security through Public Distribution System (PDS) and aiming to provide nutrition to women and children through integrated Child Development Scheme throughout the country. The present study based on primary data focusses on the performance of Integrated Child Development Scheme (ICDS) in Alleviating malnutrition in Belagavi district of Karnataka with special reference to three talukas. The ICDS is reaching the beneficiaries through anganwadi in India. Anganwadi play significant role in addressing the cause.

Key words: Malnutrition, ICDS, nutrition, food security

1.1 Introduction

The pervasive challenge of malnutrition remains a critical concern worldwide, prompting governments to allocate substantial resources and efforts for its alleviation. This study concentrates on unravelling the complexities of malnutrition mitigation, with a specific focus on the Integrated Child Development Scheme (ICDS) in the Belagavi district of Karnataka, India. The pursuit of employment, symbolized by the endeavour to secure both a basic piece of cloth and a meal, epitomizes the fundamental struggle faced by individuals.

Disparities are evident, where some possess either clothing or sustenance, leaving only a privileged few with access to both. Malnutrition, once thought to afflict solely underprivileged children, has transcended socio-economic boundaries. The influence of modern food culture has expanded its reach to include children from affluent backgrounds, necessitating comprehensive strategies to address this multifaceted issue. Despite significant governmental funding allocated towards nutrition and food security, malnutrition persists, impacting individuals globally and transcending the distinctions between developed and developing nations.

India stands out as a singular example globally, committing itself to providing food security to its citizens. The government's initiatives, particularly the Public Distribution System (PDS) and the Integrated Child Development Scheme (ICDS), reflect a collective effort to combat malnutrition. However, the enduring prevalence of malnutrition raises questions about the effectiveness of these programs, prompting a closer examination, especially in specific regions such as the Belagavi district. This research, grounded in primary data, seeks to assess the performance of the ICDS in alleviating malnutrition in the Belagavi district of Karnataka, with a specific focus on three talukas. It underscores the crucial role played by anganwadi centres in delivering nutrition to beneficiaries. Through an in-depth exploration of the local implementation of these programs, the study aims to provide valuable insights that can inform the enhancement of strategies for effectively addressing malnutrition in the region.

1.2 Review of Literature

The study employs a diverse range of sources, including reviews, surveys, literature, and expert insights, to illuminate the complex landscape of Integrated Child Development Services (ICDS) in Belagavi. It explores factors influencing malnutrition, emphasizing community awareness, government program efficacy, socioeconomic conditions, and agricultural practices. The impact of natural disasters, resilience-building measures, disabilities, and women's employment on nutritional outcomes is scrutinized. Specifically, the study evaluates the effectiveness of ICDS interventions, addressing their scope and limitations. By integrating these diverse elements, it aims to comprehensively understand and improve ICDS's role in mitigating malnutrition among vulnerable populations in Belagavi, offering actionable insights for program enhancement in the region.

1.2.1 Malnutrition and Awareness

To enhance child nutrition, there is need of shift of focus from supplementary feeding program to improve environment hygiene, introducing better child feeding practice (Dixit, Priyanka, et al. 2018). The role of anganwadi workers is crucial in providing better service. There is an urge to provide training to anganwadi workers and enhance their knowledge on nutrition values and significance (Jena, P. 2013), more studies focussed on beneficiaries' health rather than evaluating the knowledge, educational qualification of anganwadi workers without which ICDS cannot be implemented successfully. It is quite important to invest on Anganwadi Workers to enhance ICDS Services (Baliga, S. S., & Walvekar, P. R. 2017). Knowledge and attitude of the parents towards malnutrition derives positive link. This issue can be addressed by providing Health education to the parents which enhance their knowledge and change attitude towards malnutrition (Bagilkar, et al. 2015), Poverty is not only the reason for under and Malnutrition in India, Eradicating Poverty is not sufficient to reduce

undernutrition and malnutrition, there is need for addressing energy-protein intake, changing attitudes towards better nutrition and attracting digestion-friendly lifestyle (Chand, R., & Jumrani, J. 2013).

1.2.2 Malnutrition and Poverty

Malnutrition driven by poverty cause child deaths globally. It disturbs mental development and growth of child which is also affected by Educational gaps, Climate issues and socio-cultural barriers. Commitment of government in investing in such issue is much important along with fighting with corruption. Various approaches, required community programs and introducing genetically modified foods are the few solutions (brain et al. 2013). Children in impoverished households not benefiting from the Public Distribution System (PDS) are experiencing increased rates of undernutrition, underscoring the imperative to incorporate them. Enhancing the nutritional quality of food grains and broadening the range of food options available through the PDS are recommended strategies to address malnutrition. (Panda et al. 2020). India's development paradox reveals economic growth alongside lagging life quality. Malnourished children persist due to poor diets, micronutrient deficiencies, and economic vulnerability. Rural-urban migration and biased food production exacerbate food insecurity. Prioritizing cereals over essential crops risks worsening malnutrition. Strategies to combat undernutrition lack uniform implementation and lasting impact (Varadharajan et al. 2013)

1.2.3 Malnutrition and ICDS

Infrastructural gaps, limited community engagement, poor oversight, and food supply corruption are the drawbacks of childhood development in India. A vital Indian Program ICDS is attracting the sight of the government for enhancing child development programs, but as insufficient infrastructure hinders its success. To see the improvements, thorough assessment is needed to facilitate grassroots. Successful impact can be seen on childhood development in rural areas if effective monitoring and supervision is carried out (Sahoo et al. 2016). The nutrition during early childhood significantly stimulates growth and development throughout childhood, this period serves as a fundamental determinant of health and nutritional well-being during adolescence and adulthood. The findings indicate, children who attend Anganwadis experience fewer health issues compared to those who do not attend these centers. Moreover, their mothers demonstrate a higher level of awareness and understanding regarding the services offered at Anganwadis. This highlights the crucial role of early childhood intervention programs like Anganwadis in not just addressing immediate health concerns but also in providing better maternal knowledge and consequently enhancing child health outcomes (Kshirsagar & Mohite 2019). Preschoolers face significant issue such as malnutrition in India. Kerala being popular state providing better health indicators it is quite difficult to address malnutrition. Various studies prove the comparative positive nutritional status, hinting at effective interventions like nutrition programs and health education. Implementing these strategies well could reduce undernutrition among vulnerable children. ICDS is playing important role in providing nutrition program of the government (Radhamani & Rajeev 2017). Children, irrespective of gender or caste, experienced differing degrees of undernutrition associated with age and ICDS beneficiary status. Anaemia affected 14.7%, with xerophthalmia and goitre impacting 1.6% and 0.6% of children. Daily energy and nutrient intake fell below recommended levels. The findings suggest that sustained nutritional supplementation and education can alleviate children's nutritional deficiencies (Garg et al. 1997).

1.2.4 Malnutrition and Working Women

Chowdhury et al. (2021) highlight that, 65% of women reported exclusive breastfeeding for 6 months, challenges emerged from work conditions, especially in lower-paying jobs. Most women knew about breastfeeding importance but lacked effective knowledge in practical situations. Solutions include delaying return to work, closer mother-child proximity, deeper knowledge, enhanced problem-solving skills, and improved home/work conditions for effective interventions. The urban areas where cost of living is very high make both husband and wife to join a job and run family. It is quite difficult for such mothers to track early breast feeding as such mothers return to job as early as possible and lead to early weaning. In India, domestic violence notably impacts health outcomes like gynaecologic problems, contraceptive practices, asthma, tobacco use, suicide attempts, and early child mortality. A significant large-scale study linking domestic violence to malnutrition in women and children, considering various influencing factors and objective measures, highlights its severe impact. Beyond moral concerns, the broader health implications emphasize the urgency of public policies to reduce domestic violence. Addressing this issue could yield substantial health benefits, marking it as a pivotal area for focused intervention (Ackerson & Subramanian 2008). In poverty-stricken Orissa, extensive child undernourishment persists, particularly among those near the state capital, despite seemingly positive findings in this specific area. The study focused on children of working mothers, highlighting their significant role in child nutrition. Family economic status and maternal education are pivotal for a child's well-being. While global concerns for children's welfare spur national initiatives like policies for children, women, and education reforms in India, their success hinges on state governments' commitment to implementation. Ensuring a secure childhood requires immunization, education access, clean water, nutrition programs, and healthcare in underdeveloped regions (Mishra & Mishra 2007).

Contrary to the anticipated link between women's employment and reduced child malnutrition, there's a slightly positive correlation. Interestingly, among the 15 countries with the highest women's employment rates, 10 also report high levels of child malnutrition (Burroway 2017). Malnutrition prevailed among both mothers and children. Housewives, despite having more time due to non-economic activity, didn't significantly increase child care time. Factors like land ownership, season, and mother's occupation slightly affected diet and nutrition, but not statistically significantly. Working mothers and their children showed more signs of B-complex deficiency than housewives and their children. Seasonal effects on vitamin deficiency signs were evident in children (Bamji & Thimayamma 2000). A lack of time is a key factor in the negative link between a mother's job and child survival. However, in terms of child survival, there's a positive aspect: the gender gap in survival, typically seen in South Asia, seems smaller for working mothers. Unlike maternal education, which might not directly impact the gender ratio of childhood mortality, educated mothers generally experience lower child mortality rates (Basu & Basu 1991).

1.3 Objectives:

1. To Study the Nutrition and Food Security
2. To Study the Integrated Child Development Scheme in Karnataka
3. To analyse the role of ICDS in reducing malnutrition among children of Belagavi District

4. To suggest policy measures

1.4 Research Methodology

The present Study is based on both primary and secondary data. The secondary data collected genuinely from various authorized sources such as National Family Health Survey Reports, Websites of Ministry of Health and Family Welfares, Department of Women and Child Development, Food and Agriculture organization are referred. The Collected secondary data is processed and analysed adopting simple statistical tools and techniques. The primary is collected through an interview schedule framed by researcher, freshly collected for this research work.

The present study focuses on the Belagavi district, specifically examining three talukas: Savadatti, Raibag, and Chikodi, representing high, moderate, and low malnutrition levels, respectively. Within each taluka, two villages with a substantial child population are selected. In each of these villages, data is collected from four anganwadi centers. In total, 24 anganwadi centres are chosen across the three talukas for the collection of primary data through interview schedules. This comprehensive approach ensures a diverse representation of malnutrition levels and child populations, providing valuable insights for the study.

2 Nutrition and Food Security

A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern (Ramaswamy, S., & Surulivel, L. 2019).

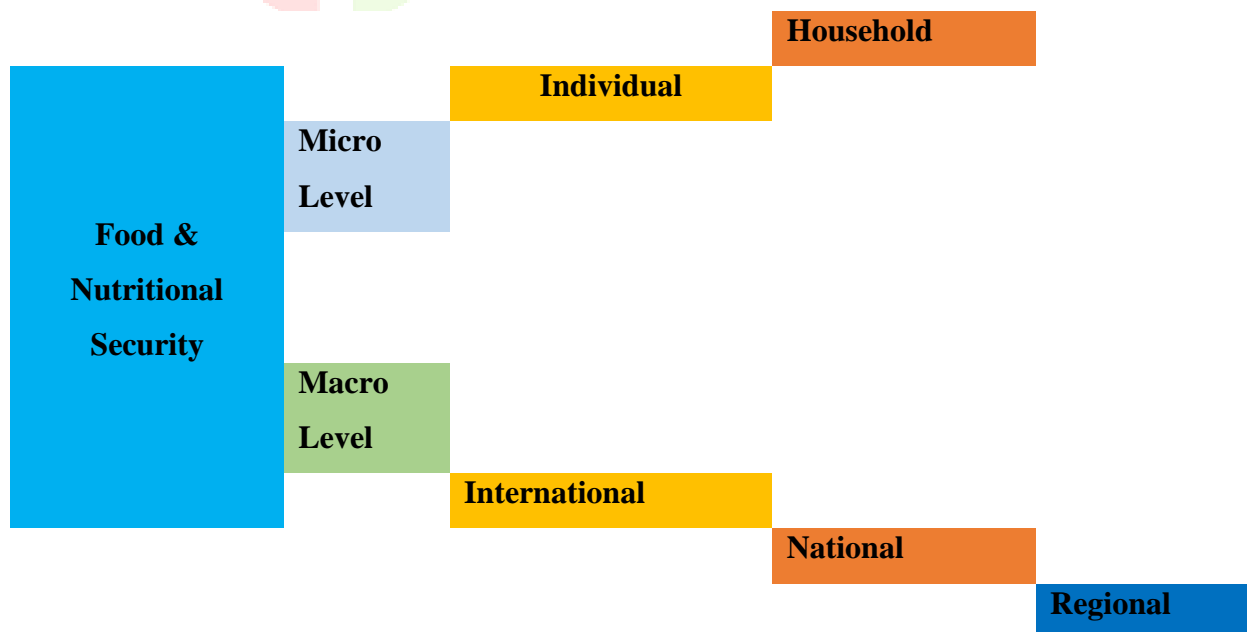
Food security guarantees individuals and households consistent access to sufficient, high-quality food for daily energy and nutritional needs. Beyond food presence, it considers accessibility, utilization, and stability over time. Availability involves agricultural production, stocks, and imports; access includes economic considerations. Utilization encompasses health, hygiene, and education. Stability reflects resilience against food supply disruptions. At the individual level, it ensures a diet for well-being, extending to overall family health at the household level. Economic factors, agriculture, infrastructure, and socio-cultural dynamics collectively shape food security, emphasizing quantity, quality, and sustainability.

2.1 Global nutrition and diet-related non-communicable disease targets and indicators

GLOBAL NUTRITION TARGETS 2025	INDICATOR
40% reduction in the number of children under five who are stunted	Prevalence of low height-for-age in children under five years of age
50% reduction of anaemia in women of reproductive age	Prevalence of haemoglobin
30% reduction in low birth weight	Prevalence of infants born
No increase in childhood over weight	Prevalence of weight-for-height >2 SD in children under five years of age
Increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%	Prevalence of exclusive breastfeeding in infants aged six months or less
Reduce and maintain childhood wasting to less than 5%	Prevalence of weight-for-height
Nutrition-related targets from the WHO Global Action Plan for the Prevention and Control of NCDs	
A 30 % relative reduction in mean population intake of salt/sodium	Age standardized mean population intake of salt (sodium chloride) per day in grams in persons aged 18+ years
Halt the rise in diabetes and obesity	Overweight women The prevalence of overweight in women of reproductive age

Source: Strategic Action Plan to reduce the double burden of in the South-East Asia Region 2016–2025-WHO

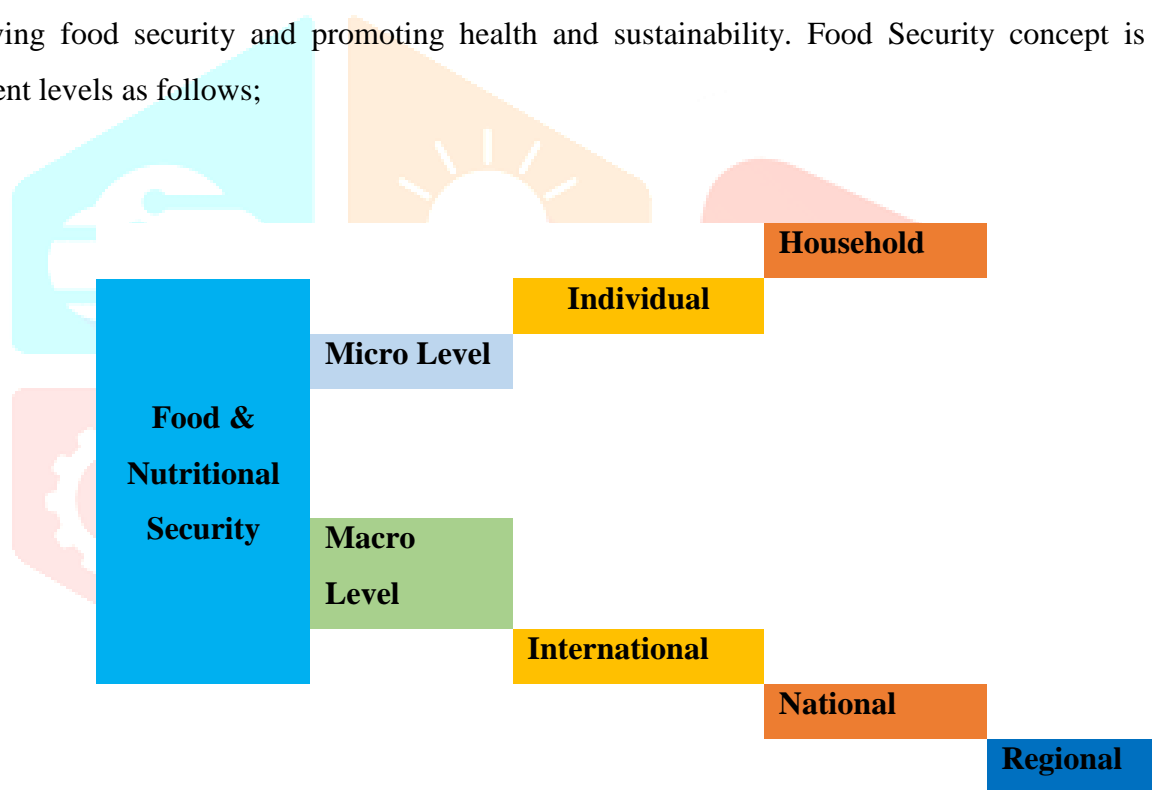
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2.3 Indicators of Food Security

Food Security includes both Physical and Economic access to nutrient food. The food Security indicators are classified in four dimensions as follows (a committee on World Food Security, 2011) FAO was set of indicators aiming to capture several features of food security as follows;

2.3.1 Availability:

Food Security is closely to the supply of food through production, distribution and exchange. The adequate quantities of suitable food available from local production, imports or assistance on a consistent base.

2.3.2 Access:

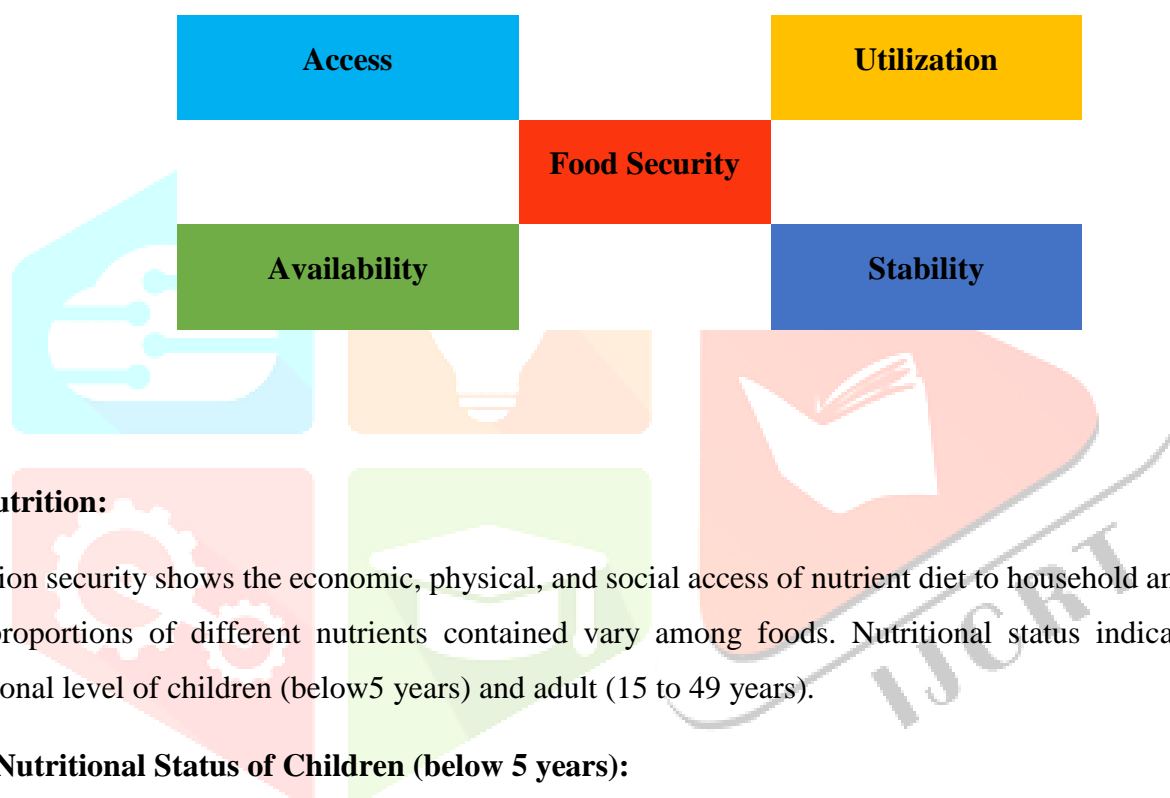
This indicator related to the affordability and distribution of food. Adequate assets or other sources are available to access suitable food through home production, purchasing, exchange borrowing or food aid.

2.3.3 Utilization:

Utilization used to the consumption of food by individuals. Food is used through processing to storage process, awareness, nutrition application and suitable health and sanitation facilities.

2.3.4 Stability:

Stability is closely to the ability to get food over time. Adequate food obtains at all period so that the availability and access of food isn't shortened by severe or crises.



2.4 Nutrition:

Nutrition security shows the economic, physical, and social access of nutrient diet to household and individual. The proportions of different nutrients contained vary among foods. Nutritional status indicators refer to nutritional level of children (below 5 years) and adult (15 to 49 years).

2.4.1 Nutritional Status of Children (below 5 years):

There are three anthropometric indices for measure nutrition of children under five years of age. Nutritional status of children calculated by using indices Z-score. This score is below minus two standard deviations from the median of the population.

2.4.1.1 Stunting: It is a symbol of under nutrition that indicates the failure to obtain adequate nutrition. Stunting or Height for Age is a measure of linear growth retardation and cumulative growth deficits. It can be affected by recurrent disease

2.4.1.2 Wasting: It indicates the failure to obtain appropriate nutrition. Wasting may outcome from insufficient food consumption. Wasting or Low weight for height measures the body mass through height and defines present nutrition level.

2.4.1.3 Under-weight: Underweight is an index of height for age and weight for height. Children with under-weight feel insecure to lead life in the society. It not only troubles child, but mentally too.

2.4.1.4 Over-weight: It symbolises the over nutrition in the children. Due to change in food culture, Change in the structure of families, habit if over feeding over weight is found in above the middle class family children, which reduces efficiency of the future population

Indicators of Nutritional Status in Children

Sl. No.	Indicator	Status	Measures/ Use
1.	Stunting (Low Height for age)	Chronic Malnutrition	Refers the result of inadequate nutritional intake and/ or chronic illness
2.	Wasting (Low Weight for Height)	Acute Malnutrition	Result of current weight loss
3.	Underweight (Low weight for age)	Chronic or Acute or both Malnutrition	Children May suffer under-weight wasting or stunting or both.

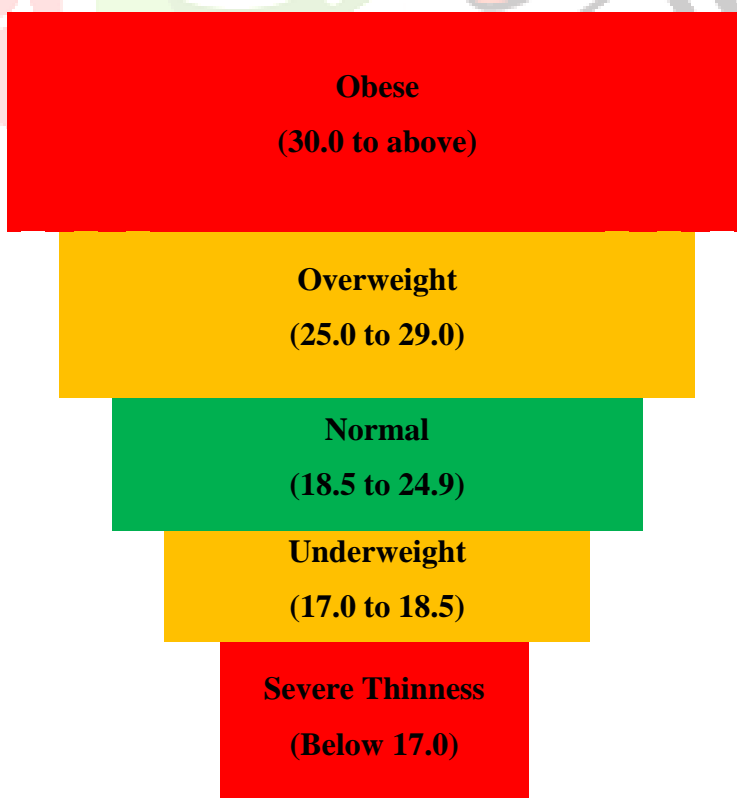
Source: WHO

2.4.2 Nutritional Status of Adults (15-49 Years):

The nutritional level of adults has calculated by using anthropometric data on height and weight. This data used to estimate four measures such as thin, normal overweight and obese. Body mass index is defining as the ratio of weight (in kg) to the square of height (in meters). Nutritional status of adults (15-49 years) is constructed using following formula;

$$\text{Body Mass Index} = \frac{\text{Weight (in Kgs)}}{\text{Height (in Meter)}^2}$$

Indicators of Nutritional Status of Adults in BMI



Note: () indicate BMI values in Kg/M²

Adult nutritional status, as per the World Health Organization (WHO), is determined by Body Mass Index (BMI). Classifications consist of Severe Thinness (BMI below 17.0), Underweight (17.0 to 18.5), Normal (18.5 to 24.9), Overweight (25.0 to 29.0), and Obese (30.0 and above). These BMI categories are essential metrics for evaluating and classifying the nutritional well-being of adults.

2.4.3 Anaemic Prevalence:

Anaemia is a situation refer the inadequate levels of haemoglobin in the blood Iron is a key factor of haemoglobin. Haemoglobin levels below which children and adults are considered anaemic.

Sl. No	Respondent	Anaemic	
		Status	Haemoglobin Level
1.	Children (Below 5 years)	Anaemic Child	Below 11.0 gms/decilitre
		Mildly Anaemic Child	10.0 – 10.9 gms/Decilitre
		Moderately Anaemic Child	7.0 – 9.9 gms/Decilitre
		Severely Anaemic Child	Below 7.0 gms/decilitre
2.	Adults (15 to 49 years)	Women (Non-Pregnant)	Below 11.0 gms/Decilitre
		Women (Pregnant)	Below 12.0 gms/ Decilitre
		Men	Below 13.0 gms/Decilitre

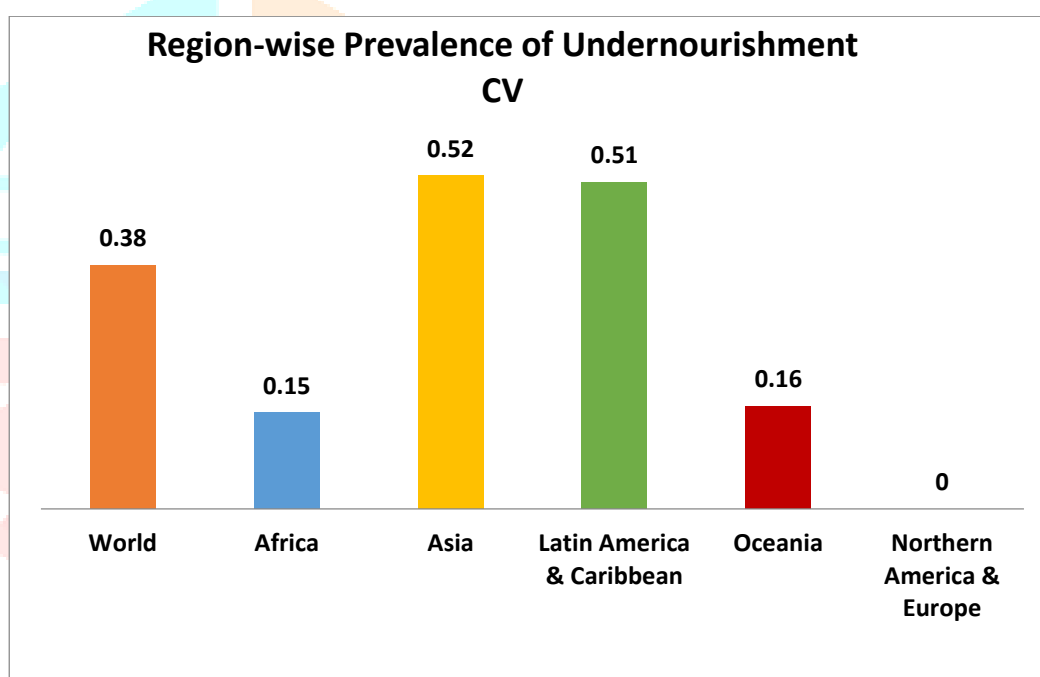
2.4.4 Region-wise Prevalence of Undernourishment in the World

Region-wise Prevalence of Undernourishment in the World (%)

Year	World	Africa	Asia	Latin America & Caribbean	Oceania	Northern America & Europe
2000	2.69	3.20	2.83	2.48	1.69	0.92
2001	2.70	3.18	2.85	2.43	1.67	0.92
2002	2.71	3.16	2.87	2.38	1.67	0.92
2003	2.71	3.14	2.88	2.34	1.70	0.92
2004	2.70	3.09	2.87	2.28	1.74	0.92
2005	2.67	3.05	2.86	2.21	1.70	0.92
2006	2.62	3.02	2.80	2.13	1.67	0.92
2007	2.57	3.01	2.74	2.04	1.63	0.92
2008	2.53	3.00	2.69	1.99	1.63	0.92
2009	2.51	2.98	2.65	1.96	1.63	0.92
2010	2.47	2.95	2.61	1.92	1.65	0.92
2011	2.45	2.93	2.59	1.89	1.67	0.92
2012	2.42	2.92	2.56	1.86	1.69	0.92

2013	2.41	2.91	2.53	1.82	1.74	0.92
2014	2.38	2.90	2.49	1.81	1.76	0.92
2015	2.36	2.91	2.46	1.82	1.77	0.92
2016	2.17	2.92	2.14	1.82	1.77	0.92
2017	2.16	2.92	2.10	1.90	1.79	0.92
2018	2.19	2.92	2.13	1.92	1.74	0.92
2019	2.19	2.95	2.12	1.99	1.76	0.92
2020	2.29	3.04	2.20	2.21	1.82	0.92
CGAR	-2.9	-1.25753	-4.18108	-4.18108	0.623938	0
Mean	51.94	63.10	53.98	43.20	35.89	19.24
SD	0.19	0.10	0.28	0.22	0.06	0.00
CV	0.38	0.15	0.52	0.51	0.16	0.00

Source: FAO-Food Security Report 2021



The table delineates the prevalence of undernourishment across diverse regions from 2000 to 2020, offering a nuanced perspective on global food security trends. The percentage values represent the proportion of undernourished populations in Africa, Asia, Latin America & Caribbean, Oceania, and Northern America & Europe, alongside a worldwide overview. Notably, negative Compound Annual Growth Rates (CGAR) in Africa, Asia, and Latin America & Caribbean imply a gradual reduction in undernourishment over the specified period. The table incorporates additional metrics such as mean prevalence rates, standard deviations, and coefficients of variation, providing insights into the variability and averages of undernourishment across regions. Sourced from the FAO-Food Security Report 2021, this data is instrumental in assessing the global trajectory of efforts to combat food insecurity. The trends observed underscore the importance of region-specific policies in addressing undernourishment challenges. As societies grapple with the complexities of achieving food security, this comprehensive dataset aids policymakers, researchers, and global organizations in

understanding the evolving dynamics of undernourishment prevalence and tailoring interventions to effectively tackle this critical issue on a worldwide scale.

2.4.5 Prevalence of Moderate/ Severe food security in the total population

Prevalence of Moderate/ Severe food security in the total population

Year	World	Africa	Asia	Latin America & Caribbean	Oceania	Northern America and Europe
2014	2.1	2.8	2.1	2.0	0.9	0.3
2015	2.1	2.8	1.8	1.9	1.0	0.3
2016	2.1	2.9	1.8	2.1	1.2	0.3
2017	2.2	3.1	1.9	2.2	1.4	0.2
2018	2.2	2.9	2.2	2.2	1.3	0.0
2019	2.3	2.9	2.2	2.3	1.4	0.0
2020	2.3	2.9	2.2	2.3	1.4	0.0
CGAR	4.0	3.3	5.5	8.1	11.7	-7.6
Mean	2.2	2.9	2.0	2.1	1.2	0.2
SD	0.1	0.1	0.2	0.2	0.2	0.2
CV	3.8	3.9	9.9	7.8	18.6	83.3

The table presents the prevalence of moderate/severe food security in the global population and various regions from 2014 to 2020. The percentages indicate the proportion of individuals facing moderate/severe food security issues in Africa, Asia, Latin America & Caribbean, Oceania, and Northern America and Europe. Over the years, the data reveals a global increase in moderate/severe food security, with varying rates across regions. Africa experienced a consistent rise, emphasizing the persistent challenges in the continent. Notably, Latin America & Caribbean demonstrated an increasing trend, reaching 2.3% in 2020, reflecting an 8.1% Compound Annual Growth Rate (CGAR). Oceania witnessed a substantial increase with a remarkable 11.7% CGAR, suggesting an escalating severity of food security issues in this region. Conversely, Northern America and Europe showed a decreasing trend, reaching 0.2% in 2018, indicating a potential improvement in food security conditions. The mean, standard deviation, and coefficient of variation provide insights into the overall trends and variability in each region. The Coefficient of Variation (CV) is particularly high in Oceania, indicating significant variability in moderate/severe food security rates. These findings underscore the importance of region-specific strategies to address food security challenges. Policymakers can utilize this data to tailor interventions, considering the diverse trends and conditions observed across continents, thereby contributing to more effective global efforts in alleviating moderate/severe food security.

2.4.6 Global nutritional Status of Children (Under 5 years)

Year	Over Weight	Wasting	Stunting
2000	4.9	8.7	32.5
2005	5.1	8.3	29.3
2010	5.4	7.7	26.2
2011	5.5	7.6	25.6
2012	5.5	7.5	25
2013	5.6	7.4	24.4
2014	5.7	7.3	23.9
2015	5.7	7.2	23.3
2016	5.8	7.1	22.8
2017	5.8	7	22.4
2018	5.9	6.9	21.9
2019	5.6	6.9	21.3
2020	5.7	6.8	22

Source: Food and agriculture organization

The global nutritional status of children under 5 years, as depicted in the provided data from 2000 to 2020, reflects a nuanced picture of child health. The prevalence rates of overweight, wasting, and stunting offer insights into different facets of childhood nutrition and development. Over the two decades, there has been a gradual increase in the prevalence of overweight children, rising from 4.9% in 2000 to 5.7% in 2020. This signals a concerning trend that necessitates attention to factors contributing to excess weight, such as diet and lifestyle. Conversely, wasting, indicative of acute malnutrition, has seen a general decline, suggesting potential improvements in nutritional interventions and health programs globally. Stunting, a measure of chronic malnutrition, has also decreased from 32.5% in 2000 to 22% in 2020, indicating progress in addressing long-term nutritional deficiencies. However, the stability and slight increase in some indicators in recent years, such as stunting in 2020, highlight the ongoing challenges and the need for sustained efforts in ensuring adequate nutrition for children worldwide. This necessitates a multifaceted approach, including nutritional education, healthcare access improvement, and policies addressing socio-economic determinants to secure the optimal health and well-being of the global child population.

4.4.7 Global prevalence of Obesity (BMI \geq 30) in adult (18 years and older)Global trends of obesity (BMI \geq 30) among adults (in Percent)

Year	Adults		Total	Y-o-Y
	Men	Women		
2000	6.7	10.6	8.7	-
2001	6.9	10.8	8.9	2.25
2002	7.1	11.1	9.1	2.20
2003	7.3	11.3	9.3	2.15
2004	7.6	11.6	9.6	3.12
2005	7.8	11.8	9.8	2.04
2006	8.1	12.1	10.1	2.97
2007	8.4	12.3	10.4	2.88
2008	8.6	12.6	10.6	1.89
2009	8.9	12.9	10.9	2.75
2010	9.2	13.2	11.2	2.68
2011	9.5	13.5	11.5	2.61
2012	9.8	13.8	11.8	2.54
2013	10.1	14.1	12.1	2.48
2014	10.4	14.4	12.4	2.42
2015	10.8	14.7	12.8	3.13
2016	11.1	15.1	13.1	2.29

Source: Food and agriculture organization

Over the past two decades, the global prevalence of obesity among adults (18 years and older) has witnessed a concerning and consistent upward trend, as reflected in the provided data. The Body Mass Index (BMI) threshold of 30 or higher is used to classify individuals as obese. The table outlines the prevalence rates for men and women separately, along with the total percentage. Starting from the year 2000, where the global obesity rate stood at 8.7%, the figures have consistently risen. Men and women both experienced a gradual increase in obesity, with men starting at 6.7% and women at 10.6% in 2000. By 2016, the global prevalence had reached 13.1%, indicating a substantial escalation over the years. The year-on-year (Y-o-Y) percentage change column highlights the annual growth rate. Notably, the rates of increase were more pronounced in the earlier years, gradually stabilizing in the latter period. The provided data underscores the urgent need for comprehensive and global strategies to address the escalating obesity epidemic, encompassing lifestyle interventions, public health initiatives, and policy changes to promote healthier living and combat this significant public health challenge.

Prevalence of Anaemia among Women of Reproductive Age (15-49 years):

Year	Women	Y-o-Y
2000	31.6	-
2001	31.3	-0.96
2002	31.0	-0.97
2003	30.9	-0.32
2004	30.7	-0.65
2005	30.6	-0.33
2006	30.4	-0.66
2007	30.2	-0.66
2008	30.0	-0.67
2009	29.9	-0.33
2010	29.9	0.00
2011	30.0	0.33
2012	30.3	0.99
2013	30.7	1.30
2014	31.3	1.92
2015	32.0	2.19
2016	32.8	2.44
2018	29.6	2.2

Source: Food and agriculture organization

The prevalence of anemia among women aged 15-49, as reported by the Food and Agriculture Organization from 2000 to 2018, shows a noteworthy pattern. Starting at 31.6% in 2000, the prevalence gradually decreased until 2009, reaching 29.9%. However, a slight increase was observed in 2018, with the prevalence recorded at 29.6%. This data signifies both progress and challenges in addressing anemia among women of reproductive age. The fluctuations in prevalence underscore the complex nature of factors contributing to anemia, including nutrition, healthcare access, and socio-economic conditions. Ongoing efforts are needed to understand and tackle the reasons behind the recent increase and to implement targeted interventions such as nutritional education and improved healthcare services. The data emphasizes the importance of continued vigilance and adaptive strategies to sustain and enhance the gains made in combating anemia among women globally.

2.5 FOOD AVAILABILITY SCENARIO IN INDIA

India's food availability hinges on agricultural output, government policies, and market dynamics. Agriculture, influenced by factors like monsoons, plays a pivotal role. Government schemes, such as the Public Distribution System, strive to guarantee economical access to vital commodities. Effective supply chains, storage facilities, and global trade bolster the nation's food scenario. Challenges persist due to population growth and environmental issues.

2.5.1 Average Dietary Energy Supply Adequacy

Year	ADESA	Y-o-Y
1999-01	4.66	-
2000-02	4.64	-1.92
2001-03	4.62	-1.96
2002-04	4.62	-0.99
2003-05	4.61	-1
2004-06	4.62	0.99
2005-07	4.62	0.98
2006-08	4.64	1.92
2007-09	4.65	0.95
2008-10	4.65	0
2009-11	4.65	0
2010-12	4.65	0
2011-13	4.66	0.94
2012-14	4.66	0
2013-15	4.67	0.94
2014-16	4.68	0.93
2015-17	4.68	0
2016-18	4.69	0.92
2017-19	4.69	0
2018-20	4.72	0
CAGR	0.41	
Mean	4.66	
SD	0.03	
CV	0.63	

The Average Dietary Energy Supply Adequacy (ADESA) in the given years indicates a stable trend, with a negligible Compound Annual Growth Rate (CAGR) of 0.41%. The mean ADESA remains consistent at 4.66, demonstrating relative stability in dietary energy supply over the years. The standard deviation (SD) of 0.03 reflects low variability around the mean. The coefficient of variation (CV) at 0.63% suggests moderate relative variability. While there are minor fluctuations in ADESA, the overall pattern shows resilience, indicating a consistent average dietary energy supply adequacy in the specified period, with limited deviation from the mean.

2.5.2 Average value of Food Production

Table: Average value of Food Production

Year	India	Y-o-Y
1999-01	5.01	-
2000-02	4.98	-3.45
2001-03	4.98	0
2002-04	4.96	-2.11
2003-05	4.99	3.4
2004-06	5.00	1.34
2005-07	5.05	4.49
2006-08	5.09	3.7
2007-09	5.10	1.22
2008-10	5.11	0.61
2009-11	5.14	2.94
2010-12	5.17	3.41
2011-13	5.20	2.76
2012-14	5.21	1.63
2013-15	5.22	0.54
2014-16	5.23	0.54
2015-17	5.22	-52.46
2016-18	5.23	0.53
2017-19	4.71	0.49
2018-20	4.72	0.5
CGAR	0.27	
Mean	5.06	
SD	0.15	
CV	3.03	

The table displays the Average Value of Food Production in India from 1999-2000 to 2018-2019, highlighting year-on-year (Y-o-Y) changes, Compound Annual Growth Rate (CAGR), mean, standard deviation (SD), and coefficient of variation (CV). The CAGR of 0.27% suggests a modest but positive growth rate in food production over the specified period. The mean value stands at 5.06, indicating the average food production level. However, the SD of 0.15 and CV of 3.03% signify notable variability and relative instability in production levels. The analysis reveals a consistent increase in food production until 2015-2016, with notable fluctuations in Y-o-Y changes. The sudden drop in 2015-2017, reflected in the negative Y-o-Y and a substantial decline in percentage terms (-52.46%), is a notable anomaly. The subsequent years show a recovery, but the production levels remain below the earlier trend. The higher CV indicates considerable variability, suggesting vulnerability to external factors such as climate change, policy shifts, or other unforeseen circumstances.

affecting food production. Policymakers should focus on strategies to stabilize production and address the challenges causing fluctuations, ensuring long-term food security. The analysis underscores the need for adaptive agricultural policies, technology interventions, and resilience-building measures to mitigate the impact of unpredictable factors on food production.

2.4.3 Prevalence of Undernourishment

The prevalence of undernourishment remains a significant concern in India, particularly in specific regions and demographic groups. Indicators such as stunting, wasting, underweight among children, and low Body Mass Index (BMI) among adults are used to measure undernourishment. Government initiatives, including the National Food Security Act and Integrated Child Development Services, strive to address these challenges. The prevalence varies across states due to factors like economic conditions, agricultural practices, and healthcare accessibility.

Table: Prevalence of Undernourishment people in India

Year	People (millions)	Percent	Y-o-Y
2001	191.2	18.2	-
2002	208.2	19.4	6.19
2003	229.3	21	7.62
2004	246.5	22.2	5.41
2005	256.5	22.8	2.63
2006	253.9	22.2	-2.70
2007	241.1	20.7	-7.25
2008	225.9	19.2	-7.81
2009	216.5	18.1	-6.08
2010	214.4	17.7	-2.26
2011	215.7	17.5	-1.14
2012	217.9	17.5	0.00
2013	218.8	17.3	-1.16
2014	216.3	16.9	-2.37
2015	210.4	16.3	-3.68
2016	202.7	15.5	-5.16
2017	196.9	14.9	-4.03
2018	194.4	14.5	-2.76
2019-21	224.3	16.3	2.2

The table presents the Prevalence of Undernourished People in India from 2001 to 2019-21, indicating millions of people, percentage prevalence, and year-on-year (Y-o-Y) changes. The analysis reveals a concerning trend with a peak in 2005 at 22.8%, followed by a fluctuating but persistent decline. The Y-o-Y changes show a sharp decrease from 2005 to 2009, reflecting a substantial reduction in undernourishment. However, subsequent years exhibit a slower decline with occasional increases. The 2019-21 data indicates a slight increase, emphasizing the need for sustained efforts and targeted interventions to address undernourishment and ensure consistent progress toward improved nutritional outcomes.

2.4.4 Nutrition Scenario of Children (below 5 years) in India:

Nutrition Scenario of Children (under 5 years of age) in India

Sl. No	Year	Stunted	Wasted	Overweight
1	2006	47.9	20	1.9
2	2014	38.7	15.1	2.0
3	2015	38.4	21	2.1

The nutrition scenario for children under 5 years in India from 2006 to 2015 shows a positive trajectory with improvements in stunting and wasting rates. In 2006, 47.9% of children were stunted, which decreased to 38.7% in 2014 and further to 38.4% in 2015. Similarly, wasting rates declined from 20% in 2006 to 15.1% in 2014, although there was a slight increase to 21% in 2015. Overweight cases remained relatively stable, indicating a need for sustained efforts in addressing malnutrition comprehensively. While progress has been made, continued attention is essential to ensure a consistent decline in malnutrition and promote overall child well-being.

2.4.5 Prevalence of Obesity (BMI>30) among Adult:

Prevalence of obesity among adult in India (percent)

SL. No	Year	Adults	Y-o-Y
1	2000	1.5	-
2	2001	1.6	6.25
3	2002	1.7	5.88
4	2003	1.8	5.56
5	2004	1.9	5.26
6	2005	2	5.00
7	2006	2.1	4.76
8	2007	2.3	8.70
9	2008	2.4	4.17
10	2009	2.5	4.00
11	2010	2.7	7.41
12	2011	2.9	6.90
13	2012	3	3.33

14	2013	3.2	6.25
15	2014	3.4	5.88
16	2015	3.6	5.56
17	2016	3.8	5.26

The prevalence of obesity among adults in India has shown a concerning upward trend from 2000 to 2016. Starting at 1.5% in 2000, the percentage has steadily increased, reaching 3.8% in 2016. This represents more than a twofold increase over the period. The year-on-year analysis reveals consistent annual increments, indicating a sustained rise in obesity rates. The highest yearly increase occurred in 2007 with an 8.70% spike. The escalating prevalence underscores the need for robust public health measures and awareness campaigns to address lifestyle factors contributing to obesity, emphasizing the importance of preventive health interventions in the Indian population.

2.4.6 Prevalence of Anaemia among Women of Reproductive Age (15-49 years):

Anemia among women of reproductive age (15-49 years) in India has been a notable public health concern. Anemia is often assessed through indicators such as hemoglobin levels. Government health surveys, including the National Family Health Survey (NFHS), provide valuable insights into the prevalence of anemia among women in different states and demographic groups. Efforts to address anemia include government programs promoting iron and folic acid supplementation, nutritional education, and awareness campaigns.

Prevalence of anaemia among women of reproductive age in India

Year	Women (%)	Y-o-Y
2000	53.3	-
2001	53.3	0.00
2002	53.3	0.00
2003	53.3	0.00
2004	53.3	0.00
2005	53.2	-0.19
2006	53.0	-0.38
2007	52.7	-0.57
2008	52.4	-0.57
2009	52.0	-0.77
2010	51.7	-0.58
2011	51.5	-0.39
2012	51.3	-0.39
2013	51.2	-0.20
2014	51.1	-0.20
2015	51.2	0.20
2016	51.4	0.39

The prevalence of anaemia among women of reproductive age in India has exhibited a gradual decline from 53.3% in 2000 to 51.4% in 2016. The year-on-year analysis indicates a consistent decreasing trend with slight fluctuations. The most substantial yearly reduction occurred in 2009 with a 0.77% decline. Although the decline is relatively modest, the overall trend suggests some progress in addressing anaemia, highlighting the need for sustained efforts in nutrition and healthcare interventions. Continuous monitoring and targeted interventions are essential to further alleviate anaemia's burden and improve the health outcomes of women in the reproductive age group.

2.4.7 Nutritional Status of Children in India:

The nutritional status of children in India remains a critical public health concern. Key indicators used to assess nutritional status include stunting, wasting, and underweight. Government initiatives such as the Integrated Child Development Services (ICDS) and the National Nutrition Mission (POSHAN Abhiyan) aim to address malnutrition issues through nutrition interventions, healthcare, and maternal education.

Trends of Nutritional Status of children in India.

Sl. No.	Report	Nutritional Indicator	India	Residence	
				Urban	Rural
1	NFHS-5 (2019-21)	Stunted	35.5	30.1	37.3
		Wasted	19.3	18.5	19.5
		Under-weight	32.1	27.3	33.8
2	NFHS-4 (2015-16)	Stunted	38.4	31.0	41.2
		Wasted	21.0	19.9	21.4
		Under-weight	35.7	29.1	38.2

Source: NFHS-5 Report 2021

2.4.8 Food Availability Scenario in Karnataka

Karnataka's food availability hinges on diverse agricultural practices, with a focus on crops like rice, sugarcane, millets, and pulses. Weather conditions, including rainfall and temperature, play a pivotal role in crop success. Government policies, efficient infrastructure, and market dynamics influence food distribution. Schemes promoting food security, subsidies, and global commodity prices also impact availability.

3 The role of ICDS in reducing malnutrition among children of Belagavi District

3.1 Introduction

Child Development Services (ICDS) in addressing malnutrition in Karnataka. It kicks off by elucidating the data collection process, encompassing surveys, interviews, and official records, to establish a robust analytical foundation. Subsequent sections delve into a meticulous analysis of malnutrition indicators, such as stunting, wasting, and underweight prevalence among children in Karnataka. Leveraging advanced tools, the chapter identifies trends and patterns, providing insights into the current state of malnutrition. The correlation and association between ICDS interventions and nutritional outcomes are thoroughly examined. A scrutiny of ICDS effectiveness across diverse demographics and socioeconomic strata is undertaken, dissecting the data to ascertain whether ICDS initiatives effectively reach vulnerable populations and address malnutrition disparities. The interpretation of the data is paramount, as the chapter aims to unravel the myriad factors influencing malnutrition in Karnataka. By integrating quantitative findings with qualitative insights from interviews and case studies, a holistic understanding of the contextual intricacies surrounding ICDS implementation emerges. Concluding the chapter is a discussion on the implications of the data for policy and practice. Recommendations, rooted in the findings, are articulated to guide stakeholders involved in the design, implementation, and evaluation of ICDS programs. The overarching objective is to contribute to the collaborative endeavour of eradicating malnutrition in Karnataka.

Distribution of Respondents' Awareness of Anganwadi in the Locality

Awareness	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
Yes	149 (100)	126 (100)	99 (100)	374 (100)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table illustrates the distribution of respondents' awareness of Anganwadi facilities in a given locality, categorized by different levels of malnutrition. The data, sourced from a Field Survey conducted in 2023, presents a breakdown of respondents' awareness across three malnutrition categories: Low Malnourished, Moderate Malnourished, and Higher Malnourished. The table reveals that in all malnutrition categories, the respondents' awareness of Anganwadi is 100%. Specifically, 149 respondents are aware in the Low Malnourished category, 126 in the Moderate Malnourished category, and 99 in the Higher Malnourished category, totalling 374 respondents. The percentages in parentheses indicate the proportion of awareness within each malnutrition category. The overall total of respondents aware of Anganwadi across all malnutrition levels is also 374, and each category contributes 100% to this total. The data emphasizes a consistent awareness level across different malnutrition categories in the locality. The table provides valuable insights into the distribution of awareness, crucial for assessing the effectiveness of Anganwadi awareness campaigns and strategizing interventions to address malnutrition concerns in the community.

Distance of Anganwadi from respondent's house

Distance	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
Less than 200 Mtrs.	22 (14.8)	18 14.3	5 5.1	45 12.0
201 to 400 Mtrs.	35 23.5	25 19.8	21 21.2	81 21.7
401 to 600 Mtrs.	34 22.8	32 25.4	28 28.3	94 25.1
601 to 800 Mtrs.	28 18.8	20 15.9	16 16.2	64 17.1
801 to 1000 Mtrs.	13 8.7	17 13.5	16 16.2	46 12.3
above 1 KM	17 11.4	14 11.1	13 13.1	44 11.8
Total	149 100	126 100	99 100	374 100

Note: () Percentage

Source: Field Survey 2023

The above table provides information on the distance between respondents' homes and Anganwadi centers, categorized by the nutritional status of their children (Low Malnourished, Moderate Malnourished, and Higher Malnourished). The table shows that the majority of respondents fall into the distance categories of 201 to 600 meters. In each distance category, the table displays the number of respondents for each nutritional status group, along with their respective percentages. Overall, it appears that accessibility to Anganwadi centers within shorter distances may encourage utilization, especially among parents of children with higher malnutrition. This data can be valuable for policymakers in planning the placement and accessibility of Anganwadi centres to address child malnutrition effectively.

Regularity of the children going to anganwadi

Regularity	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
Daily	89 (59.7)	75 (59.5)	55 (55.6)	219 (58.6)
Weekly	26 (17.4)	17 (13.5)	23 (23.2)	66 (17.6)
Occasional	6 (4.0)	3 (2.4)	4 (4.0)	13 (3.5)
Don't go	28 (18.8)	31 (24.6)	17 (17.2)	76 (20.3)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table provides a detailed breakdown of the regularity of children attending anganwadi centers based on their malnutrition status. The data is categorized into three groups: Low Malnourished, Moderate Malnourished, and Higher Malnourished, with attendance figures for each group across different levels of regularity. Examining the percentages within each malnutrition category, a notable trend emerges. The majority of low malnourished children exhibit a high level of regularity, with 59.7% consistently attending. Similarly, 59.5% of moderate malnourished and 55.6% of higher malnourished children demonstrate regular attendance. Conversely, when exploring the lower end of the regularity spectrum, there is a relatively lower percentage of attendance among moderate and higher malnourished groups. For instance, 17.4% of moderate malnourished and 23.2% of higher malnourished children have lower regularity in attendance. The overall analysis suggests a positive correlation between regularity of attendance and lower malnutrition levels. It underscores the potential influence of consistent attendance at anganwadi centers in mitigating malnutrition among children. These findings could inform targeted interventions and strategies to improve attendance rates, especially among moderately and higher malnourished groups, ultimately contributing to better nutritional outcomes.

Category-wise Distribution of Respondents

Category	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
SC	37 (24.8)	23 (18.3)	21 (21.2)	81 (21.7)
ST	8 (5.4)	8 (6.3)	7 (7.1)	23 (6.1)
OBC	67 (45.0)	51 (40.5)	52 (52.5)	170 (45.5)
OTHERS	37 (24.8)	44 (34.9)	19 (19.2)	100 (26.7)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The above table presents the number of respondents in each category and their respective percentages in parentheses. For instance, among SC respondents, 37 individuals (24.8% of the total) are low malnourished, 23 individuals (18.3% of the total) are moderately malnourished, and 21 individuals (21.2% of the total) are highly malnourished. Among SC respondents, the majority are in the "Low Malnourished" category. ST respondents have a relatively smaller number of individuals but a higher percentage in the "Higher Malnourished" category. OBC respondents make up a significant portion of the total sample and have fairly equal distribution among the malnourishment categories. "OTHERS" category has the highest number of respondents, and there is a relatively higher percentage of "Moderate Malnourished" individuals.

Distribution of Respondents upon Ration card

Ration card	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
AAY	66 (44.3)	53 (42.1)	48 (48.5)	167 (44.7)
BPL	69 (46.3)	61 (48.4)	42 (42.4)	172 (46.0)
APL	14 (9.4)	12 (9.5)	9 (9.1)	35 (9.4)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

A total of 167 respondents, which is 44.7% of the total, hold AAY cards, there are 172 respondents with BPL cards, accounting for 46.0% of the total, The APL cardholders are the smallest group, with 35 respondents, representing 9.4% of the total. Among all respondents, 149 individuals (or 44.7%) are classified as low malnourished. There are 126 respondents (or 33.7%) with moderate malnourishment. The highest level of malnourishment is observed in 99 respondents, constituting 26.5% of the total. The BPL category has the largest number of respondents, followed by the AAY category, and the APL category has the fewest respondents. The percentage of respondents with higher malnourishment is highest among AAY cardholders, followed by BPL and APL cardholders. The percentage of respondents with low malnourishment is highest among APL cardholders, followed by BPL and AAY cardholders. The distribution of malnourishment levels seems to vary among different ration card categories, with AAY cardholders having a higher proportion of highly malnourished individuals compared to APL cardholders.

house status wise distribution of respondents

Type of house	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
kacchha	51 (34.2)	35 (27.8)	27 (27.3)	113 (30.2)
Pucca	65 (43.6)	53 (42.1)	41 (41.4)	159 (42.5)
RCC	33 (22.1)	38 (30.2)	31 (31.3)	102 (27.3)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The above table presents house status wise distribution of respondents, 113 respondents (30.2% of the total) live in Kacchha houses, which are temporary or makeshift dwellings. 159 respondents (42.5%) reside in Pucca houses, which are permanent and often made of durable materials like brick and concrete. 102 respondents (27.3%) live in houses made of Reinforced Cement Concrete (RCC), indicating a relatively modern construction style. Kacchha houses have 34.2% of low malnourished individuals, Pucca houses have 43.6%, and RCC houses have 22.1%. Kacchha houses have 27.8% of moderately malnourished individuals, Pucca houses have 42.1%,

and RCC houses have 30.2%. Kacchha houses have 27.3% of highly malnourished individuals, Pucca houses have 41.4%, and RCC houses have 31.3%. The majority of respondents live in Pucca houses, which are associated with moderate malnourishment levels. Although Kacchha houses have the lowest percentage of respondents, they have a significant proportion of highly malnourished individuals. RCC houses have the lowest percentage of moderate malnourished individuals but a relatively higher percentage of highly malnourished individuals compared to Pucca houses. The distribution of malnourishment levels varies across different house types, suggesting a potential correlation between the quality of housing and the nutritional status of residents.

Occupation-wise Distribution of respondents

Occupation	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
Agriculture	76 (51.0)	62 (49.2)	39 (39.4)	177 (47.3)
Casual Agriculture Wage	39 (26.2)	29 (23.0)	40 (40.4)	108 (28.9)
Casual Non-Agri Wage	0 (0.0)	0 (0.0)	6 (6.1)	6 (1.6)
Regular Salaried	2 (1.3)	3 (2.4)	3 (3.0)	8 (2.1)
Non-Agri Self Employed	29 (19.5)	20 (15.9)	10 (10.1)	59 (15.8)
Wage Employment	3 (2.0)	12 (9.5)	1 (1.0)	16 (4.3)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The above table shows Occupation-wise distribution of Respondents across the study area, based on field survey 2023. There are a total of 177 respondents in the agriculture occupation, Out of these, 76 (51.0%) are classified as low malnourished, 62 (49.2%) as moderately malnourished, and 39 (39.4%) as highly malnourished. 108 respondents, with 39 (26.2%) categorized as low malnourished, 29 (23.0%) as moderately malnourished, and 40 (40.4%) as highly malnourished in Casual Agriculture Wage category. There are only 6 respondents in this category, and all of them (100%) are highly malnourished in Casual Non-Agri Wage category. 8 respondents fall into Regular Salaried category, with 2 (1.3%) being low malnourished, 3 (2.4%) moderately malnourished, and 3 (3.0%) highly malnourished. This category consists of 59 respondents, with 29 (19.5%) being low malnourished, 20 (15.9%) moderately malnourished, and 10 (10.1%) highly malnourished fall in Non-Agri Self Employed. There are 16 respondents in Wage Employment category, with 3 (2.0%) categorized as low malnourished, 12 (9.5%) as moderately malnourished, and 1 (1.0%) as highly malnourished.

Distribution of respondents based on land holding

Land	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
Landless	17 (11.4)	36 (28.6)	32 (32.3)	85 (22.7)
Marginal	80 (53.7)	63 (50.0)	48 (48.5)	191 (51.1)
Small	13 (8.7)	23 (18.3)	6 (6.1)	42 (11.2)
Semi	39 (26.2)	4 (3.2)	6 (6.1)	49 (13.1)
Medium	0 (0.0)	0 (0.0)	7 (7.1)	7 (1.9)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table shows the respondents categorized by their land ownership status (Landless, Marginal, Small, Semi, and Medium) and their malnutrition status (Low Malnourished, Moderate Malnourished, and Higher Malnourished). The percentages in parentheses represent the proportion of each malnutrition category within each land category. The total number of respondents as Landless: 85 respondents, Marginal: 191 respondents, Small: 42 respondents, Semi: 49 respondents, Medium: 7 respondents. Landless individuals have a significant portion of their population in the "Higher Malnourished" category (37.6%). Moderate malnutrition is also prevalent among this group (42.4%). Low malnourishment is the least common (20%) in this category. Marginal landowners have a fairly balanced distribution among the three malnutrition categories, with slightly more in the "Low Malnourished" category (41.9%). Small landowners predominantly experience moderate malnourishment (54.8%), followed by low malnourishment (31.0%). A smaller proportion falls into the "Higher Malnourished" category (14.3%). Semi landowners exhibit a high percentage of "Low Malnourished" individuals (79.6%), with only a small proportion in the "Higher Malnourished" category (12.2%). Medium landowners have a negligible number of respondents in the "Low Malnourished" and "Moderate Malnourished" categories, with the majority (7.1%) falling into the "Higher Malnourished" category.

Income-wise distribution of Respondents

Income	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
Less than 25000	1 (0.67)	2 (1.59)	0 (0.00)	3 (0.80)
25001 to 50000	14 (9.40)	19 (15.08)	9 (9.09)	42 (11.23)
50001 to 100000	51 (4.23)	36 (28.57)	39 (39.39)	126 (33.69)
100001 to 200000	49 (32.89)	51 (40.48)	30 (30.30)	130 (34.76)
200001 to 400000	20 (13.42)	12 (9.52)	13 (13.13)	45 (12.03)
above 400000	14 (9.40)	6 (4.76)	8 (8.08)	28 (7.49)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table based on field survey 2023 categorizes respondents into various income brackets, starting from "Less than 25000" to "Above 400000." The majority of "Low Malnourished" individuals fall in the income categories "100001 to 200000" (32.89%) and "200001 to 400000" (13.42%). The "Moderate Malnourished" category has a significant proportion of respondents in the income bracket "50001 to 100000" (28.57%) and "100001 to 200000" (40.48%). The "Higher Malnourished" category is most prevalent in the income bracket "50001 to 100000" (39.39%). It's worth noting that there is a small number of respondents in the lowest income bracket ("Less than 25000"), and none of them are classified as "Higher Malnourished."

Literacy status-wise distribution of Respondents

Education	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
Illiterates	15 (10.1)	21 (16.7)	9 (9.1)	45 (12.0)
Secondary	51 (34.2)	36 (8.6)	39 (39.4)	126 (33.7)
Primary	49 (32.9)	51 (40.5)	30 (30.3)	130 (34.8)
PUC	20 (13.4)	12 (9.5)	13 (13.1)	45 (12.0)
UG/PG	14 (9.4)	6 (4.8)	8 (8.1)	28 (7.5)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The above table describes the respondents literacy status based on the field survey conducted during 2023. 10.1% of illiterate respondents are in Low Malnourished category, 16.7% of illiterate respondents fall into Moderate Malnourished category, 9.1% of illiterate respondents are in Higher Malnourished category. 34.2% of respondents with secondary education experience low malnutrition. 28.6% of respondents with secondary education are moderately malnourished. 39.4% of respondents with secondary education face higher malnutrition levels. 32.9% of respondents with primary education experience low malnutrition. 40.5% of respondents with primary education are moderately malnourished, 30.3% of respondents with primary education face higher malnutrition levels, 13.4% of PUC-educated respondents experience low malnutrition, 9.5% of PUC-educated respondents are moderately malnourished, 13.1% of PUC-educated respondents face higher malnutrition levels, 9.4% of UG/PG-educated respondents experience low malnutrition, 4.8% of UG/PG-educated respondents are moderately malnourished, 8.1% of UG/PG-educated respondents face higher malnutrition levels. Moderate Malnourished is prominent across all education levels, indicating a concerning trend regardless of literacy status. Secondary education respondents have the highest percentage in Higher Malnourished category, emphasizing the need for nutritional interventions in this group, Illiterate respondents have the lowest percentage in Low Malnourished category, suggesting a need for educational programs focusing on nutrition awareness and health.

Food Culture-wise distribution of Respondents

Food Culture	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
VEGETARIAN	94 (63.1)	77 (61.1)	55 (55.6)	226 (60.4)
NON-VEGETARIAN	55 (36.9)	49 (38.9)	44 (44.4)	148 (39.6)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The respondents are distributed based on food culture practiced by them. The table shows the majority of respondents are VEGETARIAN and experience varying levels of malnutrition. The "Low Malnourished" category is the most prevalent among vegetarians, with 63.1% falling into this group. The "Moderate Malnourished" category is the next highest at 61.1%. The "Higher Malnourished" category, although lower, still has a significant percentage of vegetarians at 55.6%. NON-VEGETARIAN respondents have a more balanced distribution across the three malnutrition categories. The "Moderate Malnourished" category has the highest percentage among non-vegetarians (38.9%). The "Higher Malnourished" category is the next highest at 44.4%. The "Low Malnourished" category is the lowest among non-vegetarians at 36.9%. This data highlights the relationship between food culture (vegetarian or non-vegetarian) and malnutrition. Vegetarians tend to have a higher percentage of respondents in the "Low Malnourished" category but still have a substantial presence in

the other malnutrition categories. Non-vegetarians exhibit a more even distribution across these categories, with the "Moderate Malnourished" and "Higher Malnourished" categories having a considerable presence.

Distribution of respondents upon opinion of provision of food ant AWC

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	113 (75.8)	105 (83.3)	72 (72.7)	290 (77.5)
NO	36 (24.2)	21 (16.7)	27 (27.3)	84 (22.5)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table presents data on respondents' opinions regarding the provision of food at Anganwadi Centers (AWC) for children and how this opinion relates to their malnutrition status. 113 respondents (75.8%) are in Low Malnourished category, 105 respondents (83.3%) fall into Moderate Malnourished category 72 respondents (72.7%) are in Higher Malnourished category who say that food is provided at anganwadi. 36 respondents (24.2%) are in Low Malnourished category, 21 respondents (16.7%) fall into Moderate Malnourished category and 27 respondents (27.3%) are in Higher Malnourished category who say that food is not provided at anganawadi.

Respondents who are in favour of providing food to children at Anganwadi Centers ("YES") generally have a higher percentage in the "Low Malnourished," "Moderate Malnourished," and "Higher Malnourished" categories. The highest percentage is in the "Moderate Malnourished" category at 83.3%. Respondents who are against providing food at AWC ("NO") have a lower percentage in the "Low Malnourished" category, indicating that they may be more at risk for malnutrition. The "Higher Malnourished" category is also relatively higher at 27.3% among this group.

Distribution of Respondents opinion of substitute provided for Egg

Substitute Food	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
EGG	112 (75.2)	82 (65.1)	71 (71.7)	265 (70.9)
GROUNDNUT CHIKKI	26 (17.4)	24 (19.0)	27 (27.3)	77 (20.6)
SPROUTS	5 (3.4)	14 (11.1)	1 (1.0)	20 (5.3)
GROUND NUT	6 (4.0)	6 (4.8)	0 (0.0)	12 (3.2)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The above table Most respondents prefer EGG as a substitute for eggs. Those who opt for eggs have a higher percentage in all malnutrition categories, with the highest percentage in the "Low Malnourished" category (75.2%).GROUNDNUT CHIKKI is the second most preferred substitute, but it has a relatively lower percentage in the "Low Malnourished" category compared to eggs. It has a higher percentage in the "Higher Malnourished" category (27.3%).SPROUTS have a relatively lower preference as a substitute and are least favoured among respondents. However, this group has a higher percentage in the "Moderate Malnourished" category. GROUND NUT is chosen by a few respondents, and they primarily fall into the "Low Malnourished" and "Moderate Malnourished" categories. There are varying preferences for substitutes for eggs, and these preferences are associated with different malnutrition levels. Those who choose eggs have a lower prevalence of malnutrition, especially in the "Low Malnourished" category. Groundnut chikki is the second most chosen option but is associated with a higher prevalence of "Higher Malnourished" individuals. Sprouts are not commonly preferred, and those who choose them tend to have a higher percentage in the "Moderate Malnourished" category. Groundnut, while chosen by a few, has a relatively lower impact on malnutrition.

Distribution of opinions of the respondents of consumption of supplementary food by child.

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	111 (74.5)	96 (76.2)	72 (72.7)	279 (74.6)
NO	38 (25.5)	30 (23.8)	27 (27.3)	95 (25.4)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table provides data from a 2023 field survey, presenting the distribution of respondents' opinions regarding the consumption of supplementary food by children, categorized by different levels of malnourishment. The majority of respondents across all malnourishment levels express support for the consumption of supplementary food by children ("YES"). The overall percentage of respondents in favor is 74.6% of the total sample. A smaller percentage of respondents disagree with the consumption of supplementary food ("NO"), making up 25.4% of the total sample. Respondents are categorized into three malnourishment levels: "Low Malnourished," "Moderate Malnourished," and "Higher Malnourished." The "Low Malnourished" category has the highest number of respondents, followed by "Moderate Malnourished," and the smallest group is "Higher Malnourished."

Distribution of Opinion of Child Complaints of Food Not Given at Anganwadi Centres

Opinion	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	50 (33.6)	36 (28.6)	28 (28.3)	114 (30.5)
NO	99 (66.4)	90 (71.4)	71 (71.7)	260 (69.5)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table provides data from a 2023 field survey, presenting the distribution of opinions regarding child complaints about food not being provided at Anganwadi centres. The respondents are categorized into three groups based on malnourishment levels: "Low Malnourished," "Moderate Malnourished," and "Higher Malnourished." The table demonstrates the distribution of respondents' opinions on whether children have complained about not receiving food at Anganwadi centres. Respondents can either confirm these complaints ("YES") or deny them ("NO"). Approximately 30.5% of the total respondents acknowledge that children have complained about not receiving food, while 69.5% deny such complaints. Respondents are categorized into three malnourishment levels: "Low Malnourished," "Moderate Malnourished," and "Higher Malnourished." The "Low Malnourished" category has the highest number of respondents, followed by "Moderate Malnourished," with the smallest group being "Higher Malnourished." Within each malnourishment category, there are differences in the rates of child complaints about food not being provided. The level of agreement with complaints ("YES") varies among the malnourishment categories: "Low Malnourished" respondents have the highest rate of acknowledgment (33.6%). "Moderate Malnourished" respondents show a slightly lower rate of acknowledgment (28.6%). "Higher Malnourished" respondents also acknowledge complaints, but at a similar rate to the moderate group (28.3%).

Distribution of Respondents Satisfaction with Food System at Anganwadi Centres

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	27 (18.1)	22 (17.5)	27 (27.3)	76 (20.3)
NO	122 (81.9)	104 (82.5)	72 (72.7)	298 (79.7)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table provides insights into respondents' satisfaction with the food system at Anganwadi Centres, categorized by different levels of malnourishment (Low Malnourished, Moderate Malnourished, and Higher Malnourished). The data reveals variations in satisfaction levels across these categories, shedding light on the effectiveness of the food provision system and its alignment with the nutritional needs of children. Overall, roughly 20.3% of respondents express satisfaction with the Anganwadi Centre's food system, while a significant majority, approximately 79.7%, report dissatisfaction. However, the analysis becomes more intriguing when considering the disparities between malnourishment categories. In the "Low Malnourished" and "Moderate Malnourished" categories, the satisfaction rates are relatively similar, at 18.1% and 17.5%, respectively. Conversely, in the "Higher Malnourished" category, there's a notably higher satisfaction rate of 27.3%. This implies that the food system at Anganwadi Centres may be more effective or better aligned with the nutritional requirements of children experiencing higher malnourishment levels. These findings have important policy implications. Understanding the reasons behind these satisfaction disparities can guide improvements in the food system, ensuring that it caters to the diverse nutritional needs of children. Additionally, further qualitative

data may help uncover specific factors influencing satisfaction and drive targeted interventions. Ultimately, this data underscores the significance of tailoring food programs at Anganwadi Centres to meet the unique needs of children in various malnourishment categories, with a particular focus on enhancing the satisfaction levels of those with lower malnourishment levels.

Distribution of Incidence of Low Weight baby birth

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	85 (57.0)	62 (49.2)	41 (41.4)	188 (50.3)
NO	64 (43.0)	64 (50.8)	58 (58.6)	186 (49.7)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table outlines the distribution of low birth weight incidents categorized by malnutrition levels in a given locality, based on a 2023 Field Survey. Among Low Malnourished respondents, 57% reported incidents of low-weight baby births, while in the Moderate Malnourished and Higher Malnourished categories, the percentages were 49.2% and 41.4%, respectively. Conversely, in the No category, indicating no incidents of low-weight births, the percentages varied with the highest in the Higher Malnourished group (58.6%). The data underscores an association between malnutrition levels and the incidence of low-weight baby births, offering insights for targeted interventions in maternal and child healthcare.

Distribution of Respondents taking medical treatment

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
HOME	68 (45.6)	50 (39.7)	28 (28.3)	146 (39.0)
MEDICAL SHOP	25 (16.8)	20 (15.9)	32 (32.3)	77 (20.6)
PHC	1 (0.7)	1 (0.8)	1 (1.0)	3 (0.8)
PRIVATE HOSPITAL	10 (6.7)	11 (8.7)	7 (7.1)	28 (7.5)
CIVIL HOSPITAL	45 (30.2)	44 (34.9)	31 (31.3)	120 (32.1)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table presents data on the distribution of respondents seeking medical treatment based on malnutrition levels and the type of healthcare institution accessed, derived from a Field Survey in 2023. The institutions include HOME, MEDICAL SHOP, PHC (Primary Health Centre), PRIVATE HOSPITAL, and CIVIL HOSPITAL. The majority of respondents, accounting for 39.0% of the total 374, sought medical treatment at HOME. Among these, 45.6%, 39.7%, and 28.3% were categorized as Low, Moderate, and higher malnourished, respectively. MEDICAL SHOP was the second most frequented institution (20.6% of total cases), with 16.8%, 15.9%, and 32.3% falling into the Low, Moderate, and Higher malnourished categories, respectively. PHC had minimal utilization (0.8% of total cases), while PRIVATE HOSPITAL and CIVIL HOSPITAL had 7.5% and 32.1%, respectively. The distribution of malnutrition levels varied across these institutions.

Distribution of level of Physical growth of children post joining AWC

Status	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
SAM TO MAM	107 (71.8)	83 (65.9)	66 (66.7)	256 (68.4)
MAM TO NORMAL	42 (28.2)	43 (34.1)	33 (33.3)	118 (31.6)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table presents data on the distribution of the level of physical growth of children after joining an Anganwadi Center (AWC), categorized by malnutrition levels. The status of physical growth is divided into two categories: "SAM to MAM" (Severe Acute Malnutrition to Moderate Acute Malnutrition) and "MAM to NORMAL" (Moderate Acute Malnutrition to Normal). The data reveals that a significant portion of children across all malnutrition levels experienced improvement in their physical growth status after joining the AWC. In the "SAM to MAM" category, 71.8% of Low Malnourished, 65.9% of Moderate Malnourished, and 66.7% of Higher Malnourished children transitioned positively. This suggests the effectiveness of AWC interventions in addressing severe malnutrition and promoting an improvement in physical growth. In the "MAM to NORMAL" category, reflecting the transition from Moderate Acute Malnutrition to Normal status, 28.2% of Low Malnourished, 34.1% of Moderate Malnourished, and 33.3% of Higher Malnourished children showed improvement. While the percentage is lower compared to the "SAM to MAM" category, it indicates a positive trend in moving children from a moderately malnourished state to a normal physical growth status.

Distribution of Cleanliness awareness provided to children at AWC

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	93 (62.4)	84 (66.7)	64 (64.6)	241 (64.4)
NO	56 (37.6)	42 (33.3)	35 (35.4)	133 (35.6)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table presents data on the distribution of cleanliness awareness provided to children at Anganwadi Centres (AWC), categorized by malnutrition levels. The awareness status is divided into "YES" and "NO." The majority of children across all malnutrition levels have received cleanliness awareness at AWC, as indicated by the "YES" category. Specifically, 62.4% of Low Malnourished, 66.7% of Moderate Malnourished, and 64.6% of Higher Malnourished children have benefited from such awareness initiatives. This suggests a relatively high level of engagement and efforts in promoting cleanliness education within AWC settings. The "NO" category, denoting the absence of cleanliness awareness, is notable but less prevalent. Approximately 37.6% of Low Malnourished, 33.3% of Moderate Malnourished, and 35.4% of Higher Malnourished children did not receive cleanliness education. While the percentages are significant, they indicate that a substantial proportion of children in each malnutrition category still lack exposure to cleanliness awareness initiatives at AWC.

Distribution of Respondents accepting Pre-School education provided at AWC

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	115 (77.2)	116 (92.1)	91 (91.9)	322 (86.1)
NO	34 (22.8)	10 (7.9)	8 (8.1)	52 (13.9)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table presents data on the distribution of respondents accepting pre-school education provided at Anganwadi Centres (AWC), categorized by malnutrition levels. The acceptance status is divided into "YES" and "NO." The data reveals a high level of acceptance and utilization of pre-school education among respondents across all malnutrition levels. In the "YES" category, 77.2% of Low Malnourished, 92.1% of Moderate Malnourished, and 91.9% of Higher Malnourished respondents indicated their acceptance of pre-school education at AWC. This suggests a positive reception and recognition of the value of early childhood education among the surveyed population, regardless of malnutrition status. The "NO" category, representing the rejection of pre-school education, is notably lower. Approximately 22.8% of Low Malnourished, 7.9% of Moderate Malnourished, and 8.1% of Higher Malnourished respondents expressed a lack of acceptance. While these percentages are relatively small, they indicate some resistance or barriers to accessing pre-school education, particularly among the Low Malnourished respondents.

Distribution of differences between of child going and non-going to AWC

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	146 (98.0)	108 (85.7)	90 (90.9)	344 (92.0)
NO	3 (2.0)	18 (14.3)	9 (9.1)	30 (8.0)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table presents data on the distribution of differences between children attending and not attending Anganwadi Centres (AWC), categorized by malnutrition levels. The differences are divided into "YES" and "NO." The overwhelming majority of children, across all malnutrition levels, are attending AWC. In the "YES" category, 98.0% of Low Malnourished, 85.7% of Moderate Malnourished, and 90.9% of Higher Malnourished children are actively participating in AWC programs. This indicates a strong engagement and acceptance of AWC services among the surveyed population, reflecting the significant role these centres play in child development and nutrition. "NO" category, representing children not attending AWC, is comparatively smaller. Only 2.0% of Low Malnourished, 14.3% of Moderate malnourished, and 9.1% of Higher Malnourished children are not enrolled in AWC. While these percentages are relatively low, they highlight the existence of a minority who may not be accessing the benefits of AWC services, potentially missing out on essential early childhood education and nutritional support.

Distribution of Respondents satisfaction on education provided at AWC

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	112 (75.2)	84 (66.7)	80 (80.8)	276 (73.8)
NO	37 (24.8)	42 (33.3)	19 (19.2)	98 (26.2)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table illustrates the distribution of respondents' satisfaction with the education provided at Anganwadi Centres (AWC), categorized by malnutrition levels. The satisfaction levels are denoted as "YES" and "NO." The data reveals varying degrees of satisfaction among respondents across different malnutrition levels. In the "YES" category, 75.2% of Low Malnourished, 66.7% of Moderate Malnourished, and 80.8% of Higher Malnourished respondents expressed satisfaction with the education provided at AWC. This indicates a generally positive reception of the educational services offered, with a notable higher satisfaction rate among the Higher Malnourished group. In the "NO" category, representing dissatisfaction, 24.8% of Low Malnourished, 33.3% of Moderate Malnourished, and 19.2% of Higher Malnourished respondents expressed discontent. While these percentages are relatively small, they suggest areas where improvements may be needed to enhance satisfaction levels, particularly among the Moderate Malnourished group.

Distribution of opinions on AWC benefit poor community

Particulars	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	120 (80.5)	106 (84.1)	84 (84.8)	310 (82.9)
NO	29 (19.5)	20 (15.9)	15 (15.2)	64 (17.1)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table showcases the distribution of opinions on whether Anganwadi Centres (AWC) benefit impoverished communities, with a breakdown based on malnutrition levels. The results reveal a prevalent consensus among respondents affirming the positive impact of AWC on the well-being of poor communities. Across all malnutrition categories, a substantial majority expressed a positive opinion ("YES"). Specifically, 80.5% of respondents in the Low Malnourished group, 84.1% in the Moderate Malnourished group, and 84.8% in the Higher Malnourished group believe that AWC is beneficial for impoverished communities. This widespread agreement underscores the perceived effectiveness of AWC programs in addressing the needs of economically disadvantaged segments, potentially improving health, nutrition, and overall community development. In the dissenting category ("NO"), the percentages are comparatively lower, indicating a minority view. About 19.5% of respondents in the Low Malnourished group, 15.9% in the Moderate Malnourished group, and 15.2% in the Higher Malnourished group expressed the opinion that AWC does not benefit poor communities.

Distribution of Disparity observed in AWC by respondents

Disparity	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
YES	124 (83.2)	109 (86.5)	91 (91.9)	324 (86.6)
NO	25 (16.8)	17 (13.5)	8 (8.1)	50 (13.4)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table presents data on the distribution of responses regarding the observation of disparities in Anganwadi Centres (AWC) by respondents, categorized by malnutrition levels. The responses are divided into "YES" and "NO." The data reveals that a majority of respondents, regardless of malnutrition levels, perceive disparities in AWC. In the "YES" category, 83.2% of Low Malnourished, 86.5% of Moderate Malnourished, and 91.9% of Higher Malnourished respondents acknowledge the existence of disparities in AWC. This indicates a widespread recognition among respondents of unequal conditions or treatment within these centres. In the "NO" category, representing a dissenting opinion, the percentages are comparatively lower. Approximately 16.8% of Low Malnourished, 13.5% of Moderate Malnourished, and 8.1% of Higher Malnourished respondents do not perceive disparities in AWC.

Distribution of opinion of the respondents on overall functioning of AWC

Overall functioning	Low Malnourished	Moderate Malnourished	Higher Malnourished	Total
VERY GOOD	12 (8.1)	13 (10.3)	16 (16.2)	41 (11.0)
GOOD	137 (91.9)	113 (89.7)	83 (83.8)	333 (89.0)
Total	149 (100)	126 (100)	99 (100)	374 (100)

Note: () Percentage

Source: Field Survey 2023

The table presents data on the distribution of respondents' opinions on the overall functioning of Anganwadi Centres (AWC), categorized by malnutrition levels. The opinions are divided into two categories: "VERY GOOD" and "GOOD." The data reflects a positive sentiment among respondents regarding the overall functioning of AWC. In the "VERY GOOD" category, 8.1% of Low Malnourished, 10.3% of Moderate Malnourished, and 16.2% of Higher Malnourished respondents expressed a very positive opinion. The percentages, though relatively small, indicate that there is a subset of respondents who hold an exceptionally favourable view of the AWC's overall functioning. In the "GOOD" category, the majority of respondents across all malnutrition levels provided positive feedback. Specifically, 91.9% of Low Malnourished, 89.7% of Moderate Malnourished, and 83.8% of Higher Malnourished respondents rated the overall functioning of AWC as good. This suggests a high level of general satisfaction with the services and activities provided by AWC, emphasizing the positive impact perceived by the surveyed population.

4 Major Findings, Suggestions for policy implications

4.1 Findings

The present study has found following findings which are classified as positive findings and negative findings. Positive findings reveal the good functioning of ICDS poses improved impact on reducing malnutrition among children and Negative findings poses poor performance of ICDS in reducing malnutrition among children. Following are the findings of the study.

4.1.1 Positive findings

Achieving universal Anganwadi awareness with 100% awareness across malnutrition categories indicates the success of impactful campaigns. The majority residing within 201-600 meters from Anganwadi centers is positive, correlating with improved child nutrition. High attendance at Anganwadi centers correlates with lower malnutrition levels, showcasing positive outcomes and intervention potential. The low malnourishment prevalence among Scheduled Caste (SC) respondents suggests effective measures in addressing nutritional needs within this demographic. Diverse educational levels and balanced malnutrition distribution among vegetarians and non-vegetarians highlight the importance of targeted interventions. The overall 74.6% support for children's supplementary food reflects community recognition of its significance, contributing to positive child development outcomes.

4.1.2 Negative findings

A minority not attending Anganwadi Centres signifies potential disparities in access to crucial benefits, necessitating focused outreach and awareness efforts. While overall Anganwadi education satisfaction is high, dissatisfaction within the Moderate Malnourished group suggests targeted improvements are needed. Resistance to pre-school education, notably among Low Malnourished respondents, highlights barriers requiring attention for broader acceptance. Consensus on disparities in Anganwadi Centres, ranging from 83.2% to 91.9%, underscores the pervasive nature of the issue, urging comprehensive interventions for equitable services. Higher malnourishment levels among Scheduled Tribe (ST) individuals indicate challenges in meeting nutritional needs, demanding targeted solutions. Additionally, vulnerabilities observed in AAY cardholders and specific socio-economic groups emphasize the importance of tailored interventions for improved outcomes.

4.2 Suggestions for policy implications

To enhance Anganwadi services, efforts should focus on achieving truly universal awareness through extended outreach and community engagement initiatives. Ensuring strategic placement of centres beyond the 600-meter range can improve accessibility. Tailored educational programs for vegetarians and diverse educational levels, coupled with a robust feedback mechanism, can address specific nutritional concerns and identify areas for improvement. Introducing nutritional counseling and diversifying supplementary food options will cater to varied preferences. Targeted interventions for SC communities and collaborative initiatives with local stakeholders will further enhance the impact of Anganwadi services, fostering comprehensive support for child development and nutritional well-being.

To enhance Anganwadi services, focus on targeted outreach for the minority not attending, ensuring equitable access. Address dissatisfaction within the Moderate Malnourished group by tailoring educational improvements. Advocate for pre-school education, targeting concerns among Low Malnourished respondents for broader acceptance. Implement comprehensive interventions to rectify acknowledged disparities in Anganwadi Centers, ensuring equal access and quality services. Develop targeted solutions for challenges faced by Scheduled Tribe individuals, considering unique needs. Tailor support programs for AAY cardholders to improve outcomes. Implement initiatives focused on specific socio-economic groups, addressing vulnerabilities for comprehensive well-being.

Reference

- Ackerson, L. K., & Subramanian, S. (2008). Domestic violence and chronic malnutrition among women and children in India. *American journal of epidemiology*, 167(10), 1188-1196.
- Alderman, H., Hoddinott, J., & Kinsey, B. (2006). Long term consequences of early childhood malnutrition. *Oxford economic papers*, 58(3), 450-474.
- Anstalt, S. V. (2013). Food and agriculture organization of the United Nations.
- Bagilkar, V. V., & Savadatti, B. B. (2015). A descriptive study on Malnutrition. *Asian Journal of Nursing Education and Research*, 5(1), 72-77.
- Bain, L. E., Awah, P. K., Geraldine, N., Kindong, N. P., Siga, Y., Bernard, N., & Tanjeko, A. T. (2013). Malnutrition in Sub-Saharan Africa: burden, causes and prospects. *Pan African Medical Journal*, 15(1).
- Baliga, S. S., & Walvekar, P. R. (2017). A study on knowledge of anganwadi workers about integrated child development services at three urban health centers. *Int J Community Med Public Health*, 4(9), 3283-7.
- Bamji, M. S., & Thimayamma, B. V. S. (2000). Impact of women's work on maternal and child nutrition. *Ecology of food and nutrition*, 39(1), 13-31.
- Basu, A. M., & Basu, K. (1991). Women's economic roles and child survival: the case of India. *Health Transition Review*, 83-103.
- Behera, T. R., Satapathy, D. M., Sahani, N. C., & Sahu, T. (2009). Nutritional deficiency status among tribal children in a hard to reach area of Malkangiri district in Orissa. *Indian journal of nutrition and dietetics*, 46(3), 106-111.
- Bhutia, D. T. (2014). Protein energy malnutrition in India: the plight of our under five children. *Journal of family medicine and primary care*, 3(1), 63.

- Biswas, S., Bose, K., Mukhopadhyay, A., & Bhadra, M. (2009). Prevalence of undernutrition among pre-school children of Chapra, Nadia District, West Bengal, India, measured by composite index of anthropometric failure (CIAF). *Anthropologischer Anzeiger*, 269-279.
- Burroway, R. (2017). Are all jobs created equal? A cross-national analysis of women's employment and child malnutrition in developing countries. *Social science research*, 67, 1-13.
- Chand, R., & Jumrani, J. (2013). Food security and undernourishment in India: Assessment of alternative norms and the income effect. *Indian journal of agricultural economics*, 68(902-2016-66815), 39-53.
- Chand, R., & Jumrani, J. (2013). Food security and undernourishment in India: Assessment of alternative norms and the income effect. *Indian journal of agricultural economics*, 68(902-2016-66815), 39-53.
- Das Gupta, M., Lokshin, M., Gragnolati, M., & Ivaschenko, O. (2005). Improving child nutrition outcomes in india: can the integrated child development services program be more effective?. *World Bank Policy Research Working Paper*, (3647).
- De, P., & Chattopadhyay, N. (2019). Effects of malnutrition on child development: Evidence from a backward district of India. *Clinical Epidemiology and Global Health*, 7(3), 439-445.
- Dixit, P., Gupta, A., Dwivedi, L. K., & Coomar, D. (2018). Impact evaluation of integrated child development services in rural India: Propensity score matching analysis. *Sage Open*, 8(2), 2158244018785713.
- Donkor, C. M., Lee, J., Lelijveld, N., Adams, M., Baltussen, M. M., Nyante, G. G., ... & Zuurmond, M. (2019). Improving nutritional status of children with Cerebral palsy: a qualitative study of caregiver experiences and community-based training in Ghana. *Food science & nutrition*, 7(1), 35-43.
- Dwivedi, S., & Sharma, P. K. (2014). Economic scenario of poverty, hunger and malnutrition in India. *Agro-Economist*, 1(1), 17-23.
- Feng, J., Alam, S., & Eozenou, P. H. V. (2018). Malnutrition gap as a new measure of child malnutrition: A global application. *World Bank Policy Research Working Paper*, (8664).
- Garg, S. K., Singh, J. V., Bhatnagar, M., & Chopra, H. (1997). Nutritional status of children (1-6 years) in slums of Ghaziabad city. *Indian Journal of Community Medicine*, 22(2), 70-73.
- Gillespie, S., Harris, J., & Kadiyala, S. (2019). The agriculture-nutrition disconnect in India: What do we know?. *Gates Open Res*, 3(1115), 1115.
- Gulati, A., Kumar, A. G., Shreedhar, G., & Nandakumar, T. (2012). Agriculture and malnutrition in India. *Food and nutrition bulletin*, 33(1), 74-86.
- Jena, P. (2013). *Knowledge of Anganwadi Worker about Integrated Child Development Services (ICDS): A Study of Urban Blocks in Sundargarh District of Odisha* (Doctoral dissertation).
- Kadiyala, S., Harris, J., Headey, D., Yosef, S., & Gillespie, S. (2014). Agriculture and nutrition in India: mapping evidence to pathways. *Annals of the New York Academy of Sciences*, 1331(1), 43-56.
- Kaliamoorth, N. (2013). Poverty and malnutrition. *Language in India*, 13(4), 67-78.
- Kapil, U., Tandon, M., Nayar, D., Ramachandron, S., Yadav, R., & Dwivedi, S. N. (1999). Nutritional rehabilitation of severely malnourished children at domiciliary level through the integrated child development services (ICDS) scheme: A perspective study. *Journal of Tropical Pediatrics*, 45(2), 124-125.
- Kulkarni, V. S., Kulkarni, V., & Gaiha, R. (2014). Double burden of malnutrition: Why are Indian women likely to be underweight and obese?. *Brooks World Poverty Institute Working Paper*, (190).
- Mahapatra, B., Walia, M., Rao, C. A. R., Raju, B. M. K., & Saggurti, N. (2021). Vulnerability of agriculture to climate change increases the risk of child malnutrition: Evidence from a large-scale observational study in India. *PLoS one*, 16(6), e0253637.

- Meenakshi, J. V. (2016). Trends and patterns in the triple burden of malnutrition in India. *Agricultural Economics*, 47(S1), 115-134.
- Mishra, B. K., & Mishra, S. (2007). Nutritional anthropometry and preschool child feeding practices in working mothers of central Orissa. *Studies on Home and Community Science*, 1(2), 139-144.
- Nguyen, P. H., Scott, S., Headey, D., Singh, N., Tran, L. M., Menon, P., & Ruel, M. T. (2021). The double burden of malnutrition in India: Trends and inequalities (2006–2016). *Plos one*, 16(2), e0247856.
- Panda, B. K., Mohanty, S. K., Nayak, I., Shastri, V. D., & Subramanian, S. V. (2020). Malnutrition and poverty in India: does the use of public distribution system matter?. *BMC nutrition*, 6(1), 1-14.
- Patni, M., Kavishvar, A., & Momin, M. (2013). A study on quantitative effect of supplementary nutrition provided in Anganwadis in predicting physical growth of pre-schoolers. *Int J Med Sci Public Heal*, 2, 1-6.
- Pillai, V. K., & Ortiz-Rodriguez, J. (2015). Child malnutrition and gender preference in India: The role of culture.
- Radhakrishna, R., & Ravi, C. (2004). Malnutrition in India: Trends and determinants. *Economic and Political Weekly*, 671-676.
- Rajan, P., Gangbar, J., & Gayithri, K. (2015). *Integrated child development services in Karnataka*. Institute for Social and Economic Change.
- Ramaswamy, S., & Surulivel, L. (2019). *Food security in India*. MJP Publisher.
- Rodriguez-Llanes, J. M., Ranjan-Dash, S., Degomme, O., Mukhopadhyay, A., & Guha-Sapir, D. (2011). Child malnutrition and recurrent flooding in rural eastern India: a community-based survey. *BMJ open*, 1(2), e000109.
- Sahu, S. K., Kumar, S. G., Bhat, B. V., Premarajan, K. C., Sarkar, S., Roy, G., & Joseph, N. (2015). Malnutrition among under-five children in India and strategies for control. *Journal of natural science, biology, and medicine*, 6(1), 18.
- Singh, S., Srivastava, S., & Upadhyay, A. K. (2019). Socio-economic inequality in malnutrition among children in India: an analysis of 640 districts from National Family Health Survey (2015–16). *International journal for equity in health*, 18(1), 1-9.
- Varadharajan, K. S., Thomas, T., & Kurpad, A. V. (2013). Poverty and the state of nutrition in India. *Asia Pacific journal of clinical nutrition*, 22(3), 326-339.
- World Health Organization. (2013). *Action plan for the prevention and control of noncommunicable diseases in south-east Asia, 2013–2020* (No. sea-ncd-89). World Health Organization. Regional Office for South-East Asia.
- Yousafzai, A. K. (2001). *The nutritional status of disabled children living in Dharavi, an Indian urban slum in Mumbai*. University of London, University College London (United Kingdom).
- Yousafzai, A. K., Filteau, S., & Wirz, S. (2003). Feeding difficulties in disabled children leads to malnutrition: experience in an Indian slum. *British Journal of Nutrition*, 90(6), 1097-1106.