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ARTHA VIJÑĀNA

JOURNAL OF THE GOKHALE INSTITUTE OF POLITICS & ECONOMICS

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Tanusree Paul

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Artha Vijnana was started in March 1959. It is a quarterly journal of the Gokhale Institute of Politics and Economics and is a peer reviewed journal. It has been publishing papers on economics, demography and subjects allied to economics.

From September 2022, the Journal announced an expansion in its focus. The journal would hence forth have a broader and an inter-disciplinary approach. Articles in the areas of economic sociology, political economy are also welcome. *Artha Vijnana* is committed to publishing high quality research, aimed at the broad audience of academicians, practitioners and policy makers, across South Asia and beyond.

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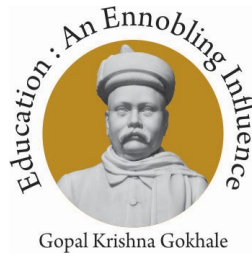
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I, **Ajit Ranade**, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Ajit Ranade
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Announcement

Artha Vijnana announces the institution of the Gopal Krishna Gokhale Memorial Annual Prize, awarded in recognition of the paper of most outstanding merit appearing in *Artha Vijnana*, irrespective of the author's age. This prize carries an award of ₹10,000, to be shared equally between all authors. In addition, *Artha Vijnana* announces the institution of the Prof. D R Gadgil Memorial Annual Prize, awarded in recognition of the paper of most outstanding merit appearing in *Artha Vijnana*, by a single author of below 40 years of age. This prize carries an award of ₹10,000.

Announcement of prizes for the best articles published in *Artha Vijnana* in the year 2023

We are happy to announce the following:

- 1) The Gopal Krishna Gokhale Memorial Annual Prize for the most outstanding article published in it by one or more authors (irrespective of age) be awarded to Apurva Apurva for the article entitled “*Discovering Boundaries, Building Dialogues: Historical Sociology, Economics, and the Evolution of the Dominant Caste in Western India*” (Vol. LXV, No. 2, June 2023, pp. 133-152) and,
- 2) The D.R. Gadgil Memorial Annual Prize for the most outstanding article published in it by a single author below the age of 40 years be awarded to Antara Dhar for the article entitled “*Financial Conditions of Elderly People in Different Regions of India*” (Vol. LXV, No. 4, December 2023, pp. 409-423).

Our heartiest congratulations to the prize winners.

Ajit Ranade
Editor

Artha Vijñāna

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Towards a *Kuposhan Mukh Bharat*: An Exploration of Nutrition Sensitive Budgeting in India

Tanusree Paul

Nutrition is rapidly emerging as a quintessential development goal. Amidst much global advocacy, interest in nutrition in Indian policy-scape has also resurfaced. With the resolve to transform India into Kuposhan Mukh Bharat (malnutrition free India), a number of missions, programmes and schemes have been launched in the country with definite time-bound targets. This paper delves into analysing Union Budget allocated to nutrition sensitive sectors during 2014-2015 to 2020-2021. It observes a declining trend in most of the nutrition-sensitive interventions. It concludes that more concerted efforts are needed in terms of increasing budgetary allocations for nutrition-sensitive interventions, particularly sanitation, women's empowerment, education, health and information-education-communication.

Key Words: Nutrition-sensitive, Nutrition, Budget, Malnutrition, Kuposhan, India

I Introduction

Nutrition is an indispensable component of development and has begun to gain increasing attention in policy discourses within and across nations. The United Nations' declaration of 2016-2025 as the UN Decade of Action on Nutrition has further fueled this momentum. According to the Global Nutrition Report 2018, among all the regions of the world, South Asia bears the highest burden of stunting with about 38.9 per cent of the world's stunted under-5 children living here. India's positioning vis-à-vis other countries in South Asia and even Africa is particularly deplorable. At the disaggregated level, two of the South Asian countries, India (46.6 million) and Pakistan (10.7 million) along with Nigeria (13.9 million) are home to almost half (47.2 per cent) of all stunted children in the world. On the other hand, India (25.5 million) is also one of the countries along with Nigeria (3.4 million) and Indonesia (3.3 million) which contribute to the highest share of wasted children under five years of age. Further, although overweight and obesity are typical problems of the upper-middle income countries, India and Pakistan are among the South Asian countries that are home to more than a million overweight

children, the other countries being China, Indonesia, Egypt and Brazil. This indicates a dual burden of malnutrition in our country.

Although nutrition received some attention of the policy-makers in India since as early as 1960s and 1970s, specific interest on nutrition resurfaced in the Indian policy-scape around the early 2010s, with the then Finance Minister Sri Arun Jaitley announcing in his Budget Speech on July 10, 2014, that “[a] national programme in Mission Mode is urgently required to halt the deteriorating malnutrition situation in India, as present interventions are not adequate. A comprehensive strategy including detailed methodology, costing, timelines and monitorable targets will be put in place within six months” (Budget Speech 2014). Realising nutrition as a quintessential development goal, the Indian Government launched a plethora of missions, schemes and programmes to address malnutrition, which also reflect ardent intent on the part of the State. However, the extent to which India is committed to implement these interventions and address malnutrition is a question that is crucial and will be engaged with in this paper. As per the Hunger and Nutrition Commitment Index (HANCI) 2019, India ranked 25 out of 45 countries (2013 rank was 19 out of 45).

That said, this paper would focus on nutrition-sensitive interventions. The specific questions that would be addressed in this paper are: first, which are the nutrition-sensitive interventions that have significant bearing upon indicators of child malnutrition in India; and second, how are these interventions prioritised in policy? The answer to the latter question would be sought for by closely looking at the budgetary outlays for the nutrition sensitive interventions. This paper is organised into five sections. This introductory section is followed by a section on survey of literature. The third section presents the data and methods used in this paper. The fourth section presents the data analysis which include two sub-sections- a) how nutrition-sensitive interventions correlate to indicators of child malnutrition such as stunting (height-for-age- Z-score is below minus two standard deviations from the median of the reference population), wasting (Weight-for-height Z-score is below minus two standard deviations from the median of the reference population) and underweight (weight-for-age Z-score is below minus two standard deviations from the median of the reference population); (b) how the budgetary outlays in selected sectors that have implications for nutrition in an indirect manner have changed over the years. The fifth section puts forth the concluding remarks.

II Survey of Literature

A unique aspect of India’s nutrition governance is its excessive focus on two programmes: Mid-Day Meals and the Integrated Child Development Scheme (ICDS). While the former was introduced in 1962-1963 for the 6-11 years old children, the latter was introduced in 1975 for both 0-6 years aged children as well as pregnant and lactating mothers. In fact, the ICDS came to be considered as India’s answer to all malnutrition concerns since the Sixth Plan (1980-1985). Later

on, India had its first National Nutrition Policy (NNP) in 1993 followed up by the National Plan of Action on Nutrition 1995. Since 1993, India did not have a second NNP for more than two decades; although a retinue of other policies and programmes were launched, that had implications for nutrition. India constituted its first National Nutrition Mission (NNM) in 2003, under the chairpersonship of the Prime Minister. Although some States subsequently constituted their respective State Missions¹, the National Mission at the Centre did not function and was later repealed in 2008. However, there was a felt need for a focused National Nutrition Strategy (NNS), particularly because notwithstanding a remarkable rise economic growth rate and reduction in poverty, malnutrition continued to persist unrelentingly. Haddad (2011) appraises that strong governance mechanisms were required underscoring inter-sectoral coordination, prioritising investment in education and a strong leadership. Reddy (2011) also emphasised the need for multi-sectoral coordination and effective implementation of convergence in planning and implementation. Amidst these expectations, in July 2014, the then Finance Minister Sri Arun Jaitley announced in his Budget Speech the need for a focused national programme in mission mode, to address malnutrition in the country. Three years later, in 2017-2018, the National Nutrition Mission (NNM) was overhauled with a three-year budget of ₹9046.17 crore started from 2017-2018 (pib.gov.in). The latest NNM targets comprehensive measures to address malnutrition. It will comprise mapping of various Schemes contributing towards addressing malnutrition, including a very robust convergence mechanism, Information Communication Technology (ICT) based Real Time Monitoring system, incentivizing States/UTs for meeting the targets, incentivizing Anganwadi Workers (AWWs) for using IT based tools, eliminating registers used by AWWs, introducing measurement of height of children at the Anganwadi Centres (AWCs), Social Audits, setting-up Nutrition Resource Centres, involving masses through *Jan Andolan* for their participation on nutrition through various activities, among others (NITI AAYOG 2017).

Another major challenge in this context is micro-nutrient deficiency. Although required in small quantities, micronutrient deficiencies, “also referred to as ‘Hidden Hunger’, affects the health, learning ability as well as productivity owing to high rates of illness and disability contributing to vicious cycle of malnutrition, underdevelopment and poverty” (Gonmei and Toteja 2018: 511). “A multipronged approach is needed to address deficiencies of key vitamins and minerals, such as vitamin A, iron, iodine and zinc, that continue to coexist and interact with protein and energy deficits” (NITI Aayog, 2020). Gonmei and Toteja in their review have highlighted that deficiencies related to iron, vitamin A, iodine and zinc are critical public health concerns, especially among children and adolescents (Gonmei and Toteja 2012). Besides, folate, vitamin B12 and vitamin D are also significant in the context of maternal and child health. Anaemia is a major public health challenge in the country. Iodine deficiency disease (IDD) is another major hurdle although introduction of iodised salt has resulted in reducing the magnitude of the problem. Vitamin A deficiency causing blindness and

Vitamin D deficiency causing rickets are other important clinical challenges. India has launched an entourage of programmes to address these micro-nutrient deficiency related challenges. In this context, mention must be made of National Nutritional Anaemia Control Programme (NACP); Food fortification which includes fortification with iron, iodine, folic acid, Vitamins A and D etc.; Dietary Diversification and increasing household access to micro-nutrient rich food; Enhanced Production to Consumption of Millets and Pulses; Monitoring, Surveillance and Management Information System for Early Detection; Nutrition Health and Education and so forth.

Notwithstanding the fact that India did have a retinue of interventions to address its malnutrition problem since the early 1960s, it continues to be one of the largest contributors to malnutrition in the world, ranking 107 out of 121 countries as per the 2022 Global Hunger Index. As recognised by Ruel, *et. al.* (2013: 536), “acceleration of progress in nutrition will require effective, large-scale nutrition-sensitive programmes that address key underlying determinants of nutrition and enhance the coverage and effectiveness of nutrition-specific interventions.” Nutrition-sensitive programmes basically target the underlying determinants of nutrition such as poverty, food insecurity, access to resources etc. and are multi-sectoral in nature cutting across sectors like agriculture, education, health, water and sanitation, social protection and so forth (Ruel, *et. al.* 2013). That said, the focus of this paper is on nutrition sensitive indicators which have been variously mapped by several national and international agencies. It may be appropriate to mention here that, in the Indian context, although there is a generally accepted list of nutrition-specific interventions², the same is not available for nutrition-sensitive interventions (Shrivastava and Singh 2017). Nevertheless, a plausible list of indirect interventions has been charted out based on an extensive review of literature. The conceptual frameworks on undernutrition by Ruel and Alderman (2013), UNICEF (2013) and Centre for Budget and Governance Accountability (CBGA) (2016) have also informed the selected interventions. By and large, four broad factors consistently emerge as crucial determinants of nutrition:

Firstly, the ***underlying causes*** which determine the potential resources having implications for nutrition. These underlying causes can further be divided into two sub-parts:

a) ***Access to adequate quantity and quality of resources:*** Adequate access to resources, not only of the household but also of the women, is one of the important indirect determinants of nutrition. In terms of household’s access to resources, a key indicator is its economic status, measured through income, expenditure or assets. For the present study, following variables have been taken from the NFHS:

i. Percentage of Households in Lowest Wealth Quintile

It is worth noting that although increased income has lead to increased expenditure on food and nutrition-rich diets (Arimond and Ruel 2006),

expenditure on non-food expenditures such as health, sanitation, electricity, water, housing, etc., that have implications for nutrition (Headey 2013); yet others have argued that income does not have a unidirectional linear positive effect on nutrition.

Another major factor that influences women's access to resources is women's education. Behrman and Wolfe (1984) observe that secondary and tertiary level education yields better outcomes so far as children's nutrition is concerned. The variable selected in this category is:

ii. *Percentage of Women Aged 15-49 Years with 10 or More Years of Completed Schooling*

A third factor strongly influencing women's access to resources is women's employment, although there seems to be some lack of consensus among scholars regarding women's work in agriculture and its impact on nutrition (See Kadiyala, *et. al.* 2014, Johnston, *et. al.* 2018).³ Besides, not only employment but working for cash earning is an important factor that influences nutrition outcomes. The variable selected here is:

iii. *Percentage of 15-49 Currently Married Women Who Were Employed and Earning Cash*

iv. *Percentage of Women Age 15-49 Who Have Access to Money that They Can Decide How to Use*

Women's access to and control over technology is another important indirect determinant of nutrition. In fact, a number of studies note that access to mobile phones expand livelihood opportunities, social contacts, as well as enhances access to health-related information and healthcare (Chib, *et. al.* 2012, Laura 2010, Tenhunen 2008). That said, the variable selected in this context is:

v. *Percentage of 15-49 Women Having a Mobile Phone that They Themselves Use*

b) ***Socio-cultural environment:*** This dimension helps understand the context in terms of its social and cultural aspects. Women's status is an important signifier of the cultural disposition of any society/community. In fact, literature abounds in studies that try to connect women's empowerment with positive nutrition outcomes. Women's status in general has been cited as an important factor by Bhagowalia, *et. al.* (2012), particularly those pertaining to mobility, decision-making power, and attitudes toward verbal and physical abuse. Malapit, *et. al.* (2013) note that women's empowerment influences quality of infant and young child feeding practices. Empowerment here has been conceptualised not as mere outcome of education and income but as a function of ability to take decisions and

not having to experience violence. Further demographic variables such as age at marriage, child bearing, birth order, etc., also signify women's position in the society. Lower the age at marriage, lower the age at first child bearing, higher the birth order, higher is the prevalence of health risks and lower is their over-all well-being. In order to map the socio-cultural dimension as the underlying cause to malnutrition, the following variables have been used:

- a. *Women aged 20-24 years married before age 18 years.*
- b. *Percentage of women aged 15-19 who have begun child bearing (have had a live birth or are pregnant with first child)*
- c. *Percentage of ever-married women age 15-49 who have ever experienced emotional, physical, or sexual violence committed by their husband*
- d. *Percentage of women aged 15-49 who have freedom of mobility (allowed to go to the market, health facility, and places outside the village/community)*
- e. *Percentage of women who usually make decisions alone or jointly with their husband about own health care*
- f. *Percentage of women aged 15-49 who own land*

Secondly, **immediate causes** which include

a) **Health scenario-** There are several dimensions to health. Since mother's health and nutrition are of paramount significance for child's nutrition, access to prenatal, pre-natal and post-natal care have been observed to be significant in several studies (Headey 2013). Hence, for the purpose of this paper, following variables have been selected:

- a. *Percentage of mothers who received financial assistance under JSY for births delivered in an institution.*
- b. *Percentage of 15-49 who had four or more ANC visits.*
- c. *Institutional deliveries.*
- d. *Percentage of women age 15-49 who had any contact with a health worker such auxiliary nurse midwife (ANM), lady health visitor (LHV), AWW, Accredited Social Health Activist (ASHA), multipurpose worker (MPW), or other community health worker.*
- e. *Percentage of children who received postnatal care from a skilled provider in the first two days of birth.*
- f. *Percentage of children age 12-23 months who received all basic vaccines (BCG, measles, and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth)).*

b) **Water Sanitation Hygiene (WASH):** Access to safe drinking-water, sanitation and hygiene (WASH) services is an essential element for healthy living. Several studies have highlighted positive impact of WASH on nutrition, particularly prevention of stunting (Alzua, *et. al.* 2015, Fink, Gunther and Hill, 2011, Spears, Ghosh and Cumming 2013). A WHO report (2015) in collaboration

with UNICEF and USAID articulates the need for integrating WASH concerns with nutrition interventions including important monitoring and evaluation (M&E) aspects. Given the importance of WASH in the context of nutrition, following variables have been selected:

- a. *Percentage of households with improved source of drinking water*
- b. *Percentage of households with toilet facilities*
- c. *Percentage of mothers with children whose stools were disposed off safely*
- d. *Percentage of women 15-24 who use hygienic methods of protection during menstruation*

Thirdly, Information Education Communication (IEC): IEC is not really a cause which can effect nutrition indirectly, however it has the potential to catalyse behavioural change in favour of nutrition. Many of the basic causes allude to socio-cultural dimensions, ranging from constraints on women's access to resources to experience of violence to restraints on women's decision-making on matters pertaining to their own lives. It is not possible to address these socio-cultural bottlenecks that each of these variables pose for women without engaging with the attitude, perception and behaviour of the community.

- a. *Percentage of fathers who said that at some time during the pregnancy, a health provider or worker spoke to them about family planning or delaying the next child*
- b. *Percentage of fathers (whose youngest living child age 0-35 months was not delivered in a health facility) who said that during the pregnancy, someone explained to them the importance of breastfeeding the baby immediately after birth*
- c. *Percentage of children under 6 years of age whose mothers received counselling from an AWC after the child was weighed*
- d. *Among the children under six years of age, percentage whose mothers received health and nutrition education from AWCs during pregnancy*
- e. *Among the children under six years of age, percentage whose mothers received health and nutrition education from AWCs while breastfeeding*

The preceding discussion identifies the nutrition-sensitive indicators based on an extensive survey of literature. In the following section, these indicators would be correlated with the different indicators of malnutrition- stunting, wasting and underweight in order to understand which underlying factors have stronger association with malnutrition and thus require focussed policy interventions. Thereafter, this paper looks into the budgetary allocations in these priority sectors. Indeed, sustainable funding is one of the most important components behind assessing India's commitment to nutrition governance (Kaia Engesveen, *et. al.* 2009, WHO, 2007, 2012; IDS 2012; Pelletier, *et. al.* 2012).

III Data and Methods

This paper primarily draws from two data sources: National Family Health Survey (NFHS) 2015-2016 and data from Union Budget official website. A major problem encountered while analysing the sectoral domains is that of temporal comparison due to periodic changes in the categorisation of the budget line items by the Ministries. Nonetheless, every effort has been made to keep the items comparable across time, in the following thematic sectors: Agriculture and allied activities, Health, Education, Water Sanitation and Hygiene (WASH), Livelihood and Employment, Women and Child Development. The budget data have been supplemented by information from other published reports as well as the Parliamentary questions, both starred and un-starred, budget speeches, etc.

IV Data Analysis

Nutrition-Sensitive Interventions: Setting Priorities

It needs to be clarified here that the indicators have been selected, subject to availability from the National Family Health Survey 2015-2016. Each of these variables has been correlated with the three indicators of child malnutrition: stunting, wasting, underweight. The correlation coefficients are presented in Table 1.

Table 1: Correlation Coefficient

Indicators	Stunted	Wasted	Under-weight
<i>Potential resources: Access and Control over resources</i>			
Percentage of households in lowest wealth <i>quintile</i>	0.749 **	0.381 **	0.699 **
Percentage of women with 10 or more years of completed schooling	-0.67 **	-0.27	-0.53 **
Percentage of 15-49 currently married women who were employed and earning cash	-0.35 *	-0.07	-0.14
Percentage of women age 15-49 who have access to money that they can decide how to use	-0.20	0.12	-0.03
% of 15-49 years women having mobile phone that they themselves use	-0.69 **	-0.59 **	-0.82 **
<i>Potential resources: Underlying contexts</i>			
Women aged 20-24 years, married before age 18 years	0.38 **	0.25	0.38 **
Percentage of women aged 15-19 who have begun child bearing (have had a live birth or are pregnant with first child)	0.32	0.22	0.35 *
Percentage of births of order 3 or more	0.614 **	-0.169	0.211
Percentage of ever-married women age 15-49 who have ever experienced emotional, physical, or sexual violence committed by their husband	0.37 *	0.24	0.41 *
Percentage of women aged 15-49 who have freedom of mobility (allowed to go to the market, health facility, and places outside the village/community)	-0.28	-0.20	-0.33 *

Contd...

Table 1: Correlation Coefficient

Indicators	Stunted	Wasted	Under-weight
Percentage of women who usually make decisions alone or jointly with her husband about own health care	-0.34 *	-0.46 **	-0.53 **
15-49 years women owning land	0.41	0.07	0.26
Immediate causes: Health care			
% of mothers who received financial assistance under JSY for births delivered in an institution	0.45 **	0.00	0.28
Percentage of 15-49 who had four or more ANC visits	-0.63 **	-0.07	-0.38 *
Institutional deliveries	-0.45 **	0.19	-0.08
Percentage of women aged 15-49 who had any contact with a health worker (auxiliary nurse midwife (ANM), lady health visitor (LHV), AWW, Accredited Social Health Activist (ASHA), multipurpose worker (MPW), or other community health worker)	-0.06	0.19	0.12
Percentage of children who received postnatal care from a skilled provider in the first two days of birth	-0.38 *	0.05	-0.04
Percentage of children aged 12-23 months who received all basic vaccines (BCG, measles, and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth)	-0.47 **	-0.10	-0.25
Immediate Cause: WASH			
Percentage of households with improved source of drinking water	-0.17	0.19	0.02
Percentage of households with toilet facility	-0.67 **	-0.64 **	-0.82 **
Percentage of mothers with children whose stools were disposed off safely	-0.65 **	-0.43 **	-0.66 **
% of women 15-24 who use hygienic methods of protection during menstruation	-0.66 **	-0.27	-0.58 **
Information Education Communication			
Percentage of fathers who said that at some time during the pregnancy, a health provider or worker spoke to them about family planning or delaying next child	-0.15	-0.39*	-0.04
Percentage of fathers (whose youngest living child age 0-35 months was not delivered in a health facility) who said that during the pregnancy, someone explained to them, the importance of breastfeeding the baby immediately after birth	-0.47 **	0.00	-0.22
Percentage of children under 6 years of age whose mothers received counselling from an AWC after child was weighed	-0.05	-0.55 **	-0.34 *
among the children under six years of age, percentage whose mothers received health and nutrition education from AWCs during pregnancy	-0.02	-0.40 *	-0.32
among the children under six years of age, percentage whose mothers received health and nutrition education from AWCs while breastfeeding	-0.04	-0.32	-0.24

Notes: N=36; * Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

Source: Author's calculations from NFHS 4.

It is evident that among the underlying contextual factors, ability to take decisions about own health jointly with their husbands is significantly correlated with all the three malnutrition indicators. Besides, early marriage and experience of violence is also significantly correlated with stunting and underweight.

Education and employment with cash earnings among women are important influencing factors so far as malnutrition is concerned. The present analysis

observes that among the factors signifying access to or control over resources, percentage of women with 10 or more years of completed education is more important than employment with wage earnings since the former is significantly correlated with two of the three malnutrition indicators. Another point worth noting is that percentage of women who own mobiles and themselves use the device is a very important factor as it is significantly correlated with all the three malnutrition indicators.

Among the health-care related indicators, assistance received under JSY, four or more antenatal visits, children receiving postnatal care from skilled birth provider within two days after birth, institutional deliveries and immunisation are significantly correlated with stunting. However, these factors do not have much effect on wasting as is indicated by the lack of significant correlation coefficients. Sanitation seems to be an extremely important component in addressing malnutrition. Particularly, safe disposal of children's stools and having toilet facilities in the household seem to be most effective as is indicated by significant correlations of these variables with all the three indicators of malnutrition. Information Education Communication (IEC) is another important indirect intervention for nutrition. As indicated in Table 1, counselling and nutrition education provided by the Anganwadi Workers are significantly correlated with wasting and underweight.

Financing Nutrition, Prioritising Actions

The preceding discussion clearly helps identify those factors which indirectly influence nutrition at the macro level. With these identified indicators, let us now understand how these are prioritised in public policies. An effective way to do so is to engage with the patterns of government spending on these interventions. This section delves into understanding the budgetary outlays by the Government of India. To start with, and in keeping with the discussion in the previous section, about seven sectors that are likely to influence nutrition outcomes have been identified: (a) Agriculture and allied; (b) Health; (c) Employment and Livelihood; (d) Education; (e) WASH; (f) Women and Child Development and (g) Information Education Communication (IEC). Each of these sectors is spread across different ministries/departments which have been mapped at the second level. Although it is extremely difficult to pin down every scheme within each sector influencing nutrition, an attempt has been made to identify the important schemes, both centrally sponsored and central-sector schemes, based on secondary literature, policy brief documents, such as those of the CBGA. The budget outlays for all these nutrition sensitive interventions are then analysed for the Union Budgets during 2014-2015 to 2020-2021 (henceforth referred to as the studied time period).

Agriculture, Livestock and Fishery

Several studies observe that there is a very strong interconnectedness between agriculture and nutrition outcomes (Pandey, *et. al.* 2016). The then Finance Minister Sri Arun Jaitley in his Budget Speech in 2014-2015 observed that “we are committed to sustaining a growth of four per cent in Agriculture and for this we will bring technology driven second green revolution with focus on higher productivity and include “Protein revolution” as an area of major focus. We would begin our analysis by looking into this sector.” The agriculture and allied sector (livestock and fishery) is spread across several ministries, namely Ministry of Agriculture and Farmers’ Welfare, Ministry of Consumer Affairs, Food and Public Distribution, Fishery, Animal Husbandry and Dairying and Jal Shakti Ministry (Department of Water Resources, River Development and Ganga Rejuvenation).

While the total budget allocation for the Ministry of Agriculture and Farmers’ welfare saw a phenomenal increase from ₹19,255.1 crore in 2014-2015 to ₹1,34,399.77 crore in 2020-2021, allocations for the National Food Security Mission declined from 9.73 per cent to 1.56 per cent of the total ministry budget during the same period. Similar is the case with the Rashtriya Krishi Vikas Yojana which declined from about 44 per cent in 2014-2015 to about three per cent of the total allocations of the Ministry. Budget allocations for the White Revolution increased while that of the Blue Revolution fluctuated during the study period. No allocation for the National Mission for Oilseeds and Oil Palms have been reported for 2019-2020 and 2020-2021. Budget outlays for National Horticulture Mission also declined from 10 per cent to about two per cent during the studied time period.

Pradhan Mantri Krishi Sinchai Yojana is an important programme that aims to improve irrigation, providing water to the field of every farmer, improving water use efficiency to provide ‘Per Drop More Crop’. Fortunately, this Yojana run by the Department of Water Resources, River Development and Ganga Rejuvenation under the Jal Shakti Ministry experienced an increase in budget outlay during the studied time period.

Table 2: Agriculture and Allied Sector (in crores)

Programmes/Schemes	2020-21		2019-20		2018-19	
	BE	AE	BE	AE	BE	AE
Agriculture and Farmers' Welfare						
National Food Security Mission (NFSM)	2100 (1.56)	1675.23 (1.54)	2000 (1.53)	1768.52 (1.87)	1690.7 (3.62)	1605.79 (3.49)
National Mission on Oilseeds and Oil Palm (NMOOP)	0 (0)	0 (0)	0 (0)	0 (0)	400 (0.86)	341.32 (0.74)
National Horticulture Mission	2300 (1.71)	1423.34 (1.31)	2225 (1.71)	1331.28 (1.41)	2536 (5.43)	1996.85 (4.33)
Rashtriya Krishi Vikas Yojana (RKVY)	3700 (2.75)	0 (0)	3745 (2.87)	2760 (2.93)	3600 (7.71)	3370.38 (7.31)
Total	134399.77	108272.83	130485.21	94251.62	46700	46076.19
Ministry of Consumer Affairs, Food and Public Distribution (Dept. of Food and Public Distribution)						
Food Subsidy	115569.68 (94.55)	541330.14 (97.46)	184220 (95.83)	108688.35 (94.31)	169323 (97.22)	101327 (94.63)
Total	122235.43	555431.70	192240.39	115172.52	174159.1	107077.98
Fishery, Animal Husbandry and Dairying						
White Revolution- Dairy	1805 (54.88)	1627.34 (66.05)	2240 (76.39)	1789.39 (65.97)	2219.89 (71.61)	2422.32 (76.39)
Blue Revolution- Integrated Development and Management of Fisheries	570 (17.33)	709.23 (80.35)	560 (19.10)	441.79 (67.89)	632.61 (20.41)	485.16 (15.30)
Total	3289.13		2932.25		3100	3170.8
Jal Shakti Ministry (Department of Water Resources, River Development and Ganga Rejuvenation)						
PM Krishi Sinchai Yojana*	5126.51 (57.21)	4376.92 (60.52)	3949.93 (47.91)	2700.04 (2.86)	3178.05 (35.87)	3438.96 (46.33)
Total	8960.39	7232.09	8245.25		8860	7422.08

Programmes/Schemes	2017-18		2016-17	
	BE	AE	BE	AE
Agriculture and Farmers' Welfare				
National Food Security Mission (NFSM)	1720 (4.11)	1377.12 (3.68)	1700 (4.72)	1286.04 (3.48)
National Mission on Oilseeds and Oil Palm (NMOOP)	403 (0.96)	263.62 (0.70)	500 (1.39)	327.5 (0.89)
National Horticulture Mission	2320 (5.54)	2027.03 (5.42)	1620 (4.50)	1493.07 (4.04)
Rashtriya Krishi Vikas Yojana (RKVY)	4750 (11.35)	3559.74 (9.52)	5400 (15.01)	3892.01 (10.54)
Total	41855	37396.72	35983.69	36912.48
Ministry of Consumer Affairs, Food and Public Distribution (Dept. of Food and Public Distribution)				
Food Subsidy	145338.6 (96.57)	100281.69 (94.73)	134834.61 (96.21)	110172.96 (95.68)
Total	150504.69	105864.26	140150	115144.89
Fishery, Animal Husbandry and Dairying				
White Revolution- Dairy	1633.97 (68.91)	1573.81 (77.83)	1138 (60.48)	1309.16 (70.46)
Blue Revolution- Integrated Development and Management of Fisheries	400.73 (16.90)	321.45 (15.90)	246.78 (13.12)	387.81 (20.87)
Total	2371	2022.1	1881.51	1857.98
Jal Shakti Ministry (Department of Water Resources, River Development and Ganga Rejuvenation)				
PM Krishi Sinchai Yojana*	1827 (26.53)	2122.54 (39.95)	1877.13 (30.27)	1632.01 (34.62)
Total	6887	5313.47	6201.21	4714.13

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Table 2: Agriculture and Allied Sector (in crores)

Programmes/Schemes	2015-16		2014-15	
	BE	AE	BE	AE
Agriculture and Farmers' Welfare				
National Food Security Mission (NFSM)	1300 (7.65)	1162.34 (7.60)	2030 (8.96)	1872.74 (9.73)
National Mission on Oilseeds and Oil Palm (NMOOP)	350 (2.06)	305.81 (2.00)	426 (1.88)	316.33 (1.64)
National Horticulture Mission	1950 (11.47)	1696.47 (11.09)	2232.5 (9.86)	1954.73 (10.15)
Rashtriya Krishi Vikas Yojana (RKVY)	4500 (26.46)	3940.01 (25.76)	9954 (43.94)	8443.21 (43.85)
Total	17004.35	15296.04	22652.25	19255.1
Ministry of Consumer Affairs, Food and Public Distribution (Dept. of Food and Public Distribution)				
Food Subsidy	124419 (99.37)	139419 (99.22)	115000 (99.43)	117671.16 (99.62)
Total	125212	140520.91	115656.84	118121.71
Fishery, Animal Husbandry and Dairying				
White Revolution- Dairy	481.5 (30.37)	937.14 (66.46)	516.47 (22.79)	415.82 (22.82)
Blue Revolution- Integrated Development and Management of Fisheries	451.14 (28.46)	199.96 (14.18)	461.3 (20.35)	387.96 (21.29)
Total	1585.43	1410.12	2266.3	1822.1
Jal Shakti Ministry (Department of Water Resources, River Development and Ganga Rejuvenation)				
PM Krishi Sinchai Yojana*	1000 (23.63)	4697.7 (68.46)	1000 (7.23)	NA
Total	4232.43	6862.05	13836.64	5480.05

Notes: Figures in parentheses indicate percentages; NA- Not available in the Budget Documents; *PM Krishi Sinchai Yojana was placed under Department of Agriculture, Cooperation and Farmers' Welfare for the 2019-20 (AE) data.

Source: Author's calculations based on Union Budget of India data.

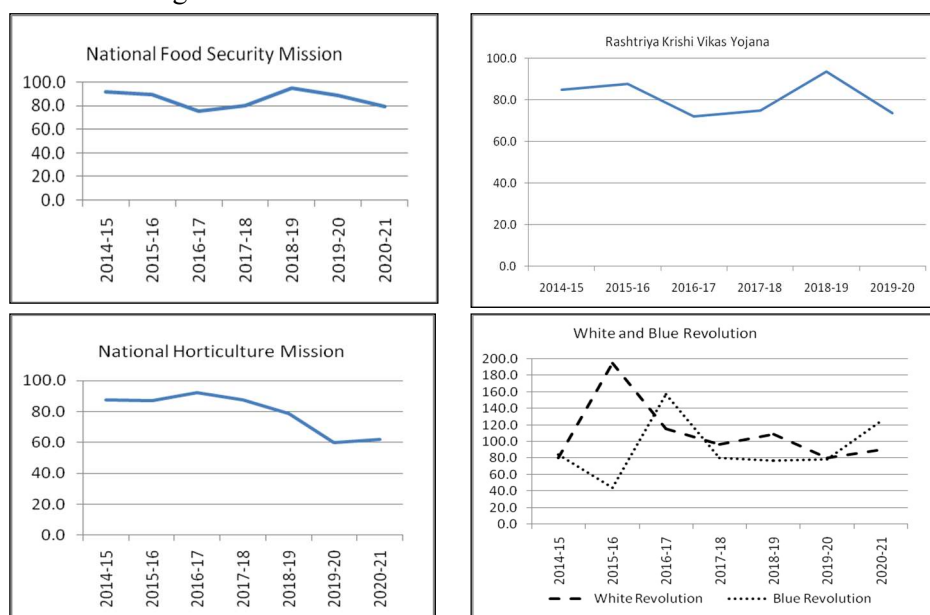
The Public Distribution System is one of the cornerstones of India's drive to attain food security. It aims at distributing food and non-food items at subsidised rates to the poor. One of the oldest interventions in India, the Government had been implementing reforms from time to time to scale up the system. The budget allocations for the Department of Food and Public Distribution under the Ministry of Consumer Affairs, Food and Public Distribution increased from 118121.71 crores to 122235.43 crores, a meagre increase by 3.48 per cent. However, allocations for food subsidies declined by about 1.8 per cent, from 117671.16 crores to 115569.68 crores.

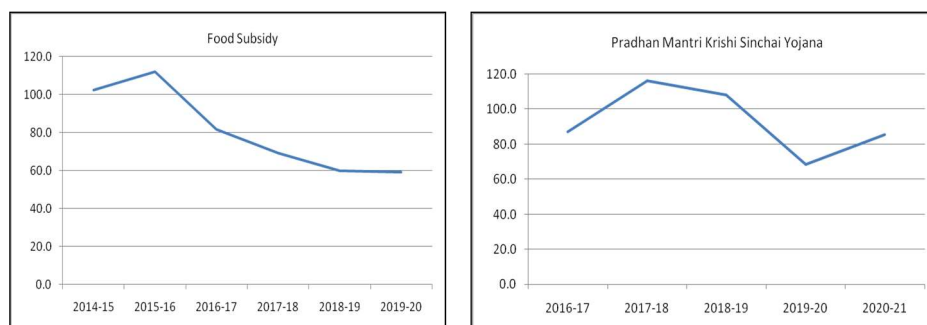
Another point worth mentioning here is that the gap between Budget Estimates (BE) and Actual Expenditure (AE) has increased over the years. While during 2014-2015, about 98 per cent of the BE for Food Subsidies was actually spent, during 2019-2020, only about 59 per cent was spent. In case of Blue Revolution and Pradhan Mantri Krishi Sinchai Yojana, the percentage of AE to BE experienced an increase during 2019-2020 to 2020-2021. All the other programmes in this sector experienced a decline.

Education

The correlation coefficients discussed in the previous section indicate that women's education, especially secondary education holds significant correlation with children malnutrition. For the budget analysis, programmes/schemes in the education sector have been selected from two ministries- Ministry of Human Resource Development (MHRD) and Ministry of Women and Child Development (MWCD). It is observed that outlays for the Mid-Day Meal scheme, one of the flagship programmes for catering to nutrition needs of the country, have been decreasing throughout the studied time period. It was 23 per cent during 2014-2015 and came down to around 18 per cent during 2020-2021. The budget estimates for the National Education Mission, a Centrally Sponsored Scheme that includes Samagra Shiksha Abhiyan, Sarva Shiksha Abhiyan, Rashtrita Madhyamik Shiksha Abhiyan and Adult education, have also decreased drastically from about 87 per cent during 2014-2015 to 65 per cent during 2020-2021. This is despite the Finance Minister's declaration during his budget speech of 2015-2016 that the Government, after universalisation of primary education would focus on quality of education

Figure 1: Temporal Changes in Actual Expenditure as a Percentage of Budget Estimates in Agriculture Sector





of 2015-2016 that the Government, after universalisation of primary education would focus on quality of education. The BE for National Scheme for Incentive to Girl Child for Secondary Education, a Central-Sector Scheme, decreased between 2017-2018 and 2020-2021, from about 0.7 per cent to 0.2 per cent of total ministry budget. The budget outlay for Beti Bachao Beti Padhao, a Centrally Sponsored Scheme to save and educate the girl child under MWCD, increased from 2014-2015 to 2018-2019, and decreased slightly in 2020-2021.

Table 3: Education (in crores)

Programmes/Schemes	2020-21		2019-20		2018-19	
	BE	AE	BE	AE	BE	AE
Ministry of Human Resource Development (Department of School Education and Literacy)						
Mid-day Meal Programme	11000 (18.38)	12878.15 (24.84)	11000 (19.46)	9699.00 (18.46)	10500 (21)	9514.34 (19.64)
National Education Mission	38860.5 (64.94)	27923.22 (53.9)	36447.4 (64.47)	32376.52 (61.64)	31212.51 (62.43)	29436.9 (60.77)
National Scheme for Incentive to Girl Child for Secondary Education	110 (0.18)	0.17 (0.0003)	100 (0.18)	8.57 (0.007)	255.9 (0.51)	164.58 (0.34)
Dept. Total	59845	51841.64	56536.63	52520.19	50000	48440.57
Ministry of Woman and Child Development						
Beti Bachao Beti Padhao *	220 (18.92)	60.57 (0.31)	280 (21.05)	85.78 (0.37)	280 (20.50)	244.73 (21.51)
Ministry Total	30007.1	19231.06	29164.9	23164.67	24700	23025.59

Programmes/Schemes	2017-18		2016-17	
	BE	AE	BE	AE
Ministry of Human Resource Development (Department of School Education and Literacy)				
Mid-day Meal Programme	10000 (21.53)	9092.3 (19.51)	9700 (22.27)	9475.43 (22.04)
National Education Mission	28255.67 (60.95)	28208.52 (60.53)	27030 (62.06)	26200.3 (60.95)
National Scheme for Incentive to Girl Child for Secondary Education	320 (0.69)	292.38 (0.63)	45 (0.10)	44.65 (0.10)
Dept. Total	46356.25	46600.44	43554	42989.43
Ministry of Woman and Child Development				
Beti Bachao Beti Padhao *	200 (18.37)	169.1 (17.89)	100 (11.03)	28.66 (3.61)
Ministry Total	22094.67	20396.36	17408.12	16873.52

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Table 3: Education (in crores)

Programmes/Schemes	2015-16		2014-15	
	BE	AE	BE	AE
Ministry of Human Resource Development (Department of School Education and Literacy)				
Mid-day Meal Programme	9236.4 (21.88)	9144.89 (21.88)	13215 (15.97)	10523.48 (23.02)
National Education Mission	36066.5 (85.43)	26140.07 (62.54)	41624.13 (50.29)	39882.01 (87.23)
National Scheme for Incentive to Girl Child for Secondary Education	NA	153.54 (0.37)	NA	NA
Dept. Total	42219.5	41799.91	82771.1	45722.41
Ministry of Woman and Child Development				
Beti Bachao Beti Padhao *	97 (13.63)	59.36 (24.87)	90 (14.32)	34.84 (10.35)
Ministry Total	10286.73	17248.72	21100	18436.18

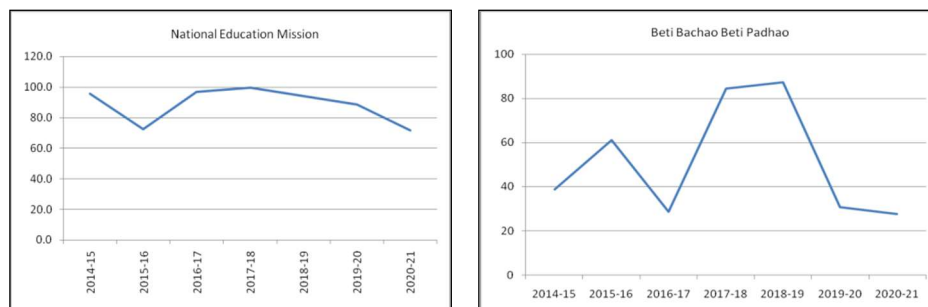
Notes: *Percentage for Beti Bachao Beti Padhao is calculated out of total allocations for Mission for Empowerment of Women till 2016-2017, percentages for 2015-16 BE and 2014-15 BE and AE are calculated out of total allocations for Children welfare schemes under MWCD; Figures in parentheses indicate percentages; NA- Data not reported in the budget tables.

Source: Author's calculations based on Union Budget of India data.

It is worth noting that with respect to Mid-Day Meal Programme, the percentage of AE to BE increased significantly over time, exceeding 100 per cent in 2020-2021. Despite the importance of secondary education, it is alarming that there has been a remarkable drop in the AE as a percentage of BE with respect to National Scheme for Incentive to Girl Child for Secondary Education from 99.2 in 2016-2017 to 0.2 in 2020-2021. Further, in the context of Beti Bachao Beti Padhao, the per cent of AE incurred out of BE is remarkably low (only 27 per cent in 2020-2021).

Figure 2: Temporal Changes in Actual Expenditure as a Percentage of Budget Estimates in Education Sector





Employment and Livelihood

Livelihood and employment are important because these contribute to expansion of income-generating opportunities leading to an increase in expenditure on food and nutrition-dense diet. So far as rural employment is considered, two schemes have been selected from the Ministry of Rural Development and one from the Ministry of Housing and Urban Affairs. The National Rural Livelihood Mission (NRLM) is an extremely important Centrally Sponsored Scheme, which aims to eliminate rural poverty through sustainable livelihood options. The Government has expressed, time and again, its resolve to provide maximum livelihood opportunities in rural India. For the NRLM, not only have the budget outlays as a percentage to total Ministry outlays increased in all the selected schemes/programmes, but the gap between the BE and AE has also decreased. While in 2014-2015, only about 37 per cent of the total BE was spent, in 2018-2019, the AE exceeded BE. Although NRLM constitutes less than 10 per cent of the ministry's total BE, there has been a 60 per cent increase in BE between 2017-2018 and 2020-2021 (*see* Table 4). The Finance Minister Sri Arun Jaitley in his budget speech of 2018-2019 announced that “in the year 2018-2019, for creation of livelihood and infrastructure in rural areas, total amount to be spent by the Ministries will be ₹14.34 lakh crore, including extra-budgetary and non-budgetary resources of ₹11.98 lakh crore. Apart from employment due to farming activities and self-employment, this expenditure will create employment of 321 crore person days, 3.17 lakh kilometres of rural roads, 51 lakh new rural houses, 1.88 crore toilets, and provide 1.75 crore new household electric connections, besides boosting agricultural growth.”

The other major scheme is Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), budget allocation for which increased only marginally, from about 50 per cent of total ministry outlays during 2014-2015 to about 51 per cent during 2020-2021. In this scheme, the AE exceeds the BE for all the financial years selected for this study, which indicates higher spending *vis-à-vis* estimated allocations. It is much disheartening to note that the allocation for the National Urban Livelihood Mission declined from about 26 per cent of total estimates in 2014-2015 to around two per cent of total estimates in 2020-2021. In

this case also, the AE is much greater than the BE for all the years. Further, except 2019-2020, the estimated budget seems to be lesser than the actual expenditure of the previous years (*see* Table 4).

Table 4: Employment and Livelihood (in crores)

Schemes	2020-21		2019-20		2018-19	
	BE	AE	BE	AE	BE	AE
Ministry of Rural Development						
National Rural Livelihood Mission	9210.04 (7.67)	9208.16 (4.69)	9024 (7.67)	9022.44 (7.38)	5750 (5.12)	5783.47 (5.17)
MGNREGS	61500 (51.19)	111169.53 (56.59)	60000 (51.0)	71686.70 (58.71)	55000 (48.93)	61815.09 (55.27)
Ministry Total	120147.2	196416.71	117647.2	122098.19	112403.9	111841.9
Ministry of Housing and Urban Affairs						
National Urban Livelihood Mission (NULM)	795 (1.59)	816.61 (1.75)	750 (1.56)	732.07 (1.75)	310 (0.74)	498.09 (1.23)
Ministry Total*	50039.9	46700.96	48032.17	42054.36	41765.13	40611.87

Schemes	2017-18		2016-17		
	BE	AE	BE	AE	
Ministry of Rural Development					
National Rural Livelihood Mission		4500 (4.27)	4327.2 (3.99)	3000 (3.49)	3157.72 (3.32)
MGNREGS		48000 (45.52)	55166.04 (50.82)	38500 (44.74)	48214.95 (50.72)
Ministry Total		105447.9	108559.6	86055.8	95069.4
Ministry of Housing and Urban Affairs					
National Urban Livelihood Mission (NULM)		349 (5.45)	598.65 (1.49)	325 (6.01)	328.68 (0.89)
Ministry Total*			40061.02		36946.32

Schemes	2017-18		2016-17		
	BE	AE	BE	AE	
Ministry of Rural Development					
National Rural Livelihood Mission		4500 (4.27)	4327.2 (3.99)	3000 (3.49)	3157.72 (3.32)
MGNREGS		48000 (45.52)	55166.04 (50.82)	38500 (44.74)	48214.95 (50.72)
Ministry Total		105447.9	108559.6	86055.8	95069.4
Ministry of Housing and Urban Affairs					
National Urban Livelihood Mission (NULM)		349 (5.45)	598.65 (1.49)	325 (6.01)	328.68 (0.89)
Ministry Total*			40061.02		36946.32

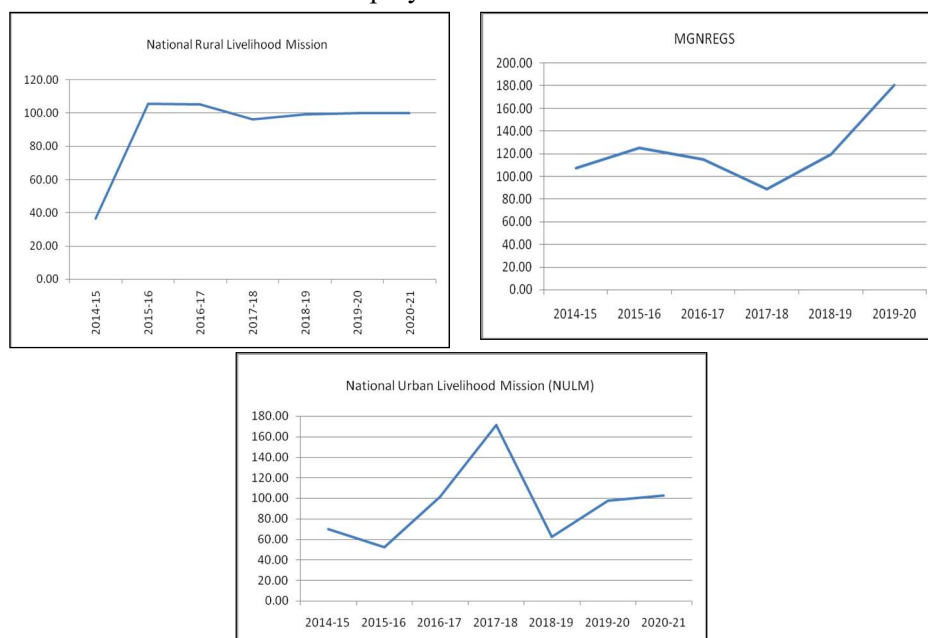
Notes: * 2017-2018 onwards, the percentages of NULM are calculated as percentage to total allocations to Housing and Urban Poverty Alleviation; Figures in parentheses indicate percentages; NA- Not available in the Budget Documents.

Source: Author's calculations based on Union Budget of India data.

It is important to note that the percentage of AE incurred out of BE is appreciably high for all the programmes in this sector. In case of MGNREGS, the

AE exceeded BE for all the years considered. For NULM, the percentage of AE with respect to BE has been consistently high and exceeded BE in 2020-2021.

Figure 3: Temporal Changes in Actual Expenditure as a Percentage of Budget Estimates in Livelihood and Employment Sector



WASH

The importance of WASH on nutrition outcomes have already been discussed in the preceding section. For the budget analysis, following interventions have been selected: the National Water Mission (NWM), a Central Sector Scheme under the Department of Water Resources, River Development and Ganga Rejuvenation of the Jal Shakti Ministry; the National Rural Drinking Water Mission (NRDWM), also known as the *Jal Jeevan Mission* (JJM) and Swachh Bharat Mission-Gramin (SBM-G) under the Department of Drinking Water and Sanitation, Jal Shakti Ministry; and the Swachh Bharat Mission –Urban (SBM-U) under the Ministry of Housing and Urban Affairs.

Table 5: WASH (crores)

Programmes/Schemes	2020-21		2019-20		2018-19	
	BE	AE	BE	AE	BE	AE
Jal Shakti Ministry (Department of Drinking Water and Sanitation)						
National Rural Drinking Water Mission	11218.2 (52.13)	10998.22 (68.9)	9150.36 (45.71)	10030.42 (54.9)	6611 (29.57)	5391.27 (29.28)
Swachha Bharat Mission-gramin	9994.1 (46.45)	4944.94 (30.97)	9994 (49.93)	8213.03 (44.96)	15343.1 (68.63)	12912.66 (70.13)
Dept. total	21518.1	15967.30	20016.34	18264.26	22356.6	18411.54
Ministry of Housing and Urban Affairs						
Swachh Bharat Mission Urban	2300 (4.60)	994.90 (2.13)	2650 (5.52)	1255.73 (6.87)	2500 (5.99)	2461.61 (6.06)
Ministry total*	50039.9	46700.96	48032.17	18264.26 2	41765.13	40611.87
Programmes/Schemes	2017-18		2016-17			
	BE	AE	BE	AE		
Jal Shakti Ministry (Department of Drinking Water and Sanitation)						
National Rural Drinking Water Mission	5105.5 (25.51)	6488.16 (27.10)	3393.99 (24.23)		5106.72 (31.00)	
Swachha Bharat Mission-gramin	13948.27 (69.70)	16888.22 (70.55)	9000 (64.24)		10484.13 (63.63)	
Dept. total	20010.79	23938.77	14009.7		16475.7	
Ministry of Housing and Urban Affairs						
Swachh Bharat Mission Urban	2300 (6.72)	2538.8 (6.34)	2300 (9.38)		2135.21 (5.78)	
Ministry total*		40061.02			36946.32	
Programmes/Schemes	2015-16		2014-15			
	BE	AE	BE	AE		
Jal Shakti Ministry (Department of Drinking Water and Sanitation)						
National Rural Drinking Water Mission	2611 (41.82)	3683.61 (33.24)	11000 (72.05)		9242.76 (76.44)	
Swachha Bharat Mission-gramin	3625 (58.06)	6703.4 (60.49)	4260 (27.90)		2840.99 (23.50)	
Dept. total	6243.87	11081.18	15266.85		12090.83	
Ministry of Housing and Urban Affairs						
Swachh Bharat Mission Urban	1000 (5.45)	765.84 (4.16)	1690.5 (15.35)		859.48 (6.48)	
Ministry total*						

Notes: 2017-18 BE onwards -Percentage of SBM is calculated to total of Urban Development Ministry; Figures in parentheses indicate percentages; NA- Not available in the Budget Documents

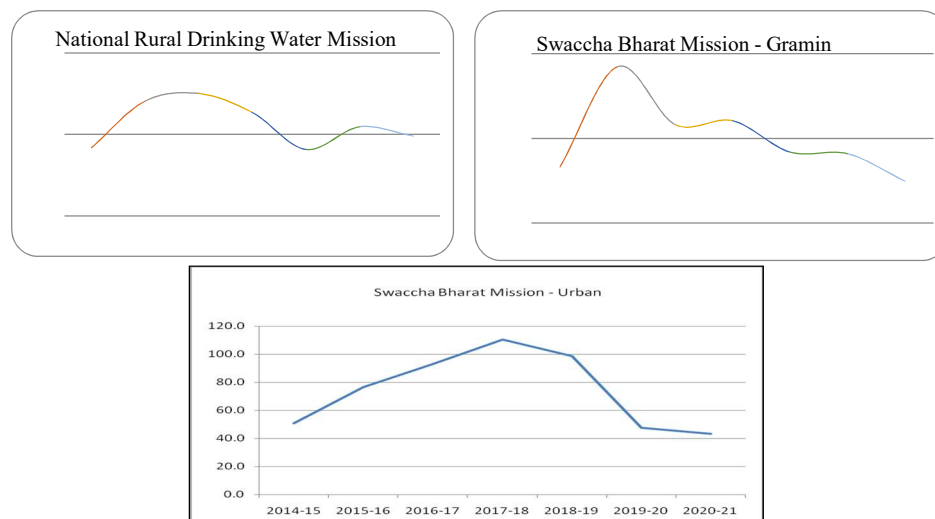
Source: Author's calculations based on Union Budget of India data.

The NWM experienced a slight increase in BE from 0.02 per cent in 2014-2015 to around 0.7 per cent in 2020-2021. However, it worth noting that amount utilised is remarkably lesser than the estimated budget outlays for all the FYs preceding 2018-2019. Under the Department of Drinking Water and Sanitation, both the selected programmes, viz., NRDWM and SBM-G (*see* Table 5) experienced fluctuations.

Much expectation is laid upon the *Jal Jeevan* Mission (JJM) which was launched in 2019 subsuming the erstwhile National Rural Drinking Water Mission. In her Budget Speech during 2019-20, the the Finance Minister Smt. Nirmala Sitharaman observed that “[e]nsuring India’s water security and providing access to safe and adequate drinking water to all Indians is a priority of the Government.This new Mantralaya (the Jal Shakti Ministry) will look at the management of our water resources and water supply in an integrated and holistic manner, and will work with States to ensure *Har Ghar Jal* (piped water supply) to all rural households by 2024 under the *Jal Jeevan* Mission. This Mission, under the Department of Drinking Water and Sanitation, will focus on integrated demand and supply side management of water at the local level, including creation of local infrastructure for source sustainability like rainwater harvesting, groundwater recharge and management of household wastewater for reuse in agriculture.” Notwithstanding such emphasis being placed upon JJM, the BE declined from 72 per cent in 2014-2015 to 24 per cent in 2016-2017 and has been increasing since then. In 2020-2021, it was 52 per cent of the total allocations of the Department. Except 2018-2019, almost all the FYs experienced higher spending vis-à-vis allocations (i.e. higher AEs compared to BEs).

Swachh Bharat Mission is a flagship Centrally Sponsored Scheme of the BJP-Lead Union Government. In 2019-2020, a budgetary allocation of ₹10,000.66 Crore has been made and as on 06.03.2020, an amount of ₹9,542.89 Crore has been released to the States/ UTs (Lok Sabha Unstarred question no. 4354, 2020). In her budget speech in 2019-2020 Union Budget, the Finance Minister Smt. Nirmala Sitharaman declared “We must not only sustain the behavioural change seen in people but also harness the latest technologies available to transform waste into energy. I now propose to expand the Swachh Bharat Mission to undertake sustainable solid waste management in every village.” However, Budgetary outlays for SBM-G too exhibit considerable fluctuations. It increased from 23.5 in 2014-15 to about 7- per cent during 2017-2018 but came down to 46 per cent in 2020-2021. During 2015-2016 and 2017-2018, the AEs exceeded BEs while during 2018-2019 and 2019-2020, the AEs were slightly above 80 per cent of the BEs, indicating a declining utilisation of funds. The Swachh Bharat Mission–Urban (SBM-U) experienced progressive decline in Budget outlays since 2014-2015, from 15 per cent to about five per cent in 2020-2021. It has already been noted that sanitation is very strongly related to nutrition outcomes. In the context of declining allocations for Swachh Bharat mission, it would not be inappropriate to be apprehensive about the malnutrition condition in the country. The AE as percentage of BE remained only less than 50 per cent, which is indeed a matter of concern.

Figure 4: Temporal Changes in Actual Expenditure as a Percentage of Budget Estimates in WASH Sector



Health

BE for 2014-2015 and 2015-2016 and AE for 2014-2015 pertain to National Health Mission. It is clear from Table 6 that BE for National Rural Health Mission (NRHM) far exceeds BE for National Urban Health Mission (NUHM) and the BE for both the Missions, as percentage to total allocations for the Ministry of Health and Family Welfare (MHFW) have declined consistently since 2016-2017. Same is true for the NUHM. Given that NRHM encompasses RCH Flexible Pool including Routine Immunization Programme, Pulse Polio Immunization Programme, National Iodine Deficiency Disorders Control Programme etc. and that immunization has been observed to be significantly correlated with child undernutrition; this decline in BE is alarming indeed. The Finance Minister in 2018-2019 declared the Government estimated schematic budgetary expenditure on health, education and social protection to be 1.38 lakh crore against estimated expenditure of ₹1.22 lakh crore in BE 2017-2018 (*see* Table 6).

Table 6: Health (in Crores)

Programmes/Schemes	2020-21		2019-20		2018-19	
	BE	AE	BE	AE	BE	AE
Ministry of Health and Family Welfare						
National Rural Health Mission	27039 (41.59)	30328.97 (39.1)	27039 (43.15)	29986.82 (48.05)	24279.61 (45.98)	25494.78 (48.15)
National Urban Health Mission	950 (1.46)	949.87 (1.22)	950 (1.52)	850.06 (1.36)	875 (1.66)	868.46 (1.64)
Total	65011.8	77569.33	62659.12	62397.08	52800	52953.95

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Table 6: Health (in Crores)

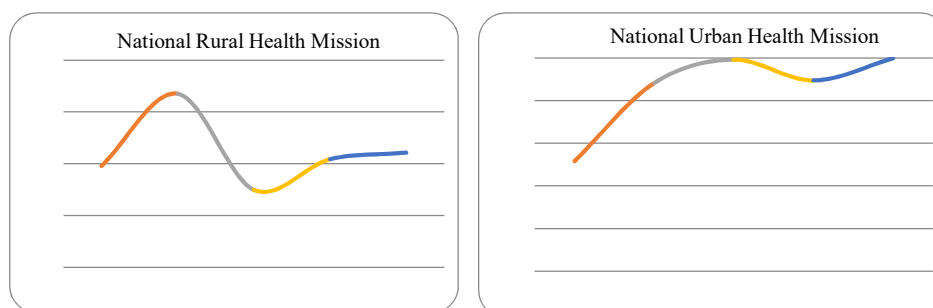
Programmes/Schemes	2017-18		2016-17	
	BE	AE	BE	AE
Ministry of Health and Family Welfare				
National Rural Health Mission	21188.65 (44.75)	26178.02 (50.95)	18087 (48.80)	19825.89 (52.63)
National Urban Health Mission	752.05 (1.59)	664.2 (1.29)	950 (2.56)	490.74 (1.30)
Total	47352.51	51381.89	37061.55	37671.3
Programmes/Schemes	2015-16		2014-15	
	BE	AE	BE	AE
Ministry of Health and Family Welfare				
National Rural Health Mission		18254 (55.11)		
National Urban Health Mission		717.49 (2.17)		
Total		33121.42	35163	30626.39

Notes: \$ Figures indicate BE and AE for National Health Mission; Figures in parentheses indicate percentages; NA- Not available in the Budget Documents.

Source: Author's calculations based on Union Budget of India data.

It is worth noting that AE as percentage of BE with respect to NUHM has increased progressively since 2016-2017. In case of NRHM, the AE has continued to exceed BE consistently across all the years.

Figure 5: Temporal Changes in Actual Expenditure as a Percentage of Budget Estimates in the Health Sector



Women and Child Development

Data for the MWCD is presented in two tables since the schemes/programmes underwent major reorganisations within the Ministry during the studied time period. Food and Nutrition Board is a technical support wing under Child Development Bureau of the MWCD. Functions of the Board include providing inputs for policy issues in nutrition, nutrition education and extension programmes, training programmes etc. BE for the Board declined from 33.7 crores in 2014-2015 to 15.32 crores in 2020-2021. Integrated Child Development

Services (ICDS) is one of the mainstays of nutrition interventions in the country. The Poshan Abhiyan or the National Nutrition Mission is a flagship programme of the Bhartiya Janata Party-led Government of India. It is heartening to note that BE for the Mission increased from 1.61 per cent of the total allocations for umbrella ICDS in 2014-2015 to 12.96 per cent in 2020-2021. The gap between BE and actual expenditure has also decreased. Actual expenditure was 6.7 per cent of BE in 2014-2015 and increased to 87.41 per cent of BE in 2017-2018. The Revised estimate for the years 2019-2020 was equal to the BE for the year. Although ICDS is the key propeller of nutrition interventions in India, the outlays on supplementary nutrition under the ICDS experienced considerable decline from 86 per cent of total umbrella ICDS in 2017-2018 to 71 per cent in 2020-2021.

Since 2016-2017, the National Creche Scheme, Scheme for Adolescent Girls and Pradhan Mantri Matru Vandana Yojana (PMMVY) were placed under Umbrella ICDS. During 2014-2015 and 2015-2016, the former two were placed under 'Child Welfare'. The Indira Gandhi Matritva Sahyog Yojana (IGMSY) was relaunched as Pradhan Mantri Matru Vandana Yojana (PMMVY) in 2017, the latter being implemented through the ICDS platform. The primary aim of the PMMVY is to provide partial wage compensation to pregnant and lactating

Table 7.1: Woman and Child Development (in crores)

Programmes/Schemes	2020-21		2019-20	
	BE	AE	BE	AE
Ministry of Women and Child Development				
Food and nutrition board	15.32 (0.05)	12.13 (0.06)	14.18 (0.05)	13.15 (0.06)
National Nutrition Mission/ Poshan Abhiyan	3700 (12.96)	408.27 (2.24)	3400 (12.33)	1880.09 (7.53)
Scheme for Adolescent Girls	250 (0.88)	40.82 (0.22)	300 (1.09)	105.46 (0.42)
National Creche Scheme	75 (0.26)	11.60 (0.06)	50 (0.18)	47.77 (0.19)
Pradhan Mantri Matru Vandana Yojana/Maternity Benefit programme	2500 (8.75)	1112.13 (6.11)	2500 (9.06)	2238.97 (8.97)
Anganwadi services-Supplementary Nutrition Programme	20532.38 (71.90)	15784.42 (86.69)	19834.37 (71.90)	16893.54 (67.69)
Total Umbrella ICDS	28557.38 (95.17)	18203.87 (94.66)	22031.66 (94.58)	24954.5 (107.7)
Mission for empowerment of women (Total)	1163 (3.88)	817.29 (4.25)	1330 (4.56)	900.88 (3.89)
Total	30007.1	19231.06	29164.9	23164.67

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Table 7.1: Woman and Child Development (in crores)

Programmes/Schemes	2018-19		2017-18	
	BE	AE	BE	AE
Ministry of Women and Child Development				
Food and nutrition board	14 (0.06)	13.16 (0.06)	14.36 (0.06)	12.12 (0.06)
National Nutrition Mission/ Poshan Abhiyan	3000 (12.99)	2622.31 (12.12)	1500 (7.23)	892.77 (4.64)
Scheme for Adolescent Girls	500 (2.16)	205.01 (0.95)	460 (2.22)	450.62 (2.34)
National Creche Scheme	128.39 (0.56)	29.76 (0.14)	200 (0.96)	48.79 (0.25)
Pradhan Mantri Matru Vandana Yojana/Maternity Benefit programme	2400 (10.39)	1054.94 (4.87)	2700 (13.01)	2048.31 (10.65)
Anganwadi services-Supplementary Nutrition Programme	16334.88 (70.75)	16814.72 (77.69)	15245.19 (73.45)	15155.4 (78.80)
Total Umbrella ICDS	23088.28 (93.47)	21642.44 (93.99)	20755.19 (93.94)	19233.7 (94.30)
Mission for empowerment of women	1365.58	1137.88	1089.02	945.09
(Total)	(5.53)	(4.94)	(4.93)	(4.63)
Total	24700	23025.59	22094.67	20396.36

Programmes/Schemes	2016-17		2015-16
	BE	AE	AE
Ministry of Women and Child Development			
Food and nutrition board	12.9 (0.07)	12.99 (0.08)	11.55 (0.07)
National Nutrition Mission/ Poshan Abhiyan	850 (5.23)	199.09 (1.25)	56.23 (0.33)
Scheme for Adolescent Girls	460 (2.83)	482.03 (3.03)	475.22 (2.82)
National Creche Scheme	150 (0.92)	124.62 (0.78)	133.02 (0.79)
Pradhan Mantri Matru Vandana Yojana/Maternity Benefit programme	400 (2.46)	75.46 (0.47)	233.37 (1.39)
Anganwadi services-Supplementary Nutrition Programme	14000 (86.10)	14433.18 (90.81)	15433.09 (91.68)
Total Umbrella ICDS	16260 (93.40)	15893.32 (94.19)	16834.55 (97.60)
Mission for empowerment of women	907	793.24	238.66
(Total)	(5.21)	(4.70)	(1.38)
Total	17408.12	16873.52	17248.72

Notes: Figures in parentheses indicate percentages; NA- Not available in the Budget Documents.

Source: Author's calculations based on Union Budget of India data.

women of 19 years of age or above for the wage loss due to child birth and child care, as well as to facilitate conditions for safe delivery, feeding practices and good nutrition outcomes. It can be observed from the table that the year 2017 saw major scaling up of the BE on PMMVY compared to what it was for the IGMSY prior to 2017. The actual expenditure declined from 75.86 per cent of BE in 2017-2018 to 43.95 per cent of BE in 2018-2019. Empirical studies observe that women's participation in wage work tend to yield negative results for child's nutrition

because these children are deprived of mothers' milk. Thus, crèche facilities in the workplace have important consequences for the child's nutrition. That said, if we look at the allocations of the National Creche Scheme, it may be noted that BE declined from 0.92 per cent of total umbrella ICDS in 2016-2017 to 0.26 per cent in 2020-2021.

Importance of addressing malnutrition among adolescents have been pushed into the centre stage of Indian policy discourses with the thrust being laid by the Poshan Abhiyan on addressing nutrition throughout the lifecycle. It is believed that addressing malnutrition at early stages in the lifecycle contributes towards arriving at long-term solutions to the problem. The Scheme for Adolescent Girls (earlier named as Rajiv Gandhi Scheme for Empowerment of Adolescent Girls), a Centrally Sponsored Scheme aims to improve the nutrition and health status of out of school adolescent girls of age 11-14 years and to motivate these girls to go back to formal schooling or skill training. The scheme has both nutrition and non-nutrition components, that latter include motivating out of school adolescent girls to go back to formal schools, IFA supplementation, Health check-up and Referral services, Nutrition and Health Education, Life Skill Education and counselling/guidance on accessing public services.

Table 7.2: Woman and Child Development (in crores)

	2015-16	2014-15	
	BE	BE	AE
Food and nutrition board	34 (0.33)	33.7 (0.16)	20.21 (0.11)
ICDS	8335.77 (95.23)	18195 (97.35)	16581.02 (99.38)
World Bank Assisted ICDS Systems Strengthening and Nutrition Improvement Project	113 (1.29)	196 (1.05)	82.62 (0.50)
National Nutrition Mission/PoshanAbhiyan	304.79 (3.48)	300 (1.61)	20 (0.12)
Total ICDS	8753.56 (85.10)	18691 (88.58)	16683.64 (90.49)
National Creche Scheme	188.44 (26.48)	112.5 (17.90)	97.68 (29.03)
Scheme for Adolescent Girls	10 (1.40)	689.65 (109.76)	622.43 (184.97)
Total Child welfare	711.62 (6.91)	628.34 (2.98)	336.51 (1.83)
Rasjtriya Mahila Kosh	0 (0)	18 (5.33)	0 (0)
Mission for empowerment of women including IGMSY	161.02 (62.33)	318.61 (94.27)	38.41 (23.55)
Total women's welfare	258.33 (2.51)	337.97 (1.60)	163.09 (0.88)
Indira Gandhi Matritva Sahyog Yojana	438 (4.26)	400 (1.90)	343.14 (1.86)
Total MWCD	10286.73	21100	18436.18

Notes: Figures in parentheses indicate percentages; NA- Not available in the Budget Documents.

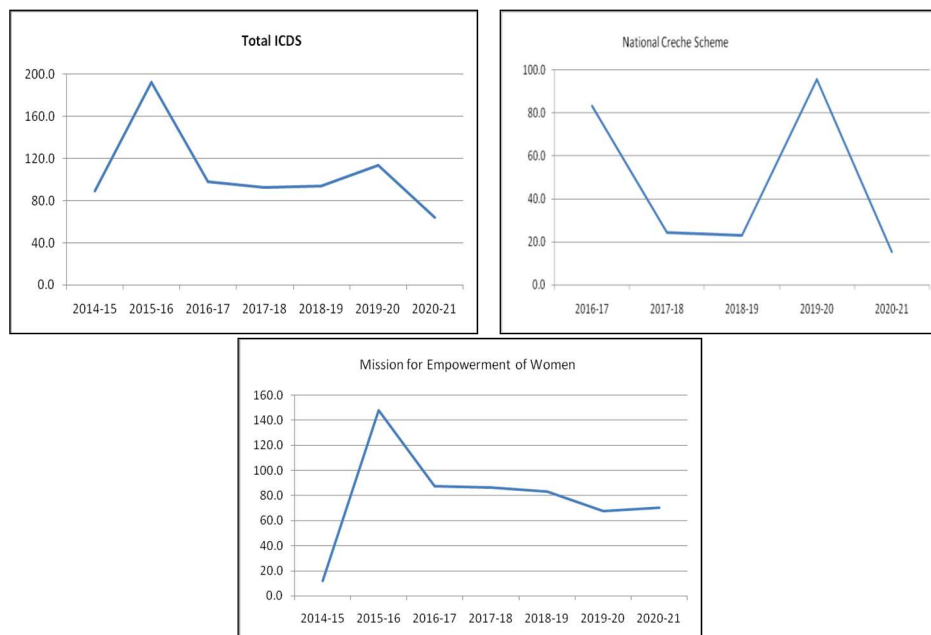
Source: Author's calculations based on Union Budget of India data.

Despite such policy focus, we note a decline in the BE on the Scheme for Adolescent Girls, whereby it dropped from 2.83 per cent of umbrella ICDS in 2016-2017 to 0.88 per cent in 2020-2021. Besides, the gap between BE and actual expenditure also increased. While the actual expenditure was 98 per cent of the BE in 2017-2018, it came down to 41 per cent of BE in 2018-2019. The RE for 2019-2020 was 50 per cent of the BE. This clearly indicates a diminishing importance of the scheme in terms of budget allocations.

The relationship between women's empowerment and nutrition has already been spelt out in this paper. That said, the Mission for Empowerment of women under the MWCD could play significant role in this context. It subsumes important schemes such as Mahila Shakti Kendra, Swadhar Greh, Ujjwala, Beti Bachao Beti Padhao, among others. This mission experienced an increase in BE, from 1.51 per cent of total MWCD to 3.88 per cent in 2020-2021. The utilisation of budget has also improved, with about 87 per cent of the BE being utilised in 2016-2017 which went up to 83 per cent in 2018-2019. The Rasjtriya Mahila Kosh (RMK) was set up in 1993 by the Government of India under MWCD to expand livelihood and employment opportunities, credit access, asset creation and so forth among women. Unfortunately, most of the years did not receive any allocation for the RMK. Thus under the MWCD, only the National Mission for Empowerment of Women experienced increase in BE over the years.

Figure 6: Temporal Changes in Actual Expenditure as a Percentage of Budget Estimates in Ministry of Women and Child Development





Information Education Communication (IEC)

The Finance Minister in his budget speech of 2014-2015 observed that “Government would focus on campaigns to sensitize people of this country towards the concerns of the girl child and women”. Behaviour change is a crucial driver for successfully delivering sanitation in the community, such as preventing open defecation, maintaining basic hygiene and so forth. Several studies, in fact, note that many members of the rural population in India continue to practice open defecation despite availability of toilets within their household premises, due to several cultural taboos. These studies call for concerted efforts targeting these attitudinal biases and effecting behaviour change among the people regarding use of toilets (Coffey, *et. al.* 2014, R Ramesh and P Sivaram 2015). It is therefore evident that communication for development that entails behavioural change through various IEC services is of paramount importance. In the previous section too, we noted that counselling of both mothers and fathers and nutrition education are significantly correlated with childhood malnutrition. That said, it would be interesting to explore how IEC has been prioritised in Indian budgets. From the Union Budget data, three major heads have been identified in this regard (though not consistently available for all the studied years)- IEC under Swachh Bharat Mission or SBM (under the Dept. of Drinking Water and Sanitation, Jal Shakti Ministry), Information and mass communication under the Mission for Protection and Empowerment for Women (Centrally sponsored scheme-Under MWCD) and Development Communication under Ministry of Information and Broadcasting. Publicity of the policies and programmes of the Government of India is undertaken

by the Ministry of Information and Broadcasting through its media units, mainly through Press Information Bureau (PIB) and Bureau of Outreach and Communication (BOC).

As per the response of the Lok Sabha un-starred question no. 3401 (2018), “Under Swachh Bharat Mission (Gramin), up to five per cent of total resources can be spent on Information, Education and Communication (IEC) for State and District level. Three per cent of the resources can be used at the Central level for the same purpose. Massive media campaigns have been started at National level using Audio Visual (TV) and Audio (Radio). States are also carrying out IEC campaigns that use interpersonal Communication (IPC) techniques. Cleanliness campaigns are held at regular intervals to create social awareness. In order to educate the people, the programme lays emphasis on community involvement. Many States are focusing on community approaches, wherein the people are directly triggered and made aware about the importance of sanitation and hygiene using interactive individual/ community-based triggering tools. Besides, conventional IEC tools are also used to educate the people. Swachh Bharat Whatsapp group has been created involving officials of GoI and all the States. Similar groups for individual States have been formed. A Facebook page for SBM(G) has also been created. Celebrities have been roped in as brand ambassadors for promoting Swachh Bharat Mission”. However, the budget

Table 8: Information, Education and Communication (in crores)

	2020-21		2019-20		2018-19	
	BE	AE	BE	AE	BE	AE
Dept. of Drinking Water and Sanitation, Jal Shakti Ministry						
IEC Under Swachh Bharat (Centrally sponsored scheme under Swachh Bharat Mission- Gramin)	70 (0.33)	14.23 (0.09)	190.13 (2.08)	37.28 (0.20)	300 (1.34)	95.1 (0.52)
Total (21518.1	15967.30	9150.36	18264.26	22356.6	18411.54
Ministry of Women and Child Development						
Information and mass communication Under Mission for Protection and Empowerment for Women (Centrally sponsored scheme-Under Mission for Protection and Empowerment for Women)	100 (0.33)	16.63 (0.09)	130 (0.45)	72.68 (0.31)	100 (4.05)	89.13 (0.39)
MWCD total	30007.1	19231.06	29164.9	23164.67	2470	23025.59
Development Communication (Centre Sector Scheme)	220 (5.03)	NA	200 (4.57)	184.20 (4.57)	182 (4.45)	232.73 (5.82)
Ministry Total	4375.21		4375.21	4028.82	4088.98	4000.8

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Table 8: Information, Education and Communication (in crores)

	2017-18		2016-17	
	BE	AE	BE	AE
Dept. of Drinking Water and Sanitation, Jal Shakti Ministry				
IEC Under Swachh Bharat (Centrally sponsored scheme under Swachh Bharat Mission- Gramin)	418 (2.09)	266.42 (1.19)	220 (1.57)	209.91 (12.74)
Total	20010.79	22356.6	14009.7	1647.57
Ministry of Women and Child Development				
Information and mass communication Under Mission for Protection and Empowerment for Women (Centrally sponsored scheme-Under Mission for Protection and Empowerment for Women)	75 (0.33)	65.12 (0.32)	60 (0.34)	53.9 (0.32)
MWCD total	22094.67	20396.36	17408.12	16873.52
Development Communication (Centre Sector Scheme)	140.2 (3.18)	147.03 (4.22)	144.6 (3.54)	3.1 (0.085)
Ministry Total	4409	3487.44	4083.63	3656.24

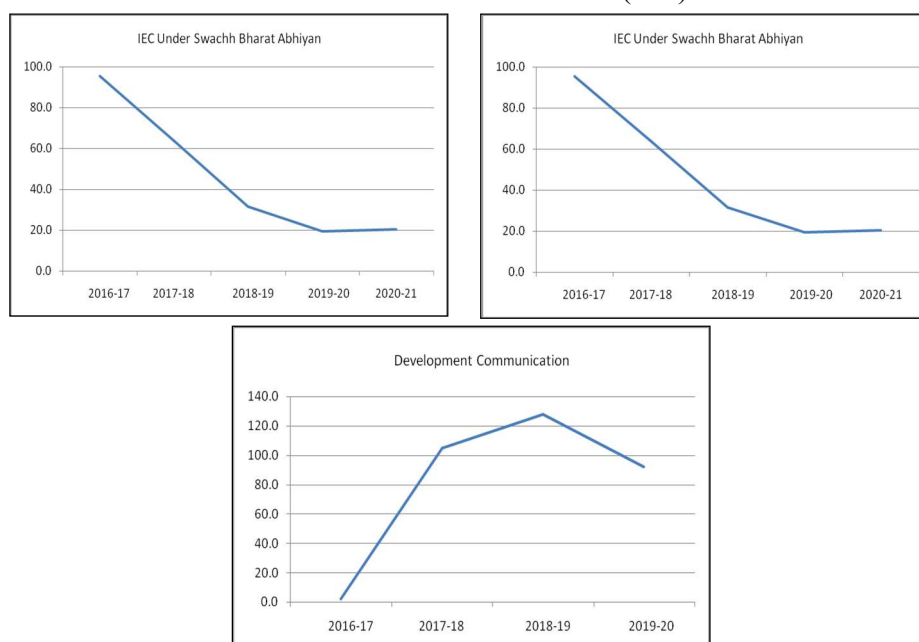
	2015-16		2014-15	
	BE	AE	BE	AE
Dept. of Drinking Water and Sanitation, Jal Shakti Ministry				
IEC Under Swachh Bharat (Centrally sponsored scheme under Swachh Bharat Mission- Gramin)	NA	159.79 (1.44)	NA	NA
Total	NA	11081.18	NA	NA
Ministry of Women and Child Development				
Information and mass communication Under Mission for Protection and Empowerment for Women (Centrally sponsored scheme-Under Mission for Protection and Empowerment for Women)	NA	30.46 (0.18)	NA	NA
MWCD total	NA	17248.72	NA	NA
Development Communication (Centre Sector Scheme)	NA	158.3 (4.46)	NA	NA
Ministry Total	NA	3550.31	NA	NA

Notes: Figures in parentheses indicate percentages; NA- Not available in the Budget Documents.

allocation status does not weave much hope. In terms of IEC under SBM, there has been a 68 per cent decline between 2016-2017 and 2020-2021. The actual expenditure was 31.7 per cent of the BE in 2018-2019 which was a drop from about 64 per cent of the BE in 2017-2018. The MWCD houses several important schemes such as the Beti Bachao Beti Padhao, Swadhar Greh, Ujjwala, to name a few, under the Mission for Empowerment of Women. The allocations for information and mass communication under this Mission have tended to fluctuate. While it was about four per cent of the total allocations for the Mission in 2018-2019, it declined to less than 0.5 per cent during 2019-2020 and 2020-2021. Such meagre allocations for information and mass communication is bound to be fraught with untoward consequences, given that it is not possible to bring about women's empowerment in its truest sense without adequately engaging with the perceptions and behaviour of the community. This also has implications for nutrition, as already discussed. Allocations on development communication under

the Ministry of Information and Broadcasting hovered around 4-5 per cent with moderate fluctuations. The actual expenditure was also not poor, in fact exceeded the BE during specific years. Over-all, the situation on government spending on IEC is grim.

Figure 7: Temporal Changes in Actual Expenditure as a Percentage of Budget Estimates in Information Education Communication (IEC)



Source: Author's calculations based on Union Budget of India data.

V Conclusion

The condition of malnutrition in India is deeply deplorable. It has the highest burden of malnutrition among the South Asian countries and one of the highest in the world. Notwithstanding the fact that the government launched several schemes with renewed vigour during the 2010s, according to the MWCD, the total outlays on nutrition as a development head decreased from 20.7 crores (2.09 per cent of total Central plan outlays) in 2014-2015 to 15.32 crores (0.38 per cent of total social services outlays) in 2020-2021. However, there has been some positive change in terms of actual expenditure. The actual expenditure on nutrition increased from 43.7 per cent of the total BE in 2014-2015 to about 93.9 per cent of total BE in 2018-2019. In 2019-2020, the Revised Estimate (RE) exceeded BE. However, focusing on nutrition specific interventions is not enough to steer India out of its dismal malnourished condition. The Lancet 2013 series note that child stunting (i.e., low height-for-age) can be reduced by only about 20 per cent, should the nutrition-specific, interventions be scaled up to 90 per cent coverage, whereas

nutrition-sensitive interventions must be put into place if the remaining 80 per cent reduction in stunting is to be achieved (Bhutta, *et. al.* 2013). This paper points out that for most of the identified sectors that affect nutrition indirectly, the allocations as percentage to total outlays of the concerned Ministries/Departments is decreasing. Some positive trends do exist, with Beti Bachao Beti Padhao, National Rural Livelihood Mission and Pradhan Mantri Krishi Sinchai Yojana experiencing an increase in outlays as well as utilisation of funds. Merely these would not suffice. More concerted efforts need to be made in terms of increasing budgetary allocations for nutrition-sensitive interventions, particularly sanitation, women's empowerment, education, health, food security and IEC, if India is to emerge as "*Kuposhan Mukh Bharat*".

Endnotes

1. Several States in India have formulated their respective Nutrition Missions such as Atal Baal Mission in Madhya Pradesh; Baal Sukham in Gujarat and now Kuposhan Mukh Gujarat Maha Abhiyan; Rajmata Jijau Mission in Maharashtra; State Nutrition Missions in Uttar Pradesh, Karnataka and Jharkhand; Mission Manav Vikas in Bihar and Social Empowerment Mission in Andhra Pradesh, among others. Resources for these State Missions mostly include additional State resources, as well as some external resources too.
2. India plus Interventions is a set of 14 nutrition interventions mapped by the IFPRI in 2015. These are included in India's policy framework and also supported by recommendations from a large network of stakeholders in India, the Coalition for Food and Nutrition Security in India 2010. These interventions are based on latest demographic projections, local costing data based on programmatic experience that are compiled from numerous credible sources in India including the MoWCD, the NRHM, UNICEF India, Alive and Thrive and the Micronutrient Initiative. The indicators are: (a) Behaviour-Change interventions- counselling for mothers during pregnancy, counselling for optimal breast feeding to caregivers of children 0-6 months, counselling for complementary feeding and hand washing to caregivers of children 0-6 months; (b) micronutrient and deworming interventions: Vitamin A supplementation for children 6-59 months, ORS and therapeutic zinc supplements for treatment of diarrhoea for children 2-59 months, deworming for children 12-59 months, deworming for adolescents 11-18 years, iron supplements for 6-59 months children, iron-folic supplements for adolescents 11-18 years, iron supplements for pregnant and lactating women; (c) complementary and therapeutic feeding interventions- complementary food supplements, supplementary food rations, additional food rations for severely malnourished children;(d) Severe Acute Malnutrition (SAM) treatment- facility-based treatment for children 6-59 months; (e) Others- Insecticide treated nets for pregnant women in Malaria.
3. Kadiyala, *et. al.* (2014) identified three different pathways between women's work in agriculture and child nutrition outcomes, both positive and negative. First, through increased income and control over it, women are likely to have greater say in matters of household expenditures on food and health, patterns of food consumption and dietary diversities etc. Second, for younger children, women's work away from household and lack of proper breastfeeding facilities in the worksites would mean that these children would be deprived from the nutritional benefits of mothers' milk. Also, their supplementary feeding is also likely to get affected due to paucity of time for the mothers. Several scholars, in fact, have discussed about a time trade-off between care work and paid work (Engle, Menon, and Haddad 1999). Thirdly, increased double burden work casts a negative impact of the women's health (Bamji and Thimayamma 2000), and in turn, their ability to care for their children's health and nutrition (*see* recent reviews by Vijay Pandey, *et. al.* 2016 and Marie T. Ruel, *et. al.* 2018).

Kadiyala, *et. al.* (2014) conclude that seasonally high work burdens in agriculture have negative impact on nutritional outcomes, both of their children and themselves, “through time trade-offs, and their own health, due to energy stress”. Johnston, *et. al.* (2018) in their systematic review observe that although women play key role in agriculture, there is no clear-cut evidence of the interlinkages between women’s agriculture work and nutrition. In fact, they found that the nutritional implications vary with the characteristics of the households and how the members respond to seasonal shifts of work burden in agriculture. They further observe that household responses are influenced by factors like household income and ability to purchase food, household type and composition (in particular, the presence of members who can take up domestic work), seasonality in the organization of agricultural labour, and work intensity, which refers to energy expenditure. According to Johnston (2018), women could cope with such seasonalities through switching of tasks, altering the mix of occupations, falling back upon social organization and support, etc.

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Capacity Utilisation in Indian Pharmaceutical Industry: A Non-Parametric Frontier Analysis

Jaswinder Singh and Kawaljeet Kaur

The present paper endeavours to analyse the production structure and provide the trends of Capacity Utilization (CU) in Indian pharmaceutical industry during the period 1980-1981 to 2017-2018 by using the non-parametric frontier analysis. Tobit regression analysis has also been used to examine the factors affecting variations in capacity utilization. For this purpose, the entire period has been divided into pre-reforms, post-reforms, pre-TRIPS (Trade Related Intellectual Property Rights) and post-TRIPS period respectively. The empirical analysis based on the econometric technique shows that the translog production function with capital using non-neutral technological progress represents the technological relationship in Indian pharmaceutical industry. The empirical results reveal that the Indian pharmaceutical industry is operating with an average excess capacity to the tune of 11.4 per cent during the entire study period. However, the comparative analysis of capacity utilization during the pre-reforms and post-reforms period reveals that the average excess capacity has marginally declined in the post-reforms period by about 0.50 per cent. Moreover, it has also been observed that the excess capacity in Indian pharmaceutical industry has decreased from 12.2 per cent in pre-TRIPS period to 9.9 per cent during the post-TRIPS period. Therefore, the result shows that both the economic reforms and implementation of TRIPS agreement has a favourable impact on the capacity utilization in Indian pharmaceutical industry. Further, the analysis for the factors affecting capacity utilization in Indian pharmaceutical industry reveals that the selected explanatory variables like skill and profitability in the industry significantly affect the capacity utilisation levels in Indian pharmaceutical industry. Therefore, it can be inferred that in the era of globalization Indian pharmaceutical industry has to comply with strict business standards and boost the level of investment in the Research and Development activities in order to expand and utilize the potential capacity during the post-TRIPS regime.

Key Words: Capacity utilization, Data envelopment analysis, Pharmaceutical industry, TRIPS, Panel data tobit- regression

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Introduction

The basic objective of this paper is to analyse the inter-temporal variations in the Capacity Utilization (CU) of Indian pharmaceutical industry. The relevance of the study stems from the fact that the technical efficiency of Indian pharmaceutical industry remains constant throughout the study period and the variations in the technical efficiency of Indian pharmaceutical industry are very weak, therefore, the capacity utilization and productivity are the major factors which influence the growth of Indian pharmaceutical industry in the current economic scenario (Singh and Singh 2016). It is a well-known fact that the under-utilization of production capacity causes low level of pharmaceutical production, therefore, low level of production leads to mismatch in demand and supply and it results in the increase in price of medicinal and pharmaceutical products. The CU measure enables an industry to know about the extent of idle excess capacities available, and the inter-temporal differences in the degree of CU which depend precisely upon the ability in adjusting their fixed factors in the short run and the instances of cost inefficiency behaviour frequently observed in most industries are precisely due to the inability of adjusting fixed factors. It is therefore imperative to analyse the industry's behaviour concerning capacity utilization, as a key economic parameter of performance, in any competitive set up.

The analysis of CU also carries worth because "The Indian Pharmaceutical industry has achieved an eminent global position in the pharma sector and has been witnessing phenomenal growth in recent years. It is well known that India is emerging as a world leader in generic pharmaceuticals production, supplying 20 per cent of the global market for generic medicines. The industry accounts for 8 per cent of global production, and is exporting to over 200 countries. Indian pharmaceutical industry is a major vaccine producer and has 18 major vaccine manufacturing facilities. These vaccines are used for the national and international market which makes India a major vaccine supplier across the globe. Although India is the global supplier of high quality medicines, maintaining continuous access to essential medicines remains a challenge to the health system. To maintain continual access to affordable medicines and health products, it is necessary for Indian pharmaceutical industry to augment and engage in optimum utilization of its production capacity and to strengthen the generic Indian pharmaceutical enterprises to meet the quality, safety and efficacy standards at national and global level. This would further require efficient production and technology adoption measures to ensure smooth access to the essential and good quality medicines" (Indian Pharma Summit, 2014-2015).

India has initiated the major economic reform program in 1991 and by virtue of the economic reforms, Indian pharmaceutical industry has witnessed the intensive changes in its policy framework. The basic objective of the economic reforms of 1991 is to make the Indian industries as well as the entire economy technically efficient, technologically up-to-date and globally competitive, which will further ensure the rapid economic growth. The Indian pharmaceutical industry

has testified a major policy change as a result of economic reforms and TRIPS agreement under the aegis of WTO, which includes the deregulation of Indian industry and price controls were gradually being dismantled under the purview of Drugs Price Control Order (DPCO).

Moreover, the Drugs and Pharmaceutical industry of India has flourished under the process patent regime under the Indian Patent Act 1970, but in the globalised regime, the Indian pharmaceutical industry is required to follow the regulations of TRIPS agreement (product as well as process patent), which intends the industry to improve its production capacity and global competitiveness. To meet the TRIPS obligations, India has amended its patent law on March 22, 2005, by abolishing its “process” patents law and reintroduced “product” patent for pharmaceuticals products. Therefore, the Indian pharmaceutical industry has to compete with strict business standards and the implementation of TRIPS agreement has necessitated to boost the level of investment in the research and development in collaboration with the foreign MNCs or with the public research institutes, because research and development has been considered as the backbone of the pharmaceutical industry. Apart from the domestic investment, foreign capital in the form of Foreign Direct Investment (FDI) is essentially required with a view to bring new technology and research and managerial capabilities (Mazumdar 2013).

It is a well acknowledged fact that the performance of an industry depends upon the product of both internal and external environment factors. The external factors are uncontrollable from the management point of view like changes in the international standards under WTO, amendments in Patent Act and other government regulations, whereas the internal factors are controllable in nature like under-utilisation of capacity, inefficient use of inputs and other managerial inefficiencies. Moreover, in the current economic scenario, each and every industry is constantly engaged in the process of self-appraisal and search for tools for assessing its own current performance. This performance can be judged suitably by analysing the inter-temporal variations in various variables and performance indicators. In a capital scarce economy like India, manufacturing capacity utilization is a key indicator of economic performance which not only determines how much more output can be obtained by fuller utilization of existing capacity but also defines the required expansion of capacity. Thus, the study of capacity utilization is very important, because if Indian Pharmaceutical industry utilizes its optimum capacity then it will be able to expand on a sustained path and to match the medicinal demand (Drugs and medicine) of the society. Therefore, various experts have suggested that the sustained growth of Indian pharmaceutical industry is possible only through the efficient and optimum utilization of production capacity and with minimum wastage of resources.

In India, a very few attempts have been made to analyse the trends of capacity utilization in Indian manufacturing at aggregated level covering the Indian pharmaceutical industry, viz., Koti (1968), Divetia and Verma (1970), Karim and Bhide (1975), Seth (1986), Bhanu (2006), Sastry (1980), Mohandoss and

Subrahmanyam (1981), Subba Rao (1981), Burange (1992), Goldar and Ranganathan (1992), Burange (1993), Pohit and Satish (1995), Azeez (2002), etc. More specifically Ray and Pal (2008) have estimated the trends of Capacity Utilization in Indian Pharmaceutical industry during 1979-1980 to 2003-2004. The study has estimated the Translog cost frontier along with capacity utilization by applying minimum capital output ratio method. The analysis reveals that the trends of CU were declining during the study period. However, after the mid 90's the low actual output growth leads to significant declining trends of the CU in the industry. The study also shows that rapid expansion of capacity output as a result of economic reforms and stagnant demand were the main reasons for the declining trends of the CU in Indian chemical industry. Moreover, Sarba P. Ray (2011) has estimated the trends of capacity utilization in Indian pharmaceutical industry during 1979-1980 to 2007-2008 and assessed the impact of economic reforms on capacity utilization. The analysis found that the capacity utilization decreased in the post-reforms period as compared to the pre-reforms period, whereas the capacity output showed the increasing trends in the post-reforms period. In the above mentioned literature, most of the work has been done relating to the overall Indian manufacturing sector and comparatively scant attention was paid by the researchers to analyze the performance of Indian pharmaceutical industry during the post liberalisation and post-TRIPS period. After a careful perusal of the above studies, it has been observed that not much work has been done relating to inter-temporal comparisons of CU in Indian pharmaceutical industry.

The literature examination reveals that most of the studies have used conventional measures in measuring CU, and have paid insufficient attention to the possible theoretical problems. Since most of them followed the conventional engineering (installed capacity) and Wharton approaches, the principal problem underlying the interpretation of most of the existing studies is the weak link between the underlying economic theory and the used measures of capacity utilization. The present study is an attempt in this direction and aims to enrich the literature on capacity utilisation in Indian industries. This paper attempts to estimate the inter-temporal variations in the trends of capacity utilization in Indian pharmaceutical industry during the period 1980-1981 to 2017-2018 and it also assesses the impact of economic reforms and TRIPS agreement on capacity utilization in Indian pharmaceutical industry. For analysis purpose, linear programming based Data Envelopment Analysis (DEA) has been used to compute the capacity utilization variations in Indian pharmaceutical industry. "The choice of DEA to compute capacity utilization levels is governed by the fact that it is a non-parametric technique and doesn't require a priori specification of production function. Also, the information on input prices is not required to obtain the estimates of capacity utilization levels.

In this context, the present paper has been divided into four sections. Section I discusses the database and construction of relevant input and output variables and it also outlines the basic concept of capacity utilization and methodological framework to compute capacity utilization and it also provides the theoretical

underpinnings and methodological framework for the estimation of production structure. Section II presents the empirical results pertaining to the production structure and trends of inter-temporal variations in capacity utilization in Indian pharmaceutical industry whereas Section III discusses the empirical results of Tobit regression model estimation to evaluate the factors influencing the CU levels in Indian pharmaceutical industry. The last section concludes the discussions along with some policy suggestions.

I Construction of Input-Output Variables

Our empirical analysis is confined to the period 1980-1981 to 2017-2018, which has been further divided into four sub-periods on the basis of changes in macroeconomic policy governing the Indian economy and international agreements: i) Pre-reforms period (1980-1981 to 1990-1991); ii) Post-reforms period (1991-1992 to 2017-2018); iii) Pre-TRIPS period (1980-1981 to 2004-2005) and iv) Post-TRIPS period (2005-2006 to 2017-2018). For the analysis purpose, the four-digit aggregate level data has been extracted from the various reports of “Summary Results of Annual Survey of Industries”, a publication of Central Statistical Organization (CSO), Government of India. In the present study, one output (gross value added at constant prices) and two inputs (gross fixed capital at constant prices and number of employees) has been taken into account. All the monetary data have been deflated by using the appropriate price deflators at 2011-2012 base year. The detailed definitions of these inputs and outputs have been given in ASI as follows:

Gross Value Added

In the present study gross value added has been used as a measure of output, because “depreciation charges in the Indian industries are known to be highly arbitrary fixed by the income tax authorities and seldom represent true/actual capital consumption” (Jayadevan 1995, Goldar 1986). The Annual survey of industries publishes the series by using the following relation:

$$GVA = TO - TI \quad \dots(1)$$

Where GVA means Gross Value Added, TO and TI represent Total Output and Total Input respectively.

“The figures of Gross Value Added are arrived at by deducting the cost of total input from the value of total output. The figures of ‘total output’ comprise of total ex-factory value of products and by-products manufactured as well as other receipts from non-industrial services rendered to others, work done for others on material supplied by them, value of electricity produced and sold, sale value of goods sold in the same conditions purchased, addition in stock of semi-finished goods and value of own construction. However, ‘total inputs’ comprise

of total value of fuels, materials consumed as well as expenditures such as cost of contract and commission work done by others on materials supplied by the factory, cost of materials consumed for repair and maintenance work done by others to the factory's fixed assets, inward freight and transport charges, rate and taxes (excluding income tax), postage, telephone and telex expenses, insurance charges, banking charges, cost of printing and stationery and purchase value of goods sold in the same condition as purchased. Rent paid and interest paid are not included" (ASI)".

Labour Input

The Annual Survey of Industries provide three distinct measures of the labour input; a) Man-hours worked, b) Number of workers and c) Number of employees (which include both workers and persons other than workers such as supervisors, technicians etc. The present study has used the number of employees consisting of both non-production and production workers as a measure of labour input. As per the definition provided by ASI "the production workers relate to all persons employed directly or through agency whether for wages or not and engaged in any manufacturing process or in cleaning any part of the machinery or premises used for manufacturing process that are lying under the production workers. However, persons holding the positions of supervisor, or management or employed in administrative office, store keeping section and welfare section, engaged in the purchase of raw material, etc., are included in the non-production workers" (ASI).

Capital Input

In the present study, "we use the gross fixed capital stock as a measure of capital input. The standard practice of perpetual inventory method has been followed here to generate the series of gross fixed capital stock at constant prices. This requires a gross investment series, an asset price deflator, a depreciation rate, and a benchmark capital stock. We followed the procedure adopted by Martin and Warr (1990), Austria and Martin (1995), Wu (1997) and Fan, *et al.* (1999) for getting an estimate of initial value of capital stock. This procedure involves the following steps:

Step 1: The gross real investment (I_t) has been obtained by using relationship:

$$I_t = (B_t - B_{t-1} + D_t) / P_t \quad \dots(2)$$

Where

B_t = Book value of fixed capital in the year t ;

D_t = Value of depreciation of fixed assets in the year t ; and

P_t = Price index of machinery and machine tools in the year t .

Following Unel (2003) we have assumed the annual rate of discarding of capital or depreciation equals to five per cent.

Step 2: The logarithm of gross real investment was first regressed against a time trend to obtain its average growth rate ω and a trend value of investment at the beginning of the same, i.e., I_0 .

Step 3: Making the conventional assumption that the capital stock grows at a steady state at time t_0 the value of capital stock for initial year (K_0) has been then estimated as:

$$K_0 = \frac{I_0}{\omega + \delta} \quad \dots(3)$$

Where

K_0 = Gross value of initial capital stock;

ω = Estimated growth rate of investment; and

δ = Annual rate of discarding of capital.

In the present analysis, following Unel (2003) we have taken annual rate of discarding of capital equal to five per cent.

Step 4: After obtaining the estimate of fixed capital for the benchmark year, the following equation has been used for the measurement of gross fixed capital series at 2011-2012 prices:

$$K_t = K_{t-1} + I_t - \delta K_{t-1} \quad \dots(4)$$

Where

K_t = Gross fixed capital at 2011-2012 prices by the end of year t ;

I_t = Gross real investment in fixed capital during the year t ; and

δ = Annual rate of discarding of capital.

All the above variables has been deflated with 2011-2012 as prices using appropriate price deflators. After obtaining gross value added at constant price, gross fixed capital at constant prices and total employees we followed Ray (2002) and Kumar (2003) and divided these variables by the total number of factories in Indian pharmaceutical industry. This step provides us GVA at constant prices per factory, Gross Fixed Capital at constant prices per factory and total person engaged per factory in Indian Pharmaceutical Industry (ASI).

Construction of Environmental Variables

The inter-temporal variations in capacity utilization of Indian pharmaceutical industry may occur due to various factors such as access to technology, structural

rigidities, differential incentive systems, level of profitability, etc. In applied research, we often rely on regression analysis to examine the influence of environment factors on capacity utilization of the industry. Therefore, a set of environmental factors that have been used to explain variations in capacity utilization in Indian pharmaceutical industry, includes capital intensity (K/L), profitability (RETURN), share of capital (CS) and proportion of non-production employees to total employees (SKILL).

Measurement of Capital Intensity (K/L)

“The variable capital intensity (K/L) can be defined as gross fixed capital (i.e., capital in place) per employee. It is used as a measure of the relative degree of mechanization in the production process. We are not certain about the direction of relationship between capacity utilization and (K/L). On the one side, high capital intensity signifies modernization in the production process which can increase the CU of Indian pharmaceutical industry, whereas on the other, if the increased capital per man remains underutilized owing to some other causes, the excess capacity will increase and the increased excess capacity will further enhance technical inefficiencies. Therefore, it has been hypothesized that capital intensity variable may have either a positive or negative influence on capacity utilization” (Kumar 2001).

Measurement of SKILL

“The variable SKILL represents the availability of human skills and highlights the availability of the trained manpower including supervisory, administrative and managerial staff. Following Ghosh and Neogi (1993) and Kumar and Arora (2007), it was measured as the ratio of skilled persons (i.e., all employees minus production workers) to all employees” (Kumar 2001). In the present study, it has been hypothesized that SKILL affects the capacity utilization levels positively.

Measurement of Profitability (RETURN)

“The variable RETURN is defined as the ratio of contribution of capital to gross fixed capital. The contribution of the capital has been worked out by subtracting emoluments from gross value added. The variable RETURN is used as a proxy for the level of profitability in the industry. We hypothesize that profitability has a positive relationship with the Capacity Utilisation of Indian pharmaceutical industry, i.e., higher profitability acts as an incentive to exploit the available capacity up to its optimum extent, and *vice-versa*” (Kumar 2001).

Measurement of Factor Shares (Share of Labour and Capital)

“The share of labour (S_L) has been obtained by the ratio of the total emoluments to gross value added. By assuming constant returns to scale, the share of capital input has been worked out as one minus share of labour, i.e., $S_K = (1 - S_L)$ ” (Kumar 2001). These factor shares have been calculated in order to analyse the impact of environment factors on capacity utilization in Indian Pharmaceutical Industry with reference to Kumar 2001.

Production Structure: Concept and Measurement

A production function is a mathematical statement which describes the technological relationship between inputs and output in physical terms or it is the functional relationship which presents the transformation of physical inputs into physical outputs. It also presents the quantitative relationship between quantity of inputs and output. “The production function is the name given to the relationship between the rates of input of productive services and the rate of output of product. It is economist’s summary of technological knowledge” (G.J. Stigler 1953). “More precisely the production function states the maximum quantity of output that can be produced from any given amount of various inputs per period of time or it states that the minimum quantity of various inputs that are required to yield a given quantity of output per period of time, technology being assumed to be remain constant. It is important to note that when a change in technology occurs such as introduction of a new technology or the substitution of skilled labour for unskilled labour then we will get a new production function” (Ahuja 2014).

Moreover, the present study attempts to estimate different components and parameters of the technical change with the use of the production function approach. A production function captures the relationship between the outputs obtainable from a given set of inputs at a specified stage of technical change. The present study restricts itself to use the translog production function... In algebraical form, production function can be represented as:

$$Q = f(K, L) \quad \dots(5)$$

Where, Q is the output of the industry, K is the quantity of the capital employed and L is the quantity of labour employed.

Transcendental Logarithmic (Translog) Production Function

The production structure in the Indian pharmaceutical industry has been analysed with the help of Translog production function. The term “Translog production function”, abridged from “transcendental logarithmic production function” which was proposed by Christiansen, Jorgenson and Lau in their two papers published in 1971 and 1973, which dealt with the problems of strong separateness and

homogeneity of Cobb-Douglas and CES production functions and their implications for the production frontier. Therefore, the Translog production function has been developed by Christensen, Jorgenson and Lau (1973). The Translog production function is conceptually simple and imposes no a-priori restrictions on elasticities of substitution and returns to scale; hence its wide use in empirical analysis. The translog production function has been used to examine input substitution (Berndt and Christensen, 1973), separateness and aggregation (Denny and Fuss 1977), technical change and productivity growth (May and Denny 1979), and productive efficiency (Greene 1980). "The Translog production function specification is a flexible functional form imposing relatively few a-priori restrictions on the properties of the underlying technology. It allows for variable elasticity of substitution (VES), variable scale elasticity and non-neutral technological progress. Homotheticity, separateness and CRTS can be imposed by testable restrictions on the parameters, and the form reduces to the multiple input Cobb-Douglas specification as a special case" (Kumar 2001). The Translog production function with n inputs and general factor-augmenting technical progress takes the form:

$$\ln Y = \beta_0 + \beta_1 t + \beta_K \ln K + \beta_L \ln L + \left(\frac{1}{2}\right) \beta_{KK} (\ln K)^2 + \beta_{KL} \ln K \ln L + \beta_{Lt} t \ln K + \beta_{Lt} t \ln L + \beta_{tt} (t)^2$$

$$\ln Y = \beta_0 + \beta_1 t + \beta_{tt} t^2 + \sum_{k=1}^m \beta_k \ln X_k + \frac{1}{2} \sum_{k=1}^m \sum_{j=1}^m \beta_{kj} \ln X_k \ln X_j + \sum_{k=1}^m \beta_{kt} (\ln X_k) t + \mu_t - v_t \quad \dots(6)$$

Where, Y is index of output, ' X_k ' represents the ' k^{th} ' input, t is time variable allowing non-neutral technological change and β 's are the parameters of the production function. ' μ_t ' is assumed to be independently and identically distributed normal, random errors, having zero means and unknown variance and ' v_t ' is technical inefficiency. "The Translog production function specification is a flexible functional form imposing relatively few a-priori restrictions on the properties of the underlying technology. Also, it does not assume a Hicks-neutral or a constant rate of technological change and the elasticity of substitution between inputs is allowed to vary with the level of inputs" (Kumar 2001). Moreover, in the specification of Translog production function, the elasticity of output with respect to inputs and capital are not constant as in Cobb-Douglas production function and the change depends on the levels of input and time. The elasticity of output of each variable input is:

$$\frac{\delta \ln Y}{\delta \ln L} = \beta_L + \beta_{LL} \ln L + \beta_{LK} \ln K + \beta_{Lt} t \quad \dots(7)$$

$$\frac{\delta \ln Y}{\delta \ln K} = \beta_K + \beta_{KK} \ln K + \beta_{LK} \ln L + \beta_{Kt} t \quad \dots(8)$$

$$\frac{\delta \ln Y}{\delta \ln X_k} = \beta_k + \sum_k \beta_{kj} \text{Log} X_j + \beta_{kt} t \quad \dots(9)$$

Since elasticity of output as well as factor shares vary with input levels in the Translog production function, the elasticity of substitution is also a function of input levels and is not a constant. The expression for the rate of technical progress in a Translog production function is given a

$$\frac{\delta \ln}{\delta t} = \beta_t + \beta_{tt} \cdot t + \beta_{Kt} \cdot \ln K + \beta_{Lt} \cdot \ln L \quad \dots(10)$$

Where β_t is the rate of autonomous technical progress (TFPG), β_{tt} is the rate of change in technical progress and β_{Lt} and β_{Kt} define the bias in technical progress. If both β_{Lt} and β_{Kt} are zero, the technical progress is the Hicks-neutral type. If β_{Kt} is positive, the share of capital increases and there is capital using bias.

“The estimation of the stochastic frontier translog production function made it possible to verify whether the deviation in technical efficiencies from the frontier output is due to industry specific factors or due to external random factors.” The estimates of the parameters of the Translog production function are generally obtained either by ‘Ridge Regression technique’ or ‘OLS’ technique and indirect estimation of share equations by Zellner’s Seemingly Unrelated regression estimations (SURE) method” (Kumar, 2001)

“The translog production functions represent in fact a class of flexible functional forms for the production functions” (Ch. Allen, St. Hall 1997). “One of the main advantages of the respective production function is that, unlike in case of Cobb- Douglas production function, it does not assume rigid premises such as: perfect or “smooth” substitution between production factors or perfect competition on the production factors market” (J. Klacsek, *et. al.* 2007). Also, the concept of the translog production function permits to pass from a linear relationship between the output and the production factors, which are taken into account, to a nonlinear one. Due to its properties, the translog production function can be used for the second order approximation of a linear-homogenous production, the estimation of the Allen elasticities of substitution, the estimation of the production frontier or the measurement of the total factor productivity dynamics. “Moreover, one significant drawback of Translog production function specification is that it is not globally well behaved in the sense that monotonicity and quasi-concavity conditions may not be satisfied globally. A production function is well behaved if it has positive marginal product for all inputs and is quasi-concave. The condition of positive marginal products or positive monotonicity requires that $(\delta Y / \delta X_k) > 0$. The quasi-concavity condition requires the Hessian matrix to be definite negative. It is to note that Translog production function will not possess these properties at all points. However, if a range of data points can be found for the inputs and output where the properties do hold, the function can be considered well

behaved and provides a good representation of underlying production technology” (Kumar 2001).

In Translog production function, where at least one $\beta_{kj} \neq 0$, where k and j refers to the inputs, there exist configuration of inputs such that neither monotonicity nor concavity is satisfied, following simply the quadratic nature of the translog production function, the concavity can be assured if constant returns to scale are imposed and own share elasticities are non-positive. If translog production function is well behaved, it is possible to explore its characteristics with respect to homotheticity and constant return to scale. However, it is also possible to impose homotheticity and constant return to scale by testable restrictions on the parameters. The homotheticity implies that marginal rate of substitution between labour and capital is constant at constant capital-labour ratio. Therefore, the optimal factor proportions are independent of scale. In translog production function, the condition for homotheticity is given as:

$$\beta_{LL} + \beta_{LK} = 0 \text{ and } \beta_{KK} + \beta_{LK} = 0$$

$$\sum_k \beta_{kj} = 0 \quad \dots(11)$$

In addition to the restriction of homotheticity, the Translog production function also requires the restriction of constant return to scale, which is given as:

$$\beta_K + \beta_L = 1$$

$$\sum \beta_k = 1 \quad \dots(12)$$

The translog production function reduces to Cobb-Douglas production function if:

$$\beta_{kj} = 0 \text{ for all } k \text{ and } j \quad \dots(13)$$

Capacity Utilization: Concept and Measurement

“Capacity is a short-run concept, for which firms and industry face short-run constraints, such as the stock of capital or other fixed inputs, existing regulations, the state of technology and other technological constraints” (Morrison 1985). However, measuring the rate of capacity utilization requires identifying the capacity output, i.e., Y^* and then, the capacity utilization rate is defined as the ratio of the actual output Y_0 to capacity output” (Kirkley, *et. al.* 2002), which can be written as:

$$CU = Y_0/Y^* \quad \dots(14)$$

However, the notion of capacity output has been defined in two alternative ways; i) primal-technology based or engineering concept; and ii) an economic based concept. Moreover, capacity utilization is usually defined as the ratio of actual output to some measure of potential output. Two dominant approaches exist in the literature to measure potential output which includes technological approach and economic approach. As per the primal-technology based engineering concept, “the (weighted) average of the ratios between the actual output of firms to the maximum that could be produced per unit of time, with existing plant and equipment or the potential output may be technologically derived and hence defined relative to the maximum possible physical output that the fixed inputs are capable of supporting when the variable inputs are fully utilized” (Johanson 1968). “Alternatively, full capacity output is that level of output which the existing stock of equipment is intended to produce under normal conditions with respect to the use of variable inputs” (Smithies 1957). On the other hand, economic concepts measure the full capacity output of the firm at the point where average cost is minimum (Chamberlin 1947). Thus, from the point of view of an economist, the potential output can be defined relative to an economic optimum such as the level of output, which minimizes cost or maximizes revenue or profits (Gréboval and Munro 1999).

Capacity Utilisation Measurement Based on Data Envelopment Analysis (DEA)

In the present study, the Production Frontier based data envelopment analysis (DEA) method has also been preferred to develop a Capacity Utilisation index for analysing the inter-temporal variations in CU of Indian Pharmaceutical Industry. Because it does not require any pre-supposition regarding the technical nature of production or cost functions (i.e., Cobb-Douglas, CES or Translog, etc.). “DEA is a mathematical programming approach for estimating the relative technical efficiency (TE) of production activities. The term DEA was originally proposed by Charnes, *et. al.* (1978). The Charnes, *et. al.* work extended the Farrell (1957) multiple input, single output measure of technical efficiency to the multiple-output, multiple input technology. Since the early Charnes, *et. al.* work, however, DEA has developed and expanded to include a wide variety of applications. DEA has been used to assess technical efficiency, scope, scale, and allocative efficiency. It has also been used to estimate optimal input utilization, productivity, identify strategic groups, determine benchmarks and total quality management programs, estimate social and private costs of regulating undesirable outputs and capacity” (Kirkley, *et. al.* 2000). “The DEA models have been extended from the static, deterministic models to include dynamics and stochastic aspects” (Fare and Grosskopf 1996, Banker 1990, and Resti 2000).

“The DEA approach derives a deterministic production frontier describing the most technically efficient combination of outputs, given the state of technology, fixed and variable inputs. The DEA approach calculates capacity

output, given the variable factors are unbounded and fixed factors, and state of technology constraint output. Capacity output corresponds to the output that could be produced, given full and efficient utilization of variable inputs and given the constraints imposed by the capacity base, i.e., the fixed factors, the state of technology, environmental conditions and resource stock. In practice, because the data reflect both technological and economic decisions made by the firm, the variable inputs correspond to full and efficient utilization under normal operating conditions" (Färe, *et. al.* 1989). The mathematical model to compute capacity measure, proposed by the Färe, *et. al.* (1994) can be defined as follows:

$$\begin{aligned} &\text{Maximize } \theta_t \\ &(\theta_t, \lambda, \mu) \end{aligned} \quad \dots(15)$$

Subject to:

$$\begin{aligned} \theta_t y_t &\leq \lambda' Y, \\ x_{tm} &\geq \lambda' X_m, m \in F_x \\ \mu_{tn} x_{tn} &= \lambda' X_n, n \in V_x \\ \lambda, \mu_t &\geq 0 \end{aligned}$$

"Where, θ_t = capacity measure at time t . Assume there are 'm' fixed inputs, 'n' variable inputs and 'k' outputs, then x_{tm} , x_{tn} and y_{tk} are denotes as fixed input, variable inputs and output for t^{th} year respectively. Thus, x_{tm} is a $(m \times 1)$ column vector, x_{tn} is a $(n \times 1)$ column vector and y_{tk} is a $(k \times 1)$ column vector. Moreover, $X_m = (x_1, x_2, \dots, x_t)$ is the $(m \times T)$ matrix of fixed inputs, $X_n = (x_1, x_2, \dots, x_t)$ is the $(n \times T)$ matrix of variable inputs and $Y = (y_1, y_2, \dots, y_t)$ is the $k \times T$ output matrix. Further, λ is vector of intensity variable of order $T \times 1$ and μ_{tn} represents input utilization rate of variable input 'n' at time 't' and defined as the ratio of the optimal use of each input to its actual usage. "However, Capacity Utilization (CU) generally refers to the proportion of potential capacity that is used, and is typically measured as the ratio of actual output to capacity output" (Kirkley and Squires 1999). This ratio cannot exceed unity" (Färe, *et. al.* 1989). Färe, *et. al.* (1989) proposed that CU be measured as the ratio of output oriented technical efficiency to the capacity measure, i.e.

$$(CU_{DEA})_t = \phi_t / \theta_t \quad \dots(16)$$

Where, ' ϕ_t ' represents technical efficiency score for the selected industry at time 't' and θ_t denotes capacity measure for the selected industry at time 't'. The ' ϕ_t ' can be defined from the following model which is popularly known as output-oriented CCR model.

$$\begin{aligned} &\text{Maximise } \phi_t \\ &(\theta_t, \lambda) \end{aligned} \quad \dots(17)$$

$$\begin{aligned} \text{Subject to } & \theta_t y_t \leq \lambda' Y, \\ & x_t \geq \lambda' X, \\ & \lambda \geq 0 \end{aligned}$$

In model (17) the output constraint is same as given in model (15) whereas, the handling of input constraints differs to some extent. In model (17), each input acquires same treatment and no differences exist between fixed and variable inputs. Thus, $X = (x_1, x_2, \dots, x_T)$ becomes a matrix of order $\{(m + n) \times T\}$. It is evident from relation (16) that capacity utilization and technical efficiency are related with each other. We made use of relationship (16) to compute the levels of capacity utilization in Indian pharmaceutical industry. The data on the above mentioned selected variables were analysed empirically and results were interpreted accordingly.

II Empirical Results

The maximum likelihood technique has been used to estimate the different variants of the stochastic frontier production function. The empirical analysis based on the econometric technique shows that the Cobb-Douglas production function with Hicks-neutral technical progress is not appropriate in case of Indian pharmaceutical industry. Therefore, it has been observed that the translog production function with capital using non-neutral technological progress represents the technological relationship in Indian pharmaceutical industry. Assuming the transcendent logarithmic translog production function, the estimated parameters of the production frontier and estimates of the technical efficiency are presented in table 1.2 and 1.3 respectively Table 1.1 shows the empirical results pertaining to the estimates of the elasticities of mean output with respect to labour, capital and rate of technical progress to the tune of 17.09, 19.38 and -0.49 respectively. Therefore, the estimated results of a translog stochastic production frontier show that the coefficients of labour and capital have expected positive signs. The positive and highly significant coefficients confirm the expected positive and significant output effects of labour and capital. The empirical findings suggest that one per cent increase in the labour input or employment leads to 17.09 per cent increase in output of the Indian pharmaceutical industry and 1 per cent increase in the capital inputs leads to 19.38 per cent increase in the output of Indian pharmaceutical industry.

Moreover, the elasticity estimates of labour and capital are statistically significant at 1 per cent level of significance. In contrast, the squared variable of labour $[(\ln L)^2]$ is negative and statistically significant at a five per cent level, which indicates a diminishing return to labour input. The same is also true for the squared capital. Its estimated coefficient, while negative, turns out to be statistically significant at 1 per cent level, where it also indicates the diminishing returns to capital input. Furthermore, the estimated coefficient of the interacting variable between labour and capital $(\ln L * \ln K)$ is negative and significant at a 10

per cent, suggesting a little substitution effect between labour and capital. Moreover, for time variables, coefficients of time (T) is negative and statistically significant at five per cent level whereas its square are negative and statistically insignificant. A non-neutral technological progress toward capital is indicated by a positive and statistically significant (at 10 per cent level) coefficient of the interacting variable between time and capital ($T * \ln K$). Moreover, the empirical analysis suggests that the return to scale seems to be constant return to scale.

Table 1.1: Maximum Likelihood Estimation for Parameters of the Translog Production Function

Variables	Parameters	Coefficients	Standard Error	Z-Values	P-Values
Constant	β_0	-89.18605	25.70461	-3.47	0.001 *
Labour	β_1	17.09153	5.516745	3.10	0.002 *
Capital	β_2	19.38344	5.504622	3.52	0.000 *
Time	β_3	-0.493413	0.225713	-2.19	0.029 **
(Labour) ²	β_{11}	-1.957729	0.770692	-2.54	0.011 **
(Capital) ²	β_{22}	-2.096249	0.546066	-3.84	0.000 *
(Time) ²	β_{33}	-.0007227	0.001475	-0.49	0.624
Labour \times Capital	β_{12}	-1.512255	0.910262	-1.66	0.097 ***
Labour \times Time	β_{13}	0.0327601	0.057120	0.57	0.566
Capital \times Time	β_{23}	0.0590215	0.031356	1.88	0.060 ***
Log Likelihood Function		48.981305			0.000 *
	σ^2	.0047544	0.0014920		
	Λ	.0404023			
	M	.0027835	0.2911156		
	N	.0688956	0.0088910		

Note: *, ** and *** indicates the level of significance at one per cent, five per cent and 10 per cent respectively.

Source: Author's Calculations.

Moreover, this section also presents the empirical results pertaining to the inter-temporal variations in the trends of capacity utilization in Indian pharmaceutical industry during 1980-1981 to 2017-2018, which has been further divided into four sub-periods i) Pre-reforms 1980-1981 to 1990-1991; ii) Post-Reforms 1991-1992 to 2017-2018; iii) Pre-TRIPS 1980-1981 to 2004-2005 and iv) Post-TRIPS period 2005-2006 to 2017-2018. Table 1.2, shows the trends of capacity utilization and excess capacity in Indian pharmaceutical industry during 1980-1981 to 2017-2018. The result shows that the capacity utilization in Indian pharmaceutical industry has varied between maximum of 93.8 per cent (0.938) and minimum of 77.4 per cent (0.774), whereas the average CU during the entire study period is recorded to the tune of 88.6 per cent (0.886). The average CU reveals that in each year of the study, the level of CU, on an average, is about 88.6 per cent in Indian pharmaceutical industry. Therefore, the average amount of excess capacity is about 11.4 per cent in Indian pharmaceutical industry during the

entire study period. The inter-temporal analysis of CU in Indian pharmaceutical industry indicates that the maximum CU has been observed in year 2016-2017 to the tune of 93.8 per cent, whereas the Indian pharmaceutical industry has experienced the minimum CU to the amount of 77.4 per cent during 1988-1989.

The comparative analysis of CU during the pre-reforms and post-reforms period reveals that the average capacity utilization in Indian pharmaceutical industry has experienced a minute increase in the post-reform period, as it has increased from 88.1 per cent (in Pre-Reforms period) to 88.8 per cent during the post-reforms period. Moreover, in order to examine the impact of TRIPS agreement on capacity utilization in Indian pharmaceutical industry the entire period has been divided into Pre-TRIPS and Post-TRIPS period. The empirical result reveals that capacity utilisation in Indian pharmaceutical industry has increased from 87.8 per cent in the pre-TRIPS period to 90.1 per cent during the post-TRIPS period. It is to be concluded from the comparative analysis that both the economic reforms of 1991 and implementation of TRIPS agreement has a favourable impact on the capacity utilization in Indian pharmaceutical industry. Therefore, the economic reforms of 1991 s integrated the Indian economy with world economy and it modernised the technological know-how and improvement in the skill of the labour force which further helped to reduce the inefficiencies and in-turn the optimum allocation and utilisation of input resource are major factors responsible for improvement in CU in Indian pharmaceutical industry.

Table 1.2: Estimated Trends of Capacity Utilisation in Indian Pharmaceutical Industry

Year	CU	EC = (1-CU)
1980-81	0.901	0.099
1981-82	0.901	0.099
1982-83	0.908	0.092
1983-84	0.902	0.098
1984-85	0.911	0.089
1985-86	0.901	0.099
1986-87	0.860	0.140
1987-88	0.840	0.160
1988-89	0.774	0.226
1989-90	0.887	0.113
1990-91	0.907	0.093
1991-92	0.877	0.123
1992-93	0.856	0.144
1993-94	0.858	0.142
1994-95	0.87	0.13
1995-96	0.869	0.131
1996-97	0.879	0.121

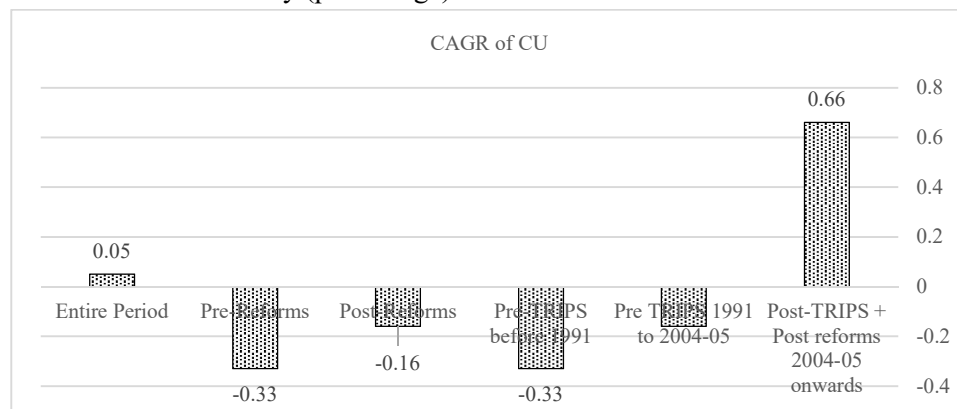
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Table 1.2: Estimated Trends of Capacity Utilisation in Indian Pharmaceutical Industry

Year	CU	EC = (1-CU)
1997-98	0.834	0.166
1998-99	0.864	0.136
1999-00	0.867	0.133
2000-01	0.879	0.121
2001-02	0.902	0.098
2002-03	0.887	0.113
2003-04	0.919	0.081
2004-05	0.916	0.084
2005-06	0.926	0.074
2006-07	0.897	0.103
2007-08	0.839	0.161
2008-09	0.877	0.123
2009-10	0.881	0.119
2010-11	0.891	0.109
2011-12	0.882	0.118
2012-13	0.895	0.105
2013-14	0.927	0.073
2014-15	0.911	0.089
2015-16	0.931	0.069
2016-17	0.938	0.062
2017-18	0.908	0.092
Entire Period	0.886	0.114
Pre-Reforms	0.881	0.119
Post-Reforms	0.888	0.112
Pre-TRIPS	0.878	0.122
Post-TRIPS	0.901	0.099

Source: Author's Calculations.

Figure 2: Compound Annual Growth Rate of Capacity Utilisation in Indian Pharmaceutical Industry (percentage)



Source: Author's Calculations.

Further, the implementation of more rigorous TRIPS agreement has a favourable impact on the capacity utilisation in Indian pharmaceutical industry, because in the post-TRIPS regime the increase in research and development expenditure and global competitiveness leads to decline in the waste of input resources and enables the Indian pharmaceutical industry to utilize its potential capacity. In addition to this, the perusal of Compound Annual Growth Rate (CAGR) of capacity utilization during the entire study period is presented in Fig 2. The analysis shows that the CAGR of capacity utilization during the entire study period is observed to be 0.05 per cent. On the one hand, the comparison of CAGR of CU levels during the Pre-reforms and Post-reforms reveals that the growth of capacity utilization increased in the post-reforms period. Here, it is to note that the capacity utilization declined at a rate of -0.16 per cent in the post-Reforms period up to 2004-2005 in comparison to -0.33 per cent in the pre-reforms period. On the other hand, the analysis of the comparison of CAGR of CU levels during the Pre-TRIPS and Post-TRIPS indicates that growth rates of capacity utilization increased in the post-TRIPS period along with post-reforms period to the tune of 0.66 per cent, whereas the CU level declined at -0.33 per cent during the pre-TRIPS period up to 1991 and -0.16 up to 2004-2005. In the nutshell, we can safely infer that the excess capacity in Indian pharmaceutical industry declined in the Post-Reforms and Post-TRIPS period

III Factors Affecting Variations in Capacity Utilization

In the above analysis, the inter-temporal variations in CU of Indian pharmaceutical industry have been observed. However, there are various factors which are responsible for the variations such as access to technology, structural rigidities, differential incentive systems, level of profitability, etc. “In applied research, we often rely on regression analysis to examine the influence of environment factors on capacity utilization. Unfortunately, the simple linear regression model is not appropriate in the present context, because the range of CU levels (dependent variable) is (0,1), therefore, estimation of the model using ordinary least square procedure may produce biased estimates if there is a significant position of the observations equal to one” (Resende 2000). “In such cases, the appropriate regression model is known as a Tobit or Censored regression model which handles data that is skewed and truncated” (Avkiran 1999).

The Tobit model is a statistical model proposed by James Tobin (1958) to describe the relationship between a non-negative dependent variable y_i and an independent variable x_i . The model supposes that there is a latent (unobservable variable) y_i^* . This variable linearly depends on x_i via a parameter (vector) β which determines the relationship between the independent variable (or vector) x_i and the latent variable y_i^* (just as in a linear model). In addition, the error term e_i is normally distributed to capture random influences on this relationship. The observable variable y_i is defined to be equal to the latent variable whenever the latent variable is above zero and zero otherwise.

$$\begin{aligned}
y_i &= y_i^* \text{ (if } y_i^* > 0 \text{)} \\
y_i &= 0 \text{ (if } y_i^* \leq 0 \text{)} \\
y_{it}^* &= \sum_{j=1}^N \alpha_j z_{ij} + \sum_{j=1}^N \beta_j x_{it}^j + \varepsilon_{it} \\
y_{it} &= y_{it}^*, \text{ if } y_{it}^* < 1, \text{ and} \\
y_{it} &= 1, \text{ otherwise}
\end{aligned}
\quad \left. \vphantom{\begin{aligned} y_i &= y_i^* \text{ (if } y_i^* > 0 \text{)} \\ y_i &= 0 \text{ (if } y_i^* \leq 0 \text{)} \\ y_{it}^* &= \sum_{j=1}^N \alpha_j z_{ij} + \sum_{j=1}^N \beta_j x_{it}^j + \varepsilon_{it} \\ y_{it} &= y_{it}^*, \text{ if } y_{it}^* < 1, \text{ and} \\ y_{it} &= 1, \text{ otherwise} \end{aligned}} \right\} \dots(18)$$

Where $z_{ij} = 1$ if $i = j$ '0' otherwise and $\varepsilon_{it} \sim N(0, \sigma_\varepsilon^2)$

However, x_{ij}^j represent the j th explanatory variables and β_j are corresponding parameters. The y_{it}^* is a latent variable and y_{it} is the dependent variable. The joint probability function or likelihood function can be written as:

$$\begin{aligned}
f \left[\left(y_{i1} \dots \frac{y_{iT}}{x_{i1}} \dots x_{iT}, z_{i1} \dots z_{iT} \right), (\alpha_j, \beta_j) \right] &= \int \prod_{t=1}^T f(y_{it}/x_{it}, z_{it}, \alpha_j, \beta_j) d\varepsilon_{it} \\
f \left[\frac{y_{it}}{x_{it}, z_{it}}, (\alpha_j, \beta_j) \right] &= \frac{1}{\sqrt{2\pi\sigma_\varepsilon^2}} e^{\frac{-1(y_{it} - \sum_{j=1}^N \alpha_j z_{ij} - \sum_{j=1}^k \beta_j x_{ij})^2}{\sigma_\varepsilon^2}} \text{ if } y_{it} < 1 \\
\text{and } &= \phi \left[\frac{\sum_{j=1}^N \alpha_j z_{ij} + \sum_{j=1}^k \beta_j x_{it}^j}{\sigma_e} \right] \text{ if } y_{it} = 1
\end{aligned}$$

Further, the Random effects panel data Tobit model can be written as

$$\begin{aligned}
y_{it}^* &= \sum_{j=1}^k \beta_j x_{it}^j + \mu_i + v_{it} \\
y_{it} &= y_{it}^*, \text{ if } y_{it}^* < 1 \text{ and } y_{it} = 1 \text{ otherwise}
\end{aligned}
\quad \left. \vphantom{\begin{aligned} y_{it}^* &= \sum_{j=1}^k \beta_j x_{it}^j + \mu_i + v_{it} \\ y_{it} &= y_{it}^*, \text{ if } y_{it}^* < 1 \text{ and } y_{it} = 1 \text{ otherwise} \end{aligned}} \right\} \dots(19)$$

Where $\mu_i \sim N(0, \sigma_\mu^2)$ and $v_{it} \sim N(0, \sigma_v^2)$ are assumed to be independent of x_{i1}, \dots, x_{iT} , using f as generic notation for a density or probability mass function the likelihood function for model '19' can be written as

$$f(y_{i1} \dots y_{iT}/x_{i1} \dots x_{iT}, \beta_j) = \int \prod_{t=1}^T f(y_{it}/x_{it}, \mu_i, \beta_j) f(\mu_i) d\mu_i$$

$$f(\mu_i) = \frac{1}{\sqrt{2\pi\sigma_\mu^2}} e^{\frac{-1}{2} \frac{\mu_i^2}{\sigma_\mu^2}}, \quad \dots(20)$$

and

$$f\left[\left(\frac{y_{it}}{x_{it}}\right), (\mu_i, \beta_j)\right] = \frac{1}{\sqrt{2\pi\sigma_v^2}} e^{\frac{-1}{2} \frac{(y_{it} - \sum_{j=1}^k \beta_j x_{it}^j - \mu_i)^2}{\sigma_v^2}} \text{ if } y_{it} < 1$$

$$= \phi\left[\frac{\sum_{j=1}^k \beta_j x_{it}^j + \mu_i}{\sigma_v}\right] \text{ if } y_{it} = 1$$

In the present study, capital intensity (K/L), profitability (RETURN), proportion of non-production employees to total employees (SKILL) and share of labour (S_L) have been used as explanatory variables to explain the variations in capacity utilization in Indian pharmaceutical industry.

Table 1.3: Results of the Tobit Regression Model

Explanatory variables (Parameters)	Coefficients	Standard Error	Z-Values	P-Values
CONSTANT	.72196	.07025	10.28	.000 *
SKILL	.10834	.05297	2.05	.041 **
RETURNS	.23884	.07058	3.38	.001 *
LSHA	.02125	.03479	0.61	.541
KL	5.48e-07	6.79e-07	0.81	.419
LR-Test	17.92			.000 *

Notes: i) * and ** represents the level of significance at one per cent and five per cent respectively; ii) LR test stands for the Likelihood-Ratio Chi-square test.

Source: Author's Calculations.

Table 1.3 presents the Tobit regression results. The result shows that the explanatory variables SKILL and RETURNS are significantly affecting the Capacity Utilisation levels in Indian Pharmaceutical industry. However, both the variable SKILL and RETURNS bears a sign in agreement with a-priori expectations, and thus found to be positively affecting capacity utilization in Indian pharmaceutical industry. The direct connotation of this result is that with the increase in profitability and availability of more skilled employees leads to increase in capacity utilization and optimum utilization of the potential capacity in Indian pharmaceutical industry. Therefore, the empirical analysis suggests that the efforts must be taken to enhance the profitability and skill of labour force to realize

the full capacity utilization in Indian pharmaceutical industry. Moreover, a positive and a statistically significant coefficient of RETURN supports our inference about the positive impact of it on CU levels in Indian pharmaceutical industry. Therefore, unskilled labour force and low returns are major reasons for excess capacity in Indian pharmaceutical industry. Further, the share of labour and capital intensity did not show any significant impact on the capacity utilization in Indian pharmaceutical industry. However, the likelihood ratio chi-square of 17.92 with a p-value of 0.000 tells us that our model as a whole is significantly fit.

IV Conclusion

The present study aims to analyse the production structure and the inter-temporal variations in capacity utilization in Indian pharmaceutical industry during 1980-1981 to 2017-2018. The maximum likelihood technique has been used to estimate the different variants of the stochastic frontier production function. The empirical analysis based on the econometric technique shows that the Cobb-Douglas production function with Hicks-neutral technical progress is not appropriate in case of Indian pharmaceutical industry. Therefore, it has been observed that the translog production function with capital using non-neutral technological progress represents the technological relationship in Indian pharmaceutical industry. The estimates of capacity utilization have been computed by applying the linear programming based Data Envelopment Analysis (DEA). The empirical analysis reveals that the Indian pharmaceutical industry is operating with an average excess capacity to the tune of 11.4 per cent during the entire study period. However, the comparative analysis of capacity utilization during the pre-reforms and post-reforms period reveals that the average excess capacity marginally declined in the post-reforms period by about 0.50 per cent. Moreover, it has also been observed that capacity utilisation in Indian pharmaceutical industry increased from 87.8 per cent in the pre-TRIPS period to 90.1 per cent during the post-TRIPS period. Therefore, the excess capacity in Indian pharmaceutical industry decreased from 12.2 per cent in pre-TRIPS period to 9.9 per cent during the post-TRIPS period. Thus, it is to be concluded from the comparative analysis that both the economic reforms and implementation of TRIPS agreement have a favourable impact on the capacity utilization in Indian pharmaceutical industry.

The economic reforms abolished the licensing rules which encouraged the new entrants and growth of demand in the globalised regime has induced the existing pharmaceutical firms to expand and utilize their potential productive capacity to the optimum level which leads to a favourable impact on CU in Indian pharmaceutical industry. In order to enhance the capacity utilisation in the Indian pharmaceutical industry both capital and labour inputs be used judiciously especially in view of the post-TRIPS regime. Therefore, it can be inferred that in the era of globalization Indian pharmaceutical industry has to comply with strict business standards and boost the level of investment in the Research and Development activities in order to expand and utilize the potential capacity during

the post-TRIPS regime. The main limitation of the study is that the capacity utilization can be measured approximately and not exactly which should be kept in mind before policy formulation. Since, DEA is an extreme point technique, noise such as measurement error can cause significant problems. Moreover, despite the theoretical superiority of the Tobit model to classical statistical techniques, the researchers must be cautioned to care of its limitations. Further, an analysis both at state level and at firm level for Indian pharmaceutical industry can be done and incorporated into the present analysis.

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Household Food Consumption Patterns and Food Security in Uttar Pradesh, India

Neha Sikarwar and Jyoti Gogia

Demand for food in India is increasing due to population growth and changing lifestyles. The main concern is to provide enough food, in quantity and quality, to meet the food and nutritional requirements of the population in a sustainable way. The study revealed that the food security level of households is positively associated with income, educational status, and area of land ownership, whereas it is negatively associated with the number of dependents in a family. Among the four selected areas of Uttar Pradesh, the food security level is found to be the highest in the western urban Uttar Pradesh due to favourable existence of its determining factors. The results also exposed that the people of western urban Uttar Pradesh are highly satisfied with their quality-of-life parameters and food consumption patterns.

Key Words: Food consumption patterns, Food security, Dietary diversity, Quality of life

I Introduction

Food is the necessity of all living beings to survive. The formal adoption of the Right to Adequate Food by the World Food Summit in 1996 implemented the rights-based approach to world food security. According to the World Food Summit (1996), “the food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”

The connotation of food security has strengthened considerably over time. Initially, the concept of food security was restricted to food availability, however, later it has transformed into food and nutrition security, and it is said to be achieved, if “adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible for and satisfactorily utilized by all individuals at all times to live a healthy and happy life” (FAO, 2000). Thus, food security has four dimensions: availability, accessibility, utilization, and stability. Assessment of consumption patterns along with the level of food production and households’

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income is crucial as it affects utilization (adequacy of nutrition intake) and stability (year-round) dimensions of food security.

Despite the high-end technology and economic development, countries are struggling hard to ensure food security for all (Tanksale and Jha 2015). India is facing similar challenges. Over the past two decades, the Gross Domestic Product of India has increased by 4.5 times, the production of food grains has increased almost twice, and the per capita consumption has increased by three times (IFBN, 2020). But, due to the increasing population of the country, a substantial part of it does not have adequate access to food despite the impressive agricultural and overall economic growth of the nation (UNICEF, 2019). The present study aims to empirically investigate the various aspects of households' food consumption patterns and the status of food security in Uttar Pradesh.

II Materials and Methods

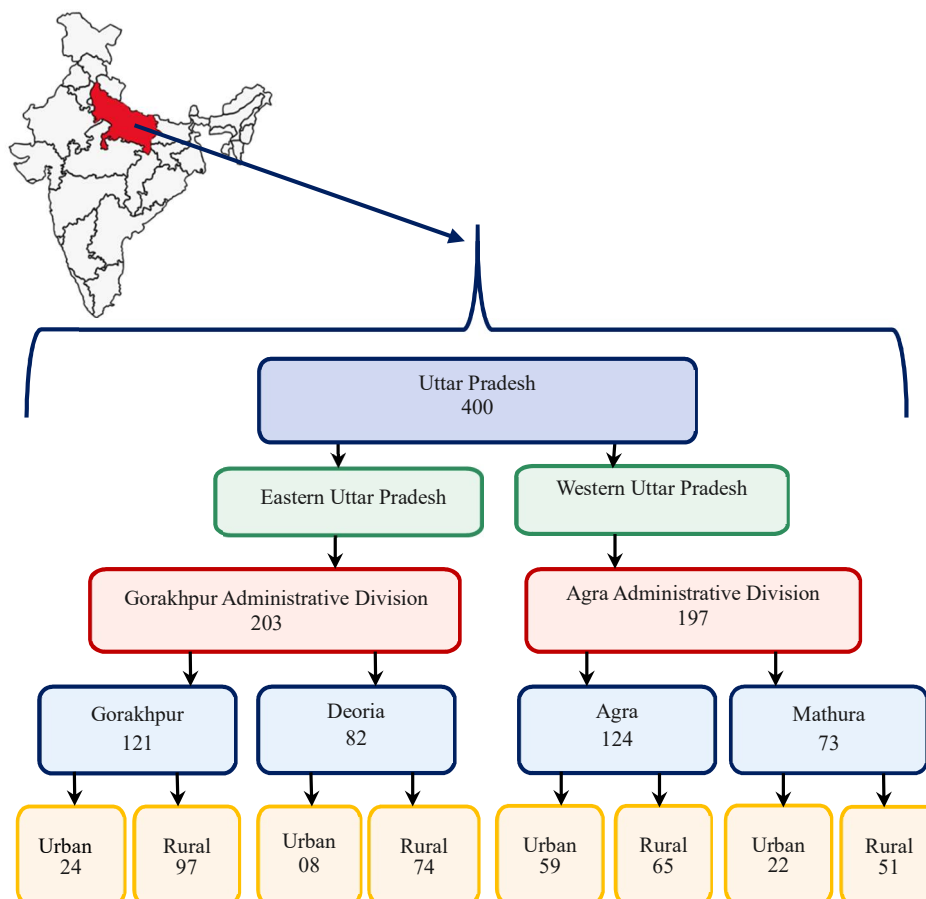
Description of the Study Area

Uttar Pradesh is India's fourth-largest state by land area. It is in the north-central part of the country. The state is divided into 18 divisions and 75 districts. The agriculture sector is the prime mover of economic growth in Uttar Pradesh and a vast section of its population relies on this sector for their livelihood. Due to the significant impact of the Green Revolution, Uttar Pradesh is the most prosperous, developed, and agriculturally rich region of India (Sebby 2010). Moreover, being the most populated state of India (Census, 2011), it requires enough food to maintain the well-being of people.

Sampling Procedure

To conduct a comprehensive study, Uttar Pradesh has been divided into two zones – eastern Uttar Pradesh and western Uttar Pradesh. Two administrative divisions - Gorakhpur and Agra have been selected randomly from eastern Uttar Pradesh and western Uttar Pradesh respectively. From each administrative division, two districts were randomly selected, viz., Agra and Mathura districts from the Agra administrative division and Gorakhpur and Deoria districts from the Gorakhpur administrative division. Considering the gap between the rural and urban households, the samples have been taken from both, separately, on a random basis. The sample size determination was based on the finite population correction factor, and a sample of 400 households was drawn randomly according to the proportion of the size of the stratum as given below:

Sampling Distribution (Uttar Pradesh)



Source: Self- Structured.

Statistical Tools/ Techniques

For the data analysis and to obtain valid and reliable results, the following statistical tools and techniques have been used:

Household Food Security Survey Module (HFSSM)

Household Food Security Survey Module is an 18-item USDA (United States Department of Agriculture) questionnaire, which is used to measure household food security on a recall period of 12 months. It is a linear and continuous scale that determines the severity of household food security level in a single numeric value ranging between 0-18 which is classified into four categories, viz., food

secure (scores 0-2), food insecure without hunger (scores 3-7), food insecure with mild hunger (scores 8-12) and food insecure with intense hunger (scores 13-18).

Household Dietary Diversity Score (HDDS)

A Household dietary diversity score is used to analyse the diverse diet of households. It comprises 12 food groups. The scale is administered on a reference period of the last 24 hours. Dietary diversity helps to know the nutrient adequacy and variation in an individual's diet. It signals the quality of the diet of an individual. Its indicators also validate as a proxy for socio-economic status.

Food Consumption Score (FCS)

Food Consumption Score provides a composite score of household dietary diversity based on nine broad food groups (staples, pulses, fruits, vegetables, meat and fish, dairies, sugar, oil and fat, condiments) and their consumption frequencies in the past seven days. The food groups are weighted according to their nutritive relevance. To calculate a composite score, the standardized weights are multiplied by their related eating incidence in the past seven days. Based on this score, the food consumption status of a household is classified into one of three categories: poor (0-21), borderline (21.5-35), or acceptable (>35). Thus, the food consumption score can be considered a representative (proxy) indicator of caloric availability in a particular household.

Binary Logistic Model

Binary Logistic Regression is an extended version of simple linear regression that is when the dependent variable is binary (dichotomous) in nature. The binary logit model can predict the relationship between the independent and dependent variables.

Likert Scale

A five-point Likert scale (1 to 5) has been used to know the level of respondents' satisfaction regarding various dimensions of food consumption patterns and food security. Five points of the scale were 1- highly dissatisfied, 2- dissatisfied, 3- neither satisfied nor dissatisfied, 4- satisfied, and 5- highly satisfied.

For Testing Propositions

The Kruskal Wallis H test is used for testing propositions. The Kruskal Wallis H test is a non-parametric statistical tool that is used to test whether the medians of

two or more than two populations are significantly different from each other or not.

Period of the Study

The period for the primary data collection was 2018-2019.

III Results and Discussions

Demographic and Socio-Economic Profile of Respondents

The demographic and socio-economic features (Table 1) affect the attitude, behaviour, and activities of the individuals and families. It reveals the various traits viz. age, gender, marital, educational, and employment status of respondents.

Table 1: Demographic and Socio-Economic Profile of Respondents

Demographic and socio-economic variables		Eastern Uttar Pradesh				Western Uttar Pradesh				Uttar Pradesh (Overall)	
		Urban		Rural		Urban		Rural		(N)	(%)
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)		
Gender	Male	32	100.0	160	93.57	81	100.0	115	99.14	388	97.00
	Female	00	00.00	11	06.43	00	0.00	1	00.86	12	03.00
Age	Mean Age (in years)	50		46		45		49		48	
	18-30 years	00	00.00	07	04.09	03	03.70	03	02.59	13	03.25
	31-60 years	29	90.63	157	91.81	74	91.36	102	87.93	362	90.50
	> 60 years	03	09.38	07	04.09	04	04.94	11	09.48	25	06.25
Caste	General	20	62.50	27	15.79	53	65.43	62	53.45	162	40.50
	Scheduled Caste	05	15.63	85	49.71	24	29.63	38	32.76	152	38.00
	Scheduled Tribe	01	03.13	32	18.71	00	00.00	06	05.17	39	09.75
	Other Backward Class	06	18.75	27	15.79	04	04.94	10	08.62	47	11.75
Marital Status	Single	00	00.00	02	01.17	00	00.00	03	02.59	05	01.25
	Married	32	100.0	161	94.15	81	100.0	112	96.55	386	96.50
	Divorced/Separated	00	00.00	01	00.58	00	00.00	00	00.00	01	00.25
	Widowed/Widower	00	00.00	07	04.09	00	00.00	01	00.86	08	02.00
Educational Status	Graduation	03	09.38	05	02.92	28	34.57	05	04.31	41	10.25
	Higher Secondary	01	03.13	04	02.34	12	14.81	10	08.62	27	06.75
	High School	09	28.13	13	07.60	30	37.04	29	25.00	81	20.25
	Middle School	01	03.13	05	02.92	01	01.23	04	03.45	11	02.75
	Primary	04	12.50	25	14.62	09	11.11	28	24.14	66	16.50
	Literate	14	43.75	115	67.25	01	01.23	36	31.03	166	41.50
	Illiterate	00	00.00	04	02.34	00	00.00	04	03.45	08	02.00

Contd...

Table 1: Demographic and Socio-Economic Profile of Respondents

Demographic and socio-economic variables		Eastern Uttar Pradesh				Western Uttar Pradesh				Uttar Pradesh (Overall)	
		Urban		Rural		Urban		Rural		(N)	(%)
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)		
Employment Status	Employed	32	100.0	162	94.74	81	100.0	114	98.28	389	97.25
	Unemployed	00	00.00	04	02.34	00	00.00	00	00.00	04	01.00
	Willingly Idle	00	00.00	03	01.75	00	00.00	00	00.00	03	00.75
	Retired	00	00.00	02	01.17	00	00.00	02	01.72	04	01.00
Occupation	Service	03	09.38	09	05.26	17	20.99	13	11.21	42	10.80
	Self Employed	12	37.50	13	07.60	55	67.90	21	18.10	101	25.96
	Daily Wage Worker	14	43.75	121	70.76	08	09.88	28	24.14	171	43.96
	Farmer	03	09.38	17	09.94	01	01.23	52	44.83	73	18.77
Family Structure	Others	00	00.00	02	01.17	00	00.00	00	00.00	02	00.51
	Nuclear	19	59.38	35	20.47	62	76.54	49	42.24	165	41.25
	Joint	13	40.63	136	79.53	19	23.46	67	57.76	235	58.75

Source: Survey, N – Numbers.

It has been found that most of the household heads were males (97 per cent) and males are still considered the breadwinners of the family. The mean age of the household head was 48 years. While categorizing data, it was found that a significant proportion of respondents (90.5 per cent) belong to the age group of 31-60 years. Indian society is divided into various castes, customs, and traditions, which have a broader impact on an individual's life. Respondents from all classes, viz., 38.0 per cent from scheduled caste, 40.50 per cent from general category, 9.75 per cent from the scheduled tribes, and 11.75 per cent belonged to other backward class have been considered for the study. The majority of the respondents (96.5 per cent) were married. Overall, 41.5 per cent of respondents were literate with no formal education. Rural people are educationally backward as compared to their urban counterparts. Parents of western Uttar Pradesh were found more inclined towards sending their children for formal education.

The expenditure behaviour primarily depends upon the level of income. A significant proportion of the respondents (97.25 per cent) were employed out of which, 43.96 per cent were daily wage earners, 25.96 per cent were self-employed, 18.77 per cent were farmers, 10.8 per cent were working in service sector, and the remaining were engaged in other kinds of jobs. A gradual shift from a joint family system to a nuclear family system can be observed especially in urban areas. This inclination is for the sake of attaining financial stability, personal and academic development. 58.75 per cent of sample households had a joint family system. The joint family system still has its existence in rural settlements. Thus, considering the rural areas, 57.76 per cent of people of western rural Uttar Pradesh and 79.53 per cent of people of eastern rural Uttar Pradesh were living in joint families.

Family Composition, Level of Income and Credit Status

The issue of food security becomes critical when the population grows rapidly, especially the number of dependents. The average number of dependents per household in Uttar Pradesh was 7.10, with an average of 3.40 children per family. Eastern rural settlements of Uttar Pradesh had the highest average number of dependents per family (7.80), followed by western rural Uttar Pradesh (7.20), Eastern urban Uttar Pradesh (6.60), and the western urban Uttar Pradesh (4.90). The figures certainly illustrate the lack of family planning practices in rural settlements. A low level of income with a noticeably high number of dependents is a burden on the earning hands of households.

Table 2: Family Composition and Level of Income

Areas of Uttar Pradesh	The average monthly income of the households (₹)	Range of monthly income (₹)		The average number of earners	The average number of dependents	The average number of children
		Minimum	Maximum			
Eastern Urban	10227	1200	25000	1.16	6.60	3.10
Eastern Rural	6672	790	26000	1.06	7.80	4.00
Western Urban	25685	7500	80000	1.12	4.90	1.90
Western Rural	9306	3000	18000	1.09	7.20	3.60
Uttar Pradesh (Overall)	11133	790	80000	1.10	7.10	3.40

Source: Survey.

Income is an important aspect of determining the expenditure capacity of a family. The accessibility dimension of food security is directly linked to the income level of households. As depicted in Table 2, the highest average monthly household income was found in western urban Uttar Pradesh (₹25,685) followed by eastern urban Uttar Pradesh (₹10,227), western rural Uttar Pradesh (₹9306), and eastern rural Uttar Pradesh (₹6,672), respectively.

An inadequate financial state leads to borrowing from various sources. Due to time-consuming long procedures, tedious documentation, and inadequate coverage of institutional sources, more than 60 per cent of respondents of eastern urban and rural and western rural Uttar Pradesh rely on non-institutional sources of credit and they get exploited in various ways. In contrast, people in western urban Uttar Pradesh (86.66 per cent) were found to be more aware and they approached the institutional credit sources. Commonly, in case of food insufficiency, households borrow (59 per cent) from other persons (Gupta A. and Mishra D.K. 2018). Overall, 51.5 per cent of respondents agreed that they took loans specifically to arrange food for their family. Most of the respondents (73.10 per cent) of eastern rural areas took loans for food purpose followed by western rural areas (51.72 per cent), eastern urban areas (34.38 per cent), and western urban areas (12.35 per cent) of Uttar Pradesh.

Agriculture and Allied Activities

Agriculture and allied sectors have crucial roles in ensuring food security by increasing the quantity of diversified food. Goli, Rammohan, and Reddy (2021) reported that 94 per cent of all food-insecure households possess no or marginal agricultural landholding. The probability of food insecurity for households with no agricultural landholding is four times higher compared to medium-to-large agricultural landholding. The livestock, along with agriculture, is helpful in making a powerful food system. Approximately, 53.25 per cent of respondents possess agricultural land, out of which 29.11 per cent do not use it for cultivation (Table 3). Most of the respondents (84.51 per cent) had marginal and small landholdings. However, 49.72 per cent of the produce is used for self-consumption. The subsistence level of farming does not help to generate a significant income, and hence the farmers, despite being the producers of the food, are not able to access the diversified food products.

Table 3: Agriculture and Allied Activities

Variables	(Per cent)				
	Eastern Uttar Pradesh		Western Uttar Pradesh		Uttar Pradesh (Overall)
	Urban	Rural	Urban	Rural	
Possession of agricultural land	21.88	62.57	16.05	74.14	53.25
Land used for cultivation	28.57	65.42	23.08	88.37	70.89
Type of landholding					
Private	85.71	91.59	100.00	96.51	93.90
Wakaf	14.29	8.41	00.00	03.49	06.10
Marginal (0-1 Hectare)	42.86	64.49	38.46	79.07	68.08
Small (1-2 Hectares)	14.29	28.97	15.38	01.16	16.43
Size of landholding					
Semi-medium (2-4 Hectares)	00.00	00.93	23.08	05.81	04.23
Medium (4-10 Hectares)	14.29	00.00	00.00	05.81	02.82
Large (>10 Hectares)	28.57	05.61	23.08	08.14	08.45
Use of harvest					
Consumption only	88.00	76.56	50.00	14.47	49.72
For sale	12.00	23.44	50.00	85.53	50.28
Possession of livestock/poultry	37.50	20.47	02.47	62.93	30.50
The average number of livestock per household	01.92	02.80	02.50	04.08	03.48
Purpose of keeping livestock/poultry					
Consumption of products	58.33	80.00	100.00	64.38	68.85
Sale of animals/products	41.67	20.00	00.00	35.62	31.15

Source: Survey.

Status and Households' Satisfaction Regarding Quality-of-Life Parameters

Good living and dwelling conditions determine the quality of life through happiness and contentment of people. Table 4 depicts the dwelling and living conditions of households in Uttar Pradesh.

Table 4: Dwelling and Living Conditions of Households

(Per cent)

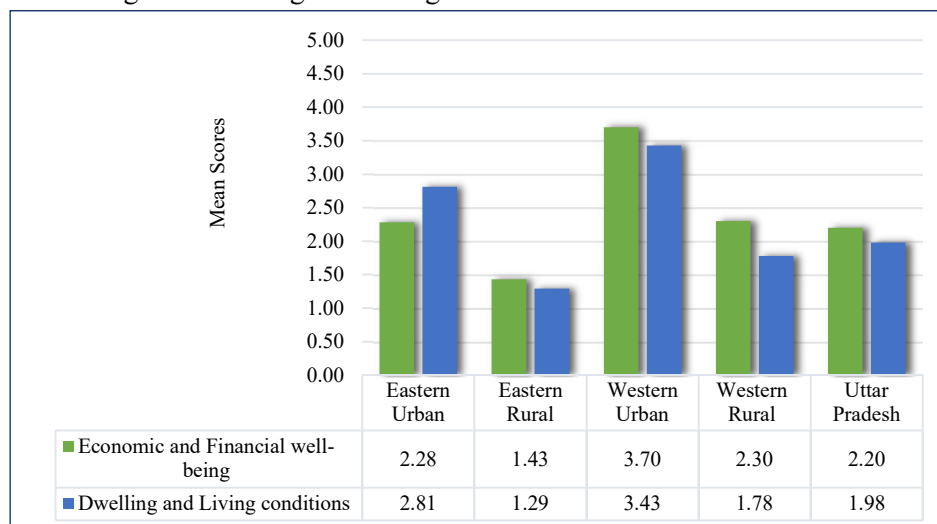
Dwelling and Living variables		Eastern Uttar Pradesh		Western Uttar Pradesh		Uttar Pradesh (Overall)
		Urban	Rural	Urban	Rural	
House ownership	Self-owned	71.88	30.99	60.49	71.55	52.00
	Rented	21.88	19.30	30.86	20.69	22.25
	Free Stay	06.25	49.71	08.64	07.76	25.75
Availability of Water	Continuous	28.13	04.09	58.02	41.38	27.75
	Irregular	53.13	06.43	35.80	37.07	25.00
	Not available at home	18.75	89.47	06.17	21.55	47.25
Source of Water	Piped Water	28.13	08.77	27.16	07.76	13.75
	Public Tap	65.63	14.62	76.54	01.72	27.50
	Protected Well	21.88	41.52	00.00	46.55	33.00
	Handpump	25.00	28.65	13.58	62.93	35.25
	Borewell	34.38	04.09	58.02	12.07	19.75
	Water Tanker	18.75	16.96	28.40	02.59	15.25
	Other Sources	34.38	30.99	13.58	06.03	20.50
	Flush Toilet	87.50	05.26	70.37	14.66	27.75
	Common Lavatory	12.50	16.37	35.80	18.97	20.75
Type of Sanitation	Open Defecation	15.63	89.47	08.64	50.86	56.00
	LPG	90.63	27.49	96.30	56.90	55.00
	Wood	03.13	32.16	03.70	42.24	27.00
Source of energy for cooking	Animal Dung	21.88	54.39	08.64	27.59	34.75

Source: Survey.

Fifty-two per cent of respondents had a self-owned home, but only 27.8 per cent receive a continuous water supply. It is a problem specifically in the rural areas of Uttar Pradesh, where people are still using hand-pumps as a significant source of water. On the other hand, urban people have accustomed themselves towards using the bore-well and public taps. The government's attempts of providing clean and safe drinking water to all seem inadequate. It is remarkably noticed that despite big efforts of government to make India an open-defecation free nation, it has been found that 56.0 per cent of households in Uttar Pradesh are still practicing defecation in open areas. In rural areas, people are still using animal dung and wood to cook food.

Figure 1 shows that only the people of western urban Uttar Pradesh are satisfied with their economic and financial well-being and dwelling and living conditions. The dissatisfaction level is maximum in case of people of eastern rural Uttar Pradesh. The satisfaction level is comparatively higher in case of urban areas rather than the rural areas.

Figure 1: Households' Satisfaction Level Regarding Economic and Financial Well-being and Dwelling and Living Conditions



Source: Survey.

The Kruskal-Wallis H test was used to determine whether there lies a statistically significant difference between the level of satisfaction regarding the dwelling and living conditions and economic and financial well-being among the households of four areas of Uttar Pradesh. The results as indicated in the table 5 have the value of $KWH=228.188$ for dwelling and living conditions and 227.176 for economic and financial well-being with degrees of freedom=3 and $N=400$. Enough statistical evidence exists to conclude that there is a significant difference between the level of satisfaction regarding the dwelling and living conditions and economic and financial well-being among the households of all four areas of Uttar Pradesh. Therefore, we reject the null hypothesis.

Table 5: Hypotheses Analysis Results for Overall Households' Satisfaction Level

HYPOTHESES TEST SUMMARY						
Null Hypotheses	Test	Kruskal-Wallis H Value	df	Asymp. Sig.	Decision	
There is no significant difference between the level of satisfaction regarding the dwelling and living conditions among households of various regions of Uttar Pradesh.	Kruskal-Wallis H Test	228.188 ^a	3	0.000	Reject the null hypothesis.	
There is no significant difference between the level of satisfaction regarding economic and financial well-being among households of various regions of Uttar Pradesh.	Kruskal-Wallis H Test	227.176 ^a	3	0.000	Reject the null hypothesis.	

Notes: ^a The test statistic is adjusted for ties, df- degrees of freedom, The significance level is 0.050.

Table 6: Pairwise Comparisons of Households' Satisfaction Level

Sample Pairs	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. ^a
Pairwise Comparisons (Dwelling and Living conditions)					
WU-EU	50.816	22.713	2.237	0.025	0.152
WU-WR	138.986	15.722	8.840	0.000	0.000
WU-ER	211.193	14.651	14.414	0.000	0.000
EU-WR	-88.170	21.759	-4.052	0.000	0.000
EU-ER	160.377	20.999	7.638	0.000	0.000
WR-ER	72.207	13.123	5.502	0.000	0.000
Pairwise Comparisons (Economic and Financial Well-being)					
ER-WR	-101.760	13.124	-7.754	0.000	0.000
ER-EU	-105.658	21.000	-5.031	0.000	0.000
ER-WU	-216.881	14.652	-14.802	0.000	0.000
WR-EU	3.898	21.761	0.179	0.858	1.000
WR-WU	-115.121	15.723	-7.322	0.000	0.000
EU-WU	-111.223	22.715	-4.896	0.000	0.000

Notes: Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same, ^a Significance values have been adjusted by the Bonferroni correction for multiple tests, ER – Eastern Rural; EU – Eastern Urban; WR – Western Rural; WU – Western Urban.

Table 6 depicts the pairwise comparison of the four areas of Uttar Pradesh and estimates the significance value of six possible pairs of the sample. The adjusted significance values of highlighted regions are significantly less than the p-value, i.e., 0.05. Therefore, these are the dominant pairs across the matrix because of which the proposed null hypothesis has been rejected. Here, five dominant pairs were identified based on p-value, which substantially steered more arguments regarding the dwelling and living conditions and economic and financial well-being than their counterparts.

Household Food Consumption and Expenditure Summary

One of the important dimensions of food security is the food consumption patterns of households. The eastern and western Uttar Pradesh has a clear distinction in food choices. The majority of respondents have a non-vegetarian diet in eastern Uttar Pradesh. On the other hand, a vegetarian diet is the preference of respondents of western Uttar Pradesh.

Table 7 depicts the per-day frequency of meals. In eastern rural and urban areas of Uttar Pradesh, 77.19 per cent and 75 per cent of respondents consumed one meal per day respectively and a marginal proportion of respondents had three meals a day. 50.90 per cent of respondents consumed two meals a day in western rural Uttar Pradesh. However, in western urban Uttar Pradesh, 87.7 per cent had three meals a day. It can be concluded that people of western urban Uttar Pradesh are getting their meals adequately.

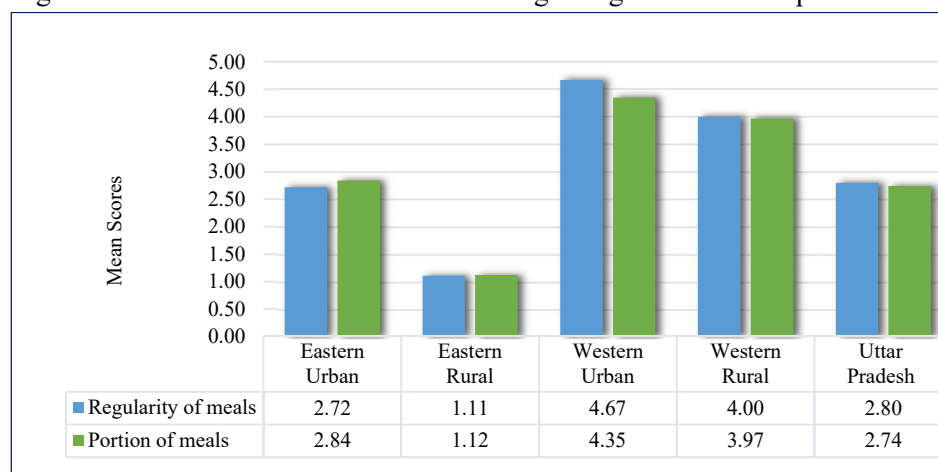
Table 7: Per-Day Frequency of Meals

Areas of Uttar Pradesh	One meal a day		Two meals a day		Three meals a day	
	N	%	N	%	N	%
Eastern Urban	24	75.00	05	15.63	03	9.38
Eastern Rural	132	77.19	37	21.64	02	1.17
Western Urban	00	00.00	10	12.30	71	87.70
Western Rural	00	00.00	59	50.90	57	49.10
Uttar Pradesh (Overall)	156	39.00	111	27.75	133	33.25

Source: Survey, N – Numbers.

The level of satisfaction related to food consumption at the household-level is portrayed in Figure 2. As considered the regularity and size of meals, it has been found that the people of western urban Uttar Pradesh were highly satisfied. The highest dissatisfaction level was found in people of eastern rural Uttar Pradesh.

Figure 2: Households' Satisfaction Level Regarding Food Consumption Patterns



Source: Survey.

The Kruskal-Wallis H test was used to determine whether there lies any statistically significant difference between the level of satisfaction regarding the regularity of meals and meal portion size among the households of four areas of Uttar Pradesh. The results indicated the value of KWH = 346.135 regarding regularity of meals and 327.358 related to meal portion size with degrees of freedom=3, N=400. Enough statistical evidence exists to conclude that there is a significant difference between the level of satisfaction regarding the regularity of meals and meal portion size among the households of all four areas of Uttar Pradesh. Therefore, we reject the null hypothesis.

Table 8: Hypotheses Analysis Results for Households' Satisfaction Level Regarding Food Consumption Patterns

HYPOTHESES TEST SUMMARY					
Null Hypotheses	Test	Kruskal-Wallis H Value	df	Asymp. Sig.	Decision
There is no significant difference between the level of satisfaction regarding the regularity of meals among households of various regions in Uttar Pradesh.	Kruskal-Wallis H Test	346.135 ^a	3	0.000	Reject the null hypothesis.
There is no significant difference between the level of satisfaction regarding the meal portion size among households of various regions in Uttar Pradesh.	Kruskal-Wallis H Test	327.358 ^a	3	0.000	Reject the null hypothesis.

Notes: ^a The test statistic is adjusted for ties, df- degrees of freedom, The significance level is 0.050.

Table 9 depicts that the adjusted significance values of all six pairs regarding regularity of meals are less than the $\alpha=0.05$, which basically suggests that these are the dominant pairs across the matrix due to which the proposed null hypothesis was rejected. Hence, all six pairs were dominant which substantially steered more arguments regarding the regularity of meal than their counterparts. Regarding meal portion size five dominant pairs were found due to which the proposed null hypothesis was rejected, and which substantially steered more arguments regarding the meal portion size than their counterparts.

Table 9: Pairwise Comparisons of Households' Satisfaction Level

Sample Pairs	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. ^a
Pairwise Comparison (Regularity of meals)					
ER-EU	-100.932	21.179	-4.766	.000	.000
ER-WR	-185.829	13.227	-14.050	.000	.000
ER-WU	-243.665	14.832	-16.428	.000	.000
EU-WR	-84.897	21.957	-3.867	.000	.001
EU-WU	-142.733	22.959	-6.217	.000	.000
WR-WU	-57.836	15.922	-3.632	.000	.002
Pairwise Comparison (Meal Portion Size)					
ER-EU	-117.829	21.263	-5.542	.000	.000
ER-WR	-195.302	13.279	-14.708	.000	.000
ER-WU	-225.228	14.890	-15.126	.000	.000
EU-WR	-77.473	22.043	-3.515	.000	.003
EU-WU	-107.399	23.050	-4.659	.000	.000
WR-WU	-29.926	15.985	-1.872	.061	.367

Notes: Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same, ^a Significance values have been adjusted by the Bonferroni correction for multiple tests, ER – Eastern Rural, EU – Eastern Urban; WR – Western Rural, WU – Western Urban.

The households' monthly food expenditure is summarized in the table 10. It presents 12 food groups and the average spending on each food group. Majority of food budget was spent in acquiring of the cereals in case of the households of eastern rural, eastern urban and western rural Uttar Pradesh. On the other hand, in case of western urban Uttar Pradesh, majority of budget was spent in procuring the miscellaneous food items. However, the minimum expenditure done upon roots and tubers, fruits, meat/poultry/offal, egg, fish/seafood and pulses/legumes/nuts, was found as low as zero.

Table 10: Households' Monthly Expenditure on Major Food Items

Food Groups	Eastern Rural				Eastern Urban				Western Rural			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
A	622.81	057.70	250	750	770.31	079.17	400	850	822.41	131.93	600	900
B	037.43	048.54	000	100	059.38	091.08	000	400	053.45	061.05	000	400
C	397.66	051.51	150	500	552.50	080.56	350	600	566.81	040.07	400	650
D	010.59	027.84	000	100	062.50	094.19	000	200	060.34	107.44	000	250
E	164.97	187.17	000	380	257.81	248.58	000	500	056.90	161.09	000	600
F	025.20	029.65	000	060	078.12	042.00	000	100	025.00	049.12	000	200
G	003.51	021.41	000	200	000.00	000.00	000	000	000.00	000.00	000	000
H	050.12	049.91	000	100	081.25	080.07	000	250	094.83	094.03	000	300
I	448.01	121.89	050	650	496.88	083.22	150	600	748.53	111.19	350	800
J	321.64	120.90	070	500	576.56	156.05	150	700	736.21	119.70	200	1000
K	093.27	012.07	000	100	103.75	012.64	100	150	117.67	47.20	100	500
L	445.61	132.60	100	600	620.31	173.60	150	950	583.62	140.62	300	850

Food Groups	Western Urban				Uttar Pradesh (Overall)			
	Mean	SD	Min	Max	Mean	SD	Min	Max
A	1007.41	026.35	1000	1100	770.37	169.08	250	1100
B	413.58	161.83	000	600	120.00	173.13	000	600
C	848.77	118.05	600	1000	550.45	181.77	150	1000
D	391.98	211.76	000	650	106.64	186.17	000	650
E	169.75	321.88	000	1200	142.03	227.03	000	1200
F	095.31	138.46	000	500	043.57	077.04	000	500
G	000.00	000.00	000	000	001.50	014.08	000	200
H	551.85	165.16	000	700	167.17	218.18	000	700
I	1605.31	725.00	400	2500	773.43	554.98	050	2500
J	1335.80	268.94	700	1700	667.62	413.19	070	1700
K	307.41	237.58	200	1000	144.55	137.44	000	1000
L	2088.89	809.32	600	4200	832.38	743.69	100	4200

Household Dietary Diversity Score

Household dietary diversity score is used to analyse the diversified diet consumed by the households. Its indicators also validate as a proxy for the socio-economic status. Cereals were consumed by every household. It is worth mentioning that keeping in view the diversity of food products to maintain adequate nutritional level; it was found that the households do not consume diversified products, especially fruits and pulses/legumes/nuts. The low percentage of category E, F and G in table 11 is due to the presence of vegetarian households who do not consume food items of these groups.

Table 11: Diversity in Food Consumption

(Association between consumption of different food groups and area of residency)

Food items	Eastern Uttar Pradesh				Western Uttar Pradesh				Uttar Pradesh (Overall)	
	Urban		Rural		Urban		Rural			
	N	%	N	%	N	%	N	%	N	%
A Cereals	32	100.00	171	100.00	81	100.00	116	100.00	400	100.00
B Roots and Tubers	25	78.13	52	30.41	60	74.07	36	31.03	173	43.25
C Vegetables	31	96.88	141	82.46	81	100.00	116	100.00	369	92.25
D Fruits	03	09.38	07	04.09	29	35.80	34	29.31	73	18.25
E Meat, Poultry, Offal	13	40.63	75	43.86	37	45.68	03	02.59	128	32.00
F Eggs	04	12.50	08	04.68	16	19.75	105	90.52	133	33.25
G Fish and Seafood	03	09.38	11	06.43	10	12.35	08	06.90	32	08.00
H Pulses/Legumes/Nuts	12	37.50	25	14.62	70	86.42	14	12.07	121	30.25
I Dairy products	14	43.75	86	50.29	73	90.12	92	79.31	265	66.25
J Oils/Fats	13	40.63	69	40.35	63	77.78	92	79.31	237	59.25
K Sugar/Honey	12	37.50	50	29.24	73	90.12	71	61.21	206	51.50
L Miscellaneous	05	15.63	03	01.75	26	32.10	16	13.79	42	10.50

Source: Survey, N – Numbers.

Table 12 exhibits three mutually exclusive dietary diversity categories, such as: Low dietary diversity (score 0-3); Medium dietary diversity (score 4-5); High dietary diversity (score 6 & above).

Table 12: Status of Households' Dietary Diversity

Areas of Uttar Pradesh	Average dietary diversity Score	Low dietary diversity (%)	Medium dietary diversity (%)	High dietary diversity (%)
Eastern Urban	5.2	18.75	62.50	18.75
Eastern Rural	4.1	35.09	60.82	04.09
Western Urban	7.6	03.70	12.35	83.95
Western Rural	6.1	20.69	28.45	50.86
Uttar Pradesh (Overall)	5.5	23.25	41.75	35.00

Source: Survey.

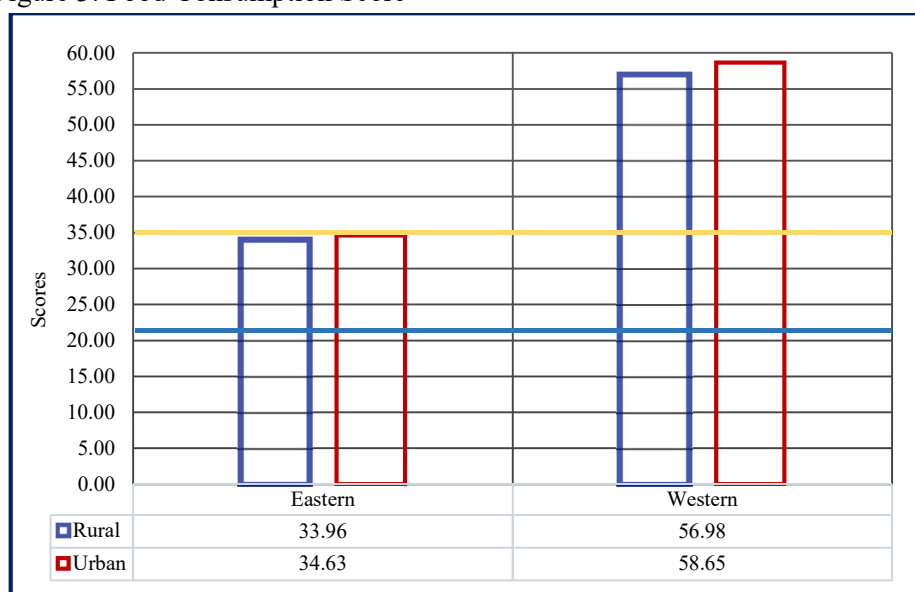
The average dietary diversity score of households of Uttar Pradesh (overall) falls in the *medium dietary diversity* category (score value is 5.5). The majority of households of western areas of Uttar Pradesh fall in the category of high dietary diversity, whereas most of the households of eastern areas of Uttar Pradesh fall in the medium dietary diversity category. Households of eastern rural Uttar Pradesh received the lowest average dietary score in comparison to the households of all other areas.

Food Consumption Score

Thresholds for food consumption score were established by the United Nations World Food Programme (WFP) in order to classify the households under assorted dietary diversities. Food Consumption Score ≤ 21 is a bare minimum score categorized as “*poor*” because it reflects that a household is not even getting staples and vegetables to eat, daily. The Food Consumption Score between 21.5-35 is considered as “*borderline*” and the Food Consumption Score ≥ 35 is considered as “*acceptable*” (World Food Programme, 2008).

The food consumption score of Uttar Pradesh (overall) was calculated to be 45.7 (n=400) which is *acceptable* as per the thresholds. The households of western Uttar Pradesh fall in the *acceptable* category of food security (FCS ≥ 35), whereas the households of eastern Uttar Pradesh belong to the *borderline* category (FCS ranges in between 21-35).

Figure 3: Food Consumption Score

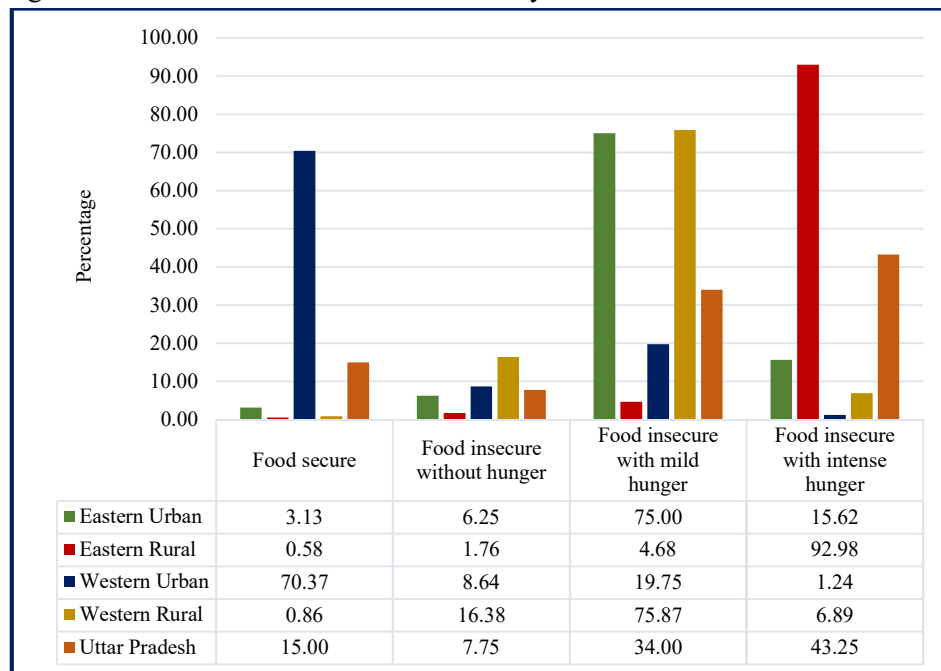


Source: Survey.

Households' Food Security

Figure 4 represents the households' food (in) security status in Uttar Pradesh. Overall, majority of the households (43.25 per cent) belong to the category of food insecurity with intense hunger, whereby the percentage of households of eastern rural Uttar Pradesh (92.98 per cent) is maximum among all four areas. Only 15 per cent of overall respondents are food secure and the highest number of food secure households (70.37 per cent) belong to the western urban Uttar Pradesh. The other three areas denote significantly less percentage of food secure households. Approximately, 75 per cent of households of eastern urban and western rural areas of Uttar Pradesh belong to the category of food insecurity with mild hunger.

Figure 4: Level of Households' Food Security



Source: Survey.

Determinants of Food Security

To estimate the various food security determinants, the binary logistic regression technique was used. It maximizes the probability of classifying the observed data into the appropriate category, given the regression coefficients. There exists an assumption of linearity between the dependent variables and the log-odds (also called logit) of the event that can be expressed in the following mathematical form

$$l = \log_b \frac{p}{1-p} = \beta_0 + \beta_1 x_1 + \beta_2 x_2$$

Where, β = parameters of the model and l = log odds.

Table 13: Description of the Logistic Regression

Variables	Symbol	Description
<i>Dependent Variable</i>		
Food Security	Y = FS	Expressed dichotomously: FS = 1 Otherwise = 0
<i>Explanatory Variables</i>		
Income of household	X ₁ = INC	Continuous variable expressed in Rupees
Number of dependents	X ₂ = DEP	Continuous variable defined in Numbers
Employment Status of household head	X ₃ = EMP	Expressed dichotomously: Employed = 1 Unemployed = 0
Educational Status of household head	X ₄ = EDU	Ordinal variable ranking the number of effective educational years
Area of land ownership	X ₅ = ARE	Continuous variable expressed in Beegha.
Region	X ₆ = EU	Eastern Urban Uttar Pradesh = 1 Otherwise = 0
	X ₇ = WR	Western Rural Uttar Pradesh = 1 Otherwise = 0
	X ₈ = ER	Eastern Rural Uttar Pradesh = 1 Otherwise = 0
	WU	Western Urban Uttar Pradesh = Reference variable

To determine the status of food security among the sample households (400), the USDA Household Food Security Scale was used. With the help of the Household Food Security Scale calculations and standard thresholds, the households were divided into dichotomous categories – Food secure and Food insecure households. The variables of regression model are expressed in table 13.

Table 14 represents the parameter estimates of determinants of household food security. There are statistically significant associations between food security and various terms (income, number of dependents, educational status, area of land ownership, and region) except the employment status of household head. It was found that income, educational status, and area of land ownership are positively associated with the food security level, whereas the number of dependents has been inversely associated with the food security level. Among the four regions of Uttar Pradesh, the food security level is found to be the highest in the western urban Uttar Pradesh due to favourable existence of determining factors. Residing in western urban Uttar Pradesh has a positive and significant impact in realizing the level of food security as compared to that residing in the eastern urban, western rural and eastern rural Uttar Pradesh respectively.

Table 14: Determinants of Households' Food Security

Variables	Coefficients	Wald	P-value	Odds ratio
Income	02.663	15.646	00.000 ***	14.334
Number of Dependents	-00.334	03.977	00.046 **	00.716
Area of Land	00.431	05.456	00.020 **	01.539
Employment status	06.481	00.000	00.999	652.609
Educational Status	00.537	04.733	00.030 **	01.712
Regions of Uttar Pradesh	Reference Variable			
Western Urban				
Eastern Urban	-02.545	00.034	00.078 *	0.058
Western Rural	-03.884	00.011	00.021 **	0.048
Eastern Rural	-06.908	00.015	00.001 ***	0.034
Constant	-42.343	00.000	00.998	0.000
Observations = 400				

Notes: *, **and *** indicate statistical significance at 10 per cent, five per cent and one per cent levels respectively.

IV Conclusions

Food has a great impact on our daily life. Not only does it provide satisfaction to an individual, but also it helps to keep oneself connected with community and culture. As per Maslow's hierarchy of needs, food is one of the foundational requirements for human well-being. Uttar Pradesh is fundamentally an agriculture-oriented state. It stands as the largest producer of grains and vegetables in India. The state also holds the largest food distribution arrangement in India but here are significant differences between all four areas of Uttar Pradesh regarding consumption patterns and the state of food security. Only western urban area of Uttar Pradesh has shown a significant positive progress in the direction. Therefore, the people residing in this area are comparatively satisfied than people residing in other areas of Uttar Pradesh. For the overall development of the Uttar Pradesh and for making it a completely food secure state, it is necessary to develop an integrated, sustainable food system in Uttar Pradesh. It is a prerequisite for attaining food and nutrition security. Therefore, there is a great requirement to pay attention to its linkages with sustainable food system to achieve sustainability in food and nutrition security.

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Annexure 1: Household Food Security Survey Module (HFSSM)

The HFSSM focuses on self-reports of uncertain, insufficient, or inadequate food access, availability, and utilization due to limited financial resources, and the compromised eating patterns and food consumption that may result.

The HFSSM is not designed to capture other possible reasons for compromised food consumption, such as voluntary dieting or fasting. The HFSSM is a household measure, that is, it assesses the food security situation of adults as a group and children as a group within a household but does not determine the food security status of each individual member residing in the household. It cannot be assumed that all members of a household share the same food security status.

The HFSSM contains 18 questions about the food security situation in the household over the previous 12 months. Each question specifies a lack of money or the ability to afford food as the reason for the condition or behaviour. The questions range in severity from worrying about running out of food, to children not eating for a whole day.

Q1.	Which of the following statements best describes the food eaten in your household in the past 12 months, that is since [current month] of last year?	
	1. You and other household members always had enough of the kinds of foods you wanted to eat.	
	2. You and other household members had enough to eat, but not always the kinds of food you wanted.	
	3. Sometimes you and other household members did not have enough to eat.	
	4. Often you and other household members didn't have enough to eat.	
	5. Don't know/refuse to answer (Go to end of module)	
Q2.	Did you and other household members worry that food would run out before you got money to buy more?	1. Often true
		2. Sometimes true
		3. Never true
		4. Don't know/refuse to answer
Q3.	The food that you and other household members bought just didn't last , and there wasn't any money to get more.	1. Often true
		2. Sometimes true
		3. Never true
		4. Don't know/refuse to answer
Q4.	You and other household members couldn't afford to eat balanced meals.	1. Often true
		2. Sometimes true
		3. Never true
		4. Don't know/refuse to answer

Q5.	You or other adults in your household relied on only a few kinds of low-cost food to feed the child(ren) because you were running out of money to buy food.	1. Often true 2. Sometimes true 3. Never true 4. Don't know/refuse to answer
Q6.	You or other adults in your household couldn't feed the child(ren) a balanced meal , because you couldn't afford it.	1. Often true 2. Sometimes true 3. Never true 4. Don't know/refuse to answer
Q7.	The child(ren) was not eating enough because you and other adult members of the household just couldn't afford enough food.	1. Often true 2. Sometimes true 3. Never true 4. Don't know/refuse to answer
Q8.	Did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food? How often did this happen?	1. Yes 2. No 3. Don't know/refuse to answer 1. Often true 2. Sometimes true 3. Never true 4. Don't know/refuse to answer
Q9.	Have you (personally) ever eaten less than you felt you should because there wasn't enough money to buy food?	1. Yes 2. No 3. Don't know/refuse to answer
Q10.	Were you (personally) ever hungry but didn't eat because you couldn't afford enough food?	1. Yes 2. No 3. Don't know/refuse to answer
Q11.	Did you (personally) lose weight because you didn't have enough money for food?	1. Yes 2. No 3. Don't know/refuse to answer
Q12.	Did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? How often did this happen?	1. Yes 2. No 3. Don't know/refuse to answer 1. Almost every month 2. Some months 3. Only 1 or 2 months 4. Don't know/refuse to answer
Q13.	Did you or other adults in your household ever cut the size of any of the children's meals because there wasn't enough money for food?	1. Yes 2. No 3. Don't know/refuse to answer
Q14.	Did any of the children ever skip meals because there wasn't enough money for food? How often did this happen?	1. Yes 2. No 3. Don't know/refuse to answer 1. Almost every month 2. Some months 3. Only 1 or 2 months 4. Don't know/refuse to answer
Q15.	Were any of the children ever hungry but you just couldn't afford more food?	1. Yes 2. No 3. Don't know/refuse to answer
Q16.	Did any of the children ever not eat for a whole day because there wasn't enough money for food?	1. Yes 2. No 3. Don't know/refuse to answer

Annexure 2: Food Consumption Score

The Food Consumption Score (FCS) is an index that was developed by the World Food Programme (WFP) in 1996. The FCS aggregates household-level data on the diversity and frequency of food groups consumed over the previous seven days, which is then weighted according to the relative nutritional value of the consumed food groups. For instance, food groups containing nutritionally dense foods, such as animal products, are given greater weight than those containing less nutritionally dense foods, such as tubers. Based on this score, a household's food consumption can be further classified into one of three categories: poor, borderline, or acceptable. The food consumption score is a proxy indicator of household caloric availability.

Method of Calculation

A brief questionnaire is used to ask respondents about the frequency of their household's consumption of eight different food groups over the previous seven days. To calculate the FCS from these results, the consumption frequencies are summed and multiplied by the standardized food group weight (see the food groups and corresponding weights below). Households can then be further classified as having "poor," "borderline," or "acceptable" food consumption by applying the WFP's recommended cut-offs to the food consumption score.

Food Group	Weight
Main staples	2
Pulses	3
Vegetables	1
Fruit	1
Meat/Fish	4
Milk	4
Sugar	0.5
Oil	0.5

Steps:

1. Group food items in the specified food groups (condiments not included)
2. Sum all the consumption frequencies of food items within the same group
3. Multiply the value of each food group by its weight (see table)
4. Sum the weighted food group scores to obtain FCS
5. Determine the household's food consumption status based on the following thresholds: 0-21: Poor; 21.5-35: Borderline; >35: Acceptable

Bodos Quest for Socio-Political Identity: A Historical Perspective

Varshali Brahma and Vibhuti Singh Shekhawat

In India, there are diverse groups of races- the Mongoloid, the Austric, the Aryans, and the Dravidian. North-eastern India has had different ethnic communities for a very long time. It is recognized as a diverse place of multi-ethnic states. Each social group has its own definite culture, languages, and customs. As such, in North-eastern States, since Independence, Indian politics has faced ethnic -conflict and inter-ethnic mobility. Most ethnic societies have experienced political articulation in the line of ethnicity. The Bodos of Assam had struggled to attain autonomy. So keeping in view such a scenario of a socio-political situation, this work will focus on the causes of identity assertion and analyze the phases of the Bodo ethnic movement for self-determination.

Key Words: Bodos, Identity assertion, Ethnicity, Ethnic movement

I Introduction

The Bodoland movement of Assam is an important event not only in the part of India but now on the broader level being acquired at the forefront of international attention. After Independence, in the last half-century, the Bodo tribe of Assam has encountered a series of movements of society-cultural autonomy and eco-political. Although such problems of identity assertion among Bodos were observed long ago in the pre-independence era, this kind of phenomenon has given a large dimension after the Independence. Ethnicity and Identity have been the major issues of mobilisation in all parts of the North-eastern India. Within the state of Assam, historically the Bodos had been known to be marginalised community. The Bodos from the colonial period had been defining themselves as a community in apposition to other communities for which the educated intellectuals and elites have articulated their divergence from the Assamese society and highlighted their problems like social, economic and backwardness arising out of land alienation.

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I am profoundly grateful to my Professor and Ph.D. Guide Dr. Vibhuti Singh Shekhawat for his immense support in writing this research article. I am also thankful to all the previous researchers and professors for their valuable insights into the historical views on the Bodos and their socio-political identity.

Since from a very long genesis, the Bodoland movement had a several forms moving towards the demand for a separate homeland.

Introducing the Land and People: The Bodos are the earliest settlers of Assam. It is believed that during the pre-historic era, the Bodos migrated to India from their original homeland of Tibet and China. E. Gait called them the "earliest known inhabitants of the Brahmaputra valley" (Gait E.A. 1967). At the time of the Mahabharata war, the Bodo, for a long time, occupied the plains of Assam valley and constituted the bulk of the population (Baruah K.L. 1966). S.K. Chatterjee believes they migrated to Assam in 1000 BC (Chatterjee S.K. 1974). B. Narzi stated that the Bodo people migrated to Assam in 2000 B.C. (Narzi B. 1962). However, the above discussion indicates that the Bodos are said to be Assam's original and oldest autochthone (Endle Sydney 1975). The Bodos belong to the descendants of the Mongoloid race. They have formed a subsection under the Assam-Burma, a group of Bodo-Naga subgroup of the Tibeto-Burman branch of the Sino-Tibetan family. Numerically the Bodos are one of the essential tribes among Northeastern states. Sociologically, they are found all over Assam with the northern bank of river Brahmaputra along the foothills of the Assam, which are adjoining Bhutan and Arunachal Pradesh. The Bodo population is also spread in some parts of North Bengal. The census report of 1927 mentioned that the Bodos have formed the 8th largest tribal society in India, and their population was around 8,67,017 (Pulloppillil 1997). The Census report of 1991 showed that the population of Bodos was 11,84,569 (Census of India 1991). Currently, the Bodos are concentrated in Kokrajhar, Dhubri, Goalpara, Darrang, Nowgang, Nalbari, Sonitpur, Kamrup, Barpeta, Dhemaji, Udalguri, Baksha, and Bongaigaon districts. The Bodos are recognized as the Scheduled Tribes of Assam by the Indian Constitution. As the origin of Bodos is concerned, it is a matter of conjecture and inference, as Bodos have no authentic history on it. It maintains the fact that Central Asia must have been the original home of the Bodos. S.K. Chatterjee pointed out that the north of China, in between the headwaters of Huang-Ho and Yang –tzse Kiyang rivers are the places where it was found to be the home from where they were dispersed and moved into different directions (Chatterjee 1974). One of the Mongoloid families migrated to Tibet and settled there for centuries. It asserted that the old name of Tibet was *Ti-bod* (Mochari M. 1997). It has been presumed that the Mongolids living in *Ti-bod* were known as *Bod*, later known as *Bodo*. In this context, Sydney Endle gave his opinion on the features and appearance of Mongoloid, which seems to suggest that Tibet and China are the two trans –Himalayan countries' original homes of this race (Endle 1975). As the Imperial Gazetteer of India has also stated, the upper courses of the yang-tzse Kiyang and the Huang-Ho Rivers in North Western China were the original homes of the Tibeto- Burman race (Grierson 1908). Navigating the present remnants of their initial stock in Tibet proves challenging; nevertheless, no linguistic traces have been discovered. Ajay Roy talks about the physiognomical and temperamental similarity which was observed between the Bodos and the present

Kham Tribes of Tibet. The Bodos were originally war-like and ferocious in nature as the Kham Tibetans (Roy 1995). Thus on the above views, it can be stated conclusively that Tibet and China were the original homes of the Bodos from where they had migrated to India.

The term *Bodo* to the whole group that is Kachari race was initially mentioned as the entire language that speaks the Tibet-Burman group known as Kacharis. The word Kachari¹, a racial name for the Bodo linguistic group of people, appears in all the early books and Government records (Endle 1975). The name Bodo was given by Brian Hodgson who is known to be a linguist (Grierson 1903). Since then, the Bodo has been used both as a generic and nationality name by the authors of the later period. Therefore, we have seen the use of similar names for people such as Kachari, Bodo, Bodo-Kachari, and so on.

It needs to be highlighted that the Bodos had entered with their advanced way of civilization and got settled down in various areas of the Northeast. Since the pre-historic period, bricks and stone are usually used for building houses, royal palaces, gates, etc., with their advanced architecture. On the other hand, the Bodos belong to the agriculturalist, one of the agricultural base economies. The example of an irrigation system is another great witness seen during the civilization. M.M. Chaudhary mentions that it is believed that Bodos were noticed as the first *agricultural nomads* who entered this part of the globe. They were the first group to initiate the process of irrigation system and to train the autochthon societies of this region on how to domicile themselves to the plants (Chaudhary M.M. 1980).

Along with that, the Bodo womenfolk are experts in weaving. Different varieties of silkworms that fabricate *Muga Silk* and *Endi* are still reared among the Bodo society. Then they are woven by them in their handlooms and manufactured into wrappers, dresses, and so on. Which always had an outstanding market, not in North-eastern India but also sold outside like in China and Tibet. The Bodos had maintained their border and trade link with the other neighbouring countries in the north and through the Chinese and Tibetan traders (Roy Ajay 1995). The Bodos export rice Endi cotton, silk yarn, and Muga. It signifies that after their settlement in Assam, the Bodos launched some new economic systems like Endi, Muga Silk (now acknowledged as an important product of the Whole Assamese culture and export system) and the Barter system.

II Methodology

The methodology used in this research article was majorly based on the historical and descriptive study of the secondary sources. The data was collected from various sources through an extensive literature survey and analyzed for this study's objectives. The secondary data was used throughout the paper accessed from various articles, books, and journals to understand Bodo's quest for their socio-political identity.

III Bodos: A Historical Study

Since time immemorial in North-eastern India, the Bodos had a powerful kingdom and were a ruling race. After the Bodo settled down in this region, it was noted that the Bodos had ruled different parts of domains with various names. Therefore, at the time of migration the, Bodos took over each kingdom in this North-East region. Other sects of the Bodos were found over the reins in some areas of the Northeast in different periods. Those kingdoms were Koch Kingdom, Chutia Kingdom, Kachari Kingdom, Moran Kingdom, the Dimasa Kingdom, and the Borathehi Kingdom were occupied by them to their will. As such, there was no single unified kingdom under the Bodos. Since Bodos had a very significant historical background with powerful kings like Bhaskar Varman, Banasura, Bhagadatta, and Narakasura, the Bodos ruled a powerful kingdom in this part of the country. The Bodo king Narakasura was the first king appointed to the ancient Brahmaputra valley. It may be noted that Mahiranga Danava (the Aryanas used this word Danava to mean the non-Aryan Mongoloid people of the Assam region). However, he was known to be the first king of pragjyotishpura, in a real sense, he was not a king. After the Mahiranga dynasty, Narakasura established a kingdom; his reign became an essential chapter in political history and cultural history. Besides the Banasura Kingdom, it is believed that the branch of Bodos built an independent kingdom around Sadiya with the capital Sadiya after the expulsion from the Kamrupa. U.C. Guha highlighted that when the Bodos were spreading throughout the Brahmaputra valley, one of the kings named Koundilya Narayana had built a town called *Koundilya* and documented the whole kingdom and set it up in their language as *Halali* – meaning bright land. There is no information regarding the Kingdom Halali due to a lack of history (Guha U.C. 1921). According to S.K. Bhuyan, he asserted that there was a powerful Kachari kingdom recognized as Sadiya (the capital of the kingdom). Sadiya surrounded this kingdom on the east of the river Dikhow and the southwest bank of the Dihang river, with Dillih on the South (Bhuyan S.K. 1951).

From the above descriptions, it can be noticed that before the coming of the Aryans, the Bodos used to attain influential and independent kingdoms along with their traditional religion, customs, language, and economic system. There were no such influences from another language, religion, or culture. They lived a tribal conventional lifestyle. There is no caste system available in their society, and they maintained the same equality among them. Since the fifth century, after the advent of Aryans came into being, Vaishnavism influenced the tribal Bodo society, particularly in the Pragjyotishpura-Kamrupa. It must be mentioned that Aryan society was divided into four sections- Brahmana, Kshatriya, Vaishya, and Sudra on a caste basis (Nath D.N. 1988). This caste system naturally got influenced slowly during the period of ancient Kamrupa and the Varman dynasty's reign. This influence had a more significant impact on society. But this influence was only limited to the royal families who came under the Aryan culture. However, such an effect whether it is invariable and necessarily initiated in Aryan –oriented society,

this impact gradually has its assimilation process where the Assamese language and culture took their major roots and Assamese being a common language and culture of the Aryans and non-Aryans.

During the advent of Ahoms, a great group of Shan race, the Bodo kingdom was surrounded by the rivers Kallang, Dhansiri valley, Dikhow, and the present north Cachar sub-division with the greater area of the southern Brahmaputra, with Dimapur as their capital (Dutta P.N. 1985). Such settlement of the flourishing kingdom at the state of Dimapur furnishes a shred of positive evidence that once upon a time the Bodos established and spread all over the Naga Hills with a heavy population in the capital city. During their reign at the capital city Dimapur, their kingdom played a wealthy and powerful role which became a glorious past among the Bodos. In fact, the Bodos were a powerful neighbour with an intense state of civilization that was more advanced. They attained over two hundred years against the Ahom for launching attacks against them (Roy Ajay 1995). But in the later course, since 1490 AD, an expansionist endeavour of the Ahoms clashed with the Bodos and other Hostilities. Later on, in 1536, Dimapur got attacked by the Ahoms, killed the prince Detsung and stripped the whole capital town. That was the end of the Bodo rule and its kingdom.

Moreover, it appears that they made a great effort towards building the formation of a greater Assamese society. Therefore, the Bodos felt they deserved more than they got. . So to alleviate the backwardness, the Bodos enabled themselves to have a respectful life, and hence, they must have political power. They wanted their due share in administrative affairs with political power. To gain this, the Bodos must have been organized based on lingo-cultural traits, which could help them get a distinct identity and bargain with the ruling elite to share power with them. It made the Bodos realize that maintaining their distinct social identity and overall development of the society are complementary to each other. Since the beginning of the twentieth century, they began asserting their identity, transforming into a movement.

IV Discussion and Analysis

Part A: Socio-Economic Causes of the Identity Assertion

The Bodos ruled independently for an extended period, and no outside influence existed over their traditional culture and language. The Bodos enjoyed a distinct way of life. But this distinctness could not be maintained for quite a long time because the arrival of the Aryans marked the beginning of a new era of the socio-cultural fusion between Aryans and non-Aryans in this part of the country.

Automatically, the process whereby individuals or groups of differing ethnic heritage being absorbed into the dominant culture of society went on, bringing the diverse ethnic groups under one common cultural platform to lay the foundation of a composite Assamese society and culture. However, over the last few decades,

when the Bodos ruled, the different cultures and societies like Brahminism, Bengali language, and culture witnessed a greater influence on their community. The Bodo group of people, especially the Bodos of lower Assam, currently known solely as Bodos of Assam, continued to maintain their language, culture, and tradition. The dominant Assamese Caste – Hindu culture existed, and the Bodos did not like to be submerged by this dominant Assamese Caste-Hindu culture. On the other hand, after the British annexation of the Bodo kingdom, the Bodos were completely disarrayed from their political Independence. Assam's socio-economic and political scenario was changed significantly due to the colonial administration and its subsequent policies, which brought forth significant changes. Like other aboriginal tribes and races, the Bodos were downgraded from a position of prominence to one of backwardness. It is vital to have an idea of their historical and socio-economic background to understand better their socio-economic causes leading to the identity assertion of the Bodos of Assam. Once, the Bodos were a powerful race, and their kingdom was confined not only in the Northwest but even extended up to the Bay of Bengal in the South and up to Bihar in the West. The Bodos of Assam took pride in the glory of the past. Reminiscences of their glorious past have contributed to arousing identity consciousness among them. They now asserted themselves by prompting a strident movement to revive their past glory and their powers. Thus, the historical factor is one of their major causes for identity assertion.

Another critical factor for creating identity consciousness among the Bodos is Social Reformation. The period between the nineteenth century and the early part of the Twentieth Century was a period of chaos and confusion in their life. Then, the Bodo society was very socially and economically backward, and an unhappy state of affairs was prevalent among them since the very old ties in the society were losing their strength daily. Due to the miserable conditions of the social system, anarchism or chaos was at large in the community. Some differences also existed among the Bodos in matters relating to religion. A few of them had been converted to Islam, Christianity, and Vaishnavism. After embracing Islam (Brahma K, 1992) the Bodo people of the Panbari area under the subdivision of Dhubri of Goalpara district converted into Muslims. Although a section of Bodo's converted to different religions, a large number of them still continued to profess/follow their own religion, which is the tribal religion². The Bodos worshipped their original God Bathou, performed pujas with the sacrifices of animals and birds, and even used rice beer. No ceremony used to take place in the absence of rice beer. The division of the Bodo people in the name of different religions by using rice beer and sacrificing birds and animals affected society. At such a critical point, a mighty man appeared among the Bodos known as Srimot Kalicharan Mech, also popularly known as "Gurudev Kalicharan". The division of the Bodo society into so many groups in the name of faith and religion was unacceptable to Gurudev. So, he thought of uniting the whole community of the Bodos into one. He read the Saranitya Kriya, a book of rites and rituals of Brahma religion or Brahma Dharma, which is a collection of teachings of Srimont Param

Sibanarayan Swami, initiator of Brahma religion and master of Kalicharan (Brahma K. 1992) and finally he concluded that the teachings of the Brahma religion would be highly appropriate for the Bodos. It is important to note that Brahma Dharma is a monotheistic religion based on the belief in the existence of a supreme being called Brahma, a collection of Upanishadic Brahma (Moshahary R.N. 1985). The basic principle of this religion is that Brahma is the only God and manifests himself in "Light" that emanates from the Sun and the Moon. The burning and worship of fire that is Hom – Yogya, known to the Bodos as Ahuti Shaoni, is the symbolic adoration of the light or Brahma, and that is all that required one to lead to Brahma. Brahma Dharma is Vedic in its rituals and is Upanishadic (Moshahary R.N. 1985) in its philosophy. He found something in the Brahma Dharma that he wanted for the Bodos to lead them from darkness to the light with the help of Brahma Dharma. The rearing of poultry, birds, pigs, and rice beer practiced at large by the Bodo community is considered discreditable by the neighbouring Assamese Hindus. In the opinion of Kalicharan, this practice led to the Hindu neighbours looking down on or casting the Bodo community. But what upset him the most was the lack of religious unity among the people. He noted that many Bodos had become Sarniya by accepting Hinduism and had assumed the titles like Koch, Rajbanshi, Chaudhary, Das, Deka, Saiba, Mondol, Karji, etc. these practices upset him. This was done to get social status raised or uplifted.

Moreover, the conversation with Saraniya about accepting Hinduism was impossible for every Bodo because it was a costly affair. On his initiation into the Hindu fold, it is said that one Raisahab Jagat Chandra Mohahary, the Mouzader of Patakata, was required to pay Rs. 6000 (Singh K.S. 1982). In various parts of Assam and north Bengal, Christianity slowly but steadily took its roots in the Bodo communities. In Goalpara district Assam, the Santhal mission of the Lutheran Churches and the American Baptist mission have absorbed several Bodos³ in Darrang and Kamrup districts, and the Anglican and the Baptist mission have drawn a sizeable number of Bodos into their folds (Basumatary S. 1977). The Scottish Mission had swept over many Bodos of the Mahakalguri area of Jalpaiguri district of north Bengal. Thus, the Bodos were breaking up as a community, and the total extinction of the people as a distinct tribal group was most feared to be imminent.

Perturbed by the circumstances, Kalicharan Mech felt the need to preserve the Bodo people's unity and their true identity. He thought this could be possible only through a change in the Bodo society and its religion. Kalicharan launched a social reform campaign with the spread of Brahma Dharma. He even urged people to abandon the traditional practice of raising pigs and poultry. They want to stop brewing and alcohol consumption altogether. Instead, he encouraged business, business, weaving, carpentry, and more. He did not trust the practice of charging the bride at exorbitant prices. In 1913 he founded a secondary school with a weaving and carpentry center in Tipkai. It was later transferred to Sapatgram near Fakiragram in present-day Kokrajhar District and expanded into Sapatgram

Integrated Academy. To facilitate the education of Bodo children, he also established a Brahma boarding house in Dubri (Basumatary S. 1977).

To encourage them in their education, he also submitted a memorandum to the Secretary of Education through Deputy Secretary A.J. Rainey in 1916 to convert the M.E. School of Tipkai into High School and to introduce the Assamese language at school (Moshahry R.N. 1985). As a result, most Bodos gradually became aware and began to get organized. In 1918, the first ever board organization, All Board-Chatra San Milan, was founded, and in 1924, Board-Maha Sabkha was founded. Therefore, it seems that Bodos initially realized their backwardness through social reform and even tried to educate themselves. It can be noted that at that time, their sense of establishment was limited only to socio-economic progress, but over time they also brought up political demands. Kalicharan Brahma submitted a memorandum to the Simon Commission in Shillong in 1929. This Memorandum was drafted by Sardar B.R. Kachari, Jadav Chandra Khaklary, and others who called for several political organizations for the tribes to form the Assam Plains Tribal League in 1933. At the request of the Tribal Federation, the Bodo tribe, along with other tribes, won reservations for at least five seats in the Assam Legislature in the 1937 elections (Tipkai 1986).

Another important factor that contributed to Bodo's claim to identity is the economic factors, including historical and social factors. The Bodos, like other Assamese tribal groups, were originally cultivators. Centuries after they settled in Assam, the Bodo economy remained primarily an agricultural economy. In the early 19th century, British officials and American missionaries who contributed their agricultural expertise were held in high esteem. However, various types of rice were grown by Bodos, including cash crops such as mustard, cotton, and sugar cane. They were also engaged in animal husbandry, significantly raising pigs, autumn vegetables, cultivated vegetables, and seasonal fruits such as oranges and bananas. Both Muga and Endi silkworms are handwoven to produce different types of garments. In addition to these activities, Bodos were also involved in border trade. It is noteworthy that the Bodo, who settled north of Bengal and Assam after migrating from the border regions of China and Tibet through numerous mountain passes, maintained trade relations with the neighbouring hill tribes to the north. Through them, the Bodos continued trade with Tibetans and Chinese traders.

Over the centuries, several trade routes existed between Tibet and northeastern India through these passes. The hilly place where these paths lead to the plains of India is known as the Kachari-Dooar, the gateway to the Kacharis. There were several such doors in the north-western slopes of Jalpaiguri in North Bengal and the districts of Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup, Darrang, and Sonitpur districts of Assam. These doors were often controlled and operated by the authorities in Bhutan and Tibet (Roy Ajay, 1995). Chinese silk, ponies, musk-wax, rubber, gold dust, etc. were imported into India through this route, while the exported items included rice, cotton thread and textiles, silk thread, and dried fish during the winter season. The Bhootias⁴ were coming down

these routes, and the trading of the above goods was between these hill tribes and the Bodos. This trading system immensely helped the Bodo economy.

The flourishing trade in Udalguri attracted some Assamese merchants from the Barpeta district, now a Kamrup District section popularly known throughout Assam as Barpetiahs⁵. As mentioned earlier, the Bodos used to produce mustard seed as a cash crop. The Barpetiahs came to Udalguri as mustard seed traders, reportedly in government dispatches (Provincial Gazateers of Assam, 1906). In the past, they exported mustard seeds for oil production outside Assam. But in some course of time, their superior business diversified into other trade routes, including frontier trading with hill traders, often forwarding locally grown mustard seeds and other vegetables. In practice, this meant that the farmers were still paying a lower rate for the bounty of the crops they had in their fields upfront, which meant they would collect the crops after harvesting, and the prices were always much higher. The poor Bodo farmers were always short of funds, so they quickly embraced this futures trading system. Gradually, this lucrative trade moved away from Bodos.

Other factors contributing to Bodo's socio-economic setbacks are education and employment issues. Education is known to play the most important role in the development and progress of society. The Bodo retreat in all parameters may therefore be related to their lack of education coupled with mass illiteracy and ignorance. The level of education in the District is far below that of the Assamese, and for a good reason. The Bodo were engaged almost exclusively in agricultural trade and using primitive methods, no theoretical knowledge was required. For Bodo farmers, sending boys to school meant losing workers on the farm. On the other hand, the language they had was exclusively spoken, without counter forms. Moreover, many adult Bodos who had daily business contact with their Assamese neighbours were able to speak Assamese with varying degrees of fluency. Today children learn the Assamese script. There was no help at home at that time, so it wasn't easy. For such Bodo children, Assamese was as foreign a language as English. Assamese was the only language of instruction available in schools and colleges for Bodo students. The degree of unavailability of educational institutions in Bodos can be judged by the fact that by 1910 there was not a single school in the entire Douar region. Assam's first state university, Cotton College, was established in 1901. Sitanath Brahma Chaudhary, the first Bodo graduate, graduated with a Bachelor of Arts degree. In 1936, during the last decade of the 19th century, Assam's Anandaram Barua passed through the I.C.S. Assam's elite embraced Western education and made it as far as Calcutta in the early 19th century. On the one hand, the complete absence of an elite class in the district community hindered such a surge of enthusiasm. Unlike the Assamese nobility, the Bodos never aspired to positions in Government as they had never enjoyed that privilege before. As such, Bodos have lagged in obtaining a modern education and in seeking alternative non-agricultural employment opportunities. At the turn of the 19th century, this drastic change that swept the entire state physically and mentally took them by surprise.

The social, religious, and economic consciousness of Bodos was transferred to political consciousness through problems of language and writing. The Bodo people have their language called the Bodo language. It can be confirmed that the language was once spoken by a large number of people spread over a wide area including Sadia in the east, North Bengal, Nepal in the southeast, parts of North Bihar in the west, and Sylhet in the South. Mymonsing, Cachar and Tripura (Brahmachaudhary B.L. 1993). The Bodo people preserved their language and this Bodo language is still their native language. Their language is a symbol of identity, so they want to preserve and nurture it.

After the country's Independence, the Bodo people were aware of their identity and took several important steps to develop their language, literature, and culture. Bodo Sahitya Sabha (B.S.S.), a literary body established in 1952, has been seriously committed to popularizing the Bodo language and literature since its establishment in 1953, according to the B.S.S. A memorandum to the then Chief Minister of Assam called for its introduction into primary schools in Bodo-controlled areas, but the Government took no action in this regard until 1963. On the contrary, the Assamese Government passed the Assamese Official Language Act in 1960, making Assamese the official language. Like other hill and plains ethnic groups, the Bodo also buried it as being the Assamese language imposed on non-Assamese by the Assamese Government. In response, the Bodo people launched a campaign to introduce the Bodo language into primary education under the banner of the B.S.S. As a result, in 1963 the Government introduced Bodo as the language of instruction at the first level, but this move by the Assamese Government failed to resolve the language problem, as Bodo students at the second level after passing the first level they need to study Assamese Medium. Therefore, it was found that it was a hurdle for Bodo students to continue their education after graduating from primary school. The Bodos were asked to claim Bodo as their language of instruction up to Sixth Form. However, the government and Assamese bureaucrats ignored this request, and Bodos felt that mainstream Assamese did not like the idea, as Bodo was not recognized as a state language by the Central Government. They had a strong Bodo identity and wanted to preserve their identity and preserve their language (Barman S. 1995). This sentiment pushed them back into the movement, as demonstrated by a 25,000-person mass rally in Kokrajhar in 1968. Strikes, class boycotts, etc. all began in Bodo's concentrated areas, and finally, the Government granted their demands later in the year. However, this was not the end of the Bodo language problems. In 1972, at the request of the All-Assam Student Union (ASSU), Guwahati University and Dibrugarh University introduced Assamese as the language of instruction in place of English in their universities. Bodo students, beyond enrolment at Bodo Medium, were directly prohibited from receiving a college education as a result of this change. The Government's language policy had also created challenges for Bodo students. From this, the Bodos realized that without autonomy they could not have higher education, and without higher education, they could not think about their identity

or the general development of their community. As a result, their socio-religious language and economic consciousness changed to political consciousness.

The Bodo problem was further complicated when in 1974 they began to require a Roman script for Bodo. Bodos didn't have its script. Therefore, the creators of this language had to rely on different scripts at different times. The tribe was illiterate before the arrival of the British in Assam. Each group had its own language, but each was predominately spoken and had no written form. Christian missionaries first gave them the status of the written word when they wrote gospel literature. Initially, the Assamese or Bengali script was used, but later the Roman script was also used. By 1974, however, the Bodos used the Assamese script for their language. However, to protest the Assamese supremacist supremacy, Bodo began to demand a Romanized script for Bodo instead of Assamese. The Assamese Government, on the other hand, refused to comply with the Romanization request. Finally, Indira Gandhi, then Prime Minister of India, pushed for the adoption of the Bodo Devanagari Bible in 1977. Today, borrowers are reluctant to accept Assamese and scripts for the Assamese middle-class Chauvinism. For example, when the Assam Secondary Board of Education (SEBA) passed an ordinance in a notice in 1986, making Assamese a mandatory third language instead of Hindi at Assam's schools, the Bodo people resolutely opposed it. Bodo leaders warned against an upset program to withdraw the SEBA circulation. So, the circulation was interrupted under the excuse of the Bodo and other non-Assamese. The Bodo were sceptical of the Assam government's language policy. Therefore, the Memorandum of Understanding ABSU accused the Assamese and the Assam government of wanting to assimilate non-Assamese by imposing Assam's language and culture. The Assamese and the Assam government were not aware of their mistakes (Memorandum of Understanding 1987).

It seemed to Bodos that the Assamese Government, ruled by an advanced group of Assamese people, did not like Bodos to progress on their own language and script. These problems made Bodos uneasy in the mixed Assamese society. A sense of alienation from mainstream Assamese society began in Bodo's minds. The Bodos are not really opposed to Assamese society and culture, but they hope to be recognized for their own Bodo language and its development in the larger Assamese society.

Part B: Phases of the Ethnic Movement

The movement for a separate state had its origins in the socio-cultural and economic aspirations of the Bodo people. For many decades, the Bodos had a feeling of exploitation, neglect, alienation and discrimination. Generally, they felt that in the atmosphere for assimilation into non-Bodo society and culture, especially into the campaign of Assamese culture, they had no chance of living or preserving their own rich culture. Therefore, the Bodo middle class and elite took a certain level of formal education and began to launch forums to mobilise the Bodo intellectuals in addressing the issues pertaining to their community.

The first phase of the movement: As a result, from the second decade of the Twentieth Century, the Bodo movement started with the first phase of the socio-religious reform movement. For the very first time, the Bodos were urged to preserve their self-identity under the leadership of Kalicharan Brahma in the course of religious reforms. He was concerned about the Bodo people's conversion to Hinduism and adopting the Saraniya Caste, which was placed at the lowest rank of the Assamese caste Hierarchy where the Bodos lost their identity and failed to earn social respectability. He put forward the idea of a new religion in the year 1907- called as "Brahma" religion⁶. Since then, he was known as Kalicharan Brahma. He always made it a point while he was propagating the rich cultural heritage of the Bodos and urged them to take pride in being Bodo. It was another new experience in Bodo society. After many years of the historical void, the first time it emerged in the minds of the Bodo people at they are the people apart from the others with the identity and self-entity. They felt that they should not be disregarded. Finally, the Bodos got conscious of their society and identity.

Along with the religious movement, Kalicharan Brahma brought social reforms as well, to contribute to the spread of education among the Bodos. Besides, he played an important role in initiating a literary movement. He made a great effort in the Bodo written language which took shape in a standard form. His works were later escalated by several pioneering leaders like Ishan Mosahary, Rupnath Brahma, Pramod Brahma, and Sitanath Brahma Choudhury. Though the Christian Missionaries had used Roman script to write evangelical literature in the Bodo language the Bodo writers wrote the Bodo language in Assamese script and since then the Bodo language embraced the Assamese script as its own (Roy Ajay, 1995).

The Spread of western education and social-religious reforms have brought a resurrection amongst the few educated elite Bodos. To assimilate with such a spirit of a new beginning, in the year 1918, the Bodo students formed an organization named *Assam Bodo Chatra Sanmilan* at Dhubri –the Head Quarter of the undivided Goalpara District. The Bodo students took up the issues of their general improvement in culture, language, educational facilities, and employment opportunities for the Bodos. For the first time, the organization had brought some activities for bringing a sense of solidarity among the Bodos and to teach them how to fight for the remedy of their indignity. Similarly, an organization of the Sonowal Kachari youth was formed in the year 1927, known as *Assam Kachari Jubak Sanmilan* to raise their voices on the grievances and matters not strictly falling under the students' activities⁷. All such organizations in the course of time started to get involved in political activities which concerned the future of the Bodos. Simon Commission in the year 1928 visited Shillong- the capital city of Assam to figure out a solution on some sort of participation by the Indians in the administration of British India⁸. The Commission had asked the members from the "primitive and Backward Tribes" of Assam to claim before it at the Shillong on January 4, 1929. The plains tribals were under the "Primitive and Backward Tribes" (Basumatary B.K. n.d). The Goalpara District Bodo Association met the

Commission at Shillong and submitted a memorandum demanding it to be considered a separate category of the Bodos in the Census Report. Whereas in the Memorandum, the Association wrote:

"The Bodo Community forms a considerable position of the population of the district of Goalpara and its numbers about one lac and fifty thousand. In the whole province of Assam, its total number is about eight lacs. A large number of Bodos live in the district of Jalpaiguri and Koch Behar in the province of Bengal. Out of one lac and fifty thousand, some thousands have been treated as Hindus, which is the cause of a decrease in the number of the Bodo population of the district of Goalpara. The Bodos have a distinct civilization of their own. There should be a separate category for the Bodos in the Census Report". – Memorandum submitted by the Bodo community of Goalpara District to the Indian Statutory Commission, New Delhi on December 30, 1928

Along with that, there should be territorial redistribution, facilities for education and appointments, separate seats in the Dhubri Local Board, a separate Bodo regiment, and Separate Electorate Status for the tribals in the Legislative Council. These were the important points demanded by the Goalpara District Bodo Community. In this matter of separate electorate, they stated:

"In our opinion, there should not be a mixed electorate. Each section of people should have the liberty of sending in their representatives to the local council. The peculiar position in which we are placed, offers us practically no chance of sending our representatives to the council, though there is a large number of voters in our community, -----A liberal view of our opinion will show that we cannot enjoy the advantages of the reforms as the other communities do. In spite of our being such a large number, all advantages of the reform are being enjoyed either by Brahmins or by Kshyatriyas, or Sudras. So in order to Safeguard the Interests of our community we should have a separate representative in the council" - Memorandum submitted by the Bodo community of Goalpara District to the Indian Statutory Commission, New Delhi on December 30, 1928

The Second Phase of the Movement: the new birth of *Bodo Sahitya Sabha* (B.S.S.) was another important phase of the Bodo movement. This phase leads to the language and script movement. The B.S.S. was formed at Basugaon on 19, 1952 with Joy Bhadra Hagjer as the president and Sonaram Thaosen as the General Secretary. Their main motive is to develop and promote Bodo literature and language. They functioned from a zero point to pervade a new life into the decaying Bodo language and accretion of literature, language, and also a mass consciousness. The B.S.S. held many literary seminars, and meetings to promote Bodo language scholars and writers. Their aim was to unite all the Bodo groups of languages currently spoken in the Northeastern part under one umbrella organization. It was agreed to frame and construct the standard Bodo language, which could form the link language between all the Bodo tribes of the North-East

and the common literary language of these tribes. This objective motivated the building up of similar bodies by other Bodo tribes and cooperation with them.

In the Third Phase of the Movement: the ethnic riots took place as another ugly and serious consequence noted in the Bodo movement between Bodos and Santhals. It was reported that there has been a constant armed revolt and conflict in the forest areas of Kokrajhar and Bongaigaon districts between the National Democratic Front of Boroland (NDFB) and Birsa Commando Force (B.C.F.) militants for long. The main problem behind such kind of violence was the large encroachment on the forest lands and infiltration of people of doubtful identity into the Bodo areas of these two districts which are written above. It may be noticed that the armed militant organization of the Santhals named Birsa Commando Force (B.C.F.) was working for the creation of the Jharkhand area within the proposed Bodoland area. This created an agitation among the Bodos about their own identity. The B.C.F. rallied with the Adivasi people in the name of Jharkhand. The rally started with looting, killing, and even challenging, threatening the Bodo people. It has greatly affected the peaceful and age-old existence of the aboriginal Bodos and Santhal people in the area. A large section of the armed Bodo youths took part in challenging all the activities of the Santhal extremists which resulted in the ethnic riots between the two communities. Hundreds of people lost their lives in these riots, and thousands of them became homeless and stayed in the different refugee camps where there were no sufficient funds or power. These issues split the Bodo People Party (BPP). Thus Premising Brahma of the Bodo People Party with his certain understanding of the Congress-led the state Government went on to form another interim Council of B.A.C. (Bodoland Autonomous Council).

Under these circumstances, the powerful All Bodo Student Union (ABSU) rejected the Bodoland Accord signed on February 20, 1993. The ABSU's main decision was to rejuvenate their struggle for a separate Bodoland State. With the view to unifying all the political parties, bringing them under one platform led to a dialogue. S.K. Bwiswmutiary- led the faction of BPP and was dissolved on February 20, 1996, which paved the unification process. Meanwhile, Premising Brahma led the faction of BPP and snapped ties with the Hiteswar Saikia –led Congress. When the State Government failed to bring any concession to Bodoland Autonomous Council (B.A.C.), Premising Brahma resigned from the Interim Council and dissolved his faction of BPP on March 26, 1996 (Assam Tribune, 1998). With both the factions, the All Bodo Student Union formed another organization named *Bodoland Statehood Movement Council* (BSMC). The ABSU on April 13, 1998, also regenerated the Bodoland People Autonomous Council (BPAC) which was dissolved in 1993 after the signing of the Bodo accord to spearhead a mass movement.

In the Assembly election in the year 1996, Prafulla Kumar Mahanta came to power in Assam and led the *Ason Gana Parishad* (A.G.P.). People's Democratic Front (PDF) and another political party that made an alliance with the A.G.P. As

the Interim Council of B.A.C. was formed under the leadership of Kanakeswar Narzary as per the notification from the State Government, the All Bodo Student Union and Bodo People Autonomous Council in the 1993 Bodoland Accord reflected betrayal of the Bodos and demanded the breaking of the Accord. The ABSU and BPAC combined and declared a fresh movement at the 31st annual conference at the beginning of February 20, 1999, to persuade the Central Government for the separate state of Bodoland. They pointed out that nothing short of a separate State of Bodoland could solve the issues of the Bodo people. The Bodo organization and the Assam Government developed a fresh notification on April 9, 1999, to incorporate 259 villages into the Bodoland Autonomous Council area (Assam Tribune, 1998). Subsequently, on May 13, 1999, the State Assembly passed the B.A.C. Amendment Bill amidst all the protests from the Bodo organizations. The ABSU later rejected along with the BPAC the demarcation for excluding the Sirampur Check post, Bijni, Tangla, and some other villages, the Bongaigaon refinery and Petrochemicals Limited (BRPL), and the Manas National Park despite their demands to include them in the Bodoland Autonomous Council (B.A.C.). Their step sparked a fresh strident demand for a Separate Bodoland State rather than solving the issues.

While in the meantime, there were several rounds of meetings and dialogues between the Assam Government and Indian Government on the one hand and the B.L.T., ABSU, and BPAC on the other, to arrive at the Bodoland Accord to solve the Bodo problems. As a result, another accord was signed between the Centre and B.L.T. to form Bodoland Territorial Council (BTC) on February 20, 2003. Besides the B.L.T. and ABSU (the Bodo student groups) and BPAC whole heartily welcomed this agreement. But the NDFB rejected it. However, the Bodoland Territorial Council (BTC) under the provision of the amended Indian Sixth Schedule of the Constitution was formed.

From the above-mentioned discussion, the result was that the Bodo movement is an old age grievance and not a sudden outcome. Initially, the Bodos wanted only to develop themselves economically, educationally, and socially. During that period this movement was not strong enough. But right after the Indian Independence, the Bodos realized that unless they attained a separate homeland and own autonomy they could not revitalize their lost identity and their glorious heritage and culture. Thus, for this reason, the Bodos got involved in this Bodoland movement. Since, the third decade of the Twentieth Century, powerful Bodo educated began to emerge. Under the banner of the tribal league at the beginning, they struggled a lot at various levels to protect their tribal interest. Due to their persistent endeavour of the Tribal League, the Line system and Tribal belts and Blocks were generated. The Bordoloi Sub-committee to the Constituent Assembly representing Assam ignored the opinions of the tribal people of Assam gradually and assimilated them into the Assamese society. In fact, there was no safeguard provided to the Assam plains tribals in the Sixth Schedule of the Indian constitution.

In August 1985, Assam Accord was signed after six long years of agitation by the All Assam Students Union (AASU) and Asom Gana Sangram Parishad (AGSP). But the ABSU strongly opposed the Accord and termed them Anti-tribal. Certain actions of the newly created Asom Gana Parishad (A.G.P.) led by the Assam Government had affected the Bodo people and provided immediate provocation to the ABSU. Under the leadership of Upendra Nath Brahma, was launched a massive movement in 1987 demanding a separate homeland of Bodoland. The movement had witnessed a growing militancy among the Bodo people. When the Bodo agitators destroyed the railways and road communication system that linked the entire northeast with the rest of the country that affected the whole Northeastern, it came into the light of national attention. The state was under massive pressure to bring a solution to the problems. After the prolonged negotiations, both the Government of India and the Government of Assam's last much-known Bodoland accord signed on February 20, 1993, provided the formation of a *Bodoland Autonomous Council*. However, it seemed a relief among the Bodo society, but it was proved wrong and it took no time for the people to realize the futility of the B.A.C. Both the State Government and Bodo organizations failed to reach an agreement made on the demarcation of the boundaries of the B.A.C. Having failed to fulfill the aspiration for the Bodos, the ABSU rejected the Accord. And they started demanding the creation of the Bodoland State, the same way the other three states Chattisgarh, Uttarakhand, and Jharkhand were created in the year 2000. After a series of dialogues between the Centre and the B.L.T. including the ABSU for creating a fresh Bodo Accord signed in 2003, which is known as Bodoland Territorial Council (BTC) and administers a territory of around 3,108 villages making four districts- Kokrajhar, Udalguri, Chirang, and Baksha, was formed under the provision of the Sixth Schedule of the Constitution of India.

It assessed that it is a regional movement which seemed to be the various phases of the Bodo movement for all round development and autonomy. This phenomenon in any state or society upraised the regional movement among the particular section of people in a natural way when they are lacking in the developmental parameters compared to the advanced communities. This is when they felt deprived and ignored by the other state members. The development of their own communities is the prime subject of this movement. They had expressed their feelings and resentment either in a violent or non-violent way. They took the neighbouring advanced society to be their enemies. Their anger indicates their attacks on the neighbouring communities. This brought the regional movement of a multi-national state to a natural cause. This movement was part of the process of national integration rather than a threat to the nation. Because regionalism is an essential mode of national integration. The Bodoland movement in general and in the context of Assam, in particular, is not a threat but all the process of national integration. The development of the Bodo community and locality will indirectly help in process of nation-building. Again this movement is not based on the

revolutionary one, but it is more of ideology of class struggle with some elements of class struggle built into its ideology (Sharma 2006).

V Conclusion

It is clear from the above description and the paper describes that the Bodos over the years have struggled for their political rights and to safeguard their ethnic language, identity, and culture for the overall development of the region. Over the years the Bodos underwent movement overground and underground to achieve their political aspiration to have a separate Bodoland. The creation of BTC in the year 2003 played a major socio-political development and ushered in a new ray of hope for peace and growth of the Bodo society. This political development has brought notable changes in the social, and political life of the Bodo people. Nevertheless, the Bodoland movement has many stories of suffering and has also brought many positive impacts on the Bodo society like preservation of language, political consciousness, ethnic identity and culture, and social and economic development. Despite many political demands, the struggle of the Bodo people still continues. So this paper brought the heroic struggles that the Bodos faced and they urged them to live naturally with dignity, and social and political rights. With this, it helps us to understand the changes in the Bodo community, the emergence of Bodo nationalism, and their phases of struggles for getting an identity of their own. Thus the Bodoland movement was neither called as revolution or reform movement. But that is a transformative movement who aimed to bring out the structural changes in the distribution of resources and powers. This element of conflict in this movement acquires a sharper focus than in the reform movement, of which the Brahma movement has been one of the good example in this movement.

Endnotes

1. According to R.N. Moshahari and M.R. Moshahary, the word *Kachari* derieved from the word Bodo *Korisa Ari* which means first born race or people or the earliest settlers of the region and the forerunners of them who were the Aryans must have spelt *Korisa Ari* or *Korosari*. Whatever the name *Kachari* or *Kosari*, it is clear that they are known as the earliest settlers of this region.
2. Tribal religious practices are animistic in nature. It has its own distinct character. The Bodos followed religious system of their own and which is free from influence by other religious system. They worship *Bathou Borai* in the form of a Cactus of the Euphorbia Splended, which is called *Sijau* in Bodo. It is equated with Lord Shiva. They also have a number of Gods and Goddess whom they worship in own customs.
3. O. Hodne, the seed Bore Fruit (A short History of the Santhal Mission of the Northern Churches, 1867-1967), Santhal Parnagas, 1967, pp.31-32
4. Collective term for all tribes living in the hills of Bhutan and the western hills of Arunachal Pradesh.

5. These Assamese Caste –Hindu traders hail from Barpeta, hence they are popularly known as Barpetiah.
6. It is like a half-way house between Hindu and Bodo religious beliefs.
7. The “Assam Kachari youth Association” was formed in 1927 by dissolving the Dangari Kachari Jubak Sanmilan which was the first social organization of the Sonowal Kacharis of Assam, born in 1921 at dangari village of present Tinsukia district of Assam. Later on, they felt the need of a common political organization to fight for fulfilment of aspirations. In view of this, the Bodos in 1993 and all the plains tribal groups including the Mikris, Khamtis and Shyams met at the Annual session of the Assam Kachari Youth Association held at Raha, Nowgaon district and formed a common political platform, by dissolving “Assam Kachari Youth Association”, under the banner of the “Assam Plains Tribal League”.
8. The Simon Commission or the Indian Statutory Commission was constituted at St. James, London, on November 26, 1927 with the following persons-Sir John Allsbrook Simon, Chairman, Mr. Henry Lawson Webster, Baron Strathcona and Mount Royal, Viscount Burnham, Mr. Donald Sterling Palmer, Mr. Edward Cecil George Cadogan, Mr. Stephen Walsh. However, on December 7, 1927, Mr. Stephen Walsh resigned and Mr. Veron Hartshorn was appointed in his place.

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Middle Class and Development: A Study of Indian State

R. Ahalya and Sourabh Bikas Paul

This paper explores the effect of middle class share on economic performance and institutional outcomes across Indian states. It is argued that the middle class has a role in creating better economic and institutional outcomes. A three stage least squares model is used to study the association between economic/institutional outcomes and middle class across Indian states. The results show that middle class size has an impact on GDP per capita and its growth. Middle class share positively influences health outcomes, but does not affect some other institutional outcomes. There is no prior empirical analysis dealing with the role of middle class in shaping economic development and institutions in the Indian context. This paper attempts to fill this gap by systematically studying the relationship using an econometric model.

Key Words: Middleclass, Economic performance, Institutions, Indian states

This paper studies the links between middle class across Indian states and various socioeconomic outcomes. Do states with a larger proportion of middle class have better economic development and growth? Does the middle class have any role to play in creating better institutions? What are the implications of caste and religious heterogeneity on these outcomes? The rapid growth of middle class in India is seen as an important harbinger of social change. It is also arguably the most significant factor shaping the developmental outcomes (Li 2010). It has been noted that policies to encourage middle class may be important to create a society with values that can contribute to higher economic growth (Amoranto, Chun, and Deolalikar 2010). In a pioneering work, Easterly (2001) finds that the regions with higher income share of middle class and lower ethnic divisions tend to have higher income as well as better developmental outcomes. He defines ‘middle class consensus’ as a high share of income for the middle classes and low degree of ethnic divisions. The paper further claims that a society with small middle class income share will have more poverty and a powerful wealthy elite class. A large middle class is associated with greater equality of opportunity and is characterized by stronger institutions (Savoia, Easaw and McKay 2010). According to Landes (1998), ideal growth and development society would have a relatively large middle class and a well-functioning democracy. Barro (1999) finds that democracy rises

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with the middle class share using a panel of 100 countries during the period 1960 to 1995. While these studies establish the consensus hypothesis in a macro perspective, the impact of emerging middle class on economic outcome within a country as diverse as India is very pertinent by its own merit.

The literature on middle class in the Indian context has two broad strands. The first strand deals with the empirical and qualitative study of middle class examining its composition and political role (Sridharan (2004), Fernandes (2000), Banerjee and Duflo (2008)). The other strand relates to studies on consumption behavior of the middle class and its role in driving the goods and services market (Beinhocker, Farrell, and Zainulbhai (2007), and Mathur (2010)). It is clear from the pre-existing studies that the emerging middle class in India has a lot of potential to shape the future of the country through its consumption behaviour and its influence on political outcomes. However, to the best of our knowledge, there is no study looking at the link between middle class, and developmental outcomes in India, particularly at the state level. The study of middle class from a state level perspective is important in a socioeconomically diverse country like India with a large democracy. Stark disparities exist across states in terms of the socioeconomic and political environment. This paper aims to be a precedent in studying the Indian middle class at the state level, and establishing the nature of its relationship with developmental outcomes. Lobo and Shah (2015) state that a holistic study of the middle class, and its relationship to the broader issues of development, society and culture remains a less explored but a hugely interesting area. According to Jodhka and Prakash (2011), middle class has to be understood analytically in terms of its role in relation to state, market and civil society. We must study the role of middle class along with the caste and religious divisions in the state as they determine the environment in which the middle class operates (Fernandes (2000) and Sheth (1999)). In this paper, we try to fill this gap in literature by studying the relationship of middle class with economic, social, and institutional outcomes while taking into account the effect of social disparities.

There is hardly any consensus in literature on how to define and measure the size of middle class. We use the absolute consumption criteria given by Kharas (2010) to define middle class. We construct a panel comprising of all Indian states and union territories for middle class share and the outcome variables for the years 1987, 1993, 1999, 2004, 2009 and 2011 corresponding to the National Sample Survey Organization's (NSSO) rounds. The approach of this paper differs from Easterly's approach in the use of the share of middle class in the total population as the main explanatory variable instead of the share of income of middle class in the total income. We consider this approach as more appropriate from a developing country perspective since we use the absolute consumption expenditure cut offs to define middle class instead of the relative income approach used by Easterly.¹ We regress each outcome variable on the share of middle class, caste heterogeneity, religious heterogeneity, urbanization ratio, and other controls. The results of the paper show that middle class does have a positive and significant effect on Gross Domestic Product (GDP) per capita, and economic growth. Among the

institutional outcomes, middle class size has a positive influence on health outcomes.

The rest of the paper is organized as follows. In section I, the nature and role of middle class in India across states and over time is discussed. Section II deals with the data used in the study, and summary statistics of the variables are discussed. Section III and IV discuss the relationship of middle class with economic and institutional outcomes respectively, the methodology used, and the results obtained. Section V analyses the problem of endogeneity in the model. In section VI, the results are discussed and the chapter is concluded.

I The Role of Middle Class in the Indian Context

Since the inception of middle class in India during the British rule, it has been a modernizing social category and an important agent of social change in Indian society (Jodhka and Prakash 2016). The role of middle class in society is looked at in light of its relationship with working class and the politically powerful bourgeoisie class. Although conventional Marxist theory was sceptical about the survival of middle class as an independent entity, neo Marxians have realized that middle class has not only survived and expanded but has been successful at weakening the exploitative relationship between the actors in a dichotomous society comprising of the bourgeoisie and the proletariats. It has been established across societies, that middle class have attributes that support democratic principles and engage in actions for the rise and maintenance of a democratic system (Eulau 1956, Lipset and Raab 1981). It has been determined that a society with a large middle class tends to be less unequal in terms of distribution of socioeconomic resources (Muller 1988). The effect of economic growth and development on the establishment of a democratic polity is not direct but works through the effect of middle class in the society (Lipset and Raab 1981, Rueschemeyer, Stephens, Stephens, *et. al.* 1992).

Despite the rich sociological literature on the subject, very few attempts have been made to identify the composition of middle class and the impact it has on the economy. According to Brandi and Bu"ge (2014), there are a variety of different middle classes in developing countries whose growth, size and consumption capacities vary. In order to take the heterogeneous nature of the emerging middle class into account, they create a typology of middle class comprising nine different types of middle classes, ranging from a small and affluent middle class to a poor large middle class. This kind of typology enables us to study the diverse nature of middle class across regions. Sridharan (2004), in his essay analyses the growth of middle class in India since 1980, focusing on the liberalization of 1991. The variations in the nature of relationship between economic growth, and middle class are due to differences in the social and cultural makeup of the region (Amoranto, Chun, and Deollikar 2010). The paper studies how the emergence of this class and its composition has affected the liberalization process in India. According to the paper, the class structure has changed from one with a small wealthy elite class

and the poor masses, to one where an intermediate class of middles has been created. According to the paper, a society where the middle class have little say in shaping government policies, the rich will strive to fulfil their vested interests by promoting skewed socioeconomic policies that are at divergence with the interests of masses.

The main hypothesis of the chapter is based on the middle class consensus theory proposed by Easterly (2001). In this paper, Easterly studied the effect of middle class income share on GDP per capita and its growth rate for 175 countries using tropical endowment (primary commodity exports) in a country, as an instrumental variable for middle class. Ethnic fragmentation in a country was used as a control variable in the regression. The results of the paper showed that the presence of a stronger middle class and lower ethnic fragmentation in a region leads to better economic outcomes. We revisit this hypothesis in the context of Indian states since every state of India is unique in its socio economic and cultural characteristics. The second part of the Easterly's hypothesis focuses on the effect of ethnic fragmentation on public outcomes due to divergent interests among multiple groups. According to Alesina, Baqir, and Easterly (1999), social fragmentation is associated with reduced access to local public goods, often because it inhibits communities from working collectively to extract public goods from the state. In the Indian context, Banerjee, Iyer, and Somanathan (2007) find that greater caste and religious divisions negatively affect access to public goods. Although the main focus of the present study is to establish the relationship between middle class and various public outcomes, it is necessary that we control for caste and religious heterogeneity across states.

This paper attempts to study the role of middle class in shaping better institutions across Indian states. It has been well established that the quality of economic and democratic institutions determine growth and development in a society (Acemoglu and Robinson (2005), Easterly, Ritzen, and Woolcock (2006)). It has also been shown that the middle class play a crucial role in shaping better institutions (Loayza, Rigolini, and Llorente 2012, Savoia, Easaw, and McKay 2010). Therefore, it is hypothesized that higher share of middle class in a region creates better institutions which in turn lead to better socioeconomic outcomes. Although we acknowledge that the mechanisms which govern these relationships are complicated and can be investigated using various sociological, anthropological, and economic tools, we study the relationship using a relatively simple empirical specification. This may not capture all possible interactions of middle class with the economy and society, but gives us insights on the direction in which middle class affects economic and institutional outcomes at the state level in India.

II Research Methodology

We can use a simple OLS and a state fixed effects model to study the effect of middle class share on various outcome variables. However, this specification may

suffer from possible endogeneity issues due to omitted variables or simultaneity. In such circumstances, it is difficult to determine whether the causality is bidirectional or unidirectional. It is important to disentangle this confoundedness of causality in order to understand the relationship between the variables. We propose to correct for this problem of endogeneity by using a suitable instrumental variable for middle class share. The state wise share of non-agricultural employment in the total employment is used as an instrument for middle class share. It has been well documented in literature that India's economic development has been led by a shift from agriculture to non-agricultural employment, specifically service sector employment. For instance, Gordon and Gupta (2003) find that India's growth experience has been characterized by a decline in the share of agriculture in GDP and an increase in the share of industry and services. Jodhka (2012) finds that the industry and service sector continue to absorb more and more people and the middle class are predominantly located in the service sector. Sridharan (2004) highlights the importance of middle class as economies shift away from agriculture and towards the service sector. Fernandes (2000) has also found that the middle class in India is characterized by the new economy service sector. It has been noted that the expansion of middle class in developing Asia has been driven by the rapid structural transition from agriculture, to industry and services (Huynh and Kapsos 2013). Clearly, the middle class is mostly employed in non-agricultural occupations rather than agriculture, and thus it will be appropriate to use employment in non-agricultural sectors as an instrumental variable for middle class size.

However, it is also apparent that non-agricultural employment share is itself endogenous in the model since it is likely to be associated with the outcome variables. In order to rectify this, we use historical average variation in rainfall across states as an instrument for non-agricultural employment share. Skoufias, Bandyopadhyay, and Olivieri (2017) study the effect of historical rainfall variability on the shift of household employment away from agriculture to non-agricultural sectors. The analysis revealed that high rainfall variability has a significant negative effect on the agricultural focus of within-household occupational choices. We use this finding as the justification of the choice of the instrumental variable.

In this manner, we run a three stage least squared regression model for the purpose of our study. This is more efficient as compared to the two stage least squares because the problem of serial correlation may still persist due to simultaneity. In the first stage, the share of non-agricultural employment is regressed on the coefficient of variation of rainfall averaged over the period 1950 to 2002 across Indian states. Since the historical coefficient of variation in rainfall is time invariant, we use the Fixed Effects Filter (FEF) model (Pesaran and Zhou 2018). This is done in order to correct the bias occurring due to the correlation of these variables with the individual effects. In the first step, use a state fixed effects model to regress the share of non-agricultural employment on the time varying factors as follows:

$$y_{it} = \alpha + \beta z_{it} + \varepsilon_{it}$$

In the second step of the FEF regression, the mean of the residuals from the above equation is regressed on the time invariant factor as follows:

$$y_{it} = \alpha + \beta x_i + \varepsilon_{it} \quad \dots(1)$$

Where, y_{it} is the share of non-agricultural employment, x_i is the time invariant variable (the coefficient of variation of rainfall), and ε_{it} is the error term, for the i^{th} state and t^{th} time period. The coefficient of variation of rainfall is calculated as the ratio of the variance and mean of the average historical rainfall over the years 1901 to 2002, for each state.

In the second stage, we regress the predicted values of non-agricultural employment on the middle class share using a pooled OLS specification as shown below:

$$y_{it} = \alpha_{it} + \beta_1 x_{it} + \beta z_{it} + \varepsilon_{it} \quad \dots(2)$$

Where, y_{it} is the middle class share, x_{it} is the predicted non-agricultural employment, z_{it} is a vector comprising of a set of control variables, and ε_{it} is the error term.

In the third stage, the outcome variables are regressed on the predicted middle class share, using generalized least squares method as shown below:

$$y_{it} = \alpha_{it} + \beta_1 x_{it} + \beta z_{it} + \varepsilon_{it} \quad \dots(3)$$

Where, y_{it} is the outcome variable, x_{it} is the predicted middle class share, z_{it} is a vector comprising of a set of control variables, and ε_{it} is the error term.

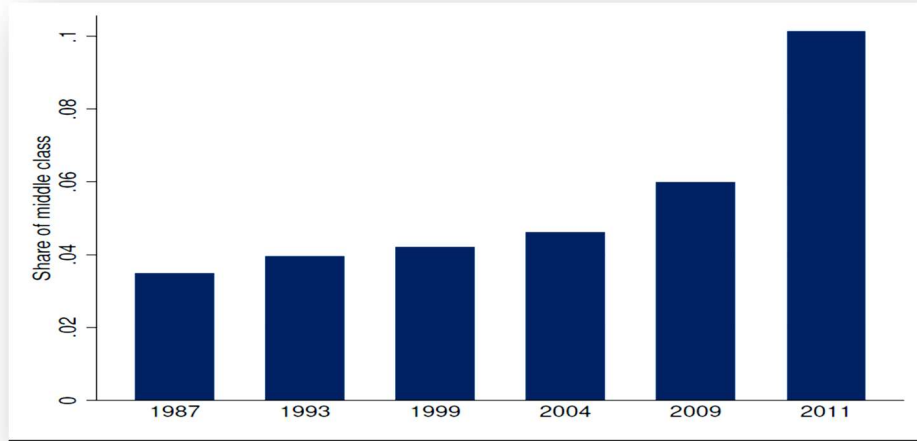
III Data and Summary Statistics

Measuring Middle Class

All thick rounds of the NSSO consumption expenditure data for the time period 1987-2011 are used for creating a state wise panel of share of middle class households in Indian states and union territories. We follow Kharas (2010) to define the middle class based on consumption expenditure criteria. Households with per capita per day consumption expenditure between \$10 and \$100 at Purchasing Power Parity are considered to be middle class.² We use the average Consumer Price Index (CPI) index for agricultural labourers (rural) and industrial workers (urban) for the period 1987-2011, to obtain the inflation adjusted cut offs for different years. Before turning to the more concrete findings of the paper, we look at how the size of middle class has changed over the period 1987-2011. The

bar graph in figure 1 shows that overall percentage of global middle class in India has consistently increased from around 3.5 per cent in 1987 to about 7.5 per cent in 2011.

Figure 1: Share of Middle Class during 1987-2011



Source: Authors' calculation using NSSO consumption expenditure data for the years mentioned

The shares are calculated in the total households in the sample for each year.

Measuring Other Variables

We use the proportion of middle class in Indian states as the main explanatory variable in the study. The other explanatory variables used in this paper are caste and religious heterogeneity. The index is based on the Herfindahl Hirschman index and is given as one minus the sum of the squares of the proportion of all caste (or religious) groups in each state. The caste, and religious heterogeneity index is given by the following formulas:

$$RHI = 1 - (\sum(\text{Religion}_i)^2)$$

$$CHI = 1 - (\sum(\text{Caste}_i)^2)$$

where RHI and CHI refer to the religious and caste heterogeneity indices respectively while Religion_i and Caste_i refer to the proportion of the i^{th} religion and caste in a particular state. Another control variable used in the study is urbanization ratio which is defined as the ratio of urban households to the total households in a state, and is obtained from the NSSO consumption expenditure data.

We divide the dependent variables into two categories: economic outcomes and institutional outcomes. The major variable in the study is GDP per capita and its growth rate. We obtain nominal state GDP data from the Central Statistical Organization (CSO) website and it is inflation adjusted using CPI index. The GDP per capita is calculated by dividing it by the state wise population.³ The GDP per capita growth rates for each year is calculated as the average of the GDP per capita growth rates during the previous two years and the next two years. We obtain the data on school enrolment rates and other control variables from the Census of India, and GOI Annual reports. The source of data on Infant Mortality Rate (IMR) and life expectancy are National Family Health Survey (NFHS) reports, and the handbook of statistics published by the reserve bank of India.

We measure the quality of institutions in terms of administrative efficiency, democratic participation and financial inclusiveness. Administrative efficiency is proxied by the extent of power loss during transmission and distribution due to misuse and corruption. According to Subramanian (2007), it reflects the quality of state level politics as well as state level bureaucracy (the state electricity boards) which enforce the laws. The annual reports of state electricity boards provide data on Transmission and Distribution (TD) losses of power. Democratic participation is measured by the share of adults who participate in the voting process in a state. We get data on voter turnout rates in the general elections from the election commission of India reports for the nearest year, in which the general elections were held.

Inclusive financial institutions are crucial for socio economic development and inclusive growth. The strength of financial institutions can be determined by their outreach and extent of utilization. In 1969, the banks were nationalized to strengthen the banking system and spread it across all sections of the society. We can define financial inclusion as a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy (Sarma 2008). According to Dixit and Ghosh (2013), inclusive growth strategy should not only aim at equitable distribution of growth benefits, but creating economic opportunities and equal access to them for all. Access to formal savings and credit mechanisms facilitate investment in productive activities such as education or entrepreneurship. Lacking such access, individuals rely on their own limited, informal savings to invest in education or business, and small enterprises on their limited earnings. This can contribute to persistent income inequality and slower economic growth (Demirguc-Kunt and Klapper 2013). We construct a multidimensional financial inclusiveness index using the method suggested by Sarma (2008). The index is constructed using three basic parameters: banking penetration, availability of banking services and usage of the banking system. We obtain data on banking penetration, availability and usage from various reports of the Reserve Bank of India (RBI).

The share of non-agricultural employment is obtained from the NSSO Employment and Unemployment Surveys, and the data on historical rainfall is

obtained from the Indian Meteorological Department's website. These are used as instrumental variables in our regression analysis.

IV Economic Outcomes and Middle Class

As already discussed, a large middle class is correlated with better economic performance. In order to determine whether middle class share affects economic outcomes, we have to choose a suitable empirical model.

Firstly, we use a simple pooled OLS specification to see the effect of middle class on economic performance. Then we use a state fixed effects model to study the same. Finally, we use the three stage least squares model to counter the problem of endogeneity, as discussed earlier. The other control variables used in the regression are caste and religious heterogeneity indices, urbanization ratio, school enrolment rates, credit deposit ratio, social sector expenditure as a share of GDP, population growth, and FDI expenditure per capita. Further, we control for the initial GDP per capita and its square as per the specification for GDP and growth regressions suggested by Barro (1991). The period dummy is included as a control for aggregate time effects.

Table 1: Impact of Middle Class on Various Socio-Economic Outcomes

Explanatory/independent variable: Middle class share in population

Dependent Variable	Pooled OLS	State Fixed Effects	3 SLS
SGDP per capita	600.01 *** (0.002)	477.00 ** (0.04)	15.77 *** (0.00)
SGDP per capita growth rate	-0.11 (0.44)	-.23 (0.25)	0.61 * (0.09)
Infant mortality rate	.126 (0.92)	.147 *** (0.001)	-5.52 * (0.087)
Life expectancy at birth	6.46 ** (0.043)	-6.4 *** (0.00)	20.63 *** (0.000)
Transmission loss of electricity (Administrative efficiency)	-3.49 *** (0.00)	-2.68 * (0.05)	-.71 (0.80)
Financial Inclusiveness	-.08 (0.721)	0.02 (0.945)	0.81 (0.128)
Voter turnout ratio	0.21 (0.598)	-.05 (0.855)	.23 (0.822)
N	86	86	80

Notes: t-statistics in parentheses; *p<0.1, **p<0.05, ***p<0.01.

Standard errors reported are robust.

Period dummies are included in all specifications.

Caste heterogeneity, religious heterogeneity, urbanization ratio, household size, initial GDP per capita, school enrolment ratio, share of social sector expenditure in GDP, share of agriculture in GDP, literacy rate, square of initial GDP per capita, and per capita FDI investment in the state are included as additional control variables.

Source: Author's calculations using NSSO consumption expenditure data.

The results of the regression of GDP per capita and GDP per capita growth rate on middle class share is shown in Table 1. Middle class share has a positive and significant effect on GDP per capita as well as on GDP per capita growth, when the three stage least squares is used. Religious heterogeneity does not have

any effect on GDP per capita or its growth rate. Caste heterogeneity has a negative and significant effect on GDP per capita growth, when the state fixed effects model is used. This may indicate lower economic growth due to caste based discrimination in states with more caste diversity. Greater urbanization ratio in a state is also associated with lower GDP per capita when a 3SLS model is used. The middle class has been recognized as a facilitator of consumption and investment since John Maynard Keynes published his book *The General theory of employment, interest and money* (Keynes 1936). Since liberalization in India, the new emerging middle class has been projected as an important agent for economic development. It is clear from the present analysis that states having a larger middle class have higher GDP per capita. The effect of middle class on economic growth may occur with a lag, since poorer states tend to grow faster than richer states. So, our results are in accordance with the hypothesis that states with a larger middle class have better economic performance.

V Institutional Outcomes and Middle Class

In this section, we analyse the relationship between the quality of institutions in Indian states and middle class share. The institutional outcomes considered here are health outcomes (IMR and life expectancy), administrative efficiency (measured by transmission and distribution loss of electricity as a proportion of availability), inclusiveness of financial institutions and democratic participation (measured in terms of voter turnout ratio). While the poor and the rich are indifferent about corrupt and undemocratic institutions, the middle class benefit from better quality institutions (Easterly 2001). It has been well established that middle class campaign for creation of better institutions and are crucial for a well-functioning democracy (Loayza, *et. al.* 2012, Savoia, *et. al.* 2010). We now study the relationship using an empirical specification.

We study the relationship using different specifications controlling, for the period dummy as has already been discussed. The results of the regression are shown in Table 1. When the three stage least squares model is used, IMR negatively affects middle class share and positively affects life expectancy, indicating its positive influence on health outcomes. However, middle class share has a negative and significant effect on transmission, and distribution loss of electricity. Also, its effect on financial inclusiveness and voter turnout ratio is not significant in any of the specifications. The results indicate that middle class has a role in creating better administrative institutions. However, there are limitations of this study since data on corruption and administrative quality is not available, but it has been proxied by transmission and distribution losses of power, that indicates the efficiency of electricity transmission. Since well-functioning institutions catalyse economic and social development, the positive influence of middle class on economic development shows that institutions may act as channels for economic development. Middle class does not affect financial inclusiveness, since more inclusive financial institutions have been established in poorer states. The

positive relationship between middle class and democratic participation is only due to co-variation over time and the empirical evidence supports no such relationship.

VI Validity of the Instrumental Variables

We have already discussed the appropriateness of the instruments used in this study, based on their fulfilment of the conditions of exogeneity, and their correlation with the instrumented variables (Woolridge 2012). This we had done based on previous literature that has highlighted these relationships. Further, we also validate the use of these instruments using statistical evidence. We show that the coefficients of the instrumental variable in the first stage, and the second stage regressions of the 3SLS model are significant, indicating their partial correlation with the instrumented variables, in this case, non-agricultural employment share, and middle class share respectively (the F-statistics may not be a reliable indicator for panel fixed effects regression). These results are shown in Table 2.

Table 2: Validity of the Instrumental Variables

	Coefficient	F statistic
First stage		
Instrumented variable: Predicted non-agricultural employment share	0.20 **	
Instrument: Coefficient of variation of rainfall	(2.56)	1.31
Second stage		
Instrumented variable: Middle class share	0.66 ***	22.47 ***
Instrument: Predicted share of non-agricultural employment	(3.34)	

Notes: t-statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Standard errors reported are robust.

Period dummies are included in all specifications.

Source: Author's calculations using NSSO consumption expenditure data.

VII Conclusion

The basic hypothesis explored in this chapter, is that states with a larger middle class and lower social heterogeneity will have better economic and institutional outcomes. This is based on the assumption that when power is in the hands of a small affluent dominant group, it will try to appropriate the resources for their own benefit rather than pushing for better economic and social outcomes. The Wald statistics are found to be significant for all the outcome variables in our study, except for financial inclusiveness, indicating that the three stage least squares model is appropriate to counter the problem of endogeneity. The study shows that a larger middle class share in the population creates better economic, and health outcomes, although its effect on the other institutional outcomes is questionable. Caste and religious heterogeneity do not have a significant effect on economic

outcomes. However, religious heterogeneity has a positive influence on health outcomes, while caste heterogeneity has a negative influence on them.

The results of this chapter indicate that in order to achieve higher GDP targets and effective institutions, the government must encourage the growth of middle class households by promoting higher education, and creating more job opportunities. In the Indian scenario, there are enormous prospects for economic mobility among the masses who are aspiring to be a part of the new middle class, provided people are given equal opportunities for skill acquisition and employment. Since the impact of middle class is important at the state level, policies to encourage economic mobility must operate at the federal level. A large and economically mobile middle class must be encouraged not just for better economic performance, and effective administration, but for a more equitable and just society. This study confirms and reinforces the view that a middle class society is instrumental in creating an environment of economic progress. Further, it highlights the importance of middle class at the state level, in a heterogeneous economy like India. Therefore, this study is the first attempt at empirically justifying the importance of middle class for socio economic development in India.

Endnotes

1. We have tested our hypothesis using both the middle class share in population and the consumption share of middle class in total consumption. We find that the results using both are very similar in terms of its significance level and the sign of the coefficients in all the regressions used in this chapter. Only the size of the coefficients differ somewhat between the two methods
2. Compared to other measures such as Banerjee and Duflo (2008) and Meyer and Birdsall (2012), the Kharas (2010) measure has been found to be more appropriate for the present analysis. While the Banerjee and Duflo (2008) criterion has lower cut off for middle class below the poverty line, Meyer and Birdsall (2012) measure is income based. The relative approach (Easterly, 2001) is also not appropriate, since the measure includes poor households in middle class bracket. Our measure gives the state wise benchmark identifying households that can afford to live comfortably without facing too much risk of falling in poverty.
3. In our analysis, real State GDP is expressed in ₹100 units at the base of 1987.

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Impact of Goods and Services Tax on the Economic Growth of India

Swathy Krishna and Shacheendran V

An efficient tax system is vital for the sustainable growth of the nation. In India, indirect taxes constitute major portion of the tax revenues for balancing government budgets. During last few decades Value Added Tax has been seen as a leading income generating source.

After prolonged discussions India adopted a comprehensive Goods and Services Tax, which aimed at the removal of cascading effect of taxes through seamless availing of input tax credit. The present paper is an attempt to find empirical evidence on the relationship between Goods and Services Tax revenue growth and economic growth proxy by GDP. The ordinary least square regression technique found that GST revenue growth has a significant and positive impact on economic growth in India during the period Q2:2017 to Q1:2021. The result shows that one per cent GST revenue growth causes 0.56 per cent economic growth. The result of correlation analysis also confirms the association between GST revenue performance and economic growth.

Key Words: Economic growth, Goods and services tax, Gross domestic product.

I Introduction

Structure of tax system has been gaining attention due to the immense impact on social, political and economic system. An efficient fiscal system can mobilise adequate financial resources to attain equilibrium growth of the economy (Munir and Riaz 2019). In India, indirect tax revenue constitutes more than 50 per cent of the total tax revenue collection, thus playing a vital role in mobilising funds for public expenditure. Many of the developing countries are facing difficulties to satisfy their revenue requirements; and it has been found that an effective tax administration and positive public perception on tax management can improve tax compliance (Mawejje and Sebudde 2019). In this globalised era, countries across the globe are incorporating various structural and fiscal reforms to enhance the tax potential. Value Added Tax (VAT) is considered to a superior method among the indirect taxes (James 2011), at present more than 160 countries follow value

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addition-based taxing mechanism. Sophisticated IT based Value Added Tax system is found to be the best taxing method with a capability of processing vast amount of data (Abd-Mansor, Mohamed, Ling, and Kasim 2016). An effectual fiscal reform could achieve optimised economic growth (Ma and Mao 2016). Fiscal reforms and its role on economic growth have been gaining more attention from the policy makers and other academicians. A well-established fiscal policy can become an economic recovery tool (Mundell 2012), fiscal reforms could improve the propensity to save and can accelerate the rate of capital formation. Economist believes that there is a strong relationship between tax reforms and economic growth, but there are also studies which found conflicting findings about the relationship between taxation and economic growth (Landau 1986, Loganathan, Shahbaz, and Taha 2014, Onakoya and Afintinni 2016, Al-Tarawneh, Khataybeh, and Alkhawaldeh 2020), thus creating a need for further exploration about the two variables.

The study is structured as follows: In Section II, we provide a brief description about tax revenue performance of the Indian economy over the study period. Section III describes the literature review that includes previous studies related to revenue analysis and forecasting. Section IV which deals with the research methodology and followed by the empirical results of the study, in Section V. The study made an attempt to draw some policy conclusion in Section VI.

II Tax Revenue Performance

Tax is the major revenue contributor at all the tiers of the government, and tax revenue constitutes the receipts from direct and the indirect taxes. The Indian GST came into existence by subsuming about 17 previously levied indirect taxes namely services tax, excise duty, value added tax, central sales tax, entertainment tax, and entry tax. As per the recommendation of the GST Council, specific petroleum products and alcoholic liquor for human consumption are kept outside the levy of GST; these products being a major revenue source for the States, converging the existing levies on such products to GST will have a significant impact of the revenue performance of the States. Thus, these products are taxed in the same manner as under the pre-GST regime.

Table 1: Indirect Taxes Contribution

	Indirect taxes as a % of GDP	Indirect taxes as a % of GTR
2014	4.38	43.67
2015	4.36	43.87
2016	5.23	48.77
2017	5.68	50.24
2018	5.45	47.59
2019	4.96	45.23
2020	4.71	47.65

Sources: Computed based on Comptroller and Auditor General Report.

Efficient tax reform ensures optimum revenue mobilisation; increased government expenditure created a need for raising additional revenues especially in case of developing countries. Tax systems across the globe have been facing different forms of revision and restructuring to enhance the efficiency of revenue mobilisation. Tax buoyancy measures the revenue efficiency, as it measures the responsiveness of change in tax revenue to the change in the GDP. Higher tax buoyancy indicates an increased share in tax revenue in the total GDP, indicating administrative efficiency (Mawia and Nzomol 2013).

Table 2: Revenue Buoyancy for 2018-19

States	Revenue Receipts 2017-18 (₹ in crores)	Revenue Receipts 2018-19 (₹ in crores)	Growth Rate of Revenue Receipts	GSDP 2017-18 (₹ in crores)	GSDP 2018-19 (₹ in crores)	Growth Rate of GSDP	Revenue Buoyancy
Arunachal Pradesh	13774.60	16195.96	17.58	24442.19	24602.88	0.66	26.74
Maharashtra	243653.56	278996.27	14.51	2496505	2632792.31	5.46	2.66
Chattisgarh	59647.07	65094.93	9.13	291681	304062.88	4.25	2.15
West Bengal	131270.39	145975.25	11.20	1020858	1089897.99	6.76	1.66
Assam	54130.94	63479.16	17.27	283821.22	315881.21	11.30	1.53
Punjab	53009.58	62269.08	17.47	470137	526376.49	11.96	1.46
Bihar	117446.74	131793.45	12.22	487628	530363.46	8.76	1.39
Tamil Nadu	146279.76	173741.16	18.77	1427074	1630207.75	14.23	1.32
Andhra Pradesh	105062.10	114670.86	9.15	803873	862957.08	7.35	1.24
Uttarakhand	27104.57	31216.44	15.17	217609	245894.60	13.0	1.17
Himachal Pradesh	27367.06	30950.32	13.09	136198	153844.80	12.96	1.01

Source: Comptroller and Auditor General Report (2018-19).

III Literature Review

Studies concerning macroeconomic impact of fiscal policy have been gaining more attention due to revenue inadequacies and increased external borrowings. Numerous studies tried using time series and other theoretical model to examine the macroeconomic impact of tax reforms. Hayo and Uhl (2014) used Blanchard and Perotti developed VAR model to study the macroeconomic impact of tax change in Germany using the variables namely output, taxes, government expenditure, inflation and short-term interest rate. The result shows a significant decline in the output level due to policy change and a point change in the tax-to-GDP ratio can reduce the output by 2.4 per cent.

Castro (2006) analysed the fiscal shock on GDP, prices and interest rates in Spain using Vector Autoregressive Model. The result showed the government expenditure shows negative response toward output, private consumption and investment in the medium run. Moreover, the expenditure shock led to higher prices and interest rate. The study confirms that in short run the increased taxes can improve the GDP, consumption and investment through effective management

of public expenditure. Madsen and Damania (1996) tried to measure the impact of fiscal structural change on wage and output levels using PRS analysing performed on the basis of Engle-Yoo (1989) procedures. The panel study was conducted among 22 OECD countries using time series data from 1960-1990, the study found in short run the tax changes led to increased output level, while in long run an opposite can be observed in majority of cases. Munir and Riaz (2019) tried to explore the relevance of planned fiscal policy for building a stable microeconomic environment. The study used VAR model to analyse the macroeconomic consequence of fiscal policy in Pakistan using quarterly time series data for the period 1976 to 2017. The result of the study found that prices do not respond to increase in government expenditure, which increase in taxes cause immediate response in prices.

Munir and Riaz (2019) studied the influence of fiscal policy on GDP, private consumption, private investment, prices and interest rate in Pakistan using Vector Auto Regressive model. The examination of macroeconomic effect found that increase in government expenditure can improve the GDP, further it was also identified that increase in total taxes lead to a positive increase in GDP. A comparative study on the macroeconomic effect of adopting GST was conducted by Bolton and Dollery and found a neutral tax design will have a negligible impact on the economy, economic efficiency is to be obtained by a broadened tax-based system. The study also highlights that the relative economic performance showed varied impact due to GST adoption across the three countries i.e., Australia, Canada and New Zealand.

A well-structured tax system could act as mediator for economic growth, through efficient mobilisation of resources and improving standard of living of the people. Value Added Tax mechanism is considered to be a more effective taxing mechanism due to revenue neutrality, revenue efficiency, simplicity and equity. There are a number of empirical studies trying to investigate the relationship between VAT and economic growth.

Hassan (2015) used OLS regression method to examine the impact of VAT on economic growth in Pakistan, using time series annual data for the period 1991-1992 to 2011-2012. The econometric analysis found a significant and positive impact of tax revenue on the nominal GDP, indicating the relationship between tax revenue and economic growth. The result shows an increase in one per cent of the VAT revenue causes 0.24 per cent increase in the economic growth. Basila (2010) tried to explore the role of VAT as an economic development tool in Nigeria. The econometric analysis found strong and positive correlation between VAT and GDP; thus, the study confirms that a good planned and implemented tax system could bring balance economic development through efficient revenue performance. Similarly, in the study conducted by Onwuchekwa and Aruwa (2014) found the VAT revenue plays a significant role in economic development of Nigerian economy, through their contribution towards total government revenue.

A number of empirical studies have found a significant relationship between tax revenue and economic growth, but there are also studies which found contrasting result. Michael and Lockwood (2010) conducted a panel study among 143 countries over the period of 25 years, which tried to explore impact of VAT on revenue performance. The empirical analysis shows inconsistent result regarding VAT impact on the economies. In majority of the cases the VAT adoption found to improve the overall revenue- to GDP ratio, while there are also situations where the system led to overall negative impact on the economies. International experience shows a significant decline in the Government revenue as a percentage of GDP during the initial phase of GST implementation (Bolton and Dollary 2010).

Leemput and Wiencek (2017) tried to analyse the welfare impact of tax reform on Indian economy, the estimated impact of GST under the baseline scenario with a standard tax rate of 16 per cent was found to increase the welfare effect by 5.3 per cent. The domestic and international trade is expected to increase by 29 per cent and 32 per cent respectively, furthermore, the static model found consistent welfare impact was found across different States in India.

IV Data and Methodology

Data

The following study carried out an empirical analysis using quarterly time series data for the period Q2:2017 to Q1:2021. The time series data on GDP were obtained from database of Reserve Bank of India (RBI) and the Press Release of Ministry of Statistics and Programme Implementation, and the data on GST revenue was obtained from the Press Release of Department of Revenue, Ministry of Finance. The data of GDP and GST revenue is expressed as the percentage growth. The study used least square regression technique to study the relationship between GST revenue growth and Economic Growth using the proxy variable GDP.

Model Specification

The study tried to examine the impact of GST revenue growth, i.e., the independent variable on the dependent variable economic growth (GDP). The study used the following model specification to investigate the relationship between the dependent and the independent variable.

$$\text{GDP} = b_0 + b_1(\text{GST}) + e$$

where

GDP Gross Domestic Product (per cent growth)

GST Goods and Services Tax Revenue (per cent growth)

b_0 is the intercept of the model, and b_1 is the regression coefficient and e is the error term.

V Empirical Results

Unit Root Test

The time series data may be affected by trend with passage of time, the unit root test ensures the presence or absence of stationarity in the data set. Presence of stationarity validates the standard hypothesis test; thus, it is significant to test the unit root of the data using appropriate test.

Table 3: Testing of Unit Root

		GDP		GST	
		T- Statistics	Prob	T- Statistics	Prob
Augmented Dickey-Fuller test statistics		-4.26	0.01	-4.62	0.00
Test critical values:	1% level	-4.12		-4.00	
	5% level	-3.14		-3.09	
	10% level	-2.71		2.69	

Source: Computed using e-views.

Augmented Dickey-Fuller test was used to check the presence or absence of stationarity in the time series data; the unit root represents the non-stationarity of the data. Since the p value of the variable GDP growth were found to be lesser than 0.05, the null hypothesis that the series has unit root is rejected. Thus, indicating stationarity of GDP growth at the level itself. The variable GST revenue growth became stationary at the level itself with a p value less than 0.05, making the data suitable for further statistical analysis.

Testing of Normality

Testing of normality is a prerequisite for performing least square regression analysis to study the relationship between the independent and dependent variable. The study used Jarque – Bera test to find out the normality of the residuals. The Jarque – Bera test uses the sample kurtosis and sample skewness to measure whether the distribution is normal or not so.

Table 4: Testing of Normality

Mean	Median	Maximum	Minimum	Skewness	Std. Dev	Kurtosis	Probability
-1.02	-0.67	30.27	-44.86	0.46	17.65	4.67	0.28

Source: Computed using e-views.

The Jarque – Bera test found the p value greater than 0.05, thus the null hypothesis is accepted that residuals follow a normal distribution.

Autocorrelation and heteroskedasticity

The diagnostic test results related to checking serial correlation and heteroskedasticity are shown in Table 5. The Breusch – Godfrey Serial Correlation LM test shows f-statistics of 0.39, observed *R of 1.00 and probability value of 0.61. The result indicates that the probability value of 0.61 is greater than 0.05 critical value, thus indicating that the model is free from the presence of serial correlation. The study used Breusch-Pagan-Godfrey test to measure heteroskedasticity, the test shows f-statistics of 3.64, observed *R of 3.28 and probability value of 0.07. The results indicate that the probability value of 0.07 is greater than 0.05 critical value, thus the hypothesis the residuals are having homoscedasticity is accepted

Table 5: Testing of Autocorrelation and Heteroskedasticity

Type of Test	F-statistics	Obs* R-squared	Probability
Breusch – Godfrey Serial Correlation LM test	2.26	4.37	0.11
Breusch-Pagan-Godfrey Heteroskedasticity Test	0.33	0.37	0.54

Source: Computed using e-views.

Correlation

The study uses Karl Pearson correlation coefficient to investigate the direction of relation between the dependent variable and the independent variable. The result shows that the variable economic growth has a strong relationship with GST revenue growth with a correlation coefficient of 0.86.

Table 6: Correlation Analysis

Variables	GDP	GST
GDP	1	0.8631
GST	0.8631	1

Source: Computed using e-views.

Table 7: Results of Least Square Regression Method

Variable	Coefficient	Std. Error	t- Statistics	Prob
GST	0.56	0.09	6.16	0.00
R-squared	0.74			6.62
Adjusted R-squared	0.73	Akaike info criterion		6.72
F-statistics	37.98	Schwarz criterion		6.62
Prob	0.00	Hannan-Quinn criterion		2.43
		Durbin-Watson statistics		

Notes: Dependent Variable: GDP; Method: Least Square; Included Observation:15.

Source: Computed using e-views.

The above Table 7, shows a R-square value of 0.74 indicating that the 74 per cent of the change in the dependent variable (GDP growth) has been explained due to the changes in the independent variable (GST growth). Similarly, the adjusted R-squared value of .73 can considered to be very good for forecasting. The analysis found that GST revenue growth has a positive and significant impact on GDP growth in India for the post GST period, with a p-value less than 0.05. The results indicate that one per cent GST revenue growth causes 0.56 per cent economic growth, corroborates the strong and positive relationship between GST revenue growth and economic growth (GDP).

VI Conclusion

The paper attempts to find empericial evidence on the impact of GST revenue growth on the economic growth of India using the time series data for the period 2017-2021. The relationship between GST revenue growth and economy growth is performed through stationarity test, i.e., Augmented Dickey-Fuller test, wherein the variables are found to be stationaryat the level. The Ordinary Least Square Regression techniques found significant and positive impact of GST revenue growth on economic growth in India. The empirical finding of the study is consistent with the result of the studies Hassan (2015), Akhor and Oshoke (2016), Gatawa, Aliero, and Aishatu (2016), Erero (2021). The result of the study corroborates the need of strengthening the tax system for enhancing the tax revenue performance, enabling the economic system to have better tax enforcement for improving tax compliance.

The main limitation of the present paper is that it has not analysed the other factors influencing the GDP growth with respect to the Indian economy. The second, that the study was primarily based on secondary data collected and compiled by various government organisations.

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Educational Outcomes of the Tribal Students of Kerala – Exploring the Potential of Cultural Capital

Parvathy P. and Kavitha A.C.

Scheduled tribes constitute 1.45 per cent of the total population of Kerala as per 2011 Census. Though Kerala has made significant strides in the field of education, tribal students in the state fall behind the non-tribal students as evident from several indicators such as lower rates of enrolment, higher drop-out rates and lower pass percentage at various levels of education. Lower pass percentage of tribal students in the qualifying examinations (58.01 per cent for the tribal students vis-à-vis the state overall pass percentage of 85.56 per cent in 2020-2021) poses a significant barrier to pursue graduation courses. Hence, an attempt is made to assess the role of cultural capital in determining the educational outcomes of the students belonging to various castes. A survey of the students enrolled in colleges revealed differences in the extent of cultural capital possessed by tribal and non-tribal students as evident from the differences in the education levels of parents which are corroborated by the results of Kruskal Wallis test. Cultural capital deficit places the tribal students at a disadvantage in various fields such as language proficiency and their ability to critically appreciate arts and literature. Inadequate cultural capital base of tribal students has adversely affected their educational outcomes.

Key Words: Cultural capital, Tribal students, Educational outcomes

I Introduction

Capital, acknowledged as a productivity enhancing factor has evolved over the years so as to incorporate multiple dimensions such as physical capital, natural capital, human capital, financial capital and social capital. One of the recent additions to the concept of capital has been 'Cultural Capital' which is often regarded as a critical factor producing enhanced educational outcomes.

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The concept of cultural capital has been introduced by Pierre Bourdieu (1986). Cultural capital may be broadly defined as a community's embodied cultural skills and values, in all their community-defined forms, inherited from the community's previous generation, undergoing adaptation and extension by current members of the community, and desired by the community to be passed on to its next generation. Cultural capital is of three types: embodied, objectified and institutionalized. Embodied cultural capital refers to quality of a person's mind or body such as skill, taste, accent, posture, mannerism, etc., which cannot be transmitted instantaneously by gift or bequest or by purchase or exchange. It functions as a symbolic capital as it is unrecognized as a capital but acknowledged as a competence. Objectified capitals are material belongings that have cultural significance. Cultural capital in the objectified state is in the form of cultural goods such as books, pictures, dictionaries, instruments, etc., and can be transmitted both materially and symbolically. Institutionalized cultural capital is symbols of authority, credentials and qualification such as the title Doctor, Advocate etc., that can give large institutionalized cultural capital. A University degree is also a powerful form of this sort of capital as it gives skill, knowledge and develops other traits. Thus, it enhances institutionalized cultural capital.

Statement of the Problem

Cultural capital is regarded as a critical factor that contributes to the educational success of an individual. In the context of disparities observed in the educational attainment among students, there is a need to identify the role played by cultural capital in influencing educational outcomes. The role of cultural capital in enhancing educational outcomes can be analysed by assessing the transmission of cultural capital across generations among the students belonging to various social classes.

Objective

- To examine the impact of cultural capital on educational attainment of the students.

Materials and Methods

A vast body of academic literature discussing the impact of cultural capital on educational attainments can be found. The core hypothesis in Cultural Reproduction Theory is that cultural capital, transferred over generations and possessed by families and individuals, is an important resource which contributes to an individual's educational success. Educational inequalities observed among the individuals can be attributed to the differences in the critical factor cultural capital possessed by individuals (Bourdieu 1986). Unequal distribution of

cultural capital leads to educational inequality at the macro level as suggested by Cultural Mobility Theory (DiMaggio 1982). It is observed that low Socio-Economic Status (SES) children have a higher return to cultural capital than high SES children (Meier and Karlson 2018). Case studies of social class differences in family-school relationships could establish that a middle class family belonging to a particular social class exhibits cultural capital higher than that of below the poverty line family belonging to the same social class (Annette and Elliot B 2003). The relationship between family SES, cultural capital and reading achievement among students in five post socialist Eastern European countries (Bulgaria, Hungary, the Czech Republic, Poland, and Russia) and three western countries (the US, France and Germany) based on the Programme for International Student Assessment data revealed that higher SES students possessed higher cultural capital contributing to higher educational attainment indicating an absence of East West divide (Katerina, Haram and Soo-yong 2017). Cultural capital has a positive impact on educational outcomes measured in terms of secondary school enrolment as well as grades scored as evident from the studies conducted in Croatia (Zeljko and Dukic 2016). Further it is found that parental reading behaviour affects children's educational attainment rather than parents' participation in cultural activities as the former reflects linguistic and cognitive skill of parents which can be transferred to their children. Parents with reading behaviour were well informed and had cultural literacy which would benefit the children by improving their schooling. Another major finding was that differences in parental cultural capital, measured by parental participation or parental reading habits are more important for children from lower and middle socio-economic backgrounds and less important for children from high socio-economic backgrounds (Graaf and Graaf 2000). Unprivileged groups certainly possess some sort of cultural capital that have no merit in the present societal structure as compared to privileged group. This results in natural exclusion of the oppressed candidates. Students in the oppressed section have to put surplus effort to reach the level of their peers. Though their parents have local knowledge and skill, traditional occupation etc., such inherited cultural capital would not be sufficient for them to be on par with upper caste students. This difference in the inherited cultural capital creates inequality in educational outcome. This necessitates affirmative action to lift the unprivileged section to ensure their representation in employment, education and politics (Syamprasad 2019).

This study seeks to examine the impact of cultural capital on the educational attainment of the students within the context of the state of Kerala, well-known for its achievements in the field of education. However, despite the appreciable track record of the state in producing better educational outcomes, the tribal population in the state has failed to excel in the field of education with the academic performance of the tribal students consistently falling behind the state average. The disparities between tribal and non-tribal students get aggravated in the field of higher education which could be evident from the enrolment and drop-out rates.

Secondary data sources such as Economic Review, Govt. of Kerala and AISHE report of Ministry of Human Resource Development are used to bring out the educational inequality across the tribal and non-tribal students within the state based on indicators such as enrolment rates, drop-out rates and pass percentage. Reckoning the disadvantaged position of the tribal students in the state especially in the field of higher education, the sample has been so selected as to include tribal and non-tribal students. A sample of 60 students comprising tribal and non-tribal students has been randomly drawn from across the colleges to examine the role of cultural capital in producing enhanced educational outcomes. In this study, parental education and their reading behaviour are taken as cultural resources that affect educational attainment, ambition and linguistic skill of students.

Kruskal Wallis test was performed to find out the extent to which the possession of cultural capital by parents and grandparents varies across the social categories. The possession of cultural capital is well reflected in the capability to nurture interests in varied fields such as language and literature, arts, music and films. Numerous statements to identify the interests, capabilities and skills demonstrated by the students in the fields of literature and arts were framed. The responses of the Scheduled Tribes (ST) and non-ST categories of students were elicited using a 5-point rating scale ranging from 1 to 5 with lower end value 1 indicating strongly disagree and the higher end value 5 indicating strongly agree for the positive statements framed. Computation of mean scores based on the responses given by the students enables us to make a comparison between ST and non – ST students.

II Results and Discussion

Despite significant strides made by Kerala in the fields of education, the performance of tribal students has consistently lagged behind non-tribal students at all levels of education. This is confirmed by various indices such as enrolment rates, drop-out rates and pass percentage of tribal students vis-à-vis the non-tribal students. The drop-out ratio of tribal students at school level though is declining, is higher than the corresponding figure for the state as a whole. Drop-out ratio of the tribal students at school level stood at 1.17 per cent vis-à-vis 0.11 per cent for the state in 2019-2020 (Economic Review 2021). Though all the social groups at various levels of school education in the state performed better than the national average in the National Achievement Survey, 2017-2018, the performance of the tribal students in Kerala was below the national figure in Mathematics.

Higher secondary examination is regarded as the qualifying examination for joining degree courses. The pass percentage of the tribal students in the qualifying examination has been consistently below the state average as revealed by the data on the results of higher secondary examination for various years. In 2018-2019, the pass percentage of the tribal students was 65.71 per cent which is significantly lower than the state overall pass percentage that stood at a high of

84.28 per cent (Economic Review 2019). Though the overall pass percentage in higher secondary examinations has increased to 85.56 per cent in 2020-2021, the pass percentage of tribal students has decreased to 58.01 per cent in the same year (Economic Review 2021). The enrolment of tribal students in the field of higher education is below the national average. Gross Enrolment Ratio in higher education in India is 27.1, while for the tribal students the corresponding figure is 18 (AISHE 2019-2020). The enrolment rate of ST students in the colleges though lower in the state has been improving steadily since 2012. The enrolment of tribal students in Kerala for UG and PG courses in Arts and Science Colleges stood at 5164 and 1792 respectively in 2018-19 (Economic Review 2019). ST students constitute 2.17 per cent of the total enrolment in higher education institutes in the state (Economic Review, 2021).

Reckoning the dismal performance of the tribal students in indicators such as pass percentage at the qualifying higher secondary examinations, enrolment in various higher education courses etc., the paper seeks to analyse the role of cultural capital in determining the disadvantage experienced by the tribal students based on a sample of 60 students belonging to tribal and non-tribal students drawn from colleges in Kerala. Higher education institutes being the symbols of institutionalized cultural capital, there is a need to assess the cultural capital base of the tribal students *vis-à-vis* the non-tribal students.

An attempt has been made to find out the role of social categories in shaping the higher educational outcomes of the students. The language proficiency of the students as well as their yearning to pursue higher education were analysed category wise and it is interesting to observe that the tribal as well as non-tribal students had language proficiency with both the groups having a flair for mother tongue. While none of the tribal students had proficiency in a language other than mother tongue, just 4 students in non-tribal category had proficiency in mother tongue as well as English. Further it is interesting to observe that both tribal and non-tribal students have aspirations for higher education.

Table 1: Cross tabulation on Social Category and Language Proficiency

		Languages handled				Total
		Malayalam	Hindi	Tamil	any two out of Malayalam, Hindi, Tamil and English	
Social category	General	7	0	1	1	9
	OBC	17	0	1	3	21
	SC	6	0	1	0	7
	ST	9	0	14	0	23
Total		39	0	17	4	60

Source: Computed based on data from Field Survey, 2019.

Language proficiency is an indicator of the magnitude of cultural capital possessed by the students and is a strong signal of the capabilities of the students to progress academically enabling them to acquire other forms of capital such as

economic capital, financial capital and social capital. An attempt was made to assess the language proficiency of the tribal and non-tribal students eliciting responses on the number of languages they can read, write and speak. It could be observed that an overwhelming number of ST students are proficient in their native tongue while a significant number of non-tribal students have proficiency in their mother tongue as well as English enabling them to make tremendous academic progress. ST students were good in handling languages like Tamil and Malayalam. But when compared to non-ST, they find difficulty in expressing their views in English (*see* Table 1).

Table 2 explicitly indicates a yearning for higher education on the part of tribal and non-tribal students. However, out of 60 respondents, all the 3 respondents who are reluctant to pursue higher education belong to the tribal category.

Table 2: Cross tabulation on Social Category and Pursuit of Higher Educations

		Pursuing higher education		Total
		no	yes	
Social category	General	0	9	9
	OBC	0	21	21
	SC	0	7	7
	ST	3	20	23
Total		3	57	60

Source: Computed based on data from Field Survey, 2019.

Cultural capital of the parents and grandparents of the students belonging to these categories were assessed to find out the extent to which the possession of cultural capital heritage would positively affect the higher educational outcomes of the students across tribal and non-tribal categories (*see* Tables 3a and 3b).

Kruskal Wallis test was performed to find out the extent to which the possession of cultural capital by parents and grandparents varies across the social categories (*see* Tables 3a and 3b). The cultural capital of the parents and grandparents were assessed using measures such as the educational qualifications of parents and grandparents and also the reading behaviour of the parents.

The results obtained for the parental education as well as for parental reading behaviour are statistically significant. As p value is less than 0.01, it can be stated that parental education as well as parental reading behaviour significantly differ across the social categories. The mean rank possessed by the ST category is lower than the non-ST categories such as General, OBC and SC in the case of parental education as well as parental reading behaviour. This is an obvious indication of the edge enjoyed by the non-ST students *vis-à-vis* the ST students in the possession of cultural capital. Besides these, a significant number of drop outs of tribal students from colleges could be observed which would pose a barrier to the accumulation of cultural capital base.

Table 3a: Cultural Capital of Parents and Grand Parents of Students across Social Categories - Mean Ranks

	Social category	N	Mean Rank
Parental education	General	9	43.33
	OBC	21	34.00
	SC	7	44.57
	ST	23	18.00
	Total	60	
Parent reading behaviour	General	9	39.78
	OBC	21	41.05
	SC	7	36.21
	ST	23	15.50
	Total	60	
Education of grandparents	General	9	30.33
	OBC	21	34.14
	SC	7	31.29
	ST	23	27.00
	Total	60	

Source: Computed based on data from Field Survey, 2019.

Table 3b: Cultural Capital of Parents and Grand Parents of Students across Social Categories - Kruskal Wallis Test Results

	Parental education	Parent reading behaviour	Education of grand parents
Chi-Square	28.051	35.172	5.990
df	3	3	3
Asymp Sig.	.000	.000	.112

Source: Computed based on data from Field Survey, 2019.

The possession of cultural capital is well reflected in the capability to nurture interests in varied fields such as language and literature, arts, music and films. Numerous statements to identify the interests, capabilities and skills demonstrated by the students in the fields of literature and arts were framed. The responses of the ST and non-ST categories of students were elicited using a 5-point rating scale ranging from 1 to 5 with lower end value 1 indicating strongly disagree and the higher end value 5 indicating strongly agree for the positive statements framed. Computation of mean scores based on the responses given by the students enables us to make a comparison between ST and non – ST students.

Table 4: Statements on the Students' Interests and Capabilities in Literature, Arts and Films

Sl. No	Attributes	ST			Non-ST		
		Mean	N	SD	Mean	N	SD
1	I enjoy reading	4.08	23	0.83	4.29	37	0.91
2	I enjoy reading literature	3.39	23	1.05	4.08	37	0.73
3	I frequently borrow and buy books	3.23	23	0.94	3.35	37	1.06
4	Parents encouraged me to read	3.21	23	1.26	4.29	37	0.97
5	We have lots of books at home	2.65	23	1.30	3.24	37	1.03
6	I know all famous music composers	3.04	23	1.35	2.45	37	1.01
7	Frequently visits museums, concerts, theaters	2.65	23	1.27	2.72	37	1.12
8	I used to take music classes outside college	2.34	23	1.05	2.45	37	1.06
9	I enjoy listening to classical music	3.00	23	1.19	3.43	37	1.29
10	I understand music well	3.73	23	0.98	3.96	37	0.96
11	I enjoy watching films	4.13	23	0.85	4.27	37	0.88
12	I enjoy watching films all genres	3.04	23	0.89	3.86	37	1.01
13	I enjoy watching films of all languages	3.26	23	0.87	3.29	37	0.98
14	I can critically appreciate movies	2.95	23	1.02	3.67	37	0.95

Source: Computed based on data from Field Survey, 2019.

The mean scores obtained for a range of statements pertaining to the skills and interests in books and literature display that the non-tribal students have a clear edge over the tribal students. There is a disparity in the mean scores obtained for ST and non – ST students in all the statements relating to interests and skills in reading and literature with the scores of the former consistently below the latter. This is evident from the first 5 statements in Table 4.

But when it comes to their interests and capabilities in the area of arts and music and other aesthetics, it is interesting to observe the higher mean score registered by the ST students *vis-à-vis* the non-ST students in statement on their knowledge about music composers. However, the mean score obtained for non-ST students happen to be higher in the case of statements like training they have received in music (2.34 for ST and 2.45 for non-ST), their interests in classical music (3.00 for ST and 3.43 for non-ST) and also the frequency of visits to concerts, theaters and museums (2.65 for ST and 2.72 for non-ST). Though the ST students have innate talents and interests in music and arts, they do not have the capabilities to enhance their potential in the field as they are not exposed to training in music and they have fewer opportunities to listen to classical music and they seldom visit music concerts, theatre and museums. It is very evident that the ST students despite possessing innate aptitude and flair for music and arts are deprived of opportunities and exposures to develop and nurture cultural capital. Further cultural capital inherited by ST students is totally different from their counterpart. Despite the traditional agricultural knowledge, local and tribal

treatment skills, tribal folk arts and music inherited by tribal students, they get little opportunities to showcase their talents in the present educational system. Though their parental reading behaviour is not same as non-ST group, they were able to acquire or inherit a different type of knowledge from their parents which is not available to others. Inequality in educational attainment is due to difference in the parental cultural resources.

Films are indeed a popular means of entertainment and enjoy considerable mass appeal as both ST and non-ST students have recorded high mean scores relating to the statements on enjoyment in watching films. But when it comes to enjoying films of all languages, non-ST students have a clear edge over the ST students. Further, when it comes to a serious approach to film viewing as evident from the statements such as watching films of all genres and capabilities to critically appreciate movies, the non – ST students have recorded higher mean score of 3.67 over and above 2.95, the mean score recorded by the ST students. These can be cited as proof on the possession of cultural capital by non-ST students compared to ST students. The study observed that present educational system is not suited for tribal students. To improve their educational condition, it is necessary to design special curriculum that is connected with life and needs of tribal communities.

III Policy Implications

Deficit in cultural capital encountered by the tribal students vis-à-vis the non – tribal students definitely call for enhanced policy intervention and affirmative action that strive to build up and accumulate cultural capital among the tribal students. Policy action can assume multiple dimensions such as fair implementation of reservation policy to ensure the enrolment of tribal students in the field of higher education, restructuring of the curriculum to suit the needs of tribal students enabling them to nurture and promote their innate talents and interests, provision of special coaching and mentoring to these students to prevent drop outs, etc., can be crucial in creating cultural capital base in the present generation tribal students.

IV Conclusion

Cultural capital deficit observed among tribal students not only serves as a barrier to attain better educational outcomes but also denies the posterity from enjoying the benefits of the accumulated cultural capital base of the earlier generations. Lower pass percentage in qualifying examinations, lower enrolment rates, higher drop-out rates, etc., would reduce the prospects of tribal students from acquiring cultural capital. Further, the issue of lack of cultural capital is reinforced by the absence of other forms of capital such as economic capital, financial capital and social capital which in turn has the possibility of creating a vicious circle dimming the educational prospects of the underprivileged. All

these call for an affirmative action to enhance cultural capital base of the tribal students so as to offer them a level playing field to better educational outcomes.

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Book Review

Sukhpal Singh, *Regulating Agricultural Markets in India: A Smallholder Perspective*, Orient BlackSwan, Hyderabad, 2023, pp.186, Price ₹580/- only.

Sukhpal Singh's latest offering, 'Regulating Agricultural Markets in India: A Smallholder Perspective,' stands as a significant addition to the contemporary discourse surrounding the agricultural sector, offering a nuanced exploration of pertinent issues, particularly through the lens of small-scale farmers. Comprising seven meticulously crafted chapters, the book draws extensively from the author's recent papers, articles, and lectures, showcasing the comprehensive expertise of Sukhpal Singh, a distinguished agro-economist.

The focal points of Singh's scholarly endeavour encompass the intricacies of Agricultural Produce Market Committee (APMC) Acts, contract farming legislations at Union and state levels, the now-repealed farm laws of 2020, and the contentious matter of providing legal status to the Minimum Support Price (MSP). The book not only delves into detailed discussions but also offers a thorough and insightful critique of the prevailing agricultural landscape.

Singh's contention, supported by his own research and insights from fellow scholars, underscores the inadequacy of the existing marketing system and agricultural laws in India in safeguarding the interests of small farmers. The book critically examines the exclusion of small farmers from the MSP regime, asserting that the current framework does not adequately cater to their needs.

While acknowledging the overdue nature of reforms in the Indian agricultural sector, particularly in marketing, Singh refrains from dismissing the strategic importance of APMCs, despite acknowledging their imperfect functioning. He argues that the enactment of APMC Acts by states, in alignment with the Union government's Model APMC Act of 2003, had already presented viable alternatives such as direct purchase, private wholesale markets, e-NAM, and contract farming. Therefore, the author questions the necessity of the 2020 agricultural laws, asserting that they were largely redundant.

Singh advocates for the promotion of contract farming but acknowledges the challenges faced by small farmers in reaping its benefits. Proposing land pooling by smallholders as a potential solution, the book critiques the presence of commission agents (arhtiyas) in APMCs and highlights the internal contradictions within the Model Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017.

The chapter dedicated to the 2020 agricultural laws critically dissects the contradictions between their stated and inherent objectives, the farmers' perspectives, and the on-the-ground reality. It unequivocally points out the indefensibility of these laws, despite government assertions of their benefits.

While the book offers a comprehensive analysis, it allocates minimal attention to issues of state autonomy and federalism concerning constitutional rights in agriculture. The author questions the need for new laws when states had already implemented various reforms, highlighting concerns about the route through which the new laws were promulgated.

Singh advocates for a profound reassessment of the MSP-APMC-based public procurement regime, arguing that it has been unfair to certain farmers and states, benefiting only a few crops in specific regions. The book posits that effective MSP implementation for all 23 covered crops could strengthen the APMC regime, promoting crop diversification and generating revenue for states.

In discussing contract farming, Singh's argument appears grounded in technical and legal flaws within existing laws, potentially overlooking farmers' perceptions and inherent implications. Additionally, the book questions studies opposing legal status for MSP.

A compelling argument emerges from the book, suggesting that the implementation of the two new laws could lead to the dominance of private mandis over APMCs, potentially diluting or eliminating MSP. Emphasizing the critical role of MSP as a reference or floor price, the book underscores its importance for the broader interests of farmers and national food security.

Regulating Agricultural Markets in India: A Smallholder Perspective is an invaluable resource for researchers, policymakers, farmers' leadership, and the media. Its nuanced exploration of complex agricultural issues makes it essential reading and a substantial reference for those engaged in shaping the future of India's agricultural landscape.

Books Received

Ananta Kumar Giri, Michael Zirkler, Divya Kirti Gupta and Minati Pradhan (Eds.), *New Works in Consciousness Corridors: Dialogues with Subhash Sharma and Creative Planetary Futures*, Indus Business Academy, Bengaluru 560082, 2023, pp. 445, Price ₹1200/-.

R.B.R.R. Kale Memorial Lectures at Gokhale Institute of Politics and Economics

- + 1937 Modern Tendencies in Economic Thought and Policy by V.G. Kale
- 1938 The Social Process by G.S. Ghurye
- * 1939 Federation Versus Freedom by B.R. Ambedkar
- + 1940 The Constituent Assembly by K.T. Shah
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- + 1945 A Statistical Approach to Vital Economic Problems by S.R. Deshpande
- + 1946 India's Sterling Balances by J.V. Joshi
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- * 1949 Public Administration in Democracy by D.G. Karve
- 1950 Policy of Protection in India by R.L. Dey
- 1951 Competitive and Cooperative Trends in Federalism by M. Venkatrangaiya
- 1952 The Role of the Administrator: Past, Present and Future by A.D. Gorwala
- + 1953 Indian Nationalism by Laxmanshastri Joshi
- 1954 Public Administration and Economic Development by W.R. Natu
- + 1955 Some Thoughts on Planning in India by P.C. Mahalanobis
- 1956 Reflections on Economic Growth and Progress by S.K. Muranjan
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- 1968 The Republican Constitution in the Struggle for Socialism by M.S. Namboodripad
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- 1971 Political Economy of Development by Rajani Kothari
- + 1972 Education as Investment by V.V. John
- 1973 The Politics and Economics of "Intermediate Regimes" by K.N. Raj
- 1974 India's Strategy for Industrial Growth: An Appraisal by H.K. Paranjape
- 1975 Growth and Diseconomies by Ashok Mitra
- 1976 Revision of the Constitution by S.V. Kogekar
- 1977 Science, Technology and Rural Development in India by M.N. Srinivas
- 1978 Educational Reform in India: A Historical Review by J.P. Naik
- 1979 The Planning Process and Public Policy: A Reassessment by Tarlok Singh

* Out of Stock

+ Not Published

No lecture was delivered in 1947 and 1970

R.B.R.R. Kale Memorial Lectures at Gokhale Institute of Politics and Economics

- 1980 Problems of Indian Minorities by Aloo J. Dastur
 - 1981 Measurement of Poverty by V.M. Dandekar
 - 1982 IMF Conditionality and Low Income Countries by I.S. Gulati
 - * 1983 Inflation - Should it be Cured or Endured? by I.G. Patel
 - 1984 Concepts of Justice and Equality in the Indian Tradition by M.P. Rege
 - 1985 Equality of Opportunity and the Equal Distribution of Benefits by Andre Beteille
 - 1986 The Quest for Equity in Development by Manmohan Singh
 - 1987 Town and Country in Economy in Transition by K.R. Ranadive
 - 1988 Development of Development Thinking by Sukhamoy Chakravarty
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 - 2019 Central Banking: Retrospect and Prospects by Y. Venugopal Reddy
 - + 2020 Introduction to Mechanism Design by Eric Maskin
- * Out of Stock + Not Published

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