Sustainable Development Goals and Multi-Dimensional Poverty Index in India

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Abstract

The paper describes the concept and measurement of multi-dimensional poverty index and analyses quantitatively in India along with across the world. It finds a significant negative relation between growth and multidimensional poverty index. The paper studies exclusively on the several researches on MPI and its improvement over the income poverty. The paper found that Sub-Saharan Africa is the poorest region and Chand is the poorest country in the world according to MPI. In 2015-16, India's multi-dimensional poverty index was 0.117 which was reduced to 0.066 in 2019-21i.e., poverty has reduced to a certain limit. In rural area, MPI decreased from 0.154 to 0.086 and in urban area MPI decreased from 0.039 to 0.023 during 2015-16-2019-21 which implies that rural poverty has reduced much higher than urban area. The paper showed a clear link between sustainable development goals and MPI of India based on the approach of NITI Aayog where SDG-1 to SDG-6, SDG-10 and SDG-13 were emphasised.

Keywords: *Multi-dimensional Poverty Index, Sustainable Development Goals, Head Count Ratio, Intensity of Poverty, indicators of deprivations*

JEL classification codes: *I00, I20, I32, O20*

Introduction

Multi-dimensional Poverty Index is developed by UNDP and Oxford Poverty & Human Development Initiative in 2010 taking 2.15$ per day per person as international poverty line at 2017 PPP. It measures the percentage of households in a country deprived along three dimensions health, education and standard of living to asses an integrated picture of poverty. It is rigorous, unique and flexible. It is easy to calculate. The index can be compared between regions and nations and among ethnic groups and communities. It is an improvement over HPI and viewed as a measure of low wellbeing rather than poverty and prevents substitution between dimensions (Walker,2015). It assumes three dimensions, namely, health, education, and living standard in which the indicators of health are nutrition and child mortality whose weights were considered as one sixth (1/6), the indicators of education are years of schooling and school attendance whose weights are one sixth (1/6), and the indicators of living standard are cooking fuel, sanitation, drinking water, electricity, housing and assets whose weights are one eighteenth (1/18) each. Nutrition is aligned to SDG-2, child mortality is related to SDG-3, years of schooling and school attendance are related to SDG-4, cooking fuel and electricity are linked to SDG-7, sanitation and drinking water are aligned to SDG-6, housing is associated with SDG-11 and asset is related with SDG-1 respectively. MPI reflects the multiple deprivations that poor people face in the areas of education, health, and living standards. UNDP surveyed 104 countries in 2010 taking the Demographic and Health Survey (DHS), the Multiple Indicators Cluster Survey (MICS), and the World Health Survey (WHS) and found out MPI.

Measurement of MPI

MPI = H x A where MPI=multi-dimensional poverty index, H= head count ratio, A=intensity of poverty.

H=q/n where q=number of persons who are multi-dimensionally poor, n=total population,

A= where for poor c≥33.3%, $c_i(k)$, the deprivation scores are summed and divided by the total number of poor persons.

In MPI, there are 3 dimensions, health, education, and living standard. Health has two indicators, namely, nutrition and child mortality, education has two indicators, namely, years of schooling and school attendance, living standard has 6 indicators, namely, cooking fuel, sanitation, drinking water, electricity, housing, and assets etc.

Growth and MPI

Seth and Alkire (2021) examined the relationship between growth and MPI and found a weak negative correlation where Burchi et al. (2019) also found weak and negative correlation examining in 51 low-and middle-income countries. Santos, Dabus and Delbianco (2019) studied a panel of 78 countries for the period from 1999 to 2014 and observed that growth negatively affects the global MPI while the elasticity was less than one. Santos et al. (2019) took 91 countries during 1990-2018 to estimate the poverty-growth elasticity, to examine whether this elasticity varies across time, based on initial conditions, and to compare the elasticity for income and multidimensional poverty and found statistically significant negative effect on multidimensional poverty but with an elasticity much lower than one.

Balasubramanian, Burchi and Malerba (2023) used Global Correlation Sensitive Poverty Index (G-CSPI) and the Global M_0 (G-M_0) on 91 low- and middle-income countries from 1990 to 2018 to assess the elasticity of multidimensional poverty to growth to estimate the growth elasticity of multidimensional poverty using the first difference estimator. The study found that the growth elasticity of multidimensional poverty is -0.46 while using the G-CSPI and -0.35 while using the G-M_0 which implied that a 10 % increase in GDP decreases multidimensional poverty by 4.6 % using G-CSPI or 3.5 %, using G-M_0. The study incorporated three equally weighted fundamental dimensions of poverty: education, work, and health. The study used MPI following Alkire and Santos (2014) and the World Bank's (2018) recent multidimensional poverty measure. It assumed

$$CSPI = \frac{1}{n}\sum_{i=1}^{n}[c_i(x_i; z)]^2$$

where given n individual i=1,2,……..n. C_i is the sum of deprivations suffered by individuals I divided by total number of deprivations. This individual weighted deprivation count is dependent on the vectors of individual achievements $[x_i=(x_{i1}; x_{i2}; x_{i3})]$ and dimensional cut-offs $[z=(z_1; z_2; z_3)]$. Thus, the CSPI is the average of the squared individual weighted deprivation counts. If there is a transfer from a poor to a less poor individual, the CSPI increases, whereas the M_0 remains unchanged or even decreases.

The result also found that the income poverty-growth elasticity was much larger in magnitude than the multidimensional poverty-growth elasticity, regardless of the multidimensional poverty measurement. The estimated elasticity of the changes in the income squared poverty gap to economic growth was -2.36, compared to -0.46 using the G-CSPI; and -2.3, compared to -0.35 using the G-M_0. Therefore, the results for income poverty are five to six times greater, and become even eight times larger using the headcount ratios. As regards heterogeneity, empirical studies on income poverty showed that poverty reacts less to growth in countries with higher initial poverty. The first difference estimate regression model of this study is divided into three distinct analyses:(i) the association between the changes in multidimensional poverty and economic growth, (ii) robustness of the poverty-growth elasticity by controlling for changes in inequality, (iii) whether the cross-country poverty growth elasticity significantly varies over time.

Some Important Researches in MPI

There are a few researches on the multi-dimensional poverty index in India and across the globe in which the paper concentrated on the following research papers. Alkire and Seth (2008) applied the methodology of 2002 on Below the Poverty Line (BPL) using NFHS to calculate MPI for India and found that 12 per cent of the poor sample population and 33 per cent of the extreme poor could be misclassified as non-poor by the pseudo-BPL method.

Dehury and Mohanty (2015) used the Indian Human Development Survey (IHDS) data of 2004-05, estimated and decomposed the multidimensional poverty dynamics in 84 natural regions of India where MPI was measured by indices of health, knowledge, income, employment and household environment. Observations revealed that 50% of India's population is multidimensional poor with large regional variations. In Mahanadi basin more than 70% of the population is multidimensional poor. On the other hand, it is less than 10% in the coastal regions of Maharashtra, Delhi, Goa, the mountainous region of Jammu and Kashmir, the Hills region and Plains region of Manipur, Puducherry and Sikkim.

Duclos and Tiberti (2016) theorized that MPI should obey the properties of continuity, monotonicity, and sensitivity to multiple deprivation. But there is discontinuity in MPI such as i) a transfer from a richer

to a poorer individual in one dimension, ii) a decrease in the inequality in one component dimension among the poor, iii) a simultaneous decrease in inequality across all dimensions, or iv) a fall in the incidence of multiple deprivation respectively.

Dotter and Klasen (2017) proposed some changes on the empirical implementation such as (i) to exclude WHS as one of the data sources, (ii) to drop the BMI as a nutrition indicator, and to change the age ranges and cutoffs for the education and mortality indicators. Author discussed on different approaches to deal with the large share of households where information on an MPI indicator is missing and also analysed empirical relevance of the changes applying Demographic and Health Surveys (DHS) for Armenia, Ethiopia, and India which showed an improvement than current formulation. Anyone can investigate further using large countries.

Santos (2019) emphasised the designing a national MPI. First of all, it is required to define the purpose of the measure followed by setting the space, then selecting the unit of identification, the dimensions and indicators. If the selected unit of identification is the household, then the procedure for transforming individual-level indicators into household is not trivial because it affects the number of people identified as poor. The inclusion or non-inclusion of income among MPI indicators also has pros and cons that need to be balanced. Other central decisions are to set weights and to define the poverty cutoff. Then verify through empirical analysis, via robustness, sensitivity and bias checks.

Tripathi and Yenneti (2019) measured MPI in India taking National Sample Survey on consumption expenditure for the period of 2004-05 and 2011-12 and observed that 62.2% people are poor in 2004-05 which decreased to 38.4% in 2011-12 in which rural poverty declined from 60.2% in 2004-05 to 16.7% in 2011-12 and urban poverty declined to 20% in 201-12 from 33.4% in 2004-05. At state level analysis suggests that Jharkhand, Uttar Pradesh, Rajasthan, Orissa, and Bihar had the higher multidimensional rural poverty, whereas Kerala, Mizoram, Nagaland, Punjab and Maharashtra had the lower level of poverty as of 2004-05. But, in 2011-12, Punjab, Kerala, Himachal Pradesh, Haryana and Jammu & Kashmir had lower level of poverty whereas Manipur, Arunachal Pradesh, Jharkhand, Orissa and Uttar Pradesh had higher level of poverty. Nagaland, Mizoram, Himachal Pradesh, Jammu & Kashmir, and Kerala witnessed lower urban poverty whereas Chhattisgarh, Arunachal Pradesh, Bihar, Manipur and Uttar Pradesh witnessed higher urban poverty ratio in 2004-05. Meghalaya, Orissa, Bihar, Jharkhand and Uttar Pradesh witnessed higher urban headcount poverty ratio while Himachal Pradesh, Haryana, Kerala, Punjab and Tamil Nadu witnessed lower urban poverty in 2011-12.

Mitchell and Macció (2021) applied Alkire-Foster measure of deprivation of MPI in Argentina to the evaluation of the NGO TECHO's emergency housing programme in physical health, psychological health, sleep, privacy, interpersonal relations and security and found that there is a large reduction in multidimensional deprivation in dimensions related to the built environment where MPI declined from 69% to 41% which is robust to variations in the selection of deprivation indicators (Privacy, interpersonal relations and psychological health), indicator weights and poverty threshold. This result provides clear evidence of the urgent need for public sector actions to improve habitat in informal settlements producing a de-clustering of deprivation among the most deprived. Sensitivity analyses demonstrate the robustness of the results to changes in the criteria used to construct the multidimensional poverty measure.

According to Hlasny, Asadullah and Sabra (2022) MPI has emerged as an international harmonized indicator simultaneously capturing overlapping deprivations in multiple dimensions of well-being –health, education, and living standards. Regional and global MPIs have been linked with the SDGs as they address concurrently multiple SDGs and their indicators. Multidimension deprivation is an improvement to alleviate socially disadvantaged group. Presently, MPI is approved and implemented with the support of national leadership and civil society. MPI can address both spatial and horizontal inequality, and can be helpful for developing specific actions tailored to local needs. MPI is used in formal design, enactment and evaluation of social policies and programs. In Asia, MPI has been utilising to fulfil the targets of SDG-1(poverty), SDG-2(food security), SDG-4(education) and SDG-6(water and sanitation) respectively. MPI also has some drawbacks. For instance, flow data are not available for all indicators, including standard MPI indicators (e.g., child mortality irrespective of the time of death), household outputs (e.g., schooling years), and inputs (e.g., indoor cooking fuel), health data are inadequate and overlook some groups' deprivations particularly for nutrition.

On the basis of China Household Tracking Survey (CFPS)-2018, Wang, Xiao, and Liu (2023) examined the impact of social capital on Multidimensional Poverty of rural households in China and found that MPI of China was 0.103 and people below MPI are 24.94%. The adult education, health, and chronic diseases reached highest incidence of 42.06%, 37.65%, and 29.90% respectively. Social capital can significantly reduce the probability of multidimensional poverty in rural households. Moreover, social network significantly and negatively affects the occurrence of multidimensional poverty in

rural households and social trust in neighbours has a significant negative effect on multidimensional poverty in rural households at the 1% level, and social prestige is positively related to multidimensional poverty in rural households. The multidimensional poverty in rural households is significantly associated with age of household head, household size, and income from working outside the home.

Global MPI

Globally, multi-dimensional poverty index is severe in Sub-Saharan Africa showing 0.262 with 49.5% people live below MPI followed by South Asia scoring 0.091with 20.5% people, the developing countries scored MPI as 0.088 with 18.2% people live below MPI where Europe and the Central Asia showed lowest having 0.004 with 1.2% people below it. In decomposition of MPI, the headcount ratio revealed that 1116713000 people live below poverty line in developing countries followed by 533772000 people in Sub-Saharan Africa,389488000 people in South Asia,105845000 people in East Asia and pacific and 52636000 people in Arab States respectively. And the intensity of poverty revealed that 52.9% people live below poverty line in Sub-Saharan Africa followed by 48.9% in Arab States,48.5% in developing countries, 44.5% in South Asia, 43.1% in Latin America and Carebbeans,42.4% in East Asia and pacific regions respectively. People in severe multi-dimensional poverty stood highest in Sub-Saharan Africa,27.9% followed by developing countries 7.9%, South Asia and Arab states showing 6.9% followed by 1.5% in Latin America and Caribbeans. The contribution of deprivation in dimension to overall multi-dimensional poverty from health is severe in Europe and Central Asia showing 66.7% followed by 33.5% in Latin America and Carebbeans,28.1% in East Asia and Pacific,27.9% in South Asia,26.1% in Arab States and 24.2% in developing countries respectively. But deprivation from education occur severely in East Asia and Pacific having 35.8% followed by Arab States 34.3%, South Asia 33.7%, developing countries 31.6%, Sub-Saharan Africa 29.6%, Latin America and Caribbeans 27.6%, and 16.8% in Europe and Central Asia respectively. The deprivation from standard of living is severe in Sub-Saharan Africa having 49.8% followed by developing countries 44.2%, Arab States 39.7%, Latin America and Caribbean countries 38.9%, South Asia 38.3%, East Asia and Pacific 36.1% and so on. According to national poverty line,41.1% Sub-Saharan people live below the poverty line followed by Latin America and Caribbeans 37.9%, Arab States 23.4%, South Asia 22.6%, developing countries 20.1% and Europe and Central Asia 12.2% respectively. According to international poverty line of 2.15$ PPP per day, Sub-Saharan Africa showed 37.4% people live below the poverty line followed by developing countries 10.5%, South Asia 9.2%, Latin America and Caribbeans 4.9% and Arab States 4.7% respectively. (Table 1).

Table 1 Indicator Based Multi-Dimensional Poverty

	Arab states	East Asia+Pacific	Europe+Central Asia	Latin America+Caribbeans	South Asia	Sub-Saharan Africa	Developing countries
MPI	0.074	0.022	0.004	0.024	0.091	0.262	0.088
People%	15.1%	5.1%	1.2%	5.6%	20.5%	49.5%	18.2%
H(2021) in 000	52636	105845	1713	33258	389488	533772	1116713
A(%)	48.9%	42.4%	37.1%	43.1%	44.6%	52.9%	48.5%
Inequality among poor	0.019	0.008	0.003	0.011	0.014	0.022	0.017
People in severe MPI	6.9%	0.9%	0.1%	1.5%	6.9%	27.9%	7.9%
Health	26.1%	28.1%	66.7%	33.5%	27.9%	20.6%	24.2%
Education	34.3%	35.8%	16.5%	27.6%	33.7%	29.6%	31.6%
Standard of living	39.7%	36.1%	16.8%	38.9%	38.3%	49.8%	44.2%
People National poverty	23.4%	3.8%	12.2%	37.9%	22.6%	41.1%	20.1%
People 2.15$ PPP	4.7%	0.8%	0.7%	4.9%	9.2%	37.4%	10.5%

Source-UNDP-2023

Among the developing countries, Multi-dimensional Poverty Index is the highest in Chand which was obtained as 0.517 followed by Central African Republic having MPI as 0.461, Burundi having MPI as 0.409,Madagascar having MPI as 0.386,Mali having MPI as 0.376 respectively where percentage of population deprived in health, education and standard of living were found as 19.1%,36.6%,44.3% for Chad,20.2%,27.8%,52.0% for Central African Republic,23.8%,27.2%,49.0% for Burundi,17.8%,31.6%, 50.6% for Madagascar, and 19.6%,41.1%,39.3% for Mali. The same observations were found in case of HCR (%) which implies that Chad showed highest HCR as 84.2% followed by CAR having HCR as 80.4%, Burundi 75.1%, Ethiopia 68.7%, Madagascar 68.4% and Mali 68.3% and so on. On the contrary, according to international poverty line, percentage of population below PPP 2.15$ per day per man during 2011-21was highest in Madagascar [80.7%] followed by Malawi [70.1%], Congo [69.7%], Burundi [65.1%], Mozambique [64.6%] respectively. According to national poverty line, Madagascar secured first rank having 70.7% population living below the poverty line, followed by Sao Tome Principe, 66.7%, Burundi, 64.9%, Congo,63.9%, and Sierra Leone ,56.8% respectively.

In South East Asia, highest MPI was seen in Pakistan having MPI as 0.198, followed by Lao PDR showing 0.108, Bangladesh as 0.104, Nepal as 0.074, and India as 0.069 respectively. On the other hand, the lowest MPI was observed in Thailand having MPI as 0.002, followed by Maldives 0.003, Vietnam 0.008 and Indonesia showing MPI as 0.014 respectively. Their percentage of population deprived in health, education and standard of living were seen as 27.6%,41.3% and 31.1% for Pakistan, followed by 21.5%,39.7% and 38.8% for Lao PDR, 17.3%, 37.6%, 45.1% for Bangladesh, 23.2%,33.9%, and 43.0% for Nepal, 32.2%, 28.2%, and 39.7% for India and so on. Incidentally, according to HCR, the ranking order somehow changed marginally as follows: Pakistan-38.3%, Bangladesh-24.6%, Lao PDR-23.1, Nepal-17.5%, and India-16.4%. Interesting to note that according to international poverty line, percentage of population below PPP 2.15$ per day per man during 2011-21, Bangladesh showed 13.5% people are living below poverty line compared with 10.0% in India,7.1% in Lao PDR and 4.9% in Pakistan.

Percentage of population living in severe MPI was found in Chad [64.6%] followed by Central African Republic [55.8%], Burundi [46.1%], Madagascar [45.8%], Mali [44.7%], Guinea [43.4%], Mozambique [43.0%], Ethiopia [41.9%], and Benin [40.9%] respectively.

There is no severe MPI in the countries like Argentina, Georgia, Costa Rica, Jordon, Kyrgyzstan, Maldives, Palestine, Serbia, Seychelles, Thailand, Tonga, Turkmenistan, Tuvalu and Uzbekistan respectively. But their health and education deprivations are very high although their values of MPI are low. Therefore, other indicators on the health and education deprivations are to be searched out by using suitable methodology that can clarify MPI fully.

Percentage of population deprivation in health in MPI was found highest in Uzbekistan [94.5%] followed by Turkmenistan [82.4%], Maldives [80.7%], Argentina [69.7%], Seychelles [66.8%], Kyrgyzstan [64.6%], and Palestine [62.9%] respectively but those countries were recorded very negligible value of MPI which ranges from 0.001 to 0.006.

Again, percentage of population deprivation in health in MPI was found highest in Tunisia [61.6%] followed by Iraq[60.9%],Albania[55.1%], Jordon [53.5%], North Macedonia [52.6%], Algeria [49.9%], Senegal [48.4%], Cambodia[48.0%], Morocco [46.8%], and Dominican [48.0%] whose MPI ranges from 0.001 to 0.070 except Senegal(MPI=0.263) where it is to be noted that all are Muslim countries except Cambodia.

In case of percentage of population deprivation in standard of living in MPI, the highest rank was occupied by Papua New Guinea having 65.3% followed by Lesotho, 60.0%, Zimbabwe, 59.2%, Haiti,57.0%, Malawi, 55.9%, Ethiopia, 54.5%, Rwanda, 54.4%, Zambia, 53.5% etc. which were influenced tremendously by the values of MPI on those countries that ranged from 0.084 to 0.293 to 0.367(UNDP,2023).

Multi-Dimensional Poverty Index of India

In India, in 2015-16, Headcount Ratio was 24.85% and Intensity of poverty was 47.14% which revealed multi-dimensional poverty index equals 0.117 which was reduced to 0.066 in 2019-21 where Headcount ratio was 14.96% and intensity of poverty was 44.39% (Table No-2).

Table 2 Multi-Dimensional Poverty Index of India

	Headcount Ratio	Intensity of Poverty	MPI=HxA
2015-16	24.85%	47.14%	0.117
2019-21	14.96%	44.39%	0.066

Source-NITI Aayog, 2023

In comparing multi-dimensional poverty index of India in context of rural and urban area during 2015-16-2019-21, the paper finds that both rural and urban areas were able to reduce the MPI. In rural area, head count ratio and intensity of poverty were 32.59% and 47.38% which transform MPI as 0.154 in 2015-16 which decreased to 0.086 in 2019-21 where headcount ratio and intensity of poverty were 19.28% and 44.55% respectively. On the

other hand, in urban area head count ratio and intensity of poverty were 8.65% and 45.27% which transform MPI as 0.039 in 2015-16 which decreased to 0.023 in 2019-21 where headcount ratio and intensity of poverty were 5.27% and 43.10% respectively. (Table 3)

Table 3 India's MPI-Rural vs Urban

	RURAL			URBAN		
	MPI	**H(%)**	**A(%)**	**MPI**	**H(%)**	**A(%)**
NFHS-5 (2019-21)	0.086	19.28%	44.55%	0.023	5.27%	43.10%
NFHS-4 (2015-16)	0.154	32.59%	47.38%	0.039	8.65%	45.27%

Source-NITI Aayog, 2023

According to the indicators of multi-dimensional poverty index in the dimensions of health, education and standard of living in India, the deprivation of India has reduced to some extents in every indicator however little. In 2015-16, nutrition deprivation was 37.60% which reduced to 31.52% in 2019-21, Child & adolescence mortality deprivation was reduced from 2.69% to 2.06%, Maternal health deprivation was reduced from 22.58% to 19.17% respectively. In education sector, deprivation of years of schooling was 13.86% in 2015-16 which decreased to 11.40% in 2019-21, deprivation of school attendance was 6.4% in 2015-16 which decreased to 5.27% in 2019-21.In standard of living, the deprivation in cooking fuel was 58.47% in 2015-16 which reduced to 43.90% in 2019-21, the deprivation in sanitation was 51.88% in 2015-16 which reduced to 30.13% in 2019-21, the deprivation in drinking water was 10.92% in 2015-16 which decreased to 7.32% in 2019-21, the deprivation in electricity was 12.16% in 2015-16 which reduced to 3.27% in 2019-21, the deprivation in housing was 45.65% in 2015-16 which dropped to 41.37% in 2019-21, the deprivation in assets was 13.97% in 2015-16 which fell down to 10.16% in 2019-21,and the deprivation in bank account was 9.66% in 2015-16 which reduced to 3.69% in 2019-21respectively (Table No-4).

Table 4 Indicator Based Deprivation of India

	NFHS-4(2015-16)	**NFHS-5(2019-21)**
Health		
Nutrition	37.60%	31.52%
Child & adolescence mortality	2.69%	2.06%
Maternal health	22.58%	19.17%
Education		
Years of schooling	13.86%	11.40%
School attendance	6.40%	5.27%
Standard of living		
Cooking fuel	58.47%	43.90%
Sanitation	51.88%	30.13%
Drinking water	10.92%	7.32%
Electricity	12.16%	3.27%
Housing	45.65%	41.37%
Assets	13.97%	10.16%
Bank accounts	9.66%	3.69%

Source-NITI Aayog, 2023

According to state-wise multi-dimensional poverty index in India, the minimum deprivation or the lowest MPI was observed in Kerala having 0.003 in 2015-16 followed by Goa having 0.015, Sikkim 0.016, Tamil Nadu having 0.019, Punjab 0.024 respectively. On the other hand, maximum deprivation or highest MPI was observed in Bihar showing 0.265 followed by Jharkhand 0.202, Uttar Pradesh 0.179 and Madhya Pradesh 0.173 respectively. But in 2019-21, the lowest MPI was observed in Kerala having 0.002, followed by Goa having 0.003, Tamil Nadu 0.009, Sikkim 0.011, Punjab and Himachal Pradesh 0.020, Mizoram and Telangana 0.024 and Andhra Pradesh 0.025 respectively. Conversely, in 2019-21 the highest MPI was observed in Bihar showing 0.160 followed by Meghalaya 0.133, Jharkhand 0.131, Uttar Pradesh 0.103, Madhya Pradesh 0.090 respectively. All the states have improved their MPI to a greater extent (Niti Aayog,2023).

Policies and Programmes

Ministry of statistics and programme implementation, Govt. of India (2023) has completed its SDG -National Indicator Framework, Progress Report-2023 where India sets 17 sustainable development goals in connection with the UNDPs SDGs in which India's SDG-1 to SDG-6, SDG-10 and SDG-13 are directly and indirectly related with multi-dimensional poverty index of India by which poverty alleviation can be implemented properly.

In SDG-1, India's extreme poverty as per US$1.25 per day per person was 5.05 in rural area and 2.70 in urban area as poverty gap ratio in 2011-12, which is targeted to zero in 2030. According to national poverty line, India's poverty was 21.92% in 2011-12 which will be reduced to half by 2030.India's health insurance coverage was 28.70% in 2011-12 and 41.00% in 2019-21 and by 2030 a substantial coverage will be done. In ICDS, MGNREGA, SHG, PMMVY, assistance to senior citizens, EPS, NPS, access of basic services, provision of telephone, the same commitment was assured by 2030. India committed to build the resilience of the poor and those in vulnerable

situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters with in 2030. India will ensure significant mobilization of resources from a variety of sources through enhanced development co-operation, in order to provide adequate and predictable means to implement programmes and policies to end poverty in all its dimensions.

According to SDG-2,India committed to end hunger and ensure safe, nutritious and sufficient food for poor within 2030 when India's 32.10 % children aged under 5 years in 2019-21 remain underweight,98.48% of people in 2022-23 are the beneficiaries of National Food Security Act 2013.In 2019-21,35.50% of children under age 5 years are stunted,19.3% are wasting,3.4% are underweight due to malnutrition and 57.0% pregnant women aged 15-49 have been fallen into anaemia, 18.70% of women's Body Mass Index (BMI) is below normal, 67.10% of children aged 6-59 months are anaemic where India aimed at zero malnutrition by 2030.Productivity of rice, wheat, Gross Value Added in agriculture per worker, (in Rs 84621 in 2022-23), Ratio of institutional credit to agriculture to the agriculture output is1.10 in 2019-21which will be doubled in 2030. Proportion of Net Sown Area to Cultivable land in 2019-20 is 77.73, percentage of net area under organic farming in 2021-22 is 3.91 will be increased subsequently by 2030.In 2022-23, 482633 plants, 294504 animals, 17.92 proportions of local breeds classified as being at risk of extinction, where India committed to maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species by 2020.

According to SDG-3,India will reduce the global maternal mortality ratio to less than 70 per 1,00,000 live births (presently 9700000 in 2018-20) by 2030, 89.40 percentage of births attended by skilled health personnel (Period 5 years) in 2019-21, 90.90 percentage of births attended by skilled health personnel (Period 1 year) in 2019-21, 58.5 percentage of women aged 15-49 years with a live birth, for last birth, who received antenatal care, four times or more (Period 5 years/1 year) in 2019-21,will be reduced substantially by 2030. In 2020, under-five mortality rate, (per 1,000 live births) of India is 32, neonatal mortality rate (per 1,000 live births) is 20,which will be changed to 12 and 25 by 2030. Now in 2022, number of new HIV infections per 1,000 uninfected population is 0.05, Tuberculosis incidence per 1,00,000 population is 197 in 2021, Malaria incidence per 1,000 population is 0.13 in 2022, Prevalence of Hepatitis 'B' per 1,00,000 population is 850 in 2021, Case Fatality Ratio of Dengue is 0.12 in 2022,where India will end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water- borne diseases and other communicable diseases by 2030. India will achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all. By 2030, India will substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. India will increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing states, support the research and development of vaccines and medicines for the communicable and non-communicable diseases, strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries respectively.

In SDG-4,India wants to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all for which India will provide complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes for all girls and boys by 2030. Presently,India's Gross Enrolment Ratio in higher secondary education is 57.6 in 2021-22, Net Enrolment Ratio in primary and upper primary education are 88.6 and 71.3 in 2021-22, Adjusted Net Enrolment Ratio in primary, upper primary and secondary education are 99.1,87.3,64.7 in 2021-22. By 2030, India will (i)ensure

access on care and pre-primary education for all boys and girls so that they are ready for primary education, (ii) ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education including university, (iii) eliminate gender disparities in education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations, (iv) increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship. Moreover, by 2030, India will ensure to achieve literacy for all youths and adults, both men and women, ensure all learners to acquire the knowledge and skills needed to promote sustainable development, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development. India will build and upgrade education facilities for all children including disability and gender sensitive, safe, non-violent, inclusive and effective learning environments for all.

In SDG-5, India will achieve gender equality and empower all women and girls and will end all forms of discrimination against all women and girls. India will (i)eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation, (ii)eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation, (iii) ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life, (iv) recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate, (v) ensure universal access to sexual and reproductive health and reproductive rights as agreed in the International Conference on population and Development and the Beijing platform for action and the outcome documents of their review conferences, (vi) undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources as per national laws, (vii) enhance the use of enabling technology especially in information and communications technology, (viii) to promote the empowerment of women, (ix) adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.

In SDG-6,India's successive steps are (i) to ensure availability and sustainable management of water and sanitation for all,(ii) to provide universal and equitable access to safe and affordable drinking water for all as against 61.52% in 2021-22,(iii) to achieve access to adequate and equitable sanitation and hygiene for all, (iv) to end open defecation with special emphasis on women and girls, (v) to improve water quality by reducing pollution,(vi) to eliminate dumping and minimise hazardous chemicals (vi) to half untreated wastewater and to recycle for safe reuse, (vii) to supply freshwater in scarcity areas, (viii) to implement integrated water resources management at all levels,(ix) to protect and restore water-related ecosystems, (x) to expand international cooperation in water- and sanitation-related activities and programmes with other countries, (xi) to support and strengthen the participation of local communities in improving water and sanitation management by 2030.

In SDG-10, India will reduce inequality within and among countries and by 2030, it will progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average, and empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status. Presently, India's Gini coefficient in rural and urban area are 0.283,and 0.363 in 2011-12,and percentage of people living below 50 per cent of median per capita household expenditure in rural and urban area are 4.28 and 10.89 in 2011-12, growth rates of household expenditure per capita among the bottom 40 per cent of the population and the total population in rural and urban area are 13.61 and 13.35 in 2011-12.India will (i) adopt fiscal, wage and social protection policies, (ii) progressively achieve greater equality, (iii)improve the regulation and monitoring of global financial markets and institutions and (iv)strengthen the implementation of such regulations, facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies, (v) implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with WTO agreements, encourage ODA and financial flows, including FDI, to states where the need is greatest, especially African countries, small island developing states and landlocked developing countries according to their national plans and programmes, and (vi) will reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent by 2030.

In SDG-13,India aims to take urgent action to combat climate change and its impacts and strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries because number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population in India was 1,0738.97 in 2018,the value of Sendai Framework for Disaster Risk Reduction 2015-2030 in India was 1.0 during 2019-23, proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies of India is 0.92 in 2022. India will improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning system. India will integrate climate change measures into national policies, strategies and planning and it will promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing states, including focusing on women, youth and local and marginalized communities through climate finance target of UNFCCC to operationalise Green Climate Fund.

Conclusion

The paper found some limitations of MPI which are (i) indicators of years of schooling, cooking fuel, child mortality are stock data where flow data are not available, (ii)data on health are weak and overlook some group deprivations, (iii) missing data should be carefully handled, (iv) intra-household inequality may be severe since all are not reflected, (v) MPI does not measure inequality among poor, (vi) data limited to direct cross-country comparability. Moreover, the review of UNICEF (2021) concluded that (1) more awareness and changing language and concept of poverty is required because child multidimensional poverty has different scale and intensity problems. (2) Policy measurement can be identified because disparities are different across geographical areas so that investment particular will be different in sectors. Thereby both child poverty and social protection can be preserved keeping in mind for long term perspective planning for SDG.

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