

ISBN : 978-81-970236-9-9

SUSTAINABLE DEVELOPMENT GOALS

The Indian Context : Annotated Bibliography

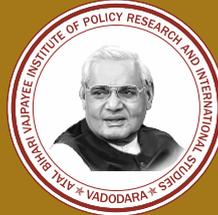
Yogesh V Gokhale
Harsh Pargat

Occasional Publication Series
No. 1 - 2025-26



सत्यं शिवं सुन्दरम्
Estd. 1949

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Atal Bihari Vajpayee Institute of Policy Research and
International Studies (AIPRIS)

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

VADODARA, GUJARAT 390002

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The Maharaja Sayajirao University of Baroda

ISBN : 978-81-970236-9-9

Published by
Atal Bihari Vajpayee Institute of Policy Research and International Studies (AIPRIS)
The Maharaja Sayajirao University of Baroda
Vadodara-390 002, Gujarat, India

Suggested Citation - Gokhale Y V and Pargat H (2026) Sustainable Development Goals - The Indian Context: Annotated Bibliography. Occasional Publication Series, No. 1 - 2025-26, Atal Bihari Vajpayee Institute of Policy Research and International Studies (AIPRIS), The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat 390002.

Printed by
Jatin H. Somani, Manager
The Maharaja Sayajirao University of Baroda Press (Sadhana Press)
Near Palace Gate, Palace Road, Vadodara - 390 001

Prof. (Dr.) Bhalchandra Bhanage

Vice Chancellor



MESSAGE FROM THE DESK OF VICE CHANCELLOR

It is a matter of pride that **Atal Bihari Vajpayee Institute of Policy Research and International Studies (AIPRIS)** has made systematic efforts to enhance the academic understanding regarding SDGs in India through the publication of **Sustainable Development Goals – The Indian Context: An Annotated Bibliography**.

India is achieving the Sustainable Development Goals (SDGs) by aligning its existing flagship national programs with the 2030 Agenda. NITI Aayog serves as the nodal agency coordinating a "Whole-of-Government 'I and 'I Whole-of-Society" approach to implement, monitor, and localize these efforts across the country. For a diverse and large country like India, assessing the impacts of the implementation of various schemes is a herculean task. In this regard, the educational institutions across India need to contribute through research activities.

In the Sustainable Development Report 2025 of United Nations, India is ranked 99th out of 167 countries, with a score of 67.0. India has entered the top 100 countries in the global SDG Index for the first time since its inception. India is ranked 99th globally, with a score of 67 out of 100. This represents a significant improvement over previous years, ranking 109th in 2024 and 112th in 2023. India is ahead of Bangladesh (114th) and Pakistan (140th), but it still yet to match with neighbouring countries like Sri Lanka (93rd), Nepal (85th), Bhutan (74th) and Maldives (53rd).

India has made good progress on several goals, particularly poverty reduction (SDG 1), access to electricity and clean energy (SDG 7), and basic infrastructure (SDG 9).

I would like to extend my deepest gratitude to the faculty, students, staff, etc who have contributed to the development of this report. Your dedication, creativity, and passion are the driving forces behind our progress. We recognize that the path toward sustainability is not linear, and there are many hurdles yet to overcome. However, the collective efforts demonstrated in this report gives me confidence that we are on the right track.



Date : December 15th, 2025

Prof (Dr.) Bhalchandra Bhanage



Atal Bihari Vajpayee Institute of Policy Research and International Studies (AIPRIS)

The Maharaja Sayajirao University of Baroda, Vadodara
Accredited Grade A+ by NAAC



Message from Prof Amit Dholakia,

Director,

**Atal Bihari Vajpayee Institute
of Policy Research and International Studies**



India has integrated the United Nations Sustainable Development Goals into its national planning framework through a wide range of flagship government schemes, with NITI Aayog functioning as the nodal agency for coordination, monitoring, and evaluation. As the world's most populous country and a growing economy, India faces acute pressures on its natural resources and ecosystem. At the same time, it has emerged as a significant contributor of solutions to global sustainability challenges. India's leadership in the International Solar Alliance and measurable progress in poverty reduction and food security underscore India's evolving role in advancing sustainable development both domestically and globally.

Despite the adoption of a structured and comprehensive approach to SDG implementation, scholarly research on the achievement of SDGs in India remains relatively limited. Constraints relating to data availability and accessibility, methodological challenges, and the complexity of outcome measurement have restricted the scope of empirical research. Nevertheless, research activity in this domain has witnessed steady growth at both national and international levels.

There is an urgent need for a systematic and critical study of the various schemes and initiatives aimed at furthering sustainable development in India. This would help assess their impacts and enable policy makers to bring about a course correction wherever necessary. This publication of the *Atal Bihari Vajpayee Institute of Policy Research and International Studies* (AIPRIS), titled *Sustainable Development Goals – The Indian Context: An Annotated Bibliography*, makes a timely and meaningful contribution by helping to identify research gaps and priorities for scholars and policy makers. I congratulate the authors on bringing out this valuable publication, which will serve as a reference for studies on the Indian approach to Sustainable Development Goals (SDGs).

The present annotated bibliography assumes particular significance, as it offers a consolidated and critical resource for researchers, policymakers, and practitioners seeking to engage with the evolving discourse on Sustainable Development Goals in India. This publication provides a systematic overview of existing literature on SDGs in the Indian context. It would enable researchers and students to assess the relevance, quality, and methodological rigour of the sources before engaging in detailed analysis. It also helps identify major research gaps, debates, theoretical frameworks, and trends within a field of study, thereby guiding the formulation of research questions.

As the Director of AIPRIS, I place on record my appreciation of the serious academic effort put in by Prof. Yogesh Gokhale and Mr. Harsh Pargat in compiling and editing this publication.

Prof. Amit Dholakia
Director, AIPRIS

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Contents

SDG 1 No Poverty	1
SDG 2 Zero Hunger	2
SDG 3 Good Health and Well Being	3
SDG 4 Education Quality	14
SDG 5 Gender Equality.....	21
SDG 6 Clean Water and Sanitation.....	32
SDG 7 Affordable and Clean Energy.....	45
SDG 8 Decent Work and Economic Growth.....	53
SDG 9 Industry, Innovation and Infrastructure	64
SDG 10 Reduced Inequalities	72
SDG 11 Sustainable Cities and Communities	77
SDG 12 Responsible Consumption and Production	86
SDG 13 Climate Action	96
SDG 14 Life Below Water	109
SDG 15 Life on Land	114
SDG 16 Peace, Justice and Strong Institutions.....	115
SDG 17 Partnership for the Goals.....	117
Cross-cutting references	122

Purpose

Annotated Bibliography is a robust tool for researchers as it gives a quick overview of literature. Such collection of research articles provides basic analysis about the diversity of studies conducted and published, gaps in research and publications within a specific theme. Sustainable Development Goals (SDGs) is one of the most holistic frameworks offered for human development. SDGs provide opportunities for socially acceptable, environmentally viable and economically affordable form of development. The Government of India has committed to follow this model and has consistently worked on it through various programmes, missions and projects. NITI Aayog has been following the progress of SDGs in each state as well as national level. But the focus on research with respect to the achievement of various SDGs in India has been limited. To meet this gap, the present work has compiled 237 publications for the researchers of SDGs. It is observed that Indian authors publish more in local journals which are often difficult to search due to various reasons; this is a limitation of this exercise.

Methodology

The publications have been mainly identified through internet based thematic search using search engines such as Google Scholar and, databases such as ResearchGate. Considering the 2030 deadline of SDG achievement, in most cases articles published in 2018 and onwards have been considered. This work has been conducted from October 2024 till September 2025. Mostly research papers, articles, reports accessible through search engines are considered for documentation.

Analysis

Table 1 provides a snapshot of all 237 references. For all 17 goals, over 170 topics have been researched at various geographical scales and locations. The number of studies which are connecting to more than one SDG are just 9 apart from among 16 studies cross-cutting studies. Total 13 studies are oriented at policy and 11 studies are focusing on analysis, impacts, assessment at various scales for different SDGs. Only three studies are based on the Corporate Social Responsibility work.

Table 1: Summary of references

Ref No.	SDG	Topic	Scale	Geography
1	1	Gap Analysis	State	Assam
2	1, 3, 16	Trade-Off	National	India
3	2	Agriculture, Livelihoods	State	Karnataka
4	2	Jhum, Traditional Knowledge	Local	Zunheboto District of Nagaland
5	2	Malnutrition	National	India
6	2	Nutrition	National	India
7	2	Policy	National	India
8	2	Land Use Trade Offs	National	India
9	3	Monitoring And Reporting	National	India
10	3	Policy	National	India
11	2,3	Evaluation	National	India
12	3	Life Expectancy	National	India

13	3	Road Safety	Local	Delhi, Mumbai, Vishakhapatnam, Agra, Patiala, Bulandshahr
14	3	Folk Media	National	India
15	3	Covid-19	National	India
16	3	Family Health	District	India
17	3	Data Governance	National	India
18	3	Health Care	States	North eastern States
19	3	Disparity	National	India
20	3	Health	National	India
21	3	Status	National	India
22	3	Air Pollution	National	India
23	3	E-Health Services	National	India
24	3	Palliative Care	State	Kerala
25	4	National Education Policy	National	India
26	4	Wage Workers	National	India
27	4	Primary School	State	Maharashtra
28	4	Evaluation	National	India
29	4	Teacher Education Programme	National	India
30	4	Stem Education	National	India
31	4	Patterns	National	India
32	4	Action Plan	National	India
33	4	Signal School	Local	Ahmedabad
34	4	Higher Education	States	Northern border States
35	4	Rural - Urban	National	India
36	4	National Education Policy	National	India
37	5	Education	Local	Delhi
38	5	Education	International	India and Australia
39	5	Gender Equality	International	South Asia
40	5	Sdgs	National	India
41	5	Human Rights	International	Global
42	5	Men	State	Kerala
43	5	Electricity Policy Making	International	India, Nepal, Kenya
44	5	ICT	National	India
45	5, 13	Climate Change	International	Global
46	5	SDG	National	India
47	5	Assessment	National	India
48	5	Performance	National	India
49	5	Violence	National	India
50	5	Feminism	National	India
51	5	Reverse Migration	National	India

52	5	Inequality	Local	Pune
53	5	Local Efforts	Local	Dakshina Kannada district, Karnataka
54	5	Women Empowerment	National	India
55	5	Electrification And Empowerment	International	India, Nepal
56	5	Impacts	National	India
57	6	SDG Convergence	National	India
58	6	Justice	National	India
59	6	Water Governance	National	India
60	6	Education, Training And Research	International	Global
61	6, 13, 8	Drinking Water And Sanitation	National	India
62	6	Water Governance	States	Andhra Pradesh, Uttar Pradesh, Uttarakhand, Telangana, Arunachal Pradesh, Karnataka, Maharashtra and Tamil Nadu
63	6	Process	National	India
64	6	Wash	Local	Indian Metro cities
65	6	Policy	National	India
66	6	Water Quality	Local	Alibaug town
67	6	Regional Priorities	State	Bihar
68	6	Policy	National	India
69	6	Goal Target Analysis	National	India
70	6	Digitalized Welfare	National	India
71	6	Water Sustainability Index	National	India
72	6	Goal Target Analysis	National	India
73	6	Drinking Water	National	Rural India
74	6	Wash	Local	Greater Hyderabad
75	6	Inequality	States	Districts
76	6	Water And Sanitation	States	Ganga River basin
77	6, 7	Progress And Challenges	National	India
78	6	Wash	National	India
79	6	Household Access	National	India
80	6	Water Governance	National	Rural India
81	7	Policy	National	India
82	7	Micro-Grid	National	India
83	7	Renewable Energy	State	Maharashtra
84	7	Policy	National	India
85	7	Energy Poverty	National	India
86	7	Energy Supply	National	India

87	7	Central And Off-Grid	International	Sub-saharan Africa and South Asia
88	7	Goal Target Analysis	National	India
89	7	Rural Electrification	National	India
90	7	Affordable And Clean Energy	International	India, Germany and Europe
91	7	Goal Target Analysis	National	India
92	7	Electric Vehicles	National	India
93	7	Socially Disadvantaged Groups	National	India
94	7	Solar Power	State	West Bengal
95	7	Policy	National	India
96	8	Gender	National	India
97	8	Corporate Social Responsibility	National	India
98	8	Goal Target Analysis	International	G 20
99	8	MDG	National	India
100	8	Multi-National Corporations	National	India
101	8	Economic Growth	National	India
102	8	Historical Context	National	India
103	8	Migration	National	India
104	8	Small- And Medium-Sized Enterprises	National	India
105	8	Employment	National	India
106	8	War	National	India
107	8	Education	National	India
108	8	Assessment	National	India
109	8	Entrepreneurial Abilities	National	India
110	8, 3	Health	Local	Case study
111	8	Carbon Accounting	National	India
112	8	Governance	Local	Case study
113	8	Bibliometric Study	National	India
114	8	Remittances	International	Global
115	9	Ease Of Doing Business	National	India
116	9	MSME	National	India
117	9	Infrastructure Policies	National	India
118	9	Industrialization	National	India
119	9	Industrialization	National	India
120	9	Assessment	International	Global
121	9	Fourth Industrial Revolution	National	India
122	9	Science, Technology, And Innovation	National	India
123	9	Premature Deindustrialization	National	India

124	9	Innovation	National	India
125	9	Business Strategies	National	India
126	9	Cottage Industries	Local	Bishnupur, West Bengal
127	9	Digital Mission	National	India
128	9	Policy	International	South and South-West Asia
129	9	Biomaterials	National	India
130	9	Heritage Sites Tourism	State	Uttarakhand
131	8	Small- And Medium-Sized Enterprises	International	India and China
132	10	Inequality	International	Global
133	10	Multilevel Approach	National	India
134	10	Factors	States	18 states
135	10	Coverage Of Child Health Work	Sub national	Districts
136	10	Education	National	India
137	10	Assessment	National	India
138	10, 7, 13	Renewable Energy	National	India
139	10	Drinking Water	States	Districts
140	10	Rural - Urban	National	India
141	10	Pandemic	National	India
142	11	Assessment	National	India
143	11	Analysis	Local	Cities - Bangalore (Bengaluru), India; Cape Town, South Africa; Gothenburg, Sweden; Greater Manchester, United Kingdom; and Kisumu, Kenya.
144	11	Smart City Mission	National	India
145	11	Urban Spaces	National	India
146	11	Resilience	National	India
147	11	Analytical Framework	National	India
148	11	Urban Planning	National	India
149	11	Challenges And Opportunities	National	India
150	11	Governance	International	India, Japan and Brazil
151	11	Urban Spaces	Local	Smart city
152	11	Temperature	Local	Bangalore city
153	11	Urban Transport	Local	Surat, Udaipur
154	11	Governance	National	India
155	11	Artificial Neural Network	Local	Smart cities
156	11	Localization	International	South Asia
157	11	Green Infrastructure	Local	metropolitan city-regions
158	11	Ppp Project	National	India
159	11	Energy Efficiency	Local	Smart cities

160	12	Manufacturing	National	India
161	12	Analysis	National	India
162	12	Consumption And Production Pattern	National	India
163	12	Global Impact	International	Global
164	12	Monitoring And Reporting	National	India
165	12	Value System	Local	Pune city
166	12	Agri-Food Supply Chain	National	India
167	12	Lifecycle Assessment	National	India
168	12	Household Value System	National	India
169	12	Energy And Waste Management	National	India
170	12	Responsible Consumption Behaviour	National	India
171	12	Status	National	India
172	12	Value System	National	India
173	12	Roadmap	National	India
174	12	Family Businesses	International	Global
175	12	Building Materials	State	Kerala
176	12	Green Consumption	National	India
177	12	Construction Supply Chains	National	India
178	13	Policy	National	India
179	13	Policy	National	India
180	13, 15	Localization	States	Himalayan states
181	13	Governance	Local	Sundarbans, West Bengal
182	13	Disaster Risk Reduction	National	India
183	13	Education	National	India
184	13	Impacts	National	India
185	13	Economic Growth	National	India
186	13	Rural - Urban	National	India
187	13	Corporate Response	National	India
188	13	Climate Policy	National	India
189	13	Progress And Challenges	National	India
190	13	Social Media	National	India
191	13	NbS For Dryland Agriculture	State	Maharashtra
192	13	Barriers And Opportunities	National	India
193	13	Status	National	India
194	13	Synergies And Trade-Offs	National	India
195	13	Agroforestry	National	India
196	13	Agriculture Carbon Credits	National	India
197	13	Food Safety	National	India

198	13	Climate Smart Agriculture	National	India
199	13	Natural Disasters	National	India
200	14	Water Governance	National	India
201	14	Coastal Monitoring	National	India
202	14	Global Biodiversity Regime	International	Global
203	14	Blue Economy	National	India
204	14	Western Indian Ocean	International	Global
205	14	Covid-19	National	India
206	14	Oceans	National	India
207	14	Blue Economy	National	India
208	14	Policy	International	India, Vietnam
209	14	Plastic Pollution	National	India
210	15, 14	Impact Of COVID-19	National	India
211	15	Land Degradation Neutrality	National	India
212	16	Implementation	National	India
213	16	Sanitation Policies	National	India
214	16	Policy	National	India
215	16	Democracy	Local	Balangir district, Odisha
216	17	Approaches	National	India
217	17	Roadmap	International	India, Europe
218	17	Agriculture	National	India
219	17	Contested Collaboration	International	Global
220	17	Development Partnerships	International	Global
221	17	Development Cooperation	International	India
222	Cross-cutting	Evaluation	National	India
223	Cross-cutting	Analysis	National	India
224	Cross-cutting	Concerns	National	India
225	Cross-cutting	Corporate Social Responsibility	National	India
226	Cross-cutting	Research	National	India
227	Cross-cutting	Process	National	India
228	Cross-cutting	Gap Analysis	National	India
229	Cross-cutting	Systems Thinking	National	India
230	Cross-cutting	Barriers	National	India
231	Cross-cutting	Challenges And Opportunities	States	Northeastern states
232	Cross-cutting	Analysis	State	Gujarat
233	Cross-cutting	Challenges And Opportunities	State	Odisha
234	Cross-cutting	Awareness	National	India
235	Cross-cutting	Indicator Framework	National	India
236	Cross-cutting	Schemes	National	India
237	Cross-cutting	Corporate Social Responsibility	Local	Case study

Figure 1 shows that over 69% studies have been conducted at the national level where the data sources are largely from government records. About 11% studies are part of international work focusing on Indian cases as one of the examples along with the sites from other parts of the world. Interestingly, about 10% studies are conducted at local level focusing on specific sites, cities, towns, etc. and such works are mainly arising from targeted research at the respective sites. For categories such as state, district or sub-national research, not much studies are available so far. This suggests a large scope for universities and colleges distributed in all districts (more than 800) across India to conduct such studies. This is particularly important since the experience, interpretation and requirement of developmental schemes would vary due to the diverse local conditions in India and such diversity needs to be captured to fulfill the objectives of the respective SDGs.

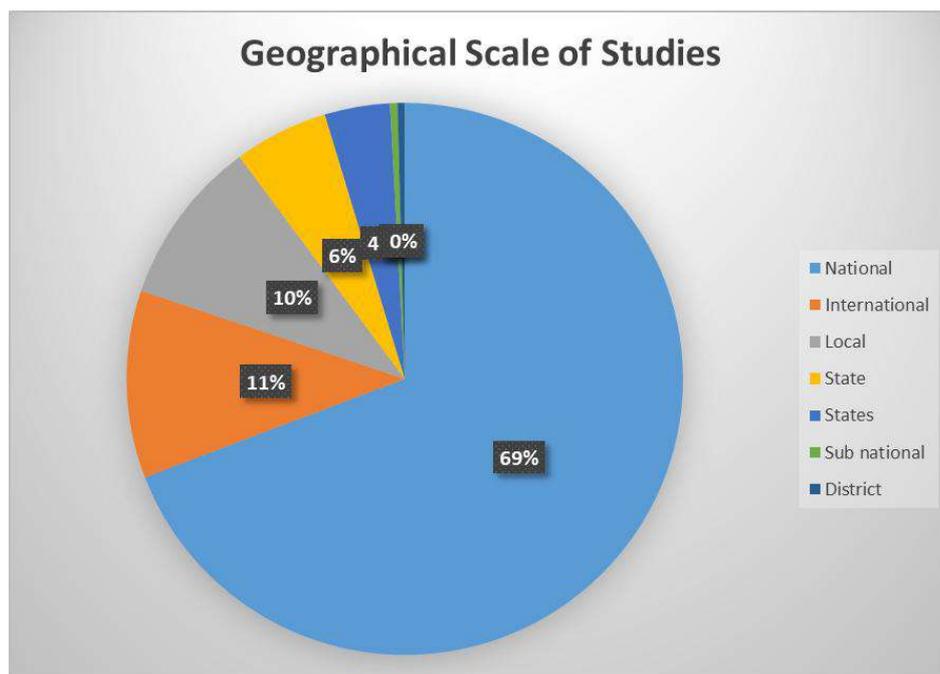


Figure 1: Geographical scale of studies on SDGs in India

Limitations

Assessments of various development programmes and SDGs have been done by many Think-Tank, voluntary organisations, etc. and such works are often published in form of reports. Such reports wherever possible and known to authors have been accessed but a large number of publications which are considered as 'Gray Literature' remain outside the ambit of such internet based research.

Contribution

Due to limitations of accessing the published literature, the scope of adding new literature remains open. The next version of this work can be enhanced through contributions of published work done by the respective authors, institutions to us. For this purpose a format has been attached and the same has been provided through a Google Form to submit the reference which is not included in this edition.

SDG 1 No Poverty

1. Measuring Gaps to Achieving the SDG 1 in Assam and Identifying Causes

Barnali Gogai and Swapnali Saikia (2023)

https://link.springer.com/chapter/10.1007/978-981-19-6478-7_18 In: Anand, S., Das, M., Bhattacharyya, R., Singh, R.B. (eds) Sustainable Development Goals in Northeast India. Advances in Geographical and Environmental Sciences. Springer, Singapore

Abstract: Poverty, with its multifaceted nature, is a complex social issue. After decades of efforts at the local, regional, and international levels to eradicate it, poverty persists, defying these all. Positioned at the third UN decade for eradication of poverty (2018–2027) with the Sustainable Development Goal (SDG) 1, it is time to analyze the progress at the local level. India has adopted the SDG framework and oriented its policies and programs toward achieving its goals. SDG India index has been developed to measure progress toward goals and targets at the district level. In this index, five indicators have been adopted to measure goal one, i.e., no poverty. In Assam, percentage of population below the poverty line is 31.98 in 2018, and the rate of poverty reduction is slower than many other states of India. In fact, the index for SDG 1 in Assam has dropped from 53 in 2018 to 48 in 2019. Moreover, with high infant mortality (44) and maternal mortality ratio (300), medium to low percentage of households with electricity (37), sanitation (64.9), and safe drinking water (54.8) multidimensional poverty is equally prevalent in the state. In spite of achievement of many targets of Millennium Development Goals (MDGs), the final report on MDGs (The Millennium Development Goals report, 2015) emphasized the monitoring and tracking at local level to prioritize the goals and for appropriate intervention. Considering the significance of analyzing at local level, this study attempts to find the variations at the district level in Assam in the path to be covered to achieve the goal in respect of the five indicators of the SDG 1 and to identify different socio-geographical factors affecting the implementation and success of the programs to eradicate poverty. A critical review of the programs is also attempted to assess long-term success in eradicating poverty. It is expected that assessment and analysis of factors will help orient the policies and the implementation strategies more appropriate.

Keywords - SDG 1, Assam, poverty

2. Reconciling Value Trade-Offs in Advancing Sustainable Development Goals: Risks and Opportunities.

Yerramsetti, S., Anand, M. (2024)

In: Zafarullah, H., Azmat, F. (eds) Governance and Sustainable Development in South Asia. South Asian Public Administration. Springer, Cham. https://doi.org/10.1007/978-3-031-67616-1_9

Abstract: This chapter discusses the centrality of sustainability as a meta-concept shaped by everyday negotiation of the trade-offs between various public values. It uses the political, legal, organizational, and market public values frames to articulate sustainable development as an effort at public value creation. It presents the case studies of Direct Benefits Transfer (DBT) for liquefied petroleum gas (LPG) and air pollution control through crop residue management in India to debate how sustainability involves a complex trade-off of public values, in which there are risks that may lead to public values failure. The book chapter makes the case for adjudicating competing public

values in a way that strikes a balance between the bureaucratic ethos and the democratic ethos, and that is mindful of the limitations of technocratic rationality.

Keywords: Sustainability, SDGs - 1, 3, 16, Public values, Regulatory welfare, Regulatory intermediaries

SDG 2 Zero Hunger

1. Identification of Sustainable Development Priorities for Agriculture through Sustainable Livelihood Security Indicators for Karnataka, India

Shankarappa Sridhara, Pradeep Gopakkali, Konapura Nagaraja Manoj, Kiran Kumar R. Patil, Venkatesh Paramesh, Prakash Kumar Jha and P. V. Vara Prasad (2022)

Sustainability 2022, 14(3), 1831; <https://doi.org/10.3390/su14031831>

Abstract: Using a disaggregated dashboard approach with agriculture, food consumption, and demographic and health survey data, this study examines the progress of Indian states towards the Sustainable Development Goal (SDG) 2 on hunger and nutrition across different years. There is evidence of both disconnects and linkages among food security indicators along the agriculture-to-nutrition pathways across states. This heterogeneity implies that a food security policy with a single focus is not appropriate, given that there are more disconnects prevailing than linkages. The southern states performed better than the rest on almost all indicators, which was primarily attributed to better governance in ensuring food security. We also provide a mapping of the SDG 2 sub-goals, corresponding indicators, and to what extent their attainment is addressed in existing policies. Through a broadened and comprehensive approach under one coordinating body with a good set of improved interventions and governance, Indian states could attain food and nutrition security by 2030.

Keywords: livelihood security; linear scoring; principal component analysis; SDG - 2

2. Exploring Indigenous and Local Knowledge and Practices (ILKPs) in Traditional Jhum Cultivation for Localizing Sustainable Development Goals (SDGs): A Case Study from Zunheboto District of Nagaland, India

Rajarshi Dasgupta, Shalini Dhyani, Mrittika Basu, Rakesh Kadaverugu, Shizuka Hashimoto, Pankaj Kumar, Brian Alan Johnson, Yasuo Takahashi, Bijon K. Mitra, Ram Avtar & Priyanka Mitra (2023)

Environmental Management 72, 147–159 (2023). <https://doi.org/10.1007/s00267-021-01514-6>

Abstract: Globally, shifting cultivation is known to be an important driver of tropical deforestation. However, in this paper, we argue that it can be sustainably managed if the environmental boundary conditions, laid by the traditional customs and practices, are fully respected. We narrate an empirical study from the Zunheboto district of Nagaland, India, where we deployed a mixed research method to explore the Indigenous and Local Knowledge and Practices (ILKPs) associated with shifting cultivation (aka Jhum), particularly concerning farm-level practices, forest and biodiversity conservation, and disaster risk reduction measures. The research method included analysis of primary data obtained through Focus Group discussions (FGDs), key informant interviews (n = 21), and a questionnaire survey (n = 153) with Jhum farmers from two

different age groups, i.e., below 50 years (middle-aged farmers) and above 50 years (older farmers). From the qualitative inquiry, we identified 15 ILKPs, which were then validated from survey responses. We used the Mann–Whitney U test to examine differences in agreement between two groups of framers. Based on this analysis, we conclude that upholding of the ILKPs holds strong potential for the local implementation of several Sustainable Development Goals (SDGs), particularly, SDG-1(No poverty), SDG-2 (Zero hunger), and SDG-15 (Life on land). However, eight of the identified ILKPs showed a statistically significant difference between older and middle-aged farmers, underlining a declining trend. Finally, we suggest suitable policy measures to mainstream ILKPs to balance the trade-offs in food production and biodiversity conservation, and to ensure the future sustainability of Jhum cultivation in the region and beyond.

Keywords: Agricultural Heritage, Landscape sustainability, Conservation, Disaster Risk Reduction (DRR), Food security, SDG - 2

3. Tackling child malnutrition and food security: assessing progress, challenges, and policies in achieving SDG 2 in India

Katoch, O.R. (2024)

Nutrition & Food Science, Vol. 54 No. 2, pp. 349-365. <https://doi.org/10.1108/NFS-03-2023-0055>

Abstract: This paper aims to evaluate the progress made in achieving sustainable development goal-2 (SDG 2) in India, with a focus on ending hunger, ensuring food security, improving nutrition and promoting sustainable agriculture. The assessment uses data from SDG Index reports, which offer a comprehensive overview of the advancements made by 28 states and 8 union territories (UTs) in India.

Keywords: Malnutrition, Hunger, SDG-2, SDG index

SDG 3 Good Health and Well Being

1. Progress Tracking of Health-Related SDGs: Challenges and Opportunities for India

Shalini Rudra and Oommen C Kurian (2018)

Asian Journal of Public Affairs 10(2), 2018, p. 24-52

Abstract: Given its size and the low baseline, India has a crucial role in global progress and achievement of the Sustainable Development Goals (SDGs), particularly in health. As a result, there is a great need for effective monitoring of the country's progress toward health-related SDGs, through timely and disaggregated data, which would allow for systematic assessment and course correction. This paper aims to classify the health and nutrition-related indicators from the existing health and healthcare surveys that India relies on for tracking progress and recommends that two of the largest household surveys be streamlined to strengthen the National Indicator Framework (NIF) for goal tracking purposes. The paper also reviews the draft NIF and proposes certain revisions from a data perspective in a revised draft framework for the government's consideration. Finally, it highlights various gaps and constraints in data availability, and develops specific recommendations to achieve a data sphere consistent with the envisaged NIF.

Keywords: SDG-3, India, Health, Nutrition, indicator framework

2. Achieving sustainable development Goal 3 in the Indian context: The policy-action incoherence

T Sundaraman and Alok Ranjan (2019),

In book: India's Social Sector and SDGs, DOI: 10.4324/9780367341824-6, Pp. 129-141

Abstract: The SDGs including the SDG-3 targets lend themselves to be interpreted as political statement that defines development as more than economic growth rates, and health as more than a few selective interventions. Clearly, achievement of SDG targets is incompatible with neo-liberal understandings of growth and development that inform current national and international economic policies and that informed the first wave of health sector reforms in the nineties and the ongoing second wave of reforms linked to the UHC discourse. The incoherence between different policy articulations and policy as practiced, both by the Indian state and by global health institutions, could lead to confusion and cynicism, but can be analysed and understood as emanating from the contradiction between the economic policies pursued and the health and human development goals. The chapter thus argues that engaging with the discussion around its measurement, interpretation and implementation could provide scope for questioning current economic policies and neo-liberal understandings that drive health reform and posing alternatives to these.

Keywords: SDG 3, policy coherence

3. Critical Evaluation of Progress of Sustainable Development Goals in India with Special Reference to SDG-2 and SDG-3

V.V. Barthwal and Renuka Barthwal (2019)

International Journal of Innovative Research and Practices, Vol.7, Issue 9, Sept 2019 ISSN 2321-2926

Abstract: Food and Nutritional Security is a serious challenge for our country, which needs to be tackled with implementation of effective policies and programmes. Despite nation's vigorous efforts, the problem is still acute. India has dubious distinctions of having prevalence of (over 50%) of under nutrition (as judged by stunting, wasting and micro nutrient deficiencies- like anemia, Vitamin-A deficiency and others) in the world. Efforts made since attaining freedom have made only marginal impact on reducing malnutrition in our country. India is also committed to implement UN Sustainable Development Goals on or before year 2030. There are 17 SDGs under UNSDGs out of which present paper seeks to assess the achievements of only two SDGs, namely SDG-2 (Zero hunger and poverty) and SDG-3 (Health and Nutrition). The picture is still gloomy. No doubt, Indian government is making her sincere efforts to control these situations and trying to eliminate hunger and poverty, nutrition related issues. The FAO estimated that in India alone 191 million people were undernourished in 2014-16- representing 24% of total number of nourished people worldwide. For this reason, addressing food security represents enormous challenges for the India Government. India's share of the world's undernourished population exceeds its share of the world's population indicating that it houses a disproportionate number of the world's poor. Since the early 1990, the number of undernourished people in India has remained relatively stable with only reduction of 15 million in number of undernourished between 1990-92 to 2014-16. This relatively small change in number of undernourished is due to strong population growth among the poor with more significant changes seen in the proportion of the population who are undernourished – falling from 24% in 1990-92 to 15% in 2014-16 (FAO-2017). The rate of

improvement in nutritional status has not kept pace with India's significant gains in economic prosperity and agricultural productivity during recent decades despite gains in reducing poverty rate, India is saddled with high levels of malnutrition, anemia, stunting and wasting. According NFHS-4, almost half of pregnant Indian women aged between 15 and 49 years are anemic, and more than one –thirds of women have a low body mass index. Among children younger than age five, 38.4 percent have low height for age and 21 per cent have low weight for age. The sustained efforts have to be made to achieve the targets set under SDIG-2 and SDG3. India's Goals set for 2030 is to end hunger and malnutrition by ensuring that quality food is accessible to all to meet their nutritional needs of healthy life. Ending hunger and malnutrition demands resilient food production system and sustainable agricultural practices. Additionally, it requires ensuring equitable access to nutritious food for all, improving sanitation and hygiene and reducing vulnerability and to shocks and disaster.

Keywords: Food and Nutritional Security, SDG - 2, 3, Stunting, NFHS-4, Malnutrition, Obese, wasting, FAO, Breast feeding, Micronutrient deficiencies

4. India, Germany and Europe: A Spatial Perspective at SDG 3 on Good Health and Well-Being

André Müller, Antonia Milbert, Volker Schmidt-Seiwert, Regine Binot, Debolina Kundu, Rakesh Mishra, Tania Debnath, Biswajit Kar (2020)

Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) within the Federal Office for Building and Regional Planning (BBR) ISBN 978-3-87994-768-3

Abstract: Responding to crucial challenges in urban and rural development the United Nations decided on the New Urban Agenda and on the 2030 Agenda and the Sustainable Development Goals (SDGs). This publication checks the progress made in implementing the New Urban Agenda against the SDGs and vice versa. In order to understand the spatial patterns, a national and supranational spatial perspective is taken on some of the SDGs. Given the significance of good health and well-being – particularly with regard to pandemics – SDG 3 thus covers:

- Life expectancy at birth and teenage parenthood
- Medical practitioners and hospital beds
- Infant and toddler mortality

Keywords: SDG – 3, health care delivery system; life expectancy; infant; baby; mortality; prophylaxis; health promotion; India; Federal Republic of Germany; Europe

5. Future of road safety and SDG 3.6 goals in six Indian cities

Dinesh Mohan, Abhaya Jha, Samradh S. Chauhan (2021)

IATSS Research Volume 45, Issue 1, April 2021, Pages 12-18.

<https://doi.org/10.1016/j.iatssr.2021.01.004>

Abstract: In this paper, we use estimates of the effectiveness of existing road safety technologies and interventions to estimate the reduction in road safety deaths in six Indian cities over the next decade, in order to achieve the SDG 3.6 goal of a 50% reduction by 2030. Only the existing interventions are considered and technologies that might be available in the future are not

accounted for. The results show that similar policies for all cities will not produce the same results, and that achieving the SDG 3.6 goal does not automatically reduce fatality rates in cities with high fatality rates. The introduction of safer cars with currently available safety technologies, although necessary, will have much less effect than the combined effect of motorcycle safety technologies, speed control and traffic calming. This study suggests that while SDG 3.6 targets may be satisfied by 2030 with great effort in India, the presently available safety interventions may not be adequate to bring about death rates below 2.0 per hundred thousand persons. Since the situation differs significantly between cities, it will be important to evolve city-specific policies for safety intervention priorities and changes in travel behavior. The desired reduction in road traffic injuries in India will not be possible without much greater investment in road safety research and road design for safer travel.

Keywords: Road safety, Safety interventions, Cities, SDG–3, Delhi, Mumbai, Vishakhapatnam, Agra Patiala, Bulandshahr

6. Sustainable Development Goal 3: Case Study of using Folk media as a Potent tool in India

Shahi Shaika, Ruhi Lal, Mehak Jonjua (2021)

Journal of Contemporary Issues in Business and Government Vol. 27, No. 1, 2021 P-ISSN: 2204-1990; E-ISSN: 1323-6903 <https://cibg.org.au/>

Abstract: This study is an attempt to provide comprehensive information and explore the significance of the role of folk media as a powerful tool towards achieving the Sustainable Development Goal 3 in India. The methodology adopted is the analysis of case studies developed through in-depth interview to show the impact of folk media in attaining the objectives. Communication plays a fundamental role in disseminating information, encouraging participation, and stimulating community action. Any program for development is a failure if the people are treated as mere recipients rather than active participants. Involving people as contributors to change and progress will accelerate the process of development. Third world countries like India have been facing odd situations in terms of poverty, environment, health, politics, and education. There have been efforts by the government and non- government agencies to sensitize the citizens and to make them acknowledge the programs intended at improving their socio-economic welfare. Communication is a vital tool in mobilizing people in the direction of the participatory process which in turn makes development an achievable goal. Traditional folk media forms have a personal appeal as they are close to the minds and hearts of the people. Folk arts like Tamasha, Nautanki, Puppetry, Bhand Pather have been used time and again to instruct the masses and bring about a change. The common denominator of communication and development is participation, hence traditional folk media forms can be used effectively for development as they work on the Participatory model.

Keywords: SDG-3, Folk media, Health, Development.

7. Covid-19 And The Sustainable Development Goals

Mohammad Hadi Dehghani, Rama Rao Karri and Sharmili Roy (Editors) (2022)

Elsevier <https://www.elsevier.com/books-and-journals> ISBN: 978-0-323-91307-2, Pg 440

Abstract: This book discusses how the coronavirus pandemic has influenced the Sustainable Development Goals (SDGs) and affected their implementation. Therefore, an effort has been made to present the global impacts of COVID-19 on hunger and the food crisis, good health and well-being, quality of education, science and technology, access to affordable and clean energy, poverty, decent work, economic growth and world trade, clean water, life below water and life on land, climate changes, psychological problems, social factors, political factors, cultural factors and tourism industry, sports industry, human rights, and disaster risk management. This book also presents the source of origination; mechanism of human COVID-19; and risk factors, challenges, opportunities, and future perspectives arising from this pandemic.

Keywords: SDG-3, Corona Virus impact, COVID-19

8. Progress on Sustainable Development Goal indicators in 707 districts of India: a quantitative mid-line assessment using the National Family Health Surveys, 2016 and 2021

S. V. Subramanian, Mayanka Ambade, Akhil Kumar, Hyejun Chi, William Joe, Sunil Rajput, and Rockli Kime (2023)

www.thelancet.com Vol 13 June, 2023 <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Abstract: India has committed itself to accomplishing the Sustainable Development Goals (SDGs) by 2030. Meeting these goals would require prioritizing and targeting specific areas within India. We provide a mid-line assessment of the progress across 707 districts of India for 33 SDG indicators related to health and social determinants of health. We used data collected on children and adults from two rounds of the National Family Health Survey (NFHS) conducted in 2016 and 2021. We identified 33 indicators that cover 9 of the 17 official SDGs. We used the goals and targets outlined by the Global Indicator Framework, Government of India and World Health Organization (WHO) to determine SDG targets to be met by 2030. Using precision-weighted multilevel models, we estimated district mean for 2016 and 2021, and using these values, computed the Annual Absolute Change (AAC) for each indicator. Using the AAC and targets, we classified India and each district as: Achieved-I, Achieved-II, On-Target and Off-Target. Further, when a district was Off-Target on a given indicator, we further identified the calendar year in which the target will be met post-2030. India is not On-Target for 19 of the 33 SDGs indicators. The critical Off-Target indicators include Access to Basic Services, Wasting and Overweight Children, Anaemia, Child Marriage, Partner Violence, Tobacco Use, and Modern Contraceptive Use. For these indicators, more than 75% of the districts were Off-Target. Because of a worsening trend observed between 2016 and 2021, and assuming no course correction occurs, many districts will never meet the targets on the SDGs even well after 2030. These Off-Target districts are concentrated in the states of Madhya Pradesh, Chhattisgarh, Jharkhand, Bihar, and Odisha. Finally, it does not appear that Aspirational Districts, on average, are performing better in meeting the SDG targets than other districts on majority of the indicators. A mid-line assessment of districts' progress on SDGs suggests an urgent need to increase the pace and momentum on four SDG goals: No Poverty (SDG 1), Zero Hunger (SDG 2), Good Health and Well-Being (SDG 3) and Gender Equality (SDG 5). Developing a strategic roadmap at this time will help India ensure success with regards to meeting the SDGs. India's emergence and sustenance as a leading economic power depends on meeting some of the more basic health and social determinants of health-related SDGs in an immediate and equitable manner.

Keywords: SDG - 3; Social determinants of health (SDH); Indicators; Population health; Gender equality; Nutrition; Aspirational districts; Policy; Monitoring and evaluation; India

9. Data Governance in Emerging Economies to Achieve the Sustainable Development Goals India Country Report Based on the Workshop Data Governance for Good Health & Well-Being: India's Way Forward to Achieving Sustainable Development Goal 3

Arul George Scaria, Vikas Kathuria, Shraddha Kulhari and Vidya Subramanian (2022)

Max Planck Institute for Innovation and Competition Research Paper No. 24-08

Abstract: This report contributes towards making a preliminary assessment of data governance approaches with a pivot to Sustainable Development Goals in emerging economies with a focus on India. It draws on the insights gathered from bringing together various stakeholders at the workshop organized in Bengaluru. Written in the specific context of SDG 3, this report underscores the role of data governance for good health and well-being in India. Following a brief introduction to the project under which the report was produced, it is structured in four sections. Section 2 provides a detailed background on the selection of SDG 3 and India for studying data governance in emerging economies. Section 3 offers an overview of the existing legal framework for data governance in India. This section not only analyzes open data initiatives but also maps the judicial and legislative steps towards safeguarding personal data, while highlighting the ongoing efforts to legislate non-personal data sharing. Section 4 leverages insights from the workshop to analyse the roles played by the public sector, the private sector, and startups for ascertaining the scope of data governance in the Indian healthcare sector. Section 5 summarises the findings and emphasises the importance of a data governance framework for achieving the SDGs, particularly SDG 3 in India. The report concludes with a set of questions aimed at developing a research agenda to contribute to building a data governance framework in emerging economies such as India.

Keywords: Data governance; SDG - 3; good health and well-being; emerging economies; personal data; non-personal data; open data; data sharing

10. Sustainable Development Goals (SDG 3) “Health and Well-Being”: What’s Ailing North–Eastern States?

Mridul Kumar Sarma (2023)

In Sustainable Development Goals in Northeast India: Challenges and Achievements Editors: Subhash Anand, Madhushree Das, Rituparna Bhattacharyya, R. B. Singh | SpringerLink pp 221-233

Abstract: The UN General Assembly sets Sustainable Development Goals (SDG) in 2015 and achieved by the participating countries by 2030 to have a better, peaceful and prosperous world by 2030. A total of 17 goals have been set. India also took a pledge to work towards the fulfilment of these goals. Among the 17 goals, “good health and well-being” is the one goal in which this paper will focus with special relation to the north–eastern states. Currently, India is at a very lowly position compared to other developed nations, and among all the states of India, north–eastern states (NE states) have so far done very poorly in many yardsticks used to measure the health

goal to be achieved. The current COVID-19 pandemic has posed additional challenges in achieving the health goals in particular. From the health indicator point of view, various parameters need changes. Currently, India ranks 117 out of 166 countries in the sustainable development report. Among the states in India, the north-eastern states have ranked towards the bottom of the table. Assam ranked 30 in 2018 and 25 in 2019. Among the NE states, Manipur ranks the best, rank 12 in 2019 in the health sector. This paper will focus on the various health parameters that are being considered for the assessment of SDG 3. The reasons why NE states are not doing well in the health sector are the maternal mortality rates, various health indicators that need improvement, etc., the various disease and conditions like HIV, tuberculosis, malaria and diarrhoea among children, the rising trend of non-communicable diseases and the menace of substance abuse that are still prevalent among the population in the north-eastern states. The ever-increasing malignancies of the lung, gastrointestinal tract and blood are also a matter of great concern in NE states. This chapter will focus on the various health indicators and try to find a solution for the various problems ailing the north-eastern states. This study will also focus on the various causes leading to reduced utilization of the various healthcare services the state has to offer.

Keywords: Northeastern States, SDG - 3, health care

11. Inter-State Disparities in Healthcare Sector of India: A Challenge in the Roadmap of SDG-3

Tinu and Archna Chaudhry (2024)

The Indian Economic Journal Vol.1, No.31; Oct-2024

Abstract: India is emerging as a leading economy being at the forefront worldwide in every field but failing in social infrastructure. In spite of continuous efforts by nations, there are at least 400 million people in the world who lack access to basic healthcare and 40 per cent lack social safety (as per UNDP). Healthcare delivery may not be similar among states which is causing a hindrance in achieving targets of SDG-3 that aims at providing good health and maintaining the well-being of the community. The study aims to explore the inter-state disparities in the Indian health sector. For the fulfilment of the purpose of the study, data is extracted from the Handbook of Statistics on Indian States. The period of the study spans from 2015 to 2020 for all the Indian states. Infant mortality rate (IMR) and life expectancy (LEI) are the health outcomes taken into consideration whereas public expenditure on health (PEH) is taken as health input. Mean, standard deviation, coefficient of variation, and disparity ratios are calculated to ascertain the differences among states. It has been found that disparities in IMR have been widening over time whereas it is declining and fluctuating in PEH as well as LEI. The study suggests that the expenditure on health should be increased and inequalities should be reduced to make healthcare accessible to every section of the population. This study adds to our knowledge of India's regional health disparities and lays the groundwork for future investigations and the creation of policies targeted at enhancing national health equity.

Keywords: healthcare, social safety, SDG-3, infant mortality, life expectancy, disparity ratio

12. Achieving SDG-3 in India: “Ensuring healthy lives and promoting wellbeing at all ages”

LNU D., Kothari A., Siddiqui M., Ranga A., Tirkey N., Dhupar D., S Walia, H Bhushan. (2025)

Global Health Econ Sustain, 3(1):243-253. <https://doi.org/10.36922/ghes.2612>

Abstract: India’s concerted efforts to achieve sustainable development goal (SDG)-3 targets, which focus on ensuring universal health coverage and promoting well-being across all age groups, form the focal point of rigorous public health actions. This study aims to assess India’s progress toward SDG-3 targets, identify areas needing improvement, and propose measures for future advancements by analyzing the common review mission (CRM) reports of India. Utilizing secondary data collected from public domains, this study employs descriptive data analysis to examine data from 2015 to 2022 and the envisioned 2030 targets across four pivotal domains: maternal health, newborn and child health; communicable diseases; non-communicable diseases and injuries; and overarching health systems strengthening. The qualitative data were obtained from the CRM reports, which are annual reviews conducted by the Government of India. The analysis underscores the average annual rate of change (AARC) calculation for all states and the national average in India, revealing substantive disparities and areas needing enhanced progress. Findings indicate that with the prevailing AARCs (AARC: 6.90%), India will not be able to achieve the maternal mortality ratio (MMR) targets. To achieve the SDGs, the AARC for MMR, neonatal mortality rate, and under-five mortality rate must improve from 6.90% to 7.80%, 3.40% to 5.40%, and 1.30% to 2.11%, respectively. This study highlights that achieving SDG-3 targets requires state-specific, data-driven planning integrated within the Block Health Action Plan, which feeds into district and state health action plans. Effective alignment with SDG-3 imperatives necessitates meticulous planning informed by disease burdens and mortality rates, prioritizing non-communicable diseases, road traffic injuries, and suicides.

Keywords: Universal health coverage; Health systems strengthening; Accessibility;

Healthcare services, SDG - 3

13. Sustainable Development Goal 3: Good Health and Well-being.

Das, T., Holland, P., Ahmed, M., Husain, L. (2021).

In: Das, T., Nayar, P.D. (eds) South-East Asia Eye Health. Springer, Singapore.

https://doi.org/10.1007/978-981-16-3787-2_4

Abstract: In September 2015, the United Nations (UN) proposed Agenda 2030, an ambitious initiative to end poverty, combat climate change, and fight injustice and inequality over the next 15 years. Agenda 2030 promises a better future for all by setting out 17 sustainable development goals (SDGs) that the Member States of countries all over the world have committed to achieving. These goals cover a range of different topics—from ending poverty, improving healthcare, and building more inclusive and sustainable cities, to reducing the impacts of climate change (Fig. 4.1). The goals were adopted by all Member States of the UN formally in 2015 (September 25–27, 2015; at the 70th anniversary of the UN), and were effective from 1st January 2016 for the period 2016–2030.

Keywords: SDG – 3

14. Pathways for India to Reduce Ambient Air Pollution Health Burden and Achieve the Sustainable Development Goal (SDG-3.4)

Debajit Sarkar, Fahad Imam, Alok Kumar, Akash Mukherjee, Pallav Purohit, Gregor Kiesewetter, Zbigniew Klimont, Santu Ghosh, Kalpana Balakrishnan, Sourangsu Chowdhury, and Sagnik Dey (2025)

Environmental Science & Technology 2025 59 (10), 4765-4777

DOI: 10.1021/acs.est.4c08697

Abstract: Sustainable Development Goal 3.4 (SDG-3.4) aims to reduce non-communicable disease (NCD) mortality by one-third by 2030, compared to 2015 levels. First, we examined whether the National Clean Air Program (NCAP) is sufficient to allow India to achieve this target. Subsequently, we integrated GAINS-simulated sector-specific PM_{2.5} concentrations across three pathways - business-as-usual (BAU), advanced control technology (ACT), and sustainable development scenario (SDS) - with the Global Burden of Disease framework to assess potential health benefits for 2030 at a subnational scale and evaluate the feasibility of accomplishing SDG-3.4. In 2015, ambient PM_{2.5} attributable premature deaths were 0.72 million (95%UIs: 0.53–0.89), and an aggregated 0.12 million (0.08–0.16) deaths could be prevented if the NCAP target is met by 2026. However, states could reduce 3.6–10.8% of targeted NCD mortality by 2030 with a lagged 40% reduction in PM_{2.5} levels relative to the baseline. PM_{2.5} –attributable deaths would change to 0.79 million (0.57–1.1), 0.76 million (0.6–1.1), and 0.63 million (0.48–0.81) in 2030 under the BAU, ACT, and SDS pathways, respectively. Implementing stringent emission controls through policy and technological interventions, primarily focusing on household and energy sectors, would reduce NCD mortality by 5–13% across subregions. Simultaneously controlling other risk factors would accelerate India’s journey toward achieving SDG-3.4.

Keywords non-communicable disease, SDG - 3, GAINS model, mortality

15. Development of consumers’ acceptance model for e-Health services: a step towards achieving SDG3 in India

Ridhi Khattar (2025)

International Journal of Pharmaceutical and Healthcare Marketing, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/IJPHM-06-2024-0063>

Abstract: eHealth services are necessary to address health-care issues of accessibility and affordability, especially in a developing country like India. As the world progresses toward achieving the Sustainable Development Goals (SDGs) set by the United Nations, eHealth plays a crucial role in advancing health-care delivery, particularly concerning SDG3, which focuses on ensuring healthy lives and promoting well-being for all at all ages. The usage of eHealth in India is at its nascent stage with its current level of adoption at the lower levels. Our understanding of the factors that influence consumer acceptance of eHealth, both in terms of intention to use and willingness to pay (WTP), is limited. Considering the importance of eHealth for providing quality health care to people in India and achieving SDG3, the purpose of this paper is to study the consumers’ acceptance of eHealth and the factors that inhibit its growth so that these factors can be taken into account by the stakeholders to promote eHealth among the population. This study is based on primary data collected through structured questionnaire administered to 1,170 respondents in Delhi and its neighboring cities. Quota sampling technique was used so that the

respondents in the sample have the required geographical spread and are demographically diverse. For data analysis and development of the conceptual model, Structural Equation Modeling technique was used. This study develops a consumer acceptance model for eHealth services, wherein the key determinants for the acceptance both in terms of behavioral intention to use and WTP are perceived usefulness of eHealth services, extent of technology use of the individual, their information seeking needs and accessibility of the medical facilities for them. The perceived ease of use of eHealth platform influences the behavioral intention to use eHealth services but not their WTP for them.

Keywords: e-Health services, Telehealth services, Health care accessibility, Technology acceptance, SDG - 3

16. Palliative care policy and practice in Kerala, India: Implications for Sustainable Development Goal 3—Health and well-being

S. Gowri and E. P. Abdul Azeez (2025)

Palliative Care and Social Practice 2025, Vol. 19: 1–9

Abstract: The higher prevalence and incidents of chronic and life-threatening illnesses and the aging population living with morbidity and life-limiting conditions necessitate the need for care provisions like palliative care globally. Palliative care strives for the quality of life of patients with terminal illnesses and serious health conditions and their families. However, globally, access to palliative care remains very limited. The situation is similar in India, except for Kerala, where palliative care access to the needy population is almost universal. Kerala's community palliative care model is globally acclaimed for its operation, which includes community participation and sustainability. The palliative care policy of Kerala, which was the first one in Asia, was a significant milestone in the palliative care movement of Kerala, as it mandated the interventions from government measures and further strengthened the community-managed palliative care interventions. The palliative care efforts in Kerala have significantly influenced the health scenario. However, discussion on the role of palliative care in achieving sustainable development goals (SDGs) is minimal. In this context, this article explores the policy and practices of palliative care in Kerala and its contribution to SDG-3, health and well-being. We have surrounded the discussion on the context of palliative care interventions and Sustainable Development Goal 3 through the unique features of the Kerala model of palliative care and its contribution to the healthcare scenario of the state. Through available literature and from the researchers' first-hand experience, this article explores the reciprocity of palliative care interventions, policy, healthcare programs, and SDG-3. Documenting the potential of Kerala's community-based palliative care for SDG-3 has implications for replications of this model in similar contexts.

Keywords: palliative care, SDG - 3, Kerala model of palliative care, health and well-being, chronic illness

17. Pathways from agriculture-to-nutrition in India: implications for sustainable development goals

Mousumi Das, Ajay Sharma & Suresh Chandra Babu (2018)

Food Sec. 10, 1561–1576 (2018). <https://doi.org/10.1007/s12571-018-0858-4>

Abstract: Using a disaggregated dashboard approach with agriculture, food consumption, and demographic and health survey data, this study examines the progress of Indian states towards the Sustainable Development Goal (SDG) 2 on hunger and nutrition across different years. There is evidence of both disconnects and linkages among food security indicators along the agriculture-to-nutrition pathways across states. This heterogeneity implies that a food security policy with a single focus is not appropriate, given that there are more disconnects prevailing than linkages. The southern states performed better than the rest on almost all indicators, which was primarily attributed to better governance in ensuring food security. We also provide a mapping of the SDG 2 sub-goals, corresponding indicators, and to what extent their attainment is addressed in existing policies. Through a broadened and comprehensive approach under one coordinating body with a good set of improved interventions and governance, Indian states could attain food and nutrition security by 2030.

Keywords: Agriculture-to-nutrition pathways, Food security indicators, Food policy, India, SDG - 3, SDG dashboard

18. Policy recommendations for enabling transition towards sustainable agriculture in India

Priya Priyadarshini, Purushothaman Chirakkuzhyil Abhilash (2020)

Land Use Policy, Volume 96, July 2020, 104718

Abstract: Aligning existing agricultural policies with UN-Sustainable Development Goals is imperative for the transition towards a cleaner and planet friendly food production, especially for a geographically and demographically diverse country like India. In this context, the present study focuses on ascertaining the major social and environmental challenges affecting agriculture in India, while evaluating the potential of efficient policy restructure in boosting growth within this sector. The methodology incorporates a quantitative assessment of social, ecological and economic indicators of agricultural sustainability in India, coupled with a co-relation analysis between several nutrition and land-based indicators for leading agriculture states across the country. The results highlight that despite attaining sufficiency in terms of food production, access to food by all in the country remains a major challenge along with incoherence between certain Sustainable Development Goals (SDGs) indicators and their corresponding data values. Furthermore, a critical analysis of operational as well as recommended agriculture and farmer welfare policies indicate that formulation of an overarching policy influencing sustainable management of agricultural systems, combined with proper implementation of social welfare schemes, would lead to the timely realisation of SDG 1 (no poverty), SDG 2 (zero hunger), and SDG 3 (good health and well-being) in India. Consequently, an umbrella policy (National Policy on Eco-Agri-Food Systems) has been proposed by authors for sustainable management of the country's entire agricultural value chain. Recommendations related to agricultural waste management and adoption of planetary healthy diets have also been suggested for enabling the smooth transition of agriculture as a sustainable enterprise in India.

Keywords: Agriculture challenges, India, Land use, Policy research, Sustainable agriculture, SDG - 3, Social indicators

19. Agricultural Development and Land Use Change in India: A Scenario Analysis of Trade-Offs Between UN Sustainable Development Goals (SDGs)

R. Hinz, T. B. Sulser, R. Huefner, D. Mason-D'Croz, S. Dunston, S. Nautiyal, C. Ringler, J. Schuengel, P. Tikhile, F. Wimmer, R. Schaldach (2020)

Earth's Future, Volume 8, Issue 2 February 2020. <https://doi.org/10.1029/2019EF001287>

Abstract: India has the second largest population in the world and is characterized by a broad diversity in climate, topography, flora, fauna, land use, and socioeconomic conditions. To help ensure food security in the future, agricultural systems will have to respond to global change drivers such as population growth, changing dietary habits, and climate change. However, alterations of how food is produced in the future may conflict with other UN Sustainable Development Goals (SDGs), such as the protection of land resources and climate change mitigation. It is crucial for decision-makers to understand potential trade-offs between these goals to find a balance of human needs and environmental impacts. In this paper, we analyze pathways of agricultural productivity, land use, and land-cover changes in India until 2030 and their impacts on terrestrial biodiversity and carbon storage. The results show that in order to meet future food production demands, agricultural lands are likely to expand, and existing farmlands need to be intensified. However, both processes will result in biodiversity losses. At the same time, the projections reveal carbon stock increases due to intensification processes and decreases due to conversions of natural land into agriculture. On balance, we find that carbon stocks increase with the scenarios of future agricultural productivity as modeled here. In conclusion, we regard further agricultural intensification as a crucial element to help ensure food security and to slow down the expansion of cropland and pasture. At the same time, policies are required to implement this intensification in a way that minimizes biodiversity losses.

Keywords: SDG – 3, agriculture

SDG 4 Education Quality

1. Achieving SDG 4 in India: Moving from Quantity to Quality Education for All

Beena Pandey (2018)

Research and Information System for Developing Countries, Discussion Paper # 232

Abstract: India has made significant progress towards implementing the scheme of Education for All. Several key programmes and policies have been initiated to provide free and compulsory education to all children in the age group of six to fourteen years as a Fundamental Right. Initiatives such as Sarva Siksha Abhiyan (SSA) and Right to Education (RTE) have given the desired impetus to education system in India. Though it has significantly improved the enrolment rates across the country in primary education, challenges remain to be addressed. The broad focus of the paper is on the current approaches adopted by India to contextualise Goal 4 on education of the Sustainable Development Goals (SDGs) in the Indian context by integrating them into the formulation of New Education Policy and its positive impact on achieving quality education, as emphasised in SDG 4. It examines the trends in education attainments at primary, secondary and tertiary levels in India and explores some major challenges facing the quality education and accessibility issues in education sector.

Keywords: Quality Education, Access, Equity, Inclusion, SDG - 4

2. Who Gains More from Education? A Comparative Analysis of Business, Farm and Wage Workers in India

Agrawal, T., & Agrawal, A. (2018).

The Journal of Development Studies, 55(6), 1081–1098.

<https://doi.org/10.1080/00220388.2018.1443209>

Abstract: The economics literature on returns to education has focused largely on wage workers, thereby ignoring a sizable section of the workforce which is self-employed. This paper presents the estimates of private returns to education for business, farm and wage workers in India using a nationally representative household survey. The paper addresses the sample-selectivity issue arising due to endogenous sector allocation in the earnings equation using the multinomial-selection approach. Our results show that the average rate of return to education is higher for wage workers followed by business and farm workers. Focusing only on wage workers would provide an overestimate of returns by 30 per cent for business workers and by 40–50 per cent for farm workers. Further, the profile of returns across the education ladder varies perceptibly for the three type of workers with higher education being more rewarding for wage workers.

Keywords: SDG - 4, self-employed workforce, multisector stakeholders in education

3. Examining the Preparedness for Achieving Goal 4 of the SDGs in India: A Case Study on School Governance vis-à-vis Outcome for Primary Schools in Rural Maharashtra

Shrabani Mukherjee, Rujutha Joshi, Debdulal Thakur (2022)

SAGE Volume 39, Issue 1 <https://doi.org/10.1177/08920206211069731>

Abstract: The study inspects the status of school governance and school outcome at primary school level and set up roadmap for all the stakeholders to achieve the mandate of Goal 4 in SDGs within 2030, especially in the context of rural India. The status of school governance and school outcome are assessed under 4 dimensions and 16 parameters through a survey of 21 rural primary schools from rural Maharashtra. Two different indices have been constructed for school outcomes and school governance using multi-stage principal component analysis. Public and private-aided schools are compared according to the degree of accountability and transparency. It has been realized that there is an absolute need for strong school governance at ground level which is very poor across public schools in rural India. The study followed the Worldwide Governance Indicators (WGI) project and ASER (2014) and considered these baselines to find the present status of school governance and school outcome for the present study.

Keywords: primary education, school governance, school outcome, rural india, principal component analysis, A20, C38, C93, SDG – 4

4. India's Progress and Initiative to Achieve Quality Education: Measuring and Tracking SDG 4.

Joseph, Vanishree; Madhuri, N. V. (2022)

Turkish Online Journal of Qualitative Inquiry, 2022, Vol 13, Issue 1, p2317 ISSN 1309-6591

Abstract: Education is an important tool for development of an individual, society and for a country. Quality Education plays an important role in Sustainable Development of a country. Over a period of time, India has shown significant progress in increasing the overall literacy level. But, whether India is able to give quality education is a big question. The Sustainable Development Goal 4 “Quality Education” focus on the educational development of the country. To achieve quality education, India has to achieve the targets of Sustainable Development Goal 4. The Sustainable Development Goal 4 has 10 targets to achieve through various government schemes, New Education Policy (NEP) and with the assessment of NITI Aayog. This paper focuses on the progress and achievements of Quality Education in Indian States and Union Territories.

Keywords: Educational Quality; Education Policy; Educational Planning; Sustainable Development; Individual Development, SDG - 4

5. Sustainable Development Goals-4: Through Teacher Education Programmes in India

S K Yadav (2022)

UNIVERSITY NEWS, 60(12) March 21-27, 2022, pg. 95-99.

Abstract: Teacher education programmes of any country play an important role for achieving the global education development agenda reflected in the Sustainable Development Goal 4 (SDG4). We all know that the quality of education

depends on the quality of teachers. Teachers truly shape the future of our children - and, therefore, the future of our nation. The quality of teachers in turn depend on the quality of teacher education. Though teacher education programmes address the global challenges we face, including poverty, inequality, climate change, environmental degradation, peace and justice, however by integrating its concerns in different teacher education programmes more emphatically will help the country in achieving the SDG-4 by 2030. At present, our country is having teacher education programmes from pre-primary to secondary stages in more than 16000 institutions including universities and colleges.

Keywords: Teacher’s training, SDG-4

6. Foldscope Embedded Pedagogy in Stem Education: A Case Study of SDG4 Promotion in India

Parul Kulshreshtha, Sunita Gupta, Rafikh Shaikh, Divya Aggarwal, Deuvshree Sharma and Praveen Rahi

Sustainability 2022, 14(20), 13427; <https://doi.org/10.3390/su142013427>

Abstract: Most government schools and colleges run on low budgets in India, yet they cater to a large population of students. In government settings, biology labs lack basic equipment such as simple microscopes or compound microscopes or sometimes possess just one instrument. In the absence of compound or simple microscopes, the students lose interest in science. To solve this issue, the Department of Biotechnology, Ministry of Science and Technology, Government of India, introduced the origami microscope, the foldscope, into the Indian educational system. In this article, we describe the design of a sustainable, inclusive, and equitable curricula for teaching

biological concepts using the foldscope. We describe the implementation of foldscope-adapted curricula in post-secondary settings to teach natural selection, developmental biology, parasitology, and economic Zoology via individual, small-group, and large-group field trips, and project-based learning that involves experiential learning. We found that these culturally sensitive pedagogies involving translanguaging instructions had the potential to retain students and make science education accessible for the linguistically and culturally diverse population of India. We could successfully implement our project as per the five priority action areas outlined by UNESCO. Therefore, we propose the adoption of the foldscope-adapted curricula under SDG4 to make STEM education accessible in budget-frugal settings.

Keywords: STEM education; education for sustainable development (ESD); foldscope; SDG - 4

7. SDG 4 and Program inclusive credit-based MOOCs in Higher Educational Institutions of India (HEIs); Students' perspective

Amardeep Singh and Karina Bhatia Kakkar (2022)

Transnational Marketing Journal, October 2022, Volume: 10, No: 3, pp. 533 –546 DOI:
<https://doi.org/10.33182/tmj.v10i3.2351>

Abstract: The United Nations in its agenda 2030 about sustainable development, has listed quality education as a Special Development Goal (SDG) 4. The National Education Policy (NEP) 2020, aims at achieving a 50% Gross Enrolment Ratio by 2030 and for this India requires more than 3 million additional teachers. To ensure equity and access to quality education, the University Grants Commission (Credit Framework for Online Learning Courses through Study Webs of Active Learning for Young Aspiring Minds) Regulations, 2021 have allowed Higher Educational Institutions (HEIs) to offer 20% to 40% of the courses of the program through credit-based massive open online courses (MOOCs). Though students' perspective of MOOCs and other e-learning models has been in focus since the last decade, there is still a paucity of studies on program inclusive credit-based massive open online courses. This research is a novel attempt to investigate the student's perspective on credit-based program inclusive MOOCs. Based on the existing theory, a proposed conceptual model has been tested by applying model fit indices. The measurement model has been tested by applying confirmatory factor analysis (CFA) and a structural model by applying path analysis and structural equation modeling (SEM). Specifically, the impact of course content, instructional language, and learning outcomes has been analysed on student preference for credit-based MOOCs. Additionally, the impact of assigning credit to MOOCs on self-efficacy has also been examined.

Keywords: MOOCs; Blended; E-learning; Credit; Program; Online, SDG - 4

8. Sustainable Development Goal for Quality Education (SDG 4): A study on SDG 4 to extract the pattern of association among the indicators of SDG 4 employing a genetic algorithm

Munish Saini, Eshan Sengupta, Madanjit Singh, Harnoor Singh, Jaswinder Singh

Education and Information Technologies (2023) 28:2031–2069
<https://doi.org/10.1007/s10639-022-11265-4>

Abstract: Sustainable Development Goals (SDG) are at the forefront of government initiatives across the world. The SDGs are primarily concerned with promoting sustainable growth via ensuring wellbeing, economic growth, environmental legislation, and academic advancement. One of the most prominent goals of the SDG is to provide learners with high-quality education (SDG 4). This paper aims to look at the perspectives of the Sustainable Development Goals improvised to provide quality education. We also analyze the existing state of multiple initiatives implemented by the Indian government in the pathway to achieving objectives of quality education (SDG 4). Additionally, a case study is considered for understanding the association among the observed indicators of SDG4. For this purpose, exploratory data analysis, and numerical association rule mining in combination with QuantMiner genetic algorithm approaches have been applied. The outcomes reveal the presence of a significant degree of association among these parameters pointing out the fact that understanding the impact of one (or more) indicator on other related indicators is critical for achieving SDG 4 goals (or factors). These findings will assist governing bodies in taking preventive measures while modifying existing policies and ensuring the effective enactment of SDG 4 goals, which also will subsequently aid in the resolution of issues related to other SDGs.

Keywords: SDG – 4, Quality education, Machine learning, Right of education, Equality

9. Integrating Sustainable Development Goal 4 (SDG 4) and Education in India: Assessment and Action Plan

Mallika Kumar (2023)

Vol. 49 No. 3 (2023): JOURNAL OF INDIAN EDUCATION

Abstract: Out of the total 17 SDGs of United Nations, SDG 4 specifically deals with quality education that talks about ensuring inclusive and equitable quality education, and promote lifelong learning opportunities for all. Out of different targets set for quality education, Target 4.3 states, “Ensure access to girls, boys, women and men quality and affordable education, including university”. The paper deals more on Target 4.3 of SDG on quality education. The paper shares insights about SDG 4 (Quality Education) and how can academia, along with the students contribute in shaping the future. In this paper, an attempt has been made to link the efforts being made at various levels, i.e., the Government, universities and colleges to fulfill the targets of the education set by United Nations. While the first part of the paper talks more about SDG 4 and its understanding, the second part deals with the initiatives taken up by the universities and the government towards contributing to the SDG 4 goals and the third part talks about the strategy for the future. The purpose of the paper is to develop awareness and understanding on SDG 4, inform about the role of education, teachers and educational institutions in supporting the nation to attain SDG 4 targets. The paper also assesses the current status of India with regard to SDG 4, and alignment of the initiatives and policies of education with that goal. The paper concludes with the challenges, and the need for action at individual, institutional and community level for the realisation of SDG 4.

Keywords: SDG - 4, quality education, role of education, teachers, initiatives and policies of education

10. A study on signal school, Ahmedabad in the context of sdg-4 (education) and comparison with other signal schools in India

Dhruva Joshi (2024)

Karnavati Journal of Multidisciplinary Studies, 2(1). Retrieved from <https://journal.karnavatiuniversity.edu.in/index.php/ojs/article/view/93>

Abstract: The two most important social indices that significantly contribute to the overall socio-economic growth of a nation are education and literacy. India has initiated various schemes and policies for education under the Right to Education (RTE). Though India is striving well in education, there are still challenges to be addressed. The paper will focus on the Gujarat Government's initiative "Signal School" in the context of Sustainable Development Goal 4: Education for all. Signal School (school in a moving bus) imparts education to kids begging at railway stations, working at signals, and dropout children. 30 mobile schools are currently in Ahmedabad. The paper will examine the various aspects of signal schools, their attainment at the primary level of education, their impact analysis and how various issues in education are addressed. "Bhiksha nahi Shiksha" is the motto for initiating this scheme. The scheme currently works in Ahmedabad only, with plans to expand later to other cities in Gujarat. The paper will broadly focus on the case study based; working of signal schools, the process of selecting, picking, and dropping children, the impact signal school is creating in the education sector, along with SDG. Also, the paper will focus on finding whether the concept of Signal School is viable in other cities of Gujarat and also study other Singal schools run by NGOs or Government of India and will do a comparative analysis as currently Signal School's presence is in Ahmedabad and Bangalore only. This paper will also contextualise the various educational schemes focusing on elementary education.

Keywords: Signal School, Monitoring, Ahmedabad, Impact, NPO, Elementary Education, SDG - 4.

11. Assessing SDG 4 indicators in online and blended higher education within conflict zones: A case study of northern India's higher education institutions

Shereiya Sareen and Sayantan Mondal (2024)

Social Sciences & Humanities Open 9(2), DOI: 10.1016/j.ssaho.2024.100903

Abstract: Resilient higher education is fostered, and further assessed, by the United Nations through the metrics provided by Sustainable Development Goal 4, called indicators. These indicators serve as a yardstick to evaluate a country's success in sustainability. Concerningly, the recent scholarly work highlights the limitations associated with Sustainable Development Goal 4 indicators, including the associated political connotations and fuzziness. However, we note a dearth of attempts to unwrap the merit of Sustainable Development Goal 4 indicators in online and blended learning in higher education, specifically in conflict zones. This study aims to bridge this gap by exploring the challenges and opportunities presented by the current Sustainable Development Goal 4 indicators in evaluating online and blended learning in higher educational institutions in India's conflict-affected northern areas. Employing a needs assessment methodology, the research draws on data from two distinct sources: primary data from 3,353 learners obtained through a self-constructed questionnaire for higher education institutions in northern India and secondary data gleaned from international and national policy documents. The thematic analysis of results, underpinned by the barriers model, underscores significant concerns

regarding the comprehensiveness, validity, and relevance of the prevailing SDG 4 indicators, particularly the Gross Enrolment Ratio and Gender Parity Index, in northern India. It is argued that these indicators fall short of accurately capturing the nuances of online and blended learning within the local contexts, thereby questioning their utility for such purposes. The study reveals that the Gross Enrolment Ratio is not successful in giving a complete picture of its variations by failing to reveal the political reasons behind its drop during emergency remote teaching in the northern conflict zones of India. Moreover, the Gender Parity Index is endowed with interpretative challenges, where despite an increased value being deemed affirmative for gender equity, its increase ironically highlights a new gender divide because of an increased dropout rate among male learners from tribal communities. Through the case of higher education institutions in J&K and Ladakh, the study further provides keywords which could bolster the effectiveness of the SDG 4 indicator framework by making it more responsive to the changing educational landscape, thus making it an indispensable tool in the hands of researchers and policy-makers. Consequently, this study positions itself at the forefront of scholarly efforts to critically re-evaluate and propose revisions to the SDG 4 indicators in light of the shifting teaching and learning paradigms.

Keywords: SDG – 4, Higher education, Online, blended learning, Conflict zones, Gross enrolment ratio, Gender parity index

12. Bridging The Urban-Rural Education Gap In India Through CSR (Corporate Social Responsibility) Initiatives: A Conceptual Study With Special Reference To Sustainable Development Goal 4 (Quality Education)

Himani Upreti, Rupa Khanna Malhotra (2024)

E3S Web of Conferences 556, 01032 (2024) <https://doi.org/10.1051/e3sconf/202455601032>

Abstract: Education plays a pivotal role in fostering the socio-economic development of any nation. Because of persistent urban-rural education gap in India, the country faces challenges in achieving Sustainable Development Goal 4 (SDG 4) – Quality Education. The current study is conducted to investigate the role of Corporate Social Responsibility (CSR) initiatives in addressing this gap, for which a comprehensive study is conducted to identify CSR initiatives undertaken by the top companies in bridging the urban-rural education gap prevailing in India. Further the study also aims to identify various challenges encountered by companies while aligning their CSR initiatives towards achievement of global goal of sustainability (SDG4). The paper also gives recommendations in meeting out these challenges.

Keywords: CSR initiatives, Education Disparities, SDG – 4

13. Sustainable Development Goal 4 and National Education Policy: A Review on Quality Education in India

Triveni Debbarma (2025)

Int. Jr. of Contemp. Res. in Multi. Volume 4 Issue 2 [Mar- Apr] Year 2025 DOI:
<https://doi.org/10.5281/zenodo.15032047>

Abstract: This article analyses the fourth Sustainable Development Goal (which stands for Quality Education) and the National Education Policy in India. The United Nations initiated the targets for

sustainable development in 2015, by the 2030 Roadmap. The fourth Sustainable Development Goal concerns quality education. The New Education Policy 2020 replaces the New Education Policy 1986, as announced by the Union Cabinet of India on July 29, 2020. The National Education Policy 2020 aims to reform the educational framework in India. This paper provides an overview of the National Education Policy in India. This presentation provides a comprehensive analysis of the Sustainable Development Goals and NEP 2020. The results will provide crucial insights for policymakers, educators, and other stakeholders to improve the alignment of educational policies with constitutional values and promote a more equal and inclusive education system in India.

Keywords: SDG - 4, National Education Policy, Quality Education

SDG 5 Gender Equality

1. Role of Education in Empowering Women Towards Gender Equality and SDGs: a Case of Delhi

Dhanya Singh, Ms. Shivani Mehta (2018)

IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 23, Issue 4, Ver. 5 (April. 2018) PP 45-57.

Abstract: According to Amartya Sen (1992) "Women Empowerment is the ability of women to exercise full control over one's actions and is one of the central issues in the process of development for many countries in the world today." Women are empowered when they have the freedom to control and command their own lives. Economic empowerment increases women's access to economic resources and opportunities including jobs, financial services, property, skill development and market information. One way of ensuring such economic empowerment of Indian women is through 'enhanced role of education'. This paper aims to focus on the economic empowerment of women by considering the enhanced role of education to eradicate gender inequality. This study tries to establish the importance of education by means of primary data collection and analysis in Delhi region for educated and uneducated women and ascertain the detrimental role of the same in the economic empowerment of women.

Keywords: Education, Gender equality, Women empowerment, SDG - 5

2. Education for Sustainable Development through International Collaboration. A Case Study on Concepts and Conceptual Change of School-Students from India and Austria on Gender Equality and Sustainable Growth

Martin Dur and Lars Keller (2018)

Educ. Sci. 2018, 8(4), 187; <https://doi.org/10.3390/educsci8040187>

Abstract- Dealing with the great challenges of the 21st century requires far reaching changes in the lifestyle and perceptions of humans to ensure an appropriate quality of life for all, now and in the future. To provide people with the necessary competencies, the UN initiated the Education for Sustainable Development (ESD) program. The two-year research-education, cooperative project 'AustriIndia-4QOL' aims to contribute to the goals of ESD. It is based on a collaboration between

students from schools in Austria and India on the topics of quality of life, sustainability and global justice. The purpose of this particular case study is to explore the effects of a weeklong face-to-face collaboration in the final part of the AustrIndia-4QOL project. Therefore, it is examined whether or not Austrian and Indian students' concepts regarding the Sustainable Development Goals 'Gender Equality' and 'Decent Work and Economic Growth' change as a consequence of encountering differing perspectives. Short texts written by the students at the beginning and at the end of this collaboration, according to guiding questions, form the basis for a qualitative content analysis. The findings illustrate that the students' awareness increased and their evaluation of topics related to the discussed sustainable development goals changed.

Keywords: SDG – 5, international collaboration, gender equality, quality of life, conceptual change

3. Leave no one behind: South Asian perspectives on Gender Equality

Vidisha Mishra (2019)

In Sustainable Development and Sustainable Development Goals in South Asia Edited By Nitya Mohan Khemka, Suraj Kumar, Routledge, London, <https://doi.org/10.4324/9781351035262> (eBook ISBN9781351035262)

Abstract: The September 2015 adoption of the United Nation's 17 Sustainable Development Goals (SDGs)—with gender equality as a central stand-alone goal in addition to being a crosscutting goal—reflected a new development paradigm. Despite having a remarkable growth story and success in achieving many of the Millennium Development Goals (MDGs), South Asia continues to account for 36 per cent of the world's poor, nearly half of its malnourished children, and significant gender inequalities in economic, health, and political opportunities and outcomes. While the subregion experienced the fastest Human Development Index (HDI) growth among developing regions with a 45.3 per cent increase since 1990, it also has the widest gap between men and women in HDI at 16.3 per cent. Given its share in the global population and poverty, South Asia is critical to determining the overall success of the SDGs. In this context, this chapter aims to analyse the key challenges in achieving Goal 5 and the accompanying nine targets—whose impact, if achieved, facilitates the achievement of many of the remaining 16 SDGs in South Asia. In turn, the achievement of this goal is also contingent on the gender-responsiveness of strategies targeted at achieving the other goals. Focusing on the mutually reinforcing nature of gender-related goals and targets, the chapter will first analyse how the SDG framework has been able to build on existing gender equality frameworks and, specifically, how it has addressed the limitations of the MDG framework. Next, highlighting three key policy areas—freedom from violence, capabilities and resources, and voice leadership and participation—the chapter will examine the current progress towards gender equality and explore future policy pathways. The chapter focuses on the policy environment in India and is supplemented with perspectives from Bangladesh, Sri Lanka, and Nepal. It is argued that the new development consensus and normative declarations alone cannot guarantee verifiable results; policy solutions must address the multidimensional nature of gender inequality across all goals and targets. The chapter ends with highlighting the major gaps that remain in data availability and comparability in the subregion in the context of the SDG indicators, as well as the need for further clarity on the financial costs of gender equality SDG targets—proposing future policy pathways.

Keywords: Human Development Index, policy environment, India, Bangladesh, Sri Lanka, Nepal, SDG – 5

4. Gender Equality & Sustainable Development Goals

Datchana Moorthy Ramu (2020)

NOTION Press ISBN:9781648504600, 1648504604

Page count:51

Abstract: This book addresses several aspects of Gender Equality in India and how it can be achieved along with the United Nations Sustainable Development Goals by the Year 2030. It was written on the Basis of Gender equality is not only a fundamental human right but a necessary foundation for a peaceful and sustainable world. This book discusses Gender inequalities, and their social causes, impact India's sex ratio, women's health over their lifetimes, their educational attainment, and economic conditions and delivers ideas to eradicate those issues.

Keywords: gender equality, empowerment of women, equal opportunities, discrimination against women, child marriage, access to education, equal rights, equal participation, SDG - 5

5. Sustainable Development Goals and Human Rights

Editors Markus Kaltenborn Markus Krajewski Heike Kuhn (2020)

ISBN 978-3-030-30468-3 ISBN 978-3-030-30469-0 (eBook) <https://doi.org/10.1007/978-3-030-30469-0>

Abstract: Human rights are one of the normative cornerstones of contemporary international law and global governance. Due to the complexities of actual or potential violations of human rights and in light of current crises, new and interdisciplinary research is urgently needed. The series Interdisciplinary Studies in Human Rights recognizes the growing importance and necessity of interdisciplinary research in human rights. The series consists of monographs and collected volumes addressing human rights research from different disciplinary and interdisciplinary perspectives, including but not limited to philosophy, law, political science, education, and medical ethics. Its goal is to explore new and contested questions such as the extraterritorial application of human rights and their relevance for non-state actors, as well as the philosophical and theoretical foundations of human rights. Claiming that human rights and the United Nations Sustainable Development Goals (SDGs) have much in common and contribute to their mutual implementation seems like stating the obvious. Yet, more often than not discussions about human rights and about the SDGs are held in different circles and by different stakeholders. Bringing together these stakeholders was the goal of a Conference in June 2017 at the Federal Ministry for Economic Cooperation and Development in Bonn, Germany, organized by the Institute of Development Research and Development Policy (IEE) of the Ruhr-University Bochum and the Centre for Human Rights Erlangen Nürnberg (CHREN) in collaboration with the Federal Ministry for Economic Cooperation and Development. This volume collects some of the papers presented at this conference but also goes beyond the discussions.

Keywords: SDG – 5, Human rights, extraterritorial application

6. Men: a missing factor in SDG 5? A study on gender equality in Kerala with a focus on men`s attitudes towards women

Ingunn Håberg (2020)

Master`s thesis in International Education and Development –Power, Inequality and Change Spring, 2020 Faculty of Education and International Studies, OsloMet – Oslo Metropolitan University (Candidate 103)

Abstract: Sustainable Development Goal 5 (SDG 5) seeks to empower all women and girls by 2030; however, the goal only indirectly mentions men. Is it possible to achieve goal followed by 156 countries if there is no specific focus on men? Through the literature we know much about women's lives and struggles throughout the world. However, it is only recently that scholars have attempted to analyse men`s lives and their experiences with gender equality. This thesis attempts to ask the normative question: To what extent should there be more focus on men in the process of achieving gender equality? It follows a case-study on one of the front runners in India to achieve SDG 5 by 2030, namely the southern state of Kerala. With data from a nine weeks fieldwork in Kerala; the thesis seeks to provide insight into what is being done in Kerala with SDG 5, whether the state includes a focus on men, and to understand experiences of men's attitudes towards women from a rural village. The findings are discussed with the use of theoretical concepts of 'symbolic violence' and 'hegemonic masculinity'. Findings show that SDG 5 does not get any particular attention in Kerala other than the already existing women-oriented programmes, where a focus on both genders through SDG 5 is not immediately visible. A possible focus on men can be located in the realms of gender awareness programmes. Furthermore, insight into the experiences of men`s attitudes in the Village reveals that patriarchal values are persistent in Kerala. Both men and women maintain these values. By following the answers given by the informants, over half of them (both men and women) wishes there to be more focus on men when it comes to gender equality. As this thesis will discuss, it might be time to include a focus on men and their attitudes to be able to attain sustainable development.

Keywords: Gender Equality, SDG - 5, Men, Masculinity, Attitudes, Kerala

7. Gender in electricity policymaking in India, Nepal and Kenya.

Govindan, M., Palit, D., Murali, R., & Sankar, D. (2020)

In G. Bombaerts, K. Jenkins, Y. A. Sanusi, & E. W. Guoyu (Eds.), *Energy justice across borders* (pp. 111–135). Springer Nature Switzerland AG.

DOI: https://doi.org/10.1007/978-3-030-24021-9_6

Abstract: Electricity is regarded as a basic amenity fundamental to improving human well-being and overall economic development. It also contributes to improving gender parity and social inclusion, especially in situations where women are challenged by harsh living conditions. This chapter examines how gender issues that were considered are addressed in the policies related to electricity in India, Kenya, and Nepal. The analysis reveals that whilst more than half of the reviewed documents were devoid of any explicit mention of gender concerns, an increasing number of electricity policies are now reflecting gender considerations. The predominantly "gender-blind" approach towards the potential benefits of electricity access emanates from a reluctance to explicitly acknowledge gender based differences in needs in creating equitable outcomes. The

assumption that electricity access itself is enough for associated benefits to trickle down, that too equitably for men and women, stems from limited awareness. This is aggravated further by the absence of documented evidence on the merit of including gender elements in electrification policies and programmes. Based on the review of existing electricity policies, this chapter provides specific recommendations for incorporating gender in the electricity policies with a view to support and address the broader energy justice concerns.

Keywords: SDG – 5, electricity, India, Nepal, Kenya

8. ICT: An Innovative Move to Promote Gender Equality and Sustainable Future for Women in India

Showkat Ahmad Dar and Aadil Ahmad Shairgojri (2022)

LC INTERNATIONAL JOURNAL OF STEM, Volume-03 | Issue-02| June-2022, 3(2), 179–185.
<https://doi.org/10.5281/zenodo.6849974>

Abstract: Indian civilisation is male-dominated, and women's efforts were disregarded. ICT has brought a glimpse of hope and a wealth of viable answers to this imbalance, which is why women's empowerment has been prioritised. ICT can boost gender equality. Digital technology can help eliminate gender gaps by boosting access to welfare, ID, financial services, and information. Technology can remove many of the obstacles women encounter, opening up new economic options and allowing them to join the workforce, improving their future. Digital technology has impacted how we organize, the strategies we use, breaking down boundaries, eroding state power, producing information, and developing unfathomable solidarity networks. Digital revolution changes how people live, work, and interact. Globally, gender equality is important. ICTs have added additional dimensions. ICTs improve service delivery, government, and poor populations' opportunities. Gender-neutral ICT policy can boost women's employment. SDG 5 aspires to increase the use of ICTs to achieve gender equality and empower all women and girls. ICTs are continuing to change the way we live and work. For women, girls, and the 2030 Agenda for Sustainable Development, using technology to advance gender equality and women's empowerment is critical. This article examines ICT-enabled networking for gender equality. It also discusses policy framework for gender equality through ICT and goes on to suggest ways to improve the conditions leading to Gender equality.

Keywords- ICT, Gender, Empowerment, Exploitation, SDG - 5

9. Synergies and trade-offs between climate change adaptation options and gender equality: a review of the global literature

Joyashree Roy, Anjal Prakash, Shreya Some, Chandni Singh, Rachel Bezner Kerr, Martina Angela Caretta, Cecilia Conde, Marta Rivera Ferre, Corinne Schuster-Wallace, Maria Cristina Tirado-von der Pahlen, Edmond Totin, Sumit Vij, Emily Baker, Graeme Dean, Emily Hillenbrand, Alison Irvine, Farjana Islam, Katriona McGlade, Hanson Nyantakyi-Frimpong, Federica Ravera, Alcade Segnon, Divya Solomon & Indrakshi Tandon (2022)

Humanities Social Sciences Communication 9, 251 (2022). <https://doi.org/10.1057/s41599-022-01266-6>

Abstract: Climate change impacts are being felt across sectors in all regions of the world, and adaptation projects are being implemented to reduce climate risks and existing vulnerabilities. Climate adaptation actions also have significant synergies and tradeoffs with the Sustainable Development Goals (SDGs), including SDG 5 on gender equality. Questions are increasingly being raised about the gendered and climate justice implications of different adaptation options. This paper investigates if reported climate change adaptation actions are contributing to advancing the goal of gender equality (SDG 5) or not. It focuses on linkages between individual targets of SDG 5 and climate change adaptation actions for nine major sectors where transformative climate actions are envisaged. The assessment is based on evidence of adaptation actions documented in 319 relevant research publications published during 2014–2020. Positive links to nine targets under SDG 5 are found in adaptation actions that are consciously designed to advance gender equality. However, in four sectors—ocean and coastal ecosystems; mountain ecosystems; poverty, livelihood, sustainable development; and industrial system transitions, we find more negative links than positive links. For adaptation actions to have positive impacts on gender equality, gender-focused targets must be intentionally brought in at the prioritisation, designing, planning, and implementation stages. An SDG 5+ approach, which takes into consideration intersectionality and gender aspects beyond women alone, can help adaptation actions move towards meeting gender equality and other climate justice goals. This reflexive approach is especially critical now, as we approach the mid-point in the timeline for achieving the SDGs.

Keywords: SDG - 5, climate change adaptation, options,

10. Gender Equality and Sustainable Development: A Case study of UNO's SDG 5

Bonagani Rama Rao (2022)

Research Journal of Humanities and Social Sciences. 13(4): October - December, 2022, pp. 267-274, DOI: 10.52711/2321-5828.2022.00043

Abstract: The gender equality means when the people of all male and female genders have equal rights, responsibilities and opportunities. The sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. An United Nations Organisation (UNO)'s 17 Sustainable Development Goals (SDGs) were adopted by all its member states in 2015 with 169 targets to reach by 2030. India has adapted these SDGs. Among the 17 goals, the SDG goal 5 is related to 'Gender equality: Achieve gender equality and empower all women and girls'. There are 9 targets there in this goal. The coronavirus has exacerbated existing inequalities for women and girls across every sphere from health and economy to security and social protection etc. This article has focused for the assessment of the UNO's SDG 5 at the international and separately by another data at an Indian levels in order to know to what extent gender equality for females had been achieved. The gender equality for females sustainable development on the whole had been slightly progressing under the SDG 5 at international level.

Keywords: SDG - 5, Equality, Gender, Assessment, Sustainable.

11. Sustainable development goals for gender equality: Extracting associations among the indicators of SDG 5 using numerical association rule mining

Saini Munish, Adebayo, Sulaimon Oyeniya, Singh Harnoor, Singh Harpreet, Sharma Suchitacy (2023)

Journal of Intelligent & Fuzzy Systems, vol. 44, no. 3, pp. 5151-5162, 2023, DOI: 10.3233/JIFS-222384

Abstract: The United Nations prescribed the Sustainable Development Goals (SDGs) to various nations to provide enduring answers to widespread problems and to give long-lasting solutions to common issues being faced across the globe. SDG 5 in particular was aimed at minimizing gender inequality by employing 9 targets and 14 indicators. The indicators serve as a yardstick to measure the progress of each of the 9 targets. This research takes an in-depth look at the perspectives of SDG 5 –Gender Inequalities, its targets, and indicators. Furthermore, explanatory data analysis and numerical association rule mining alongside QuantMiner are applied to the generated Indian datasets on SDG 5 to extract patterns and associations among the fourteen indicators of SDG 5. The association rule mining carried out on the indicators reveals the pattern of association among these indicators. Legal provision for women and the rate of crimes against women have a perfect association of 100% while the association between legal provision for women and women who have experienced physical violence stands at 80%. The full relationships of all the 14 indicators are discussed extensively in the result and discussion section. Overall, it is established that these indicators are interdependent. This will make it easier for academics, the general public, and governmental and non-governmental organizations to understand the trends and form informed opinions on issues relating to gender inequality and SDG 5.

Keywords: SDG – 5, international collaboration, gender equality, quality of life, conceptual change

12. Gender Equality and Goal 5 of Sustainable Development Goals

Chakrabarty S N (2023)

Women's Health Science Journal, Volume 7 Issue 2 DOI: 10.23880/whsj-16000182

Abstract: With 14 indicators distributed over nine targets, SDG-5 aims at achieving gender equality and empowerment of all women and girls by 2030 for all countries agreed to work towards achieving them. NITI Aayog of Govt. of India selected six indicators towards improvement in SDG-5. Focusing attention to SDG-5 only, the paper proposes simple method of aggregating indicators of SDG-5 and discusses properties of the proposed methods. Each of the indicators was expressed in terms of proportions which were combined to reflect overall proportion for a State/UT at current period. The proposed method of combining indicators expressed as proportions is simple, appealing and helps to assess current status (achievement) of a State by computing combined proportion. Current status of the States can similarly be combined to get current status of a country and its distance from the 2030 targets. Similar procedure may be extended to find current status of the world by combining the country-wise current status. Measures of percentage improvement or deterioration at country/State levels at a period from the previous period were discussed. Important inferences on comparison of countries may be drawn on the basis of path of improvement registered by a State or country. Future studies suggested.

Keywords: SDG-5; Combined proportions; Target vector; Achievement vector; Composite index

13. The etymology of Gender Violence (SDG-5) in Anthropocene: India

Siba Prasad Mishra, Durga Prasad Mishra, and Saswat Mishra (2023)

Journal of Applied Life Sciences International Volume 26, Issue 3, Page 53-69, 2023; Article no.JALSI.100990 ISSN: 2394-1103

Abstract: Gender equality measures the human right of a nation. Feminist encounters are common in modern society and gender inequality is mounting in India during the present Anthropocene epoch (1950 onwards). Gender-based violence (GBV) has a myriad of adverse effects but is underreported in India. The Paris Protocols of Agenda-2030 stipulate Sustainable Development Goals (SDGs) for all sex and age groups of *Homo sapiens*. The present investigation emphasizes the theoretical perceptions and statistical approaches to comprehending GBVs (SDG-5) in India. The present work involves the qualitative investigation of the frequency, physical appearance, and socio-demographic factors that correlate with gender equality and girl-child empowerment (SDG-5) during the Anthropocene epoch and finding means for both social and legal achievement. Feministic violence is mainly grounded upon childhood marriage, humane trafficking, female genital mutilation, etc. Achieving gender equality, and empowering all girls under hunger, war, climate challenges (CC), men dominance, and environmental exploitation, during the Anthropocene epoch. India has recently ranked top in population than China. The pandemic COVID 19 has challenged the life/livelihood of Indians. Peculiar results of women and girl child atrocities are unexpectedly high in states like Assam, Odisha, and Delhi. During the last decade, the dowry and rapes reduced but intimate partner violence and kidnapping are mounting during biological disasters. The transformation of males' outlook toward their partners must be changed to achieve the SDG-5 goals.

Keywords: Anthropocene; gender equality; SDG-5; women's healthcare; United Nations; gender Violence

14. SDG 5: Addressing Gaps and Accelerating Progress Towards a Feminist, Intersectional, and Transformative Vision for Change

Nalini V. Khurana and Ravi K. Verma (2023)

In: Pachauri, S., Verma, R.K. (eds) Transforming Unequal Gender Relations in India and Beyond. Sustainable Development Goals Series. Springer, Singapore. https://doi.org/10.1007/978-981-99-4086-8_1

Abstract: Sustainable Development Goal (SDG) 5 calls for gender equality and empowerment of women and girls as a key part of sustainable and inclusive development. However, evidence shows that global progress on gender equality between 2015 and 2020 has been slow—and in some cases, stagnant or reversed. The adverse impacts of the COVID-19 pandemic have further exacerbated gender and other inequities and stalled progress towards the achievement of the goals of Agenda 2030. This introductory chapter traces the evolving paradigms leading up to SDG 5 and critically reviews its conceptual underpinnings and approach, the scope of thematic issues and targets, and the frameworks established for monitoring and accountability. The authors draw attention to the role of power in shaping SDG 5 and Agenda 2030 and argue for a shift from current neo-liberal, growth-oriented approaches towards a feminist, gender transformative, and intersectional development paradigm where equity is centered and duty bearers are held accountable. As the 2030 deadline for the SDGs draws closer, the authors identify four priority

areas to pave the way towards gender equity in the 'new normal': (i) building a feminist, care oriented economic paradigm; (ii) fostering women's leadership and collective action; (iii) bridging data gaps for evidence-based policy and programming; and (iv) embedding intersectionality within data systems to ensure that no one gets left behind.

Keywords: SDG - 5, neo-liberal, role of power

15. Reverse migration, sustainable development, and innovation during Covid-19 pandemic: a case study of Indian women and children

Subhomay Saha, Karanx Peer and Shrabani Saha (2023)

International Journal of Innovation and Sustainable Development Vol. 18, No. 1-2, 2023

Abstract: The COVID-19 pandemic has created a devastating and far-reaching consequences for countries and communities across the globe. However, a month-long national-lockdown during the first wave of COVID-19 in March- April 2020 in India has drawn enormous attention from media, policy makers and researchers around the world. The national lockdown has been especially difficult for the sizable migrant population of India, whose woes were heightened by their engagement in India's informal economy, which denied them any access to social security benefits upon stoppage of work. This was reflected in the unprecedented reverse migration witnessed in India. Hence, this study uses an analytical framework with some statistical figures to explore the effects of the pandemic on migrant workers in particular women and children and how it threatens the United Nations sustainable development goals (SDGs). It also critically analyses the current policies to reduce the economic effect of this adverse shock.

Keywords: COVID-19 pandemic, return migration, women and children, SDGs, sustainable development goals, India

16. Does inequality exist in attaining sustainable development goals within a city? A case study in Pune city, India.

Chandiramani, J., Tripathi, S., Benara Misra, S., Patil, G., & Shende, A. (2024).

International Journal of Urban Sciences, 1–38. <https://doi.org/10.1080/12265934.2024.2382705>

Abstract: A significant portion of the advancement of Sustainable Development Goals hinges on how well it is implemented locally, such as at the city level. In this study, we answer the following two questions: First, what is the level of progress of sustainable development targets between ward levels of Pune city for the marginalized segment of the population? Second, what are the main drivers of this progress? The analysis is based on a primary survey of 5726 households in 2023. Based on the Government of India's prescribed pointers and 2020 Indicators for European cities, we consider 107 variables for assessment. The two-stage principal component analysis is used to calculate the overall sustainable development goals at the ward level. The study suggests that Shivajinagar, Bhawani Peth, Dhole Patil, Dankarwadi, and Sinhgad wards are ranked higher. Better performance depends on poverty reduction, improving good health and well-being, and reducing gender and inequality. The regression analysis suggests that agglomeration economies are important for achieving higher sustainable development goals even at the ward level. Greater the distance to political power reduces implementation strategies. Finally, we recommend several

policies to reduce disparities in achieving different sustainable objectives at the city level. Cities in other developing nations can take lessons from this study.

Keywords: Inequality localization SDG -5, municipal ward, Pune

17. Accelerating Gender Equality for Sustainable Development: A Case Study of Dakshina Kannada District, India.

Aiyappa, S., Kodikal, R., Rahiman, H.U. (2024)

In: Khamis Hamdan, R., Hamdan, A., Alareeni, B., Khoury, R.E. (eds) Information and Communication Technology in Technical and Vocational Education and Training for Sustainable and Equal Opportunity. Technical and Vocational Education and Training: Issues, Concerns and Prospects, vol 38. Springer, Singapore. https://doi.org/10.1007/978-981-99-6909-8_30

Abstract: India has a female population of roughly 660 million and has been clambering slowly towards the attainment of gender equality. The Global Gap Index, 2022, as released by the World Economic Forum has placed India at 135 out of 146 countries. It shows that there is hardly any reason to smile as India has faltered on the road to achieving gender equality. To be at par with the gender equality goals set by the UN SDG 5, the Indian Government and NGOs are trying their best to move India's abysmal ranking in this dimension and help women overcome staggering economic and social barriers. This chapter is a case study that discusses the nuances of the operations adopted by Prajna Counselling Centre, an NGO located in Dakshina Kannada district of Karnataka, India. The case describes how a developing country like India is striving to attain SDG 5 at the grassroots level and discusses the implementation of developmental programs at 12 villages (referred to as panchayats in India) in the chosen district of the Indian state. The results show a remarkable increase in gender sensitivity and participation of women backed with a three-tier functional mechanism to protect women and girl children against violence and discrimination.

Keywords: Dakshina Kannada, Karnataka, SDG - 5

18. Advancing gender equality: assessing progress towards SDG 5 through women's empowerment in India

TSK Durgesh, M Bhaskar Rao, Parma Siman C, Ravichandran G (2024)

Conference Proceeding *Achieving Sustainable Women Empowerment* PP – 295-309.

Abstract: India aims to achieve United Nations-mandated Sustainable Development Goal-5, which focuses on women empowerment and gender equality, by 2030. Women comprise around 50 percent of the country's population, and a bulk of them stays economically dependent on each other without employment. This paper examines the progress towards achieving Sustainable Development Goal 5 (SDG 5) in India through the lens of women's empowerment. Gender equality is a critical aspect of sustainable development, and SDG 5 specifically targets the empowerment of women and girls. Through an analysis of various indicators based on the SDG Index, NITI Aayog 2018, such as women and girls health, workforce participation, political representation, and experienced violence, this paper assesses the current status of women's empowerment in India. It explores the initiatives, policies, and challenges encountered in advancing gender equality, highlighting both successes and areas requiring further attention. By providing a comprehensive

overview, this paper contributes to the understanding of the complexities involved in achieving SDG 5 and offers insights into strategies for fostering women's empowerment in India. Invest in programs that empower women economically, such as microfinance initiatives, entrepreneurship training, and access to credit and markets. Enhance women's access to healthcare services, including reproductive health services, maternal care, and family planning, to ensure their well-being and autonomy over their bodies.

Keywords: Women Empowerment, SDG 5, Gender Equality, Composite SDG India Index Score

19. Women's Empowerment Through Electrification: What Is the Evidence from the Indian Subcontinent?

Palit, D., Govindan, M., Murali, R. (2024)

In: Rocha Lawton, N., Forson, C. (eds) *Women and the Energy Sector*. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-43091-6_3

Abstract: It is recognised that modern energy services, particularly electricity, are crucial for overall human well-being. It is also seen as an important pathway for improving gender equality and ensuring social inclusion, in addition to serving a broader range of development objectives. However, how and why the provision of electricity results in specific gender outcomes remains unclear. In particular, the extent of involvement of women in the electricity value chain and how it may spur women's empowerment need further examination. Understanding these nuances is constrained due to a fragmented body of evidence and the absence of specific analytical tools for gauging the gender–electricity–empowerment linkages. All these aspects clearly indicate pathways to women's empowerment are multifaceted and continue to be elusive and debatable. Hence, to address the above-mentioned questions and challenges, this chapter presents key observations from the fieldwork undertaken in the Indian subcontinent, focussing on India and Nepal, on the gender-electricity-empowerment linkages. In addition, the electricity policies in the focused countries were also analysed to understand the role of policies as a driver for the promotion of gender equality and empowerment.

Keywords: Promotion of Gender Equality, Empowerment SDG - 5

20. Measuring the Impact of SDG 5 on Empowerment in India

Pritha Dev, Ananya Acharya, Astha Kushwaha (2025)

In Ranjula Bali Swain, Peter Dobers (edit) *Routledge Handbook of the UN Sustainable Development Goals Research and Policy*, eBook ISBN 9781003285472

Abstract: We examine the pursuit of SDG 5, which focuses on achieving gender equality, in the context of India, considering the measures implemented by both the central and the state governments. Using data from two rounds of the National Family Health Survey (NFHS), we assess the policy impact on achieving the SDG 5 target on women's empowerment in India. Additionally, we explore the theoretical connections between SDG 5 and other Sustainable Development Goals (SDGs). Through empirical research, we establish interconnections between SDG-5 indicators across time. We consider how district-level averages of empowerment measures related to decision-making and freedom of movement from NFHS-4 influence individual-level outcomes regarding employment, education, and family planning in the subsequent NFHS-5 round.

This study underscores the significance of tailoring data surveys and refining target visions to align with worldwide diverse cultural contexts.

Keywords: SDG-5, National Family Health Survey, Districts

SDG 6 Clean Water and Sanitation

1. Advancing Clean Water and Sanitation in India: Aligning Sustainable Development Goals for Improved Outcomes

Nibedita Mahatao (2015)

AIJRA Vol. IX Issue I (ISSN 2455-5967)

Abstract: India, with its vast and diverse population, faces significant challenges in providing equitable access to clean water and adequate sanitation. This is not only a matter of public health and wellbeing (SDG 3) but also crucial for achieving gender equality (SDG 5) as women and girls often bear the burden of water collection in rural areas. Improving water and sanitation infrastructure can have a ripple effect on several other SDGs. It can reduce waterborne diseases, contributing to better health outcomes, and ensure sustainable water management (SDG 6), which is vital for maintaining ecosystems (SDG 15) and combating climate change (SDG 13). Moreover, it can foster economic growth (SDG 8) by reducing healthcare costs and increasing productivity. Government policies and initiatives, in partnership with local communities and international organizations, are essential for developing sustainable water and sanitation systems. Investments in technology, infrastructure, and awareness campaigns are critical for long-term improvements.

Keywords: Industrialization, CLTS, Jal Shakti Abhiyan, IWRM, Public Awareness, SDG - 6.

2. Sustainable Development Goal 6: watering down justice concerns

Sharachchandra Lele (2017)

WIREs Water 2017, 4:e1224. doi: 10.1002/wat2.1224

Abstract: The Sustainable Development Goals (SDGs) give much greater attention to environmental concerns than the Millennium Development Goals. SDG6, the water sector goal, is also more broadly framed, as it recognizes conservation needs in addition to drinking water and sanitation. However, normatively speaking, SDG 6 is still framed in adequacy and sustainability terms, downplaying the goal of justice. This is a serious lacuna. Intragenerational justice is fundamental to many environmental problems, and especially to water, because water is a common-pool, multiple-use and unidirectionally flowing resource. Most debates in the water sector—upstream—downstream sharing, intersectoral allocations and specifically allocation to in-stream conservation, water pollution, and even groundwater depletion—are about the ‘biophysical (in)justice’ caused by these characteristics of the resource. The debates then focus on how the outcomes may be made more equitable (within sectors) or fair (across sectors). Large interventions, such as big dams, create multiple benefits and costs across multiple users and sectors, focusing attention on procedural justice. Social inequities may add another layer, as they often correlate with biophysical injustice. While SDG6 recognizes conservation and public health needs, it fails to recognize the fundamental tension between these needs and other uses of water, and therefore the issues of equity, fairness, and/or procedural justice in allocating between them.

Policy makers may be more comfortable with framing environmental problems as sustainability problems. However, researchers have contributed to this narrowing by framing environmental problems along disciplinarily fragmented lines. The idea of biophysical justice offers an interdisciplinary bridge that may help broaden the discourse.

Keywords: SDG – 6, biophysical justice

3. Towards a more sustainable water future: water governance and Sustainable Development Goal 6 achievability in India

Danielle Lindamood (2017)

Unpublished Thesis, Masters of Environmental Studies in Sustainability Management Waterloo, Ontario, Canada, 2017

Abstract: Humans and the environment in which we live are deeply connected to one another. These interconnections allow for many positive benefits and are foundational to our ability to live on Earth, but also pose many challenges. These challenges are often complex and can lead to negative effects on humans and the environment alike, especially under the pressures of multiple drivers, including climate change. The United Nations created the Sustainable Development Goals (SDGs) to address many of these complex problems through global, regional, and local action. The connection between water resources and humanity – and the resulting challenges – is a potent example of problems the SDGs aim to confront. Particularly, SDG 6 seeks to ensure sustainable access to clean water and sanitation for all, with targets for water quality, efficiency, management, cooperation, capacity building, and ecosystem health. While the SDG 6 vision and targets are admirable, little is known about how to enhance the achievability of this goal, especially considering sustained efforts to address water challenges around the world. Particularly, it is unclear if pre-existing water governance mechanisms, such as institutions, policies, rules, and practices will be able to facilitate SDG 6 achievement. In order to better understand how those involved in water governance can help enhance the achievability of SDG 6 at multiple scales, a study using qualitative research methods was performed using India as a case study. This included interviews and focus groups to explore three research objectives: (1) current water governance structures and paradigms, (2) capture experiences around success and failure in water projects, and (3) synthesize learnings for insights into enhancing the achievability of SDG 6. Additionally, the concept of the ‘water governance landscape’ is proposed as a tool to more systematically understand trends in water governance, particularly assessing the structural, functional, and normative dimensions. This research concludes the water governance landscape in India is not currently poised to facilitate SDG 6 achievement by 2030, but there are many positive trends toward betterment in policies and programs for water governance. Findings of this research regarding enhancement of SDG 6 achievement include the value of determining contextual enabling and hindering factors for water goals. While the subject matter of specific enabling and hindering factors was not surprising, analyzing trends in the suite of enabling and hindering factors highlighted five broad thematic areas important to enhancing SDG 6 achievement: practical considerations, power relations, knowledge & capacity building, policy design, and institutional design. Additionally, the development of better coordinated water governance processes, the use of diagnostic tools and concepts, and the value of addressing contextual water challenges is discussed. A few generalizable results include the importance of understanding and addressing ‘water sustainability challenges’ in particular, as well as the importance of scale and context. Overall, through better understanding the water governance systems under investigation,

delineating processes for what helps and hinders SDG 6 achievability, and putting those processes into practice well, clarity for the pathways toward a more sustainable water future can be attained.

Keywords: social-ecological systems, achievability, governance, water governance, mechanisms, human rights, water challenges, SDG – 6

4. A Review of the SDG 6 Synthesis Report 2018 from an Education, Training, and Research Perspective

Angela Renata Cordeiro Ortigara, Melvyn Kay and Stefan Uhlenbrook (2018)

Water 2018, 10(10), 1353; <https://doi.org/10.3390/w10101353>

Abstract: In 2015, UN Member States adopted the 2030 Agenda for Sustainable Development, including Sustainable Development Goal 6 (SDG 6): “Ensure availability and sustainable management of water and sanitation for all”. Commonly known as the ‘water goal’, SDG 6 went well beyond the limited focus on water supply and sanitation in the Millennium Development Goals (MDGs) and recognized the importance of all aspects of the water cycle in development and that water was embedded directly and indirectly in all 17 SDGs. In 2018, the UN published a report: “Sustainable Development Goal 6 Synthesis Report on Water and Sanitation 2018” (referred to in this paper as ‘the report’) that reviewed progress with SDG 6 at global and regional levels. Overall, the report concluded there was progress, but it was too slow, and the world was not on track to achieve SDG 6 by 2030 without a significant change of gear. The report was written primarily for those working in sustainable development to guide finance and resource allocation, but there was much embedded in the report that was of value to those engaged in research and in developing the much-needed capacity to plan and manage water resources, particularly in developing countries. This paper attempts to distill these issues and to ask how those involved in education, training, and research could contribute to enabling and accelerating progress towards achieving SDG 6. Three key areas of engagement were identified: the urgent need for more data and improved monitoring to assess SDG 6 progress and to enhance decision-making, the need to address the serious lack of human and institutional capacity that was constraining progress, and the challenge of taking research into policy and practice. Note: This paper is a review of selected aspects of the report (in which production the authors were chiefly involved as coordinators and editors), and as such most of the facts, figures, and discussion in this review are taken from the report. For this reason, we have not continually attributed them to the report to avoid repetition. However, in some cases, we have attributed report material to the primary sources where we considered it important to do so. We have also attributed material we have included, and which is not cited in the report. A review inevitably depends, to some extent, on the views of the reviewers and as such we have tried to make it clear where we are expressing our personal views rather than those expressed in the report. The report contains full references to all the primary sources.

Keywords: SDG - 6; water resources; water and sanitation; research; education

5. A Study of Drinking Water and Sanitation in India Under the Sustainable Development Goals 2030

Basanta Kalita (2019)

EPRA International Journal of Economic and Business Review, Volume - 7, Issue -11, November 2019, e-ISSN : 2347 - 9671| p- ISSN : 2349 – 0187 <https://doi.org/10.36713/EPRA2966>

Abstract: The SDGs agenda is the outcome of a series of international conferences on the issue of environmental sustainability.

A principle of common and differentiated responsibility was endorsed by the Rio Declaration on Environment and Development (1992) and the United Nations Conference on Sustainable Development, Rio+20 (2012). The political commitments from the world leaders were confirmed during the 3rd International Conference on Financing for Development held in Addis Ababa in July 2015 for a common policy on sustainable development. The goals are broad based and interdependent. Finally the Paris Declaration on Climate Change (2016) paved the way for the adoption of a comprehensive list of goals to be achieved by 2030. Each of the 17 sustainable development goals has a list of targets which are measured with indicators and are interdependent. The present study will be confined to the 6th goal which is ensuring “Clean water and Sanitation” in the Indian context.

Keywords: SDG13 , SDG 8, SDG6

6. Water Governance in India: Evidence on Water Law, Policy, and Administration from Eight Indian States

Masood Ahmed and Eduardo Araral (2019)

Water 2019, 11(10), 2071; <https://doi.org/10.3390/w11102071>

Abstract: Water governance is a widely acknowledged as an important factor for sustainable development. This study attempts to assess if the water governance in eight Indian states has improved after the announcement of the United Nations Sustainable Development Goals (SDGs). We utilize the Institutional Decomposition and Analysis (IDA) framework developed by Saleth and Dinar. Using survey data from two periods and 152 respondents, we calculate the scores on 17 indicators of water law, policy, and administration. We found that average scores on water law, policy, and administration have increased between the first and the second survey. We attributed this improvement to the fact that the Indian government is paying special attention to the provision of clean drinking water after the announcement of the SDGs. We also calculated nominal and weighted water governance indices (WGIs) for eight Indian states. This study made an important contribution to the existing water governance literature by capturing improvements in the water governance scores of eight Indian states after the announcement of the SDGs.

Keywords: water governance; water law; water policy; water administration; sustainable development goals; water governance index; Indian states, SDG - 6

7. Analysing progress of sustainable development goal 6 in India: Past, present, and future

Ajishnu Roy, Kousik Pramanick (2019)

Journal of Environmental Management, 232 (2019) 1049–1065,
<https://doi.org/10.1016/j.jenvman.2018.11.060>

Abstract: The attainment of sustainable development in water and sanitation i.e. Sustainable Development Goal 6 (SDG 6) requires a comprehensive monitoring and knowledge base of social

and economic water needs at national scale in such a way that should not cause negative environmental manifestations from regional to global scale. India holds a key position among developing economies with a complex interconnected web of fast-growing population, coupled with biophysical stress, social deprivation and economic inequality related to utilization, availability and access to water resources and sanitation facilities. This study addresses some of these challenges related to monitoring and implementation of the targets of the UN SDG 6 in India. Acknowledging the contribution of society and economy in sustainability paradigm, here we have chosen 28 indicators (clustered into 11 dimensions) under two major groups, concerning biophysical and social development aspects of water and sanitation. We have shown declining level of per capita biophysical water resource and slow to rapidly developing societal indicators related to SDG 6 in India. From past trends, we have calculated probable scenario of biophysical consumption of India up to 2050. We have also analysed the interrelationship of water and sanitation (SDG 6) with health (SDG 3) and end to poverty (SDG 1) in India. These show a positive impact of increasing per capita GDP on improving sanitation related indicators, which in turn positively influence to reduce water and sanitation related diseases, especially in children and aged population. This cumulative assessment framework contributes a tool to prioritize water resource appropriation and assessment of sanitation, management response and policy implementations to national level inclusive sustainability of water and sanitation sector, keeping in mind the societal and economic development scenario in India.

Keywords: SDG - 6, National water security, Planetary boundaries, Safe and just operating space, Water and sanitation

8. Availability, accessibility, and inequalities of water, sanitation, and hygiene (WASH) services in Indian metro cities

Shashi Kala Saroj, Srinivas Goli Md Juel Rana, Bikramaditya K. Choudhary (2020)

Sustainable Cities and Society Volume 54, March 2020, 101878

Abstract: We examined the availability and accessibility of water, sanitation, and hygiene (WASH), and the overall 'WASH' performance in terms of levels, trends and inequality across the six cities (Mumbai, Delhi, Chennai, Bangalore, Kolkata, and Hyderabad) of India using data from two rounds of the India Human Development Survey conducted during 2004-05 and 2011-12. Findings summarise that accessibility and overall WASH performance during 2011-12 were better than 2004-05. The change was not significant across cities in terms of WASH availability during the survey years. The availability of WASH was poor, but accessibility was better in Mumbai. Chennai reported a reverse trend, where availability was better, but accessibility was poor. The overall level of WASH became significantly better in Mumbai during 2011-12 compared to 2004-05, but changes were minor in other cities. The cities with poor WASH performance (Kolkata, Hyderabad, and Chennai) exhibited more inequality compared to better performing cities (Mumbai, Bangalore, and Delhi). The intra-city inequality is attributable to housing conditions, economic status, educational level, socio-religious affiliation, and occupational status. The efficiency with equity in WASH performance – both between and within cities should be the prioritised issue for urban policies to make cities more socially inclusive and sustainable.

Keywords: SDG – 6, WASH, cities

9. Clean Water and Sanitation: India's Present and Future Prospects

Nilanjan Ghosh, Soumya Bhowmick, Roshan Saha (2020)

In book: Sustainable Development Goals (pp.95-105), DOI:10.1007/978-3-030-42488

Abstract: SDG 6 entailing 'Clean Water and Sanitation', a crucial goal for general public health, remains an essential driver of the human capital base of an economy. The linkages of SDG 6 with natural, social and physical capitals are also fundamental in effecting its implementation. In light of this, this paper traces through the Indian government's policies to facilitate SDG 6, at both rural and urban scales, and develops an index to report on the progress on this particular goal across various Indian states. In course of this exercise, it emerges that Gujarat fares as the best state in terms of SDG 6 achievement while the states of Jharkhand, Bihar, Rajasthan, West Bengal, Assam and Punjab lags behind by a large margin. Finally, the chapter also comments on the importance of business solutions and international partnerships to ameliorate the budget gaps while incentivizing the SDG 6 targets in India.

Keywords: SDG – 6, rural, urban, budget, States

10. The reality of water quality monitoring for SDG 6: a report from a small town in India

Rayasam, Swati DG Rao, Bakul Ray, Isha (2020)

Journal of Water Sanitation and Hygiene for Development, 10(3)

<https://escholarship.org/uc/item/74s871xk>

Abstract: Based on a study of microbial water quality in a small town (Alibag) in India, we show the practical limitations of monitoring for fecal indicator bacteria to meet SDG 6. We find that even when water quality monitoring and testing infrastructure is in place, low institutional capacity and the pressure to not 'fail' the expected water quality standards can result in the failure to accurately report bacterial water quality.

Keywords: SDG - 6, urban India, WASH monitoring, water quality

11. Aligning regional priorities with global and national goals: constraints on the achievement of Sustainable Development Goal 6 in rural Bihar, India

Aviram Sharma (2021)

Area Development and Policy Volume 6, 2021 - Issue 3

<https://doi.org/10.1080/23792949.2020.1829495>

Abstract: To achieve United Nations' Sustainable Development Goal (SDG) 6 and for domestic reasons, the central government of India and several state governments are promoting aligned policies for universal access to sustainable and improved sanitation facilities. As most sanitation-related cross-sectional studies in India are national, this research examines the case of rural Bihar and identifies critical issues standing in the way of achievement of regional, national and international goals. The study reports four major constraints, which include the non-alignment of government and beneficiary perspectives, the absence of feedback loops, landlessness among

marginalized communities, and inadequate engagement with environmental constraints in sanitation policies.

Keywords: open defecation, sanitation, Bihar, SDG – 6

12. Achieving Sustainable Development Goals in water and sanitation sectors in India

S. K. Sarkar and Girija K. Bharat (2021)

Journal of Water, Sanitation and Hygiene for Development Vol 11 No 5, 693 doi: 10.2166/washdev.2021.002

Abstract: India, with over 1.37 billion population and housing one-sixth of the world's inhabitants, has a significant role to play in the achievement of the Sustainable Development Goals (SDGs). This paper analyses the policies and programmes of the Government of India, towards the achievement of Targets 6.1 and 6.2 of SDG-6 that focus on safe drinking water and sanitation. The alignment of the policies and programmes is discussed in correlation of the output, outcome, and impacts on these targets of SDG 6. The Swachh Bharat (Clean India) Mission (SBM) launched in 2014 led the country with more than 98% of households having access to toilets. The Jal Jeevan Mission has the ambitious target of universal coverage of drinking water supply. While these programmes have led to the overall development, a vast scope of improvement in these sectors exists especially considering the growing population, economic activity, urbanisation, and climate change impacts. Analysis also shows that adequate quantitative and qualitative data on the implementation of the various policies and programmes would be instrumental in synergising the implementation of the SDGs. A systems-thinking approach for sustaining the efforts of the ongoing programmes and ensuring equitable benefits of development in the water and sanitation sectors in India is recommended.

Keywords: HarGhar Jal, Jal Jeevan Mission, open defecation, SDG - 6, Swachh Bharat Mission, water and sanitation

13. India's achievement towards sustainable Development Goal 6 (Ensure availability and sustainable management of water and sanitation for all) in the 2030 Agenda

Sourav Biswas, Biswajit Dandapat, Asrafal Alam and Lakshminarayan Satpati (2022)

BMC Public Health 22, 2142 (2022) <https://doi.org/10.1186/s12889-022-14316-0>

Abstract: Clean water and sanitation are global public health issues. Safe drinking water and sanitation are essential, especially for children, to prevent acute and chronic illness death and sustain a healthy life. The UN General Assembly announced the 17 Sustainable Development Goals (SDGs) and 169 targets for the 2030 Agenda on 25 September 2015. SDG 6 is very important because it affects other SDG (1, 2,3,5,11,14 and 15). The present study deals with the national and state-wise analysis of the current status and to access deficiency of India's achievement towards SDG 6 (clean water and sanitation for all) for the 2030 agenda based on targets 6.1, 6.2,6.4,6.6 from 2012 to 2020. Data of different indicators of SDG 6 are collected from different secondary sources—NSS 69th (2012) and 76th (2018) round; CGWB annual report 2016–2017 and 2018-2019; NARSS (2019–2020); SBM-Grameen (2020). To understand overall

achievement towards SDG 6 in the 2030 agenda, the goal score (arithmetic mean of normalised value) has been calculated. According to NSS data, 88.7% of Indian households had enough drinking water from primary drinking water sources throughout the year, while 79.8% of households had access to toilet facilities in 2018. As per the 2019–2021 goal score for States and UTs in rural India based on SDG 6 indicator, SDG 6 achiever States and UTs (100%) are Sikkim, Himachal Pradesh, Andaman and Nicobar Islands. Drinking water and sanitation for all ensure a healthy life. It is a matter of concern for the government, policymakers, and people to improve the condition where the goal score and indicator value of SDG 6 are low.

Keywords: SDG 6, Public Health, Clean Water and Sanitation, Universal coverage, latrine, sanitation

14. Digitalized Welfare for Sustainable Energy Transitions: Examining the Policy Design Aspects of the Cooking Gas Cash Transfers in India.

Yerramsetti, S., Anand, M., & Ritz, A. (2022).

Sustainability, 14(16), 10117. <https://www.mdpi.com/2071-1050/14/16/10117>

Abstract: This article examines the extent to which digitalized welfare harmonizes the socio-economic goals of economic reform and low-carbon energy transitions in an emerging democratic context. It analyzes digitalized welfare's effectiveness in facilitating sustainable energy transitions through market mechanisms using a centralized approach to welfare delivery. Using narrative analysis, this article describes the shift to the direct benefits transfers regime from a regime of indirect subsidies for cooking gas in India. It describes the design aspects of various government programs through which target populations are socially constructed, as part of the policy of cooking gas cash transfers in India. Further, it analyzes the role of the practices of communicative governance and digitalization in calibrating the key policy characteristics to strengthen policy legitimacy. The insights from this article contribute to the emerging body of the theory and practice of digitalized welfare for sustainable energy transitions.

Keywords: SDGs- 6, 10, sustainable energy transitions; sustainable public administration; digitalized welfare; technopopulism; policy design; citizen–state interactions; constructivism; interpretivism; narrative analysis

15. Formulation of Water Sustainability Index for India as a performance gauge for realizing the United Nations Sustainable Development Goal 6

Jayanta Kumar Biswas, Bipradeep Mondal, Priya Priyadarshini, Purushothaman Chirakkuzhyil Abhilash, Soma Biswas, Amit Bhatnagar (2022)

Ambio 2022, 51:1569–1587 <https://doi.org/10.1007/s13280-021-01680-1>

Abstract: Anthropogenic activities targeting economic progress have triggered changes in the Earth system processes causing depletion of resources and degradation of ecosystems. Water is a critical natural resource which has been severely impacted through groundwater depletion, surface water contamination and ocean acidification resulting in repercussions on human health and biodiversity losses. Likewise, India, a mega biodiversity nation has been critically affected by

degradation and drawdown of water resources with far reaching consequences on environmental vitality and socio-economic development. In order to prevent extreme water scarcity in the near future, the country needs to promote sustainable utilisation of water resources by adhering to the targets of Goal 6 of the United Nations Sustainable Development Goals (UN-SDGs). The present work, therefore, has focussed on the development of a Water Sustainability Index (WSI) for India that would help attaining the targets of SDG 6. A total of 12 indicators categorized under biophysical and social development dimensions and synonymous with the targets of SDG 6 have been used for the formulation of WSI and thereby understanding how much water resources are used annually in a sustainable manner. The study also highlights the interrelationship between the diverse social development and health indicators (SDG 3) of Indian community. The research has the potential to provide guidance for efficient use of water resources in India. Acting as a yardstick and guiding star, the sustainability metric will help the nation to monitor whether it is on the right track and navigate its journey towards achieving water sustainability. It also calls for cautious course correction and restructuring of current Indian policy and operational instruments for effective green governance and sustainable water management.

Keywords: Biophysical indicators, Health indicators, Policy analysis, Social development indicators, SDG – 6, Water Sustainability Index

16. Analysis of the Targets and Progress toward Meeting the 2030 Sustainable Development Goal – 6 on Clean Water and Sanitation: Evidence from India

Romesh Sharma and Om Raj Katoch (2022)

South Asian Journal of Social Studies and Economics 15(3): 16-26, 2022; Article no. SAJSSE. 91202 ISSN: 2581-821X

Abstract: Sustainable Development Goals (SDGs) success has been a major challenge for governments of every nation over the past few years. In particular, this research focuses on the progress being made toward achieving SDG 6 which aims to make sure that every person has access to clean drinking water and sanitation. Access to safe drinking water and sanitation is perhaps the most squeezing challenge in the nation and is being tended to by the public authority on a fundamentally important premise. The core purpose of this paper was to evaluate the progress made to achieve the SDG 6 objectives in India and Indian states and UTs. Using SDG Index reports for 2018, 2019 and 2020, we assess the progress made in terms of SDG 6. The results showed that most states and UTs are in the front runner category and progress is being made. The paper raises various policy issues, including drafting water and sanitation regulations that benefit the poor and marginalized sectors of society, as well as states and areas that lack access. The importance of formal education, especially for rural women, cannot be overstated, which impacts their decisions about the type of bathroom to use and what water treatment alternatives are most applicable to their particular needs. Strong collaboration between non-state organizations and the government as well as involvement of local institutions such as PRIs in introducing reforms in the water and sanitation sectors are the ways to achieve targets under SDG 6.

Keywords: SDG - 6; progress; clean drinking water; sanitation; SDG index.

17. Meeting SDG6: Ensuring Safe Drinking Water for All in Rural India

Aviram Sharma (2023)

In: Brears, R.C. (eds) The Palgrave Encyclopedia of Urban and Regional Futures. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-87745-3_308

Abstract: United Nations Sustainable Development Goal (SDG) 6 aims to ensure availability and sustainable management of water and sanitation for all by 2030. Despite tremendous efforts and progress made in the water sector, globally, two billion people lack access to safe drinking water. Most of the population without proper access to safe drinking water is primarily from the Global South. India is one of the major countries, which is lagging in meeting the SDG 6 targets. Millions of Indians do not have yet access to safe drinking water. Compared to urban India, the population without access to safe drinking water is higher in rural India. Against this backdrop, the entry reviews the interventions and progress made in ensuring safe drinking water for all in rural India. In addition, the entry charts out the challenges for meeting SDG 6 in rural India.

Keywords: Clean water; Drinking water standards; Improved water sources; Rural areas; Safe drinking water; SDG 6; Water for all; Water quality

18. Urban Water Management Linked to WASH (SDG-6) of Greater Hyderabad City, India

Siba Prasad Mishra, Kumar Chandra Sethi and Kamal Kumar Barik (2023)

Asian Journal of Environment & Ecology Volume 22, Issue 3, Page 153-175, 2023

Abstract: The water planning of the Musi River sub-basin, a tributary of the river Krishna faces challenges of urban floods, drainage disposal, and irrigation deficiencies which must be addressed with the escalation of the demography of Hyderabad city. The river is of length 240km and lies in Telangana state of the basin area of about 11270 km² and is of urban origin and is the lifeline to Hyderabad City. The 21st-century status of the river is polluted and needs immediate rejuvenation. In the present case, the hydrologic model is structured using the Soil and Water Assessment Tool, ArcSWAT10.3.1, that builds up having an interface with ArcGIS 10.3.1, ERDAS IMAGINE to the DEM Data from Satellite origin (LISS-III RESOURCESAT-1), and SWAT Model to study the soil characteristics Musi Basin, Watershed delineation, HRU Analysis, slope delineation, and reclassification of the basin against Land use (LU). The bearing to the LU changes of the Musi and adjacent basins have been investigated during the years 2005-2006 and 2015-2016. The study has inferred that Sustainable Development Goal 6.1 (SDG) has been well attempted by the basin managers and administration but failed to achieve SDG (6-2) to have bearable portable quality drinking water, effective management of wastewater and ecosystems to protect the people of Hyderabad and its environment. The Water, sanitation and hygiene (WASH) for one million slum dwellers have been neglected. The model results infer that the sediment fluctuation is due to expansion and changes in the city, agricultural practices, and industrial establishments. Recommendations for effectively moderating floods, 100% sewage and septage disposals, and crop planning in the basin are discussed.

Keywords: SDG - 6, Hyderabad; heritage; HRU analysis; Musi River; swat model; ArcGIS

19. Inequality Among Social Groups in Accessing Improved Drinking Water and Sanitation in India: A District-Level Spatial Analysis

Pritam Ghosh, Moslem Hossein, Sanjit Sarkar (2023)

The Professional Geographer, Volume 75, 2023 - Issue 3,
<https://doi.org/10.1080/00330124.2022.2124181>

Abstract: Persisting wide inequality among various geographical spaces and social groups is a significant disincentive to India's healthy socioeconomic growth and human development. Therefore, arranging adequate safe drinking water and sanitation for all (United Nations Sustainable Development Goal [SDG] 6) and reducing inequality among social groups (United Nations SDG 10) by 2030 is a big challenge to one of the most populated and eco-socio-culturally diversified nations. We have tried to map the inequality among social groups and geographical space in accessing improved drinking water and sanitation (IDWS) facilities. Besides, we have classified Indian districts through the quadrant analysis technique, combining these two aspects of inequality (district-level geographical inequality and inequality between Scheduled Caste/Scheduled Tribe [SC/ST] and other groups). This might find inclusive, sustainable strategies, reducing inequality between social groups and geographical space. The study was carried out in about 46 percent to 60 percent of districts characterized by lower coverage of various IDWS facilities, with more SC/ST community deprivation in accessing these facilities. Despite having higher coverage of IDWS facilities, nearly 45 percent to 49 percent of districts showed a higher deprivation of SC/ST groups in this case. The study's findings demand more attention and investment to develop IDWS facilities among SC/ST groups and lower performing districts.

Keywords: SDG - 6, India, scheduled caste, schedule tribe, social inequality

20. Clean Water and Universal Sanitation in an Era of Sustainable Development: Understanding the Challenges and Prospects for SDG 6 in the Ganga River Basin

Sya Burynd Kedzior (2023)

In: Dutta, V., Ghosh, P. (eds) Sustainability: Science, Policy, and Practice in India. Sustainable Development Goals Series. Springer, Cham. https://doi.org/10.1007/978-3-031-50132-6_7

Abstract: In a recent progress report by the WHO and UNICEF (Progress on household drinking water, sanitation and hygiene, 2000–2020. <https://www.who.int/publications/i/item/9789240030848>, 2021), India was lauded for advancement toward SDG 6 and improvements in its provision of basic water and sanitation services for a burgeoning population. Indeed, the report cites improvement in rates of basic water services by 5 percentage points and in basic sanitation services by an impressive 15 percentage points over only the previous 5 years. Improved provision of basic sanitation, combined with aggressive social programs (Jain et al., *Int J Environ Res Public Health* 17(4):1384, 2020), has contributed to another sharp decline in open defecation rates from 29% to 15% over the same period. But these improvements begin to pale when examining far lower rates of access to safe and clean water supplies, piped water services, safe sanitation, and wastewater treatment across the country, along with often sizable gaps in access between social groups and subnational regions. What emerges from this report is an incredibly complex picture of significant, though hampered, progress and many questions about India's prospects for meaningful and substantive progress toward achieving SDG 6. Drawing on more than a decade of research on

water access and water quality in the Ganges River Basin, I explore these questions through an in-depth examination of changing conditions in India's largest watershed. Home to a population of more than 400 million people, along with significant centers of agricultural and industrial production, India's Ganges River Basin has long been the focus of government efforts to improve water and sanitation access while addressing related goals of improving water quality, sanitation, and ecosystem health. Most recent of these is the Namami Gange Programme, a conservation and pollution abatement effort that serves as one of the three flagship programs of the Union Government for achieving SDG 6, along with the national Swachh Bharat Abhiyan (Clean India Campaign) and the National Rural Drinking Water Programme. Together, these initiatives seek to develop the Ganga Basin as a model for water and sanitation management throughout the nation. By exploring the dynamics surrounding clean water and sanitation in this subregion, I highlight the challenges associated with providing sustainable access to water and sanitation across India and identify some of the potential pathways and prospects for achieving the aims of SDG 6.

Keywords: SDG – 6, Ganga River Basin, Namami Gange, Swachh Bharat Abhiyan

21. Sustainable development goals in India: with special focus on SDG 6 (Clean Water and Sanitation) and SDG 7 (Affordable and Clean Energy)

Kajal Bhati and Shalini Saxena (2024)

IRJHIS| Volume 5, Issue 4, April 2024|ISSN 2582-8568| <https://doi-ds.org/doiink/04.2024-81348258/IRJHIS2404021>

Abstract: The world's economies are working together to achieve sustainable development objectives. The pursuit of excellence and expansion has thrown off the ecological balance, destroyed many natural resources, and caused imbalances in the economic development of different nations. Global warming and temperature changes are two effects of this. Given that this poses a serious threat to human existence on Earth, it is imperative that action be taken to ensure safe environments for coming generations. The phrase "sustainable development" may have been coined to indicate that development occurs in a manner that preserves natural resources and passes them on unaltered to future generations. This paper attempts to comprehend how well India has implemented the sustainable development objectives, paying particular attention to SDGs 6 and 7 (AFFORDABLE AND CLEAN) and SDG 6 (CLEAN WATER AND SANITATION).

Keywords: SDGs 6 and 7, Ministry of Statistics and Programme Implementation, SDG INDIA INDEX

22. Disparities in access to water, sanitation, and hygiene (WASH) services and the status of SDG-6 implementation across districts and states in India

Sourav Biswas, Mihir Adhikary, Asrafal Alam, Nazrul Islam, Ranjan Roy (2024)

Heliyon Volume 10, Issue 18, e37646, September 30, 2024

Abstract: Access to affordable and improved Water, Sanitation, and Hygiene (WASH) facilities is essential for people's daily lives, and it is the primary goal of Sustainable Development Goal 6 (SDG-6). However, achieving this goal is a significant challenge for many countries, including India. The aim of this study is to assess the progress made towards achieving SDG-6 targets in

Indian districts, states, and Union Territories (UTs) and to identify clusters by measuring spatial inequality of WASH coverage in India. The primary objective of this study is to measure the progress made towards achieving the SDG-6 targets for WASH facilities in Indian districts, states, and UTs. To fulfill this objective, the study used the household data of the National Family Health Survey-5 (NFHS-5) conducted from 2019 to 21. The study used the household data of NFHS-5, which is a nationally representative survey that provides information on household and individual-level characteristics related to health and nutrition. The study identified the variables associated with WASH and created a composite index to measure WASH coverage separately and combined. The study used Gini coefficient to show WASH inequality, and Moran's statistics were used to show spatial dependency. The study found that the inequality of improved water coverage sources in Indian districts was high. Western and northeastern districts need to catch up in terms of achieving the SDG-6 targets. The value of the Gini coefficient (0.29) indicates that inequality in sanitation coverage is also high. All states have reached close to SDG-6 achievement in hygiene indicators. Goa, Sikkim, Andaman & Nicobar Islands, and Lakshadweep are close to the overall WASH coverage achievements of SDG-6. However, Jharkhand, Orissa, Tripura, Assam, and Rajasthan are behind in meeting the goal of SDG-6. The study suggests that more government initiatives and investments are needed to increase the availability, accessibility, and affordability of WASH facilities to improve WASH conditions in western and northeastern Indian districts. The localization or bottom-up approach by giving responsibility to rural and urban local bodies can also help enforce the achievement of SDG-6. The findings of this study can be used to guide policymakers in developing targeted interventions to improve WASH conditions and reduce inequality in India.

Keywords: SDG – 6, Drinking water, Sanitation, Hygiene, WASH, poverty, NFHS-5

23. Progress and determinants of household access to improved drinking water in India using a Water Access Index: insights from the National Family Health Survey towards achieving SDG 6.1

Sourav Biswas, Zeba Khanam, Asraful Alam, Lakshminarayan Satpati (2025)

BMJ Open 2025;15:e091269. doi: 10.1136/bmjopen-2024-091269

Abstract: Access to clean drinking water is essential for health and development. Despite global and national initiatives, many regions in India continue to face inadequate water access. This study assesses progress, sociodemographic determinants and geographic disparities in access to drinking water in India, aligning with Sustainable Development Goal (SDG) 6.1. This study used secondary data from five rounds of the National Family Health Survey (NFHS-1 to NFHS-5; 1992–2021), nationally representative surveys conducted across India. Logistic regression was employed to examine the association between household sociodemographic characteristics and access to improved drinking water. A Water Access Index (WAI) was constructed using Principal Component Analysis (PCA) based on four indicators: access to improved sources, on-premises availability, 5-minute round-trip access and household water treatment. The scores were normalised to a 0–100 scale. The study used household data from NFHS-1 (88 562 households), NFHS-2 (92 477), NFHS-3 (109 041), NFHS-4 (601 506) and NFHS-5 (636 699), covering all 36 states/union territories in India. There has been a notable improvement in access to improved sources, on-premises water and timely availability. Factors such as higher educational attainment, pucca housing and the absence of a below poverty line card were positively associated with better access. Based on WAI scores, 343 districts (49%) were categorised as front runners (65–99%),

142 districts (20%) as performers (50–64%) and 221 districts (31%) as aspirants (0–49%). Only one district (0.1%) achieved universal access. Many districts in West Bengal, Bihar, Odisha, Jharkhand and other states still exhibit low-to-moderate water access. While access to improved drinking water has advanced, regional and socioeconomic disparities remain stark. Targeted, multisectoral policies are essential to ensure equitable progress towards SDG 6.1 across all districts and population groups in India

Keywords: SDG - 6, National Family Health Survey, national level

24. Bridging the Gap: Community-Based Water Governance For Achieving SDG 6 In Rural India

N. Murugeswari (2025)

SELP Journal of Social Science, Volume XVI, Issue 61, April - June 2025

Abstract: Community-Based Water Governance (CBWG) has emerged as a transformative strategy in addressing rural water challenges in India, especially in ecologically sensitive and economically marginalized regions. As India strives to meet the targets under Sustainable Development Goal 6 (SDG 6) which emphasizes universal access to safe and sustainable water and sanitation CBWG offers a participatory, inclusive, and locally tailored solution to the persistent issues of water scarcity, infrastructure neglect, and inequitable access. Empowering communities to lead water management efforts is a critical step toward realizing SDG 6 in spirit and practice, while also contributing to broader goals such as poverty alleviation, gender equity, and sustainable livelihoods in rural India.

Keywords: Community-Based Water Governance, SDG - 6

SDG 7 Affordable and Clean Energy

1. India's sustainable development goals – Glide path for India's power sector

R Srikanth (2018)

Energy Policy, Volume 123, December 2018, Pages 325-336

Abstract: India has adopted the 2030 Agenda during the United Nations Summit held in September 2015. Energy is intimately connected with 74% of the 169 targets related to the 17 Sustainable Development Goals (SDGs) to be achieved by 2030. Subsequently, India has also submitted its Nationally Determined Contributions (NDCs) for the period 2021–2030 to the United Nations Framework Convention on Climate Change (UNFCCC). While the Government of India (GOI) has ambitious plans for enhancing the installed capacity of RE sources, 75% of its electricity is currently generated by coal-fired power plants. As India's electricity requirements grow to meet the aspirations of 1.3 Bi people, it needs a policy framework that integrates all low-carbon energy technologies with coal in such a manner that the reliability, security, and affordability of electric supply are balanced with sustainable development. India also needs to develop innovative strategies to clean up the country's coal sector while enhancing the integration of renewable energy into the National Power Grid. In this context, certain recommendations are proposed in this

article for timely implementation by GOI to facilitate the achievement of India's targets with respect to SDG 7 and the NDCs in an efficient and effective manner.

Keywords: Energy and environment, Renewable energy, Electricity policy, Power sector reforms, Low-carbon economy

2. Hybrid Renewable Energy Microgrid for a Residential Community: A Techno-Economic and Environmental Perspective in the Context of the SDG7

Kumar, Nallapaneni Manoj, Shauhrat S. Chopra, Aneesh A. Chand, Rajvikram Madurai Elavarasan, and G.M. Shafiullah. 2020.

Sustainability 2020, 12(10), 3944; <https://doi.org/10.3390/su12103944>

Abstract: Energy, being a prime enabler in achieving sustainable development goals (SDGs), should be affordable, reliable, sustainable, and modern. One of the SDGs (i.e., SDG7) suggests that it is necessary to ensure energy access for all. In developing countries like India, the progress toward SDG7 has somewhat stagnated. The aging conventional electric power system has its dominant share of energy from fossil fuels, plagued with frequent power outages, and leaves many un-electrified areas. These are not characteristics of a sustainable and modern system in the context of the SDG7. Promoting renewable-based energy systems, especially in the context of microgrids (MGs), is one of the promising advances needed to rejuvenate the progress toward the SDG7. In this context, a hybrid renewable energy microgrid (HREM) is proposed that gives assurance for energy access to all in an affordable, reliable, and sustainable way through modern energy systems. In this paper, a techno-economic and environmental modeling of the grid-independent HREM and its optimization for a remote community in South India are presented. A case of HREM with a proposed configuration of photovoltaic/wind turbine/diesel generator/battery energy storage system (PV/WT/DG/BESS) was modeled to meet the community residential electric load requirements. This investigation dealt with the optimum sizes of the different components used in the HREM. The results of this model presented numerous feasible solutions. Sensitivity analysis was conducted to identify the best solution from the four optimized results. From the results, it was established that a PV + DG + BESS based HREM was the most cost-effective configuration for the specific location. In addition, the obtained optimum solutions were mapped with the key criteria of the SDG7. This mapping also suggested that the PV + DG + BESS configuration falls within the context of the SDG7. Overall, it is understood that the proposed HREM would provide energy access to households that is affordable, reliable, sustainable, and modern.

Keywords: techno-economic modeling; environmental analysis; community microgrid; hybrid renewable energy microgrid; energy access to all; SDG - 7

3. A Holistic Review of the Present and Future Drivers of the Renewable Energy Mix in Maharashtra, State of India

Madurai Elavarasan, Rajvikram, Leponraj Selvamanohar, Kannadasan Raju, Raghavendra Rajan Vijayaraghavan, Ramkumar Subburaj, Mohammad Nurunnabi, Irfan Ahmad Khan, Syed Afridhis, Akshaya Hariharan, Rishi Pugazhendhi, Umashankar Subramaniam and Narottam Das (2020).

Abstract: A strong energy mix of Renewable Energy Sources (RESs) is needed for sustainable development in the electricity sector. India stands as one of the fastest developing countries in terms of RES production. In this framework, the main objective of this review is to critically scrutinize the Maharashtra state energy landscape to discover the gaps, barriers, and challenges therein and to provide recommendations and suggestions for attaining the RES target by 2022. This work begins with a discussion about the RES trends in various developing countries. Subsequently, it scrutinizes the installed capacity of India, reporting that Maharashtra state holds a considerable stake in the Indian energy mix. A further examination of the state energy mix is carried out by comparing the current and future targets of the state action plan. It is found that the installed capacity of RESs accounts for about 22% of the state energy mix. Moreover, the current installed capacity trend is markedly different from the goals set out in the action plan of the state. Notably, the installed capacity of solar energy is four times less than the target for 2020. Importantly, meeting the targeted RES capacity for 2022 presents a great challenge to the state. Considering this, an analysis of the state's strengths, barriers, and challenges is presented. Moreover, strong suggestions and recommendations are provided to clear the track to reach the desired destination. This can be useful for the government agencies, research community, private investors, policymakers, and stakeholders involved in building a sustainable energy system for the future.

Keywords: Maharashtra Energy System; energy mix; energy policy; Renewable Energy Sources; SDG - 7

4. A Comprehensive Review on Renewable Energy Development, Challenges, and Policies of Leading Indian States with an International Perspective

Rajvikram Madurai Elavarasan; G.M. Shafiullah; Sanjeevikumar Padmanaban; Nallapaneni Manoj Kumar; Annapurna Annam; Ajayragavan Manavalanagar Vetrichelvan (2020)

IEEE Access, vol. 8, pp. 74432-74457, 2020, doi: 10.1109/ACCESS.2020.2988011

Abstract: Clean and environment-friendly energy harvesting is of prime interest today as it is one of the key enablers in achieving the Sustainable Development Goals (SDGs) as well as accelerates social progress and enhances living standards. India, the second-most populous nation with a population of 1.353 billion, is one of the largest consumers of fossil fuels in the world which is responsible for global warming. An ever-increasing population is projected until 2050, and consequently, the energy demand in the upcoming decades will be co-accelerated by the rapid industrial growth. The Ministry of New and Renewable Energy (MNRE) with the support of National Institution for Transforming India (NITI) Aayog is working to achieve the Indian Government's target of attaining 175 GW through renewable energy resources. Many Indian states are currently increasing their renewable energy capacity in an objective to meet future energy demand. The review paper discusses in-depth about the three Indian states namely Karnataka, Gujarat, Tamil Nadu which pioneers the renewable energy production in India. The global energy scenario was discussed in detail with Indian contrast. Further, the barriers to the development of renewable energy generation and policies of the Indian government are discussed in detail to promote renewable energy generation throughout India as well as globally since the challenges are similar for other nations. This study analyzed various prospects of the country in renewable energy which

has been done in a purpose to help the scholars, researchers, and policymakers of the nation, as it gives an insight into the present renewable energy scenario of the country.

Keywords: Renewable energy sources, Production, Global warming, Fossil fuels, Meteorology, Electric potential, Sociology, Renewable energy potential, global energy scenario, renewable energy barriers, prospects of renewables in India, SDG - 7

5. Advancing energy poverty measurement for SDG7

Shonali Pachauri and Narasimha D Rao (2020)

Progress in Energy 2 043001 <https://doi.org/10.1088/2516-1083/aba890>

Abstract: Existing indicators used to track progress towards achieving target 7.1 of the sustainable development goals (SDGs) narrowly interpret energy poverty as a lack of connections. Recently proposed measurement frameworks are multidimensional, but complex and conceptually muddled. We propose an alternative framework that simplifies and distinguishes two conceptually distinct aspects of energy access — energy supply conditions and the status of household energy poverty. This approach, with refinements through further applications to real data, can improve the design and targeting of policies to both service providers and vulnerable groups to accelerate affordable and reliable energy service provision.

Keywords: SDG – 7, energy access, energy supply conditions

6. Energy Supply Using Nexus Approach for Attaining Sustainable Development Goal 7

Pramod Kumar Painuly, Ruchi Tyagi, Suresh Vishwakarma, Sunil Kumar Khare and Manouchehr Haghighi (2020)

W. Leal Filho et al. (eds.), Affordable and Clean Energy, Encyclopedia of the UN Sustainable Development Goals, https://doi.org/10.1007/978-3-319-71057-0_84-1 Springer Nature Switzerland AG 2020

Abstract: The renewable energy map analysis shows that energy-related emissions would need to decline by 25% by 2030 and by 70% by 2050. In the IEA's Sustainable Development Scenario, in which cost-effective energy efficiency potentials are maximized, the annual rate of intensity improvement between 2017 and 2030 reaches 3.6% against the target of 2.6% for 2016–2030. This highlights that it is still possible to meet SDG target 7.3 by strengthening mandatory energy efficiency policies, providing targeted fiscal or financial incentives, leveraging market-based mechanisms, and disseminating high-quality information about energy efficiency. In addition to wide-sweeping societal and market change, the transformation requires adjusting the traditional way energy is consumed and shifting toward a more decentralized energy system, which would require new infrastructure investments, further development of innovative technologies, new business models, and new energy market designs. The transition touches on topics beyond energy and enshrined in the wider aims of the Sustainable Development Goals, particularly as these relate to ensuring universal access to modern energy services, the water-energy nexus, and potential geopolitical implications of the transition.

Keywords: SDG – 7, Access, nexus

7. A critical review of literature on the nexus between central grid and off-grid solutions for expanding access to electricity in Sub-Saharan Africa and South Asia

Bhattacharyya, S.C. and Palit, D. (2021),

Renewable & Sustainable Energy Reviews, Volume 141, May 2021, 110792

<https://doi.org/10.1016/j.rser.2021.110792>

Abstract: This paper critically examines the literature on the grid-offgrid debate and discusses the role of and the relationship between different electricity access options through a synthesis and critical reflection. This paper finds that models using greater resolution and capturing low voltage distribution infrastructure appear to recommend decentralised electricity solutions, whereas central grid extension emerges as the preferred outcome of more aggregated analysis, concentrated population clusters and for higher demand scenarios. However, model results are seriously influenced by assumptions, data limitations, technology choice options, and model flexibility. Exclusion of cost of generation for grid systems, lack of village level information, inherent bias towards scale and type of technology, and absence of social equity considerations in the analysis remain major weaknesses of the existing models. Universal electrification requires a strong leadership and an enabling environment. An appropriate organizational set-up, a robust regulatory framework with reporting and evaluation oversight and a more inclusive approach to promote alternative options are vital ingredients. Power sector decarbonization pathways may affect electrification choices but our understanding is limited or lacking. Further work is required to develop a programmatic approach to delivery and more affordable and fairer outcome for all.

Keywords: SDG – 7, off-grid solutions, central grid, Sub-Saharan Africa, South Asia

8. Analysis of the Targets and Progress toward Meeting the 2030 Agenda for SDG 7 on Affordable and Clean Energy: Evidence from India

Om Raj Katoch, Shallu Sehgal, Romesh Sharma and Ashraz Nawaz (2022)

Journal of Energy Research and Reviews 12(4): 92-102, 2022

Abstract: The success of the SDGs has been a major challenge for governments around the world in recent years. This research focuses specifically on progress toward SDG 7, which aims to ensure that everyone has access to affordable and clean energy. The primary goal of this paper was to assess progress toward SDG 7 objectives in India and Indian states and UTs. Using SDG Index reports for 2018, 2019 and 2020, we assess the progress made in terms of SDG 7. The findings revealed that for SDG 7, the SDG Index Score ranges between 50 and 100 for States and 71 to 100 for UTs. There are fifteen states and five UTs in the class of Achievers (with an Index score of 100) and twelve states and three UTs in the class of Front Runners (with an Index score ranges between 65 and 99). The paper raises various policy issues, including drafting of regulations that benefit the poor and marginalized sections of the society, as well as states and areas that lack access. The importance of formal education, especially for rural women, cannot be overstated, which impacts their decisions about the type of fuel used for cooking. Through strong collaboration between non - state organizations and the government in rural communities within the country, the SDG 7 goals can be achieved through effective planning and delivery of reforms, thereby reducing the harmful effects of the lack of access to clean and affordable energy. It will be crucial in the long run for effective participation of local institutions (PRIs) to carry out reforms in

the energy sectors to have adequate budgetary allocations for providing access to affordable energy services.

Keywords: progress; affordable and clean energy; SDG 7

9. Towards convergence of central grid and decentralised electricity solutions – Assessment of Indian rural electrification cases using a socio-technical framework

Palit D. and Kumar A. (2022)

Energy for Sustainable Development 71: 27-53; DoI: <https://doi.org/10.1016/j.esd.2022.08.026>

Abstract: The paper examines the dynamics of rural electrification in India and explores the transition to a complementary convergence of decentralised and centralised electricity systems for sustainable rural electricity services. A novel socio-technical framework of analysis for assessment of cases of rural electricity systems is developed and applied in Indian villages to explore the interplays of different elements of rural electricity systems, enabling and hindering factors, and actors and institutions that affect the governance and sustenance of rural electrification. A mixed research method, along with document analysis, was applied to study the socio-technical perspectives, using 21 indicators representing nine different interplays of elements of rural electricity systems. The analysis reveals there is a significant effect of governance on technology performance, which in turn affects customer practices. There is also a significant correlation between customer practices and governance. Policy enablers along with strong institutions and actors - both at the subnational and local level - are key drivers to effective governance. Furthermore, irrespective of centralised or decentralised technology, adequacy and reliability of electricity supply and effective customer service delivery at the local level are important i.e., both supply reliability and quality, and customer service quality are equally important. The findings have clear policy implications for the governance of the electricity sector in India.

Keywords: SDG – 7, central grid, electricity governance

10. India, Germany and Europe: A Spatial Perspective at SDG 7 on Affordable and Clean Energy

André Müller, Antonia Milbert, Volker Schmidt-Seiwert, Regine Binot, Lukas Kiel, Debolina Kundu, Tania Debnath, Swastika Chakravorty, Gautam Kumar Das (2023)

BBSR-Analysen KOMPAKT 01/2023

Abstract: Responding to crucial challenges in spatial and urban development, the United Nations agreed upon the 2030 Agenda, the Sustainable Development Goals (SDGs) and the New Urban Agenda. This publication checks the progress made in implementing the SDGs against the New Urban Agenda and vice versa. In order to understand the spatial patterns, a national and supranational spatial perspective is taken on some of the SDGs. Given the relevance of affordable and clean energy for balanced urban and rural societies, SDG 7 covers, amongst others:

- Renewable energy access and share
- Energy intensity
- Installed renewable energy

Keywords: SDG -7, Urban, 2030 agenda

11. India's Journey Toward Cleaner and Affordable Energy for Achieving SDG 7: Progress and Prospects

Anurag Piyamrao Wasnik (2023)

In: Dutta, V., Ghosh, P. (eds) Sustainability: Science, Policy, and Practice in India. Sustainable Development Goals Series. Springer, Cham. https://doi.org/10.1007/978-3-031-50132-6_8

Abstract: Sustainable Development Goals (SDGs) are 17 intertwined international sets of goals introduced by the UN in 2015. SDG 7, which talks about affordable and clean energy, is essential for sustainable human development and for powering economic growth. It is a prerequisite for achieving other SDGs, including health, education, gender equality, and poverty eradication. Hence, this research chapter strives to understand the progress made by India in achieving SDG 7 goals and recognize the opportunities from a national and subnational point of view. India is no exception to the clean energy transition, which has become a global phenomenon, and this study shows how India has used the international SDG principles and has applied them in its local context. Despite the significant challenges India has faced in bringing shared responsibility to its population, it has embraced a sustainable energy future and clean technologies and remains the only G-20 nation on track to meet the 2 °C global warming targets. This chapter is developed by qualitative methods drawn out by resourcing secondary research tools. The study has been segregated into different areas, intending to cover government policies, corporate efforts, and international collaborative efforts toward achieving SDG 7. The chapter highlights critical policy initiatives such as Pradhan Mantri Sahaj Bijli Har Ghar Yojana and Pradhan Mantri Ujjwala Yojana and initiatives undertaken to strengthen the EV ecosystem in the country. Similarly, the research helps one understand India's present and future paths of energy mix and energy efficiency. The study, through SWOT analysis, intends to examine inevitable challenges restricting the efforts and potential institutive actions to overcome or avoid them. The consolidated information illustrated in this chapter will benefit current researchers and motivate future investigators to take up SDG 7 in India as part of their proposed research.

Keywords: SDG – 7, SWOT, Pradhan Mantri Sahaj Bijli Har Ghar Yojana, Pradhan Mantri Ujjwala Yojana

12. FCEV vs. BEV — A short overview on identifying the key contributors to affordable & clean energy (SDG-7)

S. Vengatesan, Arunkumar Jayakumar, Kishor Kumar Sadasivuni (2024)

Energy Strategy Reviews Volume 53, May 2024, 101380

Abstract: Battery electric vehicles (BEVs) are surging worldwide due to technology improvements in lithium-based batteries and rising petroleum prices. India's EV30 30 campaign aggressively penetrate the Electric vehicle and target share by 30% in 2030. Sarcastically, from the Indian context, the availability of Li-source is limited and subsequently, there has been an impetus to find out a promising electric vehicle (EV). Fuel cell-based EVs are one such potential option. The present review critically assesses the scope and perspective of battery electric vehicles (BEVs) with fuel cell electric vehicles (FCEVs) in line with the Indian context. The assessment validates that fuel cell-based EVs can be a likely option for the Indian sub-continent. As a whole, FCEV technology will advance, and over time, smaller and mid-segment commercial vehicles will eventually be more affordable in addition to being sustainable, especially when using green

hydrogen as a fuel. The total cost of ownership (TOC) of FCEV is better than BEV for the period of twelve years and also supports the future of FCEV in the Indian context (Sontakke et al. 2024).

Keywords: SDG – 7, Fuel cell electric vehicle, Battery electric vehicle, Socio-economic aspect, Infrastructure, Range

13. Targeting SDG7: Identifying heterogeneous energy dilemmas for socially disadvantaged groups in India using machine learning

Jiajia Li, Shiyu Yang, Jun Li, Houjian L (2024)

Energy Economics, Volume 138, October 2024, 107854

Abstract: To achieve Sustainable Development Goal (SDG) 7, prioritizing the socially disadvantaged segments of the population is imperative, given their inherent susceptibility to heightened risks of energy exclusion. However, a comprehensive understanding of the diverse energy challenges faced by households with socio-economic disparities remains elusive. This article thus addresses this gap by examining three widely acknowledged categories of marginalized households in India: racial inferiority, income poverty, and gender inequality. It notably pioneers the quantification of an umbrella pattern of energy deprivation within the SDG7 framework, encompassing energy unaffordability, energy unreliability, energy inaccessibility, and energy inequality. To do so, leveraging the latest household survey dataset and employing least squares estimates, we preliminarily capture that these three disadvantaged groups encounter significant energy barriers in the pursuit of SDG7 achievement. Given respectively selected models based on Least Absolute Shrinkage and Selection Operator (LASSO) approach, the gradient boosting model (GBM), another state-of-the-art machine learning technique, is subsequently adopted to verify feature significance and rank its importance in determining diverse energy deprivation faced by each group. The results reveal that the disadvantaged caste groups and those experiencing greater gender inequality encounter the greatest impediments to their right to reliable energy access. In comparison, energy unaffordability poses a paramount challenge for low-income households. These findings enable policymakers to design straightforward interventions that address a spectrum of socio-economic disparities, thereby fostering a just energy transition grounded in data-driven evidence.

Keywords: SDG – 7, gradient boosting model, Least Absolute Shrinkage and Selection Operator (LASSO)

14. Multi-Criteria Decision Analysis-Based Solutions for the Installation of Photovoltaic (PV) Solar Power Plants in an Energy Deficit State of India: An Effort Toward SDG-7 (Affordable and Sustainable Energy)

Debanu Ghosh, Suman Sinha, Tarun Pratap Singh, Alexandre S. Gagnon, Dharmaveer Singh (2024)

Transactions in GIS Volume28, Issue 7, November 2024, Pages 2545-2556,
<https://doi.org/10.1111/tgis.13251>

Abstract: Sustainable Development Goal-7 (SDG-7) of the United Nations promotes the use of renewable and affordable energy. Solar energy holds significant promise as an effective and affordable renewable source in tropical countries. GIS-based Multi-Criteria Decision Analysis

(MCDA) approach has been applied to evaluate land suitability for installing ground-mounted and grid-connected solar photovoltaic power plants in Purulia district of West Bengal (India) to satisfy the growing demand of energy in an eco-friendly manner. The study reveals that variation in Global Horizontal Irradiance (GHI) is the most relevant parameter for installing solar PV power plants in the district among the 13 physical parameters, followed by the aspect, slope, and proximity to the grid. The site-suitable map created using the weights of these factors has revealed that about 33.4% of the district's total land area is ideal for installing solar PV power plants, with most of these areas being in the western and central regions.

Keywords: SDG – 7, Purulia, West Bengal, PV Solar

15. Achieving Targets of SDG 7 in Post-COVID-19: Critical Review of Recent Indian Energy Policies

Sanjukta Niyogi and Soumyananada Dinda (2024)

In Chatterjee, T. (Ed.) International Trade, Economic Crisis and the Sustainable Development Goals, Emerald Publishing Limited, Leeds, pp. 149-160. <https://doi.org/10.1108/978-1-83753-586-620241010>

Abstract- Clean energy is the most demanding issue for sustainable development, especially in post-COVID-19 scenario. The Government of India (GOI) has adopted various reform policies in the energy sector focusing on Sustainable Development Goal 7 (SDG 7). India has taken initiative on SDG 7 to ensure access to sustainable energy for all. The core interest area of this paper is to analyse recent energy reform policies in energy sectors covering power generation, transmission, distribution and consumption and discusses mechanism SDG target achievement within 2030 in India. In the COVID-19 pandemic scenario, every country faces a major issue of energy security since the undisrupted energy security is related to energy demand. In the time period of pandemic, industrial energy demand goes down rapidly all over the world, especially in India. Though in the eve of festive season in India the difference between the energy supply and demand slightly overcomes. In the year 2003, GOI through Electricity Act opened electricity market for private participation to increase efficiencies. In the COVID-19 pandemic scenario, every country faces a major issue of energy security since the undisrupted energy security is related to energy demand. Further, the Ministry of Power has taken several policies such as National Electrification Policy in 2005, National Tariff Policy, Rural Electrification Policy in 2009 and Integrated Energy Policy. This policy brief paper highlights the progress of clean energy in India and provides their future trajectory towards achieving SDG targets, especially in the period of COVID-19 pandemic.

Keywords: SDG -7, COVID-19, Energy policy, Reform, Electricity Act, Clean Energy, P18, Q01, Q28, Q48

SDG 8 Decent Work and Economic Growth

1. SDG 8: Decent work and economic growth – A gendered analysis

Shirin M. Rai, Benjamin D. Brown, Kanchana N. Ruwanpura (2019)

World Development, Volume 113, January 2019, Pages 368-380

Abstract: SDG 8 calls for promoting ‘sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all’. Even as it highlights the importance of labour rights for all, it also makes visible some significant tensions. We note, for example, that despite many critiques of narrow economic measures of growth, the focus here remains on GDP and per capita growth. This is problematic, we argue, because the GDP productive boundary excludes much of social reproductive work. This puts SDG8 in tension with SDG 5 which calls for the recognition of the value of unpaid care and domestic work. There has been a significant increase in the rate of working women in the formal and informal sector. However, there has not been a subsequent gender shift in the doing of social reproductive work. In this paper we argue SDG 8’s focus on decent work and economic growth is inadequate; that productive employment and decent work for all men and women by 2030 needs to take into account the value and costs of social reproduction. We trace key historical debates on work to argue that both gender and labour rights have to underpin SDG 8 if its promise of inclusive, sustainable and decent work is to be realized.

Keywords: Decent work, SDG – 8, Informal labour, Social reproduction, Degrowth, Depletion

2. A study of corporate social responsibility practices of the top Bombay Stock Exchange 500 companies in India and their alignment with the Sustainable Development Goals

Anushree Poddar, Sapna A. Narula, Ambika Zutshi (2019)

Corporate Social Responsibility and Environmental Management, Volume26, Issue 6, November/December 2019, Pages 1184-1205

Abstract: This paper highlights the organic link that exists between the corporate social responsibility (CSR) activities undertaken by the Indian corporate sector and their alignment with the Sustainable Development Goals (SDGs) from 2014–2016; the period after mandatory CSR came into existence as per Indian Companies Act. In this study, we identify critical areas pertaining to SDG goals neglected by corporate sector as far as CSR investments are concerned. We find that more CSR investments must be drawn towards climate change, biodiversity, Sustainable consumption and production, marine life and conserving flora and fauna. The sectoral analysis reveals that the companies falling under sectors that have a higher environmental footprint and impact are more concerned about taking up initiatives through CSR. The geographic analysis revealed that efforts need to be made to increase CSR expenditure in seven north-eastern states, Jammu and Kashmir, and Union Territories. This paper recommends that the system needs to be further reviewed in light of the current observations.

Keywords: SDG – 8, CSR, Bombay Stock Exchange

3. Assessment of The Sustainable Economic Development Goal 8: Decent Work And Economic Growth in G20 Countries

Indrė Lapinskaitė and Silvija Vidžiūnaitė (2020)

ECONOMICS AND CULTURE 17(1), 2020 DOI: 10.2478/jec-2020-0011

Abstract: The importance of sustainable development, the need to achieve sustainable economic development that does not harm the environment, conserve natural resources or exacerbate

tensions in society has been increasingly discussed over the last decade. The purpose of the research is to evaluate the economic growth and decent work environment in G20 countries during 2013–2018 as G20 countries are the fastest growing countries in the world, and their economy describes the major part of the global economy. Qualitative data analysis based on the comparative analysis of scientific literature, content analysis, interpretation, comparison and grouping is used, in order to analyse the theoretical aspects of sustainable development and its goals, especially goal 8: decent work and economic growth. TOPSIS method helps to rank G20 countries according to the indicators of SDG 8. The results showed that Japan reached the best work environment and the most significant economic growth during 2013–2018. The United States is in second place and the third – the Republic of Korea. In the bottom three are Argentina, Brazil and South Africa. Since it is challenging to identify the achievements of the economic and work environment development, as an essential part of sustainable development goals, the results could lead to future insights that will create value to policymakers, economists and other stakeholders.

Keywords: SDG - 8; Economic Development; Economy; G20.

4. Sustainable Development Goal 8: Achieving Decent Work – An Illusion

Prabir Kumar Bandyopadhyay (2020)

Springer Nature Switzerland AG 2020 D. Crowther, S. Seifi (eds.), The Palgrave Handbook of Corporate Social Responsibility, https://doi.org/10.1007/978-3-030-22438-7_87-1

Abstract: Sustainable Development Goal (SDG) has evolved from Millennium Development Goal (MDG). It is therefore logical to discuss on MDG from the perspectives of its achievement and short comings, which can explain the rationale for adoption of SDG. World political leaders, scientists, and philosophers came to a consensus on different goals and targets for ending poverty worldwide as a developmental goal in 2000, and these goals and targets are institutionalized in the UN Millennium Declaration and become the MDGs. Prior to the declaration of MDGs, poverty reduction was the main agenda of UN, but it was thought to be combated by strategies focused toward economic liberalization, infrastructure development, and institutional and governance reform. This approach was criticized by academicians and civil society advocates on the ground that it neglects the poverty and human dimensions (Fukuda-Parr and Hulme 2011). Growth in GDP is not a prerequisite for human development. Recent example of achieving improvement in human dimensions without improving much in GDP growth by Bangladesh is a case in point. MDG consists of 8 goals having 18 targets. The UN later developed for better monitoring of progress 48 indicators. All these are integral part of the main objective of eradication of extreme poverty and dehumanizing conditions. MDG recognizes the multidimensional nature of poverty.

Keywords: SDG – 8, Decent work, UBI, Profit sharing, MDG

5. Incorporating SDG 8 for Decent Work Practices: A study of MNC Subsidiaries in India,

Khaliq, Fehmina; Madan, Poornima; Puri, Geetika; and Parimoo, Daleep (2021)

Australasian Accounting, Business and Finance Journal, 15(5), 2021, 83-98. doi: 10.14453/aabfj.v15i5.7

Abstract: The objective of Sustainable Development Goal (SDG 8) in the 2030 Agenda for Sustainable development is to attain economic prosperity through Decent Work across the member nations of the United Nations. In order to achieve this goal in the next 10 years it is the responsibility of the Governments across the globe to work for its attainment by leveraging through its business houses and corporates at large. The target for decent work for all includes equal opportunities and equal pay for all that leads to economic development. India has already started working on the target by implementing various schemes attached to SDG 8 and to supplement it through organisations across the country that are including these SDG targets into their strategic goals and mission and vision statements up to a large extent. The current study delves into the role of Multi-National corporations (MNCs) operating out of India in incorporating workforce diversity, equal opportunity and inclusive growth of its employees by providing a decent work environment. The study focuses on 9 MNCs having headquarters in the United States of America and Europe and operating as subsidiaries in Delhi, NCR. The data was collected through secondary sources like websites, HR manuals and Annual reports. The data was qualitatively analysed and presented in the form of small cases for each MNC. These business conglomerates operate through best practices and policies. These practices are disseminated through Human Resource department that acts as a backbone for the MNCs. The study reveals that workforce diversity is prevalent in these MNCs and equal opportunity is also practiced. The implications of the current study are that other private and public enterprises or start-ups can take learning from these MNCs that form a benchmark for implementing workforce diversity in their operations. This will lead to achieving not only business goals but also help in building a better economy for the country.

Keywords: MNCs, SDG - 8, Decent Work, Workforce diversity

6. Economic growth through Sustainable Development Goal - 8 decent work and economic growth in India

Akanksha Taunk and Vijay Nimbalkar (2021)

NeuroQuantology December 2021, Volume 19, Issue 12, Page 604-615,
doi: 10.48047/nq.2021.19.12.NQ21260

Abstract: Economic progress should be a positive development for the entire world. We must make sure that economic development creates respectable and gratifying occupations in order to prevent environmental damage. The abolition of modern slavery and child labour is necessary, as is the protection of workers' rights. We can make sure that everyone benefits from innovation and entrepreneurship if we support the development of jobs by enhancing access to banking and financial services. In this article, the economic development of India is the main topic, and equitable employment is the goal of sustainable development. This paper focuses on inclusive and sustainable economic growth since it is essential to achieving this goal that everyone has access to employment and quality, respectable labour. In an effort to increase living standards by creating excellent jobs for everyone, the economy is growing gradually and broadly. Due to the appalling working conditions in the nation, India, needs excellent jobs. In India, there are four ways to conduct decent labour that will help you achieve long-term goals. Every employer ought to be able to expect a fair income, job stability, social support for their families, and social inclusion. India's progress towards this long-term goal of sustainable growth will be evaluated with the help of this study. India has already started a variety of initiatives to improve employment possibilities for the

country's expanding population dividend, including Make in India, Start-up India, the Skill Development Programme in India, and Digital India.

Keywords: Decent work, Economic growth, SDG - 8, Skill Development, Social inclusion

7. SDG 8: Decent Work and Economic Growth

Xu, Zhun;Chakraborty, Shouvik (2021)

WORKING PAPER SERIES Number 539, POLITICAL ECONOMY RESEARCH INSTITUTE, UMASS-Amherst

Abstract: This chapter reviews the concepts of economic growth and decent work in a historical context. Capitalism created the condition for economic growth that we know in the last two centuries. The struggle for decent work has also originated in capitalism, and the working class has made great progress since the late 19th century. The Golden Age was a unique period when many countries have succeeded in pursuing both economic growth and decent work. But the later rise of neoliberalism has damaged those achievements, and we are living in a period of global stagnation and increasing inequality. Considering the urgency of climate change and global warming, any new proposal of economic growth needs to be based on green economy/clean energy. It also needs to consider the global labor division, environmental justice, and the quality of work.

Keywords: SDG – 8, green economy, global labor division

8. SDG implementation A policy analysis of internal migration in India

Rohini Mitra, Priyansha Singh (2021)

In Sustainable Development Goals and Migration Edited ByP. Sivakumar, S. Irudaya Rajan (2021) London, Routledge India DOI <https://doi.org/10.4324/9780429346866> Pages 244, eBook ISBN 9780429346866

Abstract: In recent times, there is an increasing recognition of how migration and mobility are key aspects of contemporary life, and this is reflected in the Sustainable Development Goals (SDGs) 2030 of the United Nations Development Programme. The SDGs address issues around migration extensively, with 11 out of 17 goals involving migration directly and indirectly. However, this discourse revolves largely around international migration, with no explicit focus on internal migration. Indians form one of the largest diasporas worldwide and are also tremendously mobile within the country, with the Census of 2011 estimating a staggering 139 million internal migrants. In this chapter, we examine the SDG framework pertaining to internal migration in India by analysing policy frameworks of three major internal migrant receiving states – Punjab, Maharashtra and Kerala– all three of which also exist under differing political frameworks under different parties. Using the Interstate Migrant Policy Index (IMPEX) analysis developed by India Migration Now (based on MPG's MIPEX), the policy performance of these states with regard to internal migrants and the SDGs is assessed. Based on the IMPEX analysis, we then argue for the need for more coordination between policymaking at the central and state levels such that states may learn from the best practices prevalent elsewhere.

Keywords: SDG – 8, migrant, Interstate Migrant Policy Index (IMPEX)

9. Sustainable Development Goal-8 for Stock Exchanges: An Evidence-Based Performance Analysis of Indian SME Stock Indices

Kishan, Egurla; Kiran, V Usha. (2022)

IUP Journal of Accounting Research & Audit Practices; Hyderabad Vol. 21, Iss. 4, (Oct 2022): 50-86.

Abstract: Sustainable development has become a global agenda with the initiation of Sustainable Development Goals (SDGs) by the United Nations. The UN Sustainable Stock Exchange (SSE) Initiative has set SDGs for stock exchanges. The paper focuses on SDG-8 (target:8.3), SMEs and Sustainable Development. It analyzes the performance of Indian SME stock indices and estimates the long-term relationship with Indian benchmark stock indices. For the analysis, the daily stock returns of S&P BSE SME IPO, Nifty SME Emerge, S&P BSE SENSEX and Nifty 50 indices have been considered from 2015 to 2021. ADF test, GARCH model, Johansen cointegration and VECM have been applied. The findings indicate that a majority of stock exchanges of UN SSE have adopted SME listing initiative; the SME indices generate better returns with slightly high volatility than the benchmark indices; the SME indices have cointegrated with benchmark indices; and the Nifty SME Emerge index has established a long-term relationship with both benchmark indices, i.e., S&P BSE SENSEX and Nifty 50. The findings also reveal that the S&P BSE SENSEX, Nifty 50 and Nifty SME Emerge price movements show significant long-term equilibrium convergence from short-term disturbances.

Keywords: SDG-8, UN Sustainable Stock Exchange, SMEs

10. India's Performance in the Achievement of SDG – 8: An Inquest with Special Reference to Employment Generation and Labour Force Participation

Biswajit Paul (2022)

In Sustainable Strategies for Economic Growth and Decent Work: New Normal Edited by Ashish Kumar Sana, Bappaditya Biswas, Samyabrata Das, Sandeep Poddar Published by Lincoln University College, Malaysia (e-ISBN:- 978-967-2819-05-9) in collaboration with Lincoln Research and Publications Limited, Australia (ISBN:- 978-0-6488798-8-6), Doi:- 10.31674/book.2022.sseg

Abstract: In the last five years, since the adoption of the SDGs, India has been trying to improve in all aspects according to the set targets. Significant progress has already been made in India in recent years. India has taken several SDG initiatives in recent times. Most of the initiatives of the Government of India (GoI) are aligned with the SDG framework to steer development activities. At present, we have 17 UN Sustainable Development Goals (SDGs), and the specific targets for each goal are there. SDG – 8 for economic growth and decent work is one of them. The research question is how far India has achieved the targets of SDG–8 because this goal is directly related to economic growth. In this context, the paper attempts to analyse the performance of India in the achievement of SDG–8, presenting the trends of employment generation and labour force participation rate. These two indicators are analysed in this study with the help of the International Labour Organisation (ILO) database. It is possible to conclude from this analysis that the improvement in India's employment rate and labour force participation rate over the last decade has been insufficient.

Keywords: SDG-8; Economic Growth; Employment Generation; Labour Force Participation Rate

11. Impact of Russia-Ukraine War on sustainable development goals : a study through Indian financial market perspective

Smriti Pathak, Jalpa Thakkar, Arpita Gurbaxani, Shreya Virani, Prerak Thakkar (2023)

International Journal of Energy Economics and Policy 13 (1), S. 389 - 394.

<https://econjournals.com/index.php/ijeep/article/download/13895/7147/32097>

doi:10.32479/ijeep.13895.

Abstract: This study measures impact of geopolitical crisis concerning Russia Ukraine War with reference to Sustainable development Goal 8. The researchers have analyzed the variables such as Indian stock market performance, MCX crude oil and Indian GDP Indices to calculate the linear interdependencies among crude oil, Indian stock market performance and Gross Domestic Product using monthly data from January 2016 to May 2022 using a Vector Autoregressive (VAR) model. Time series stationarity is checked using Augmented Dickey-Fuller test. The time series used for the analysis are MCX iCOMDEX crude oil Index, Nifty 50 Index, and GDP Index. Correlation is measured using the Granger Causality Test and VAR model. The outcome demonstrates that the lagged values of the Nifty and crude oil prices indexes are very effectively used to explain the GDP Index. Granger's Causation Matrix shows that past value of NIFTY Index causes change in GDP Index similarly past value of Nifty Index causes change in MCX Crude oil Index, whereas MCX crude oil does not cause much change in GDP Index. Further research could be done using a detailed time series for a longer period to find any impact of crude oil prices on GDP.

Keywords: MCX Crude Oil Index, Nifty Index, GDP Index, Vector Auto regression, SDG - 8

12. Decent work and economic growth (SDG 8)

Jennifer Liston, Tandeep Kaur, Ann Devitt (2024)

In Teaching the Sustainable Development Goals to Young Citizens (10-16 years)

A Focus on Teaching Hope, Respect, Empathy and Advocacy in Schools Edited by Anne M. Dolan. London, Routledge, DOI <https://doi.org/10.4324/9781003232001> Pages 522 eBook ISBN9781003232001

Abstract: This chapter explores teaching SDG 8 in schools. The chapter begins by considering theoretical and policy understandings related to SDG 8 with a particular focus on financial justice, equality and child labour. The challenge of teaching SDG 8 with empathy, hope and advocacy is considered in the chapter and reflective tasks are included for educators to consider their roles in terms of financial justice and children's rights. The chapter explores pedagogical approaches, learning objectives and teaching examples in order to support teachers with achieving balance in teaching about decent work while also considering the implications of economic growth.

A number of practical exemplars are included to promote rich discussions on SDG 8 topics. For example, 'Mind the pay gap' – an activity based on equality in the workplace, 'From farm to cup' – an activity focusing on consumption and distribution of income, 'A day in my life' – an activity to introduce child labour, 'Forest conversation' – an activity to explore forest management and understand forest dependant livelihoods and 'SDG 8 and Covid-19' – an activity to probe the dilemma of balancing economics and public health. Resources pertaining to SDG 8 are listed and interconnections between SDG 8 and some other SDGs are illustrated.

Keywords: SGD – 8, pedagogical approaches, teaching

13. A New Assessment of Progress of SDG 8 and Progress of all SDGs

Satyendra Nath Chakrabarty (2024)

Asian Journal of Economics and Finance. 2024, 6, 2 : 163-178 ISSN: 2582-340X

<https://DOI:10.47509/AJEF.2024.v06i02.03>

Abstract: Background: Methods of SDG index depicting progress and extent of sustainability achieved by normalizing the indicators and weighted sum suffer from limitations and lead to different rankings. Methods: The paper proposes multiplicative aggregation to compute country-level Index for overall progress of SDG-8 (ISDG-8) and progress of all the 17 SDGs at global level. Results: The proposed index satisfies desirable properties and facilitates identification of critical targets requiring managerial attention for correcting policy measures, assessment of progress over time, distance from the SDG targets at a given time-point, testing statistical hypothesis of equality of ISDG-8 for two different countries for a given year and also for equality of I(SDG-8) for two successive time points., plotting of progress path at country level and computing measure of similarity between such paths registered by a pair of countries. Conclusion: The proposed method of multiplicative aggregations without scaling and choosing weights offers significant benefits and contributes to improve aggregation of SDG avoiding major limitations of existing methods of aggregations, is recommended. Future studies suggested.

Keywords: SDG – 8, SDG Index; Sustainable Composite Index, Geometric mean, Progress path, Testing of hypothesis.

14. Integrating Cognitive Competency, Social Competency and Risk Propensity with the Theory of Planned Behaviour to Attain Sustainable-Development-Goal-8-Driven Sustainable Entrepreneurial Intentions

Simpi Malhotra and Ravi Kiran (2024)

Sustainability 2024, 16, 3888. <https://doi.org/10.3390/su16103888>

Abstract: This paper empirically examines whether integrating entrepreneurial abilities with the theory of perceived behaviour positively influences Sustainable-Development-Goal-8-driven sustainable entrepreneurial intentions (SDG-8 SEIs). The data used in this study were gathered from 540 students from top-ranked Indian engineering colleges that offer entrepreneurship courses and have access to company incubators. According to the theory of planned behaviour (TPB), perceived behavioural control, subjective norms, and entrepreneurial drive are the three elements of perceived entrepreneurial behaviour. The TPB's dimensions in this study have entrepreneurial competencies as their antecedents. Cognitive competency, risk propensity, and social competency and resilience are antecedents of the TPB's dimensions. One entrepreneurial viewpoint uses sustainable UNDP-SDG-8 as a metric for assessing intentions; its objectives are the promotion of inclusive and sustainable economic growth, full and productive employment, and decent work for all. This study used partial least squares structural equation modelling (PLS-SEM). According to the findings, engineering students in India are more likely to have entrepreneurial-focused intentions based on sustainability if they adhere to the TPB's dimensions along with additional constructs. Using an expanded TPB model, we show that the TPB has learnable and stimulating antecedents, with these having a positive effect on SDG-8 SEIs, thus extending entrepreneurial activity in India. Policymakers, universities, and students will find these results very intriguing. The

TPB's dimensions and three additional dimensions are proposed as antecedents in a new conceptual model aimed at sustainable entrepreneurship in this study.

Keywords: entrepreneurship; entrepreneurial perceived behaviour; theory of planned behaviour; entrepreneurial competencies; entrepreneurial success; SDG-8 SEIs

15. Improving Quality of Work for Positive Health: Interaction of Sustainable Development Goal (SDG) 8 and SDG 3 from the Sustainable HRM Perspective

Sugumar Mariappanadar (2024)

Sustainability 2024, 16, 5356. <https://doi.org/10.3390/su16135356>

Abstract: Evidence indicates that harmful work practices such as long working hours in high income countries kill more people than road accidents (International Labour Organisation, 2021). The Global Reporting Initiatives (GRIs) for Sustainability—Occupational Health and Safety (OHS) 403 standards (2018)—include 'work-related leading indicators', but currently, a limited understanding of these exists to prevent an increase in deaths due to work-related non-communicable diseases. The health harm of work construct, which is different from work stress, is a recent development in the sustainable HRM literature explaining employees' perception of the restrictions imposed by work practices on achieving positive health. To promote health and well-being for all in the employment stage of life (SDG 3), this study aims to establish the health harm of work that is caused by work intensification as work-related leading indicators of adverse/decent working conditions (SDG 8). A total of 605 white-collar full-time employees completed work intensification, the health harm of work, and mental well-being questionnaires, and self-reported on health risk factors and chronic health conditions. Structural equation modelling was used to analyse the mediational research model of the dynamic transitional effect of work intensification on employee health and well-being through the health harm of work. The findings indicate that work intensification improves employee mental well-being (SDG 3), but the mediation transitional effect of the health harm of work highlights that mental well-being is reduced when work intensification (SDG 8) started increasing the health harm of work among individuals. The health harm of work from the sustainable HRM perspective is found to be effective work-practice related leading indicators of health and well-being in the working population. Research and practical implications to develop a business-health agenda of shared values are discussed.

Keywords: health in SDGs; interactions of SDGs; leading indicators, SDG - 8

16. Intellectual capital through decarbonization for achieving Sustainable Development Goal 8: a systematic literature review and future research directions

Assunta Di Vaio, Anum Zaffar and Meghna Chhabra (2024)

Journal of Intellectual Capital Vol. 25 No. 7, 2024 pp. 54-86 Emerald Publishing Limited 1469-1930
DOI 10.1108/JIC-05-2024-0131

Abstract: The aim of this study is to review the literature on how intellectual capital (IC) contributes to the decarbonization efforts of firms. It explores how carbon accounting can measure the components of IC in decarbonization efforts to balance profitability with environmental and social goals, particularly in promoting decent work and economic growth (Sustainable Development Goal

[SDG]8 and its targets [2,5,6,8]). Moreover, it emphasises the importance of multi-stakeholder partnerships for sharing knowledge, expertise, technology, and financial resources (SDG17-Target 17.G) to meet SDG8. As a consolidated methodological approach, a systematic literature review (SLR) was used in this study to fill the existing research gaps in sustainability accounting. To consolidate and clarify scholarly research on IC towards decarbonization, 149 English articles published in the Scopus database and Google Scholar between 1990 and 2024 were reviewed. The results highlight that the current research does not sufficiently cover the intersection of carbon accounting and IC in the analysis of decarbonization practices. Stakeholders and regulatory bodies are increasingly pressuring firms to implement development-focused policies in line with SDG8 and its targets, requiring the integration of IC and its measures in decarbonization processes, supported by SDG17-Target 17.G. This integration is useful for creating business models that balance profitability and social and environmental responsibilities. The integration of social dimension to design sustainable business models for emission reduction and provide a decent work environment by focusing on SDG17-Target 17.G has rarely been investigated in terms of theory and practice. Through carbon accounting, IC can be a key source of SDG8Targets 8.[2, 5, 6, 8] and SDG17-Target 17.G. Historically, these major issues are not easily aligned with accounting research or decarbonization processes.

Keywords: Intellectual capital, Decarbonization processes, Decent work and economic growth Carbon accounting, Partnerships, positive health, mental well-being, work intensification, sustainable HRM, SDG - 3, 8

17. The Rise And Fall Of Chanda Kochhar: Icici’s Governance Breakdown And Its Linkage To SDG 5, 8 And 16

Meenakshi Verma, Anuj Verma, Prachita Patil, Rajani Pillai, Gangu Naidu Mandala, Saket Bansod (2024)

Journal Lifestyle and SDGs Review | Florida, USA | VOL. 4| e02351| pag: 01-17| 2024. DOI: <https://doi.org/10.47172/2965-730X>

Abstract: The primary objective of this paper is to explore how corporate governance failures can disrupt progress toward SDGs by eroding organizational commitment and sustainability. This paper has adopted “The Stewardship Theory” model to align with the Corporate Governance practices at ICICI Bank and thereby highlight the flaws in the system. Chanda Kochhar began her career at ICICI Bank in 1984 as a Management Trainee. After navigating through a fierce succession battle, she rose to the level of Managing Director in 2009. She became the first woman in Indian history to lead a mighty bank, succeeding the group Chairman K.V. Kamath. She was the face of Women Empowerment in India till one fine day when she was accused of corporate misconduct and quid pro quo for her involvement in questionable deals between her husband and Venugopal Dhoot, which were brought to light by whistle-blower Arvind Gupta, prompting an investigation. After preliminary hitches, the Central Bureau of Investigation thoroughly investigated this matter and found Chanda Kochhar guilty. This breakdown greatly impacted ICICI and had larger implications for achieving sustainability development goals (SDGs), predominantly those related to strong institutions & ethical leadership SDG 16, gender equality SDG 5 and decent work and economic growth SDG 8. It was brought to light by an autonomous investigation that ICICI Banks’ CEO had failed to adhere to the set rules, regulations, and policies of the bank. In fact, she had dishonored

the bank's norms. This episode demonstrates how corporate governance failures can disrupt progress toward SDGs by eroding organizational commitment and sustainability.

Keywords: Chanda Kochhar, ICICI bank, women empowerment, organizational commitment, whistle blowing, SDG - 16, 5 and 8, corporate governance.

18. Mapping the literature on decent work: A bibliometric analysis of Sustainable Development Goal 8

Alisha Ralph, Akarsh Arora (2024)

Sustainable Development Volume 32, Issue 4 August 2024, Pages 3937-3952

Abstract: The bibliometric study based on the Scopus database aims to investigate the global literary development of “decent work” over a span exceeding two decades. The noticeable surge in publications since 2015 underscores the growing significance of the concept. Limited representation of lower-middle and lower-income countries, except India, among the top 10 contributors is observed, revealing a considerable research gap in the study of decent work. The research highlights five principal themes: the labor market's impact on economic development, corporate social responsibility and sustainable development, gender equality, governance, and social justice, as well as decent work, job quality, education, well-being, and job satisfaction. The study also shows the importance of the topic in different fields. Future researchers may consider the variables or indicators identified for surveys and questionnaire construction.

Keywords: SDG-8, bibliometric study, labor market, CSR, gender equality, governance, social justice

19. Path to achieving SDG 8: do worker remittances reduce vulnerable employment?

Sridevi Yerrabati (2025)

Journal of Economic Studies, Vol. 52 No. 3, pp. 500-517. <https://doi.org/10.1108/JES-11-2023-0674>

Abstract: The prevalence of high levels of vulnerable employment in developing countries poses a formidable obstacle to their progress towards achieving SDG 8. While worker remittances (remittances) are widely recognised as a potential source of improving the welfare of people experiencing poverty, their effectiveness in alleviating vulnerable employment from a macro perspective remains unclear. Consequently, the study examines the impact of remittances on reducing vulnerable employment. The study uses macro-level data from 73 developing countries covering 1990–2021. Vulnerable employment is measured in three forms: total, male, and female. Remittances are measured as a percentage of the gross domestic product. The findings are empirically analysed using dynamic panel data estimation techniques. A two-stage least squares (IV 2SLS) approach addresses remittance endogeneity. Two key findings emerge from the study. First, increased remittances are associated with a decline in the total share of workers resorting to vulnerable employment, albeit a modest decline. Second, the remittance surge is associated with more males than females leaving vulnerable employment, indicating its gender-specific effects. These findings remain robust to several checks. The study's findings underscore the potential of leveraging remittances to reduce vulnerable employment. To this end, selective and targeted policy

interventions that promote financial literacy and inclusion, which serve as the cornerstones for effectively utilising remittances, are advised.

Keywords: Worker remittances, Vulnerable employment, SDG - 8

SDG 9 Industry, Innovation and Infrastructure

1. SDG Index and ease of doing business in India: A sub-national study

Nilanjan Ghosh, Soumya Bhowmick and Roshan Saha (2019)

ORF Occasional Paper 199 June 2019

Abstract: This paper offers a business case for the United Nations Sustainable Development Goals (SDGs): the promotion of the SDGs creates an enabling business environment by nurturing capital in its human, social, natural and physical forms. This proposition is exhibited across the sub-national economies delineated by the Indian states through the development of an SDG index entailing 76 component indicators across 23 states. The paper argues that this index is more useful than the one developed by government's NITI Aayog, as it possesses statistical robustness and variable inclusivity. Further, econometric analyses suggest that this index is a statistically significant variable explaining the Ease of Doing Business index, and FDI flows to the states. A state's development policy, through the promotion of the SDGs, is therefore not divorced from its investment promotion strategy

Keywords: SDG – 9, SDG index, Ease of Doing Business index

2. Role of Micro, Small And Medium Enterprises (MSMEs) In Achieving Sustainable Development Goals

Toran Lal Verma (2019)

Verma, Toran Lal, Role of Micro, Small And Medium Enterprises (MSMEs) In Achieving Sustainable Development Goals (April 1, 2019). Available at SSRN: <https://ssrn.com/abstract=3669470>

Abstract: Micro, Small and medium enterprises (MSMEs) plays a catalytic role in the development of any economy. MSMEs are considered as nurseries for entrepreneurship and innovation around the globe. India is no exception. MSMEs in India are extensively dispersed across the country and produce around more than 6000 diverse range of products and services. There are more than 63 million MSME units operating in different parts of India. These MSME establishments employ around 11 crore people. Given the dynamic and flexible nature of MSMEs, they are considered an essential sector in achieving Sustainable Development Goals (SDGs) set by United Nations. MSMEs have a huge role to play in achievement of SDGs, especially the goals of Poverty Alleviation (Goal 1), Decent Work and Economic Growth (Goal 8) and Industry Innovation and Infrastructure (Goal 9). MSMEs contribution is not restricted to these three goals, they also directly or indirectly help in achieving other goals. In this paper, an attempt has been made to study the role of MSMEs in achieving the SDGs. We have categorized the role of MSMEs by different activity

attributes in the achievement of different goals. We have also outlined some suggestive measure which is helpful in making MSMEs more sustainable, which in turn, would help achieve SDGs.

Keywords: MSMEs, SDG - 9, Poverty Alleviation, Industry Innovation, Economic Growth

3. Analysis of Infrastructure Building Policies in India: Meeting SDG 9

Sakharam Mujalde and Shivani Bairagi (2019)

International Journal of Trend in Scientific Research and Development (IJTSRD) Volume: 3 | Issue: 4 | May-Jun 2019

Abstract: This paper focuses on Indian economy in the light of sustainable development goal number 9. Indian economy is a developing mixed economy. It is world's sixth largest economy in terms of nominal GDP and third largest economy by GDP (PPP) 181 countries as per International Monetary Fund. The Indian economy is projected to grow at an annual rate of 7.4% in 2018 and 7.8% in 2019, according to a recently released IMF Economic Outlook. Forbes cites that, India's economy is lifted by strong private consumption, waning transitory effects of demonetisation and implementation of the national goods and services tax. Over time, growth is expected to gradually rise with continued implementation of structural reforms that increase productivity and incentivize private investment. In 2015, the General Assembly embraced Sustainable Development as its agenda. 17 Sustainable Development Goals (SDGs) were framed to be achieved till 2030. It is built on the premise that no one is left behind. It ensures development for all. Amongst these 17 goals is-Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. This goal targets to develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure. It also aims to support economic development and human well-being, with an edge on affordable and equitable access for all.

Keywords: SDG – 9, GDP, Indian economy, IMF

4. Sustainable Development Goal 9: Building Resilient Infrastructure, Sustainable Industrialization and Fostering Innovation

Swati Saxena (2019)

ABS International Journal of Management, Volume VII Issue 2 December 2019 pp 21-24.

Abstract: India is aspiring to become a global power which will critically depend upon its ability to double the manufacturing industry's share of GDP by 2030 and invest in scientific research and innovation. With over half the world's population now living in cities, mass transportation and renewable energy are becoming more important along with the growth of new industries and information and communication technology. Promoting sustainable industries and investing in scientific research and innovation are very crucial ways to facilitate sustainable development. Investments in Infrastructure like in transportation, irrigation, energy and information and communication technology are very important for achieving sustainable development and it has been recognized that improvements in health and education requires investment in infrastructure. Therefore technological progress is the foundation to achieve environmental objectives and it is synonyms to say that industrialization will require technology and innovation and similarly, development requires industrialization. The paper will describe the targets set under SDG9, the

global as well as domestic initiatives taken in order to achieve the commitments, it will critically analyze the impediments to successful implementation of the goal and lastly, it will assess India's position and the way forward.

Keywords: SDG - 9, Industrialization, Scientific research, Innovation, Infrastructure

5. Revisiting Industrialisation and Innovation in India: Roadmap for SDG 9

Sabyasachi Saha and Prativa Shaw (2019)

In: Chaturvedi, S., James, T., Saha, S., Shaw, P. (eds) 2030 Agenda and India: Moving from Quantity to Quality. South Asia Economic and Policy Studies. Springer, Singapore.
https://doi.org/10.1007/978-981-32-9091-4_3

Abstract: This chapter contextualises and conceptually captures industrialisation as part of the discourse on Sustainable Development Goal 9 (SDG 9). It is evident that there is huge divergence in the per capita manufacturing value-added between industrialised countries and Least Developed Countries (LDCs) which needs to be corrected and industrialisation should urgently adopt sustainable practices. Though by global standards, India's industrial base remains large and diversified; it has failed to achieve global competitiveness across the board resulting in stagnation in terms of its share in the GDP that negatively impacts the quality of economic growth in terms of employment creation. The chapter proposes reorientation of industrialisation in India through building knowledge capacities to adopt to fast-moving industrial frontiers. Subsequently, the chapter focuses on the scope for deepening industrialisation in India against current priorities and future needs. Finally, it reflects on the indicator framework relevant to SDG 9 that would act as a guide for strengthening evaluation of the progress on industrialisation in the Indian context.

Keywords: SDG - 9, Roadmap, GDP, LDCs

6. Composite index as a measure on achieving Sustainable Development Goal 9 (SDG-9) industry-related targets: The SDG-9 index

Petra Kynčlová, Shyam Upadhyaya, Thomas Nice (2020)

Applied Energy, Volume 265, 1 May 2020, 114755

Abstract-This article introduces the SDG-9 index as a measure of country progress towards achieving industry-related targets of Sustainable Development Goal 9 (SDG-9). The SDG-9 index represents a comprehensive but straightforward approach to assess the extent to which countries have industrialized while promoting social inclusiveness and minimizing natural resource use and environmental impacts. The selection of indicators is based on the global indicator framework for the Goals and targets of the 2030 Agenda adopted by the United Nations General Assembly. The resulting SDG-9 index benchmarks inclusive and sustainable industrial development in 128 economies over the period 2000–2016. In general, industrialized economies outperform other countries, with the top five leading the 2016 ranking being Ireland, Germany, the Republic of Korea, Switzerland and Japan. The calculated scores of the SDG-9 index can show in which dimensions countries represent the leaders or lag behind other economies. Thus, the SDG-9 index forms a valuable tool for policy makers and analysts.

Keywords: SDG-9, Index

7. Achieving Sustainable Development Goals through Fourth Industrial Revolution: An Indian Perspective

Himani Mishra and Prateek Maheshwari (2020)

Indian Journal of Commerce and Management Studies, Vol. 11 No. 2 (2020)

Abstract: Today's world is technology driven. With the emergence of Fourth Industrial Revolution, it is of utmost importance to harness the power of technology for the collective good of more than a billion people living in India. The paper aims to explore the status of the United Nations Sustainable Development Goals (UN SDG) in India and how Fourth Industrial Revolution technologies can be utilized for fulfillment of these goals. Methodology: A detailed systematic review of research papers, articles, reports, and book has been done to explore the aspects of Fourth Industrial Revolution and Sustainable Development at global and India level. Findings: The Fourth Industrial Revolution has offered countries opportunity to build a more inclusive and sustainable society through technology. Moreover, for a country like India, where still domains defined in UN SDGs are not digitized fully, Fourth Industrial Revolution may provide solution to the problems. Poverty, hunger, inequality, and digital exclusion can be redressed, lead to sustainable development, and provided prompt digitization is preceded. Implications: The paper provides a deep insight into Fourth Industrial Revolution and sustainable development in context of India and how bringing both aspects together can revolutionize the Indian economy. The paper also discusses challenges which further lay for country. The paper points out the various modern technology solutions which can facilitate in achieving UN SDGs. Originality: The paper is first to explore the potential of the Fourth Industrial Revolution technology in achievement of UN SDG, hence facilitating India' aim to achieve UN SDGs by 2030

Keywords: Fourth Industrial Revolution, Sustainable Development, Technology, United Nations, SDG - 9

8. Strengthening science, technology, and innovation-based incubators to help achieve Sustainable Development Goals: Lessons from India

Kavita Surana, Anuraag Singh, Ambuj Sagar (2020)

Technological Forecasting and Social Change, Volume 157, August 2020, 120057

Abstract: Policymakers in developing countries increasingly see science, technology, and innovation (STI) as an avenue for meeting sustainable development goals (SDGs), with STI-based startups as a key part of these efforts. Market failures call for government interventions in supporting STI for SDGs and publicly-funded incubators can potentially fulfil this role. Using the specific case of India, we examine how publicly-funded incubators could contribute to strengthening STI-based entrepreneurship. India's STI policy and its links to societal goals span multiple decades—but since 2015 these goals became formally organized around the SDGs. We examine why STI-based incubators were created under different policy priorities before 2015, the role of public agencies in implementing these policies, and how some incubators were particularly effective in addressing the societal challenges that can now be mapped to SDGs. We find that effective incubation for supporting STI-based entrepreneurship to meet societal goals extended beyond traditional incubation activities. For STI-based incubators to be effective, policymakers must strengthen the 'incubation system'. This involves incorporating targeted SDGs in specific incubator goals, promoting coordination between existing incubator programs, developing a

performance monitoring system, and finally, extending extensive capacity building at multiple levels including for incubator managers and for broader STI in the country.

Keywords: Science technology and innovation, developing countries entrepreneurship, incubators, public policy, SDG - 9, science policy

9. Avoiding Premature Deindustrialization in India: Achieving SDG 9

Selim Raihan (2020)

S. Hazra, A. Bhukta (eds.), Sustainable Development Goals, Sustainable Development Goals Series, https://doi.org/10.1007/978-3-030-42488-6_9

Abstract: How to substantially increase the manufacturing value-added share in GDP and thus promote manufacturing-led economic growth in India? As Raihan (2017b) argued, India has to adopt the right kind of policies and programs which can trigger much faster rate of growth of the manufacturing sector compared to those of agricultural and services sectors. The experiences of the successful countries show that human capital has made a major difference. In India, compared to the East and Southeast Asian countries, both the quantity and quality of human capital are at much lower levels. Therefore, policies and programs should be targeted at the rapid enhancement of human capital in India. There is also a need for pro-active trade and industrial policies in terms of providing effective incentives to domestic investors, setting up special economic zones and attracting foreign direct investment (FDI) for diversified manufacturing industries. Such policies should also be aimed at integration of the domestic manufacturing industries with the global value chains.

Keywords: SDG – 9, Industrialisation, human capital

10. Relationship among Economic Contribution for R&D, Innovation and SDG9 of Indian State

Mondal, Sudipta and Das, Gourab, (2021).

International Journal of Advanced Research in Science, Communication and Technology, Volume 2, Issue 2, February 2021, Available at SSRN: <https://ssrn.com/abstract=3828655>

Abstract: In the present context, all the countries are trying to achieve sustainable Development Goals (SDGs). India is also trying to do the same with the help of different initiatives. Among these SDGs, one of the vital SDG is SDG9 which is related with industry, innovation and infrastructure. In the recent years Indian government has published SDG scores and innovation index for all the States. Government in general publishes Public Finance reports which consist of different expenditure for the people and states development. Considering this, it has been tried to find out whether or not the related economic contribution of the states and central government can be helpful to realise and estimate the innovation and SDG9 of the states. By using correlation analysis and linear regression model, it has been found that the significant contribution are found with respect to the research expenditure in agriculture and total research expenditure of the states. The results implied that the state governments should take proper initiative regarding the research expenditure in science and technology, that can enhance innovation capability more.

Keywords: Innovation, SDG - 9, R&D, Economic Contribution by States

11. Attaining sustainable development goals (SDGs) through supply chain practices and business strategies: A systematic review with bibliometric and network analyses

Rohit Agrawal, Abhijit Majumdar, Kirty Majumdar, Rakesh D. Raut, Balkrishna E. Narkhede et al (2022)

April 2022 *Business Strategy and the Environment* 31(1)

Abstract- Sustainable development goals (SDGs), adopted by the United Nations in 2015, are gaining importance in all the industrial sectors. The attainment of SDGs will lead to simultaneous betterment of human lives, environment and economic prosperity. Therefore, the adoption and implementation of SDGs in the supply chain (SC) activities is the need of the hour. In this regard, there is a need to analyse the extant SC literature focussing on SDGs. This study reviews the articles on SDGs in SC published in last 6 years (2015–2021). A total of 144 articles are shortlisted for the analysis. Bibliometric and network analyses are performed to create an intellectual map of the field and to visualise the network among authors and keywords, respectively. Various emerging research themes are identified using bibliometric coupling analysis. The content analysis of the articles has been performed by considering different activities and stages of SC. Articles are also mapped on various dimensions of SDGs. The strategies associated with adopting sustainable practices in SC to achieve SDGs have also been elucidated. Finally, future research propositions have been presented which can help in achieving SDGs in the SC.

Keywords: bibliometric coupling analysis, SDG – 9, supply chain

12. Industrial infrastructure development of cottage industries for inclusive economic growth in a sustainable manner: case study of the urban growth centre in Bishnupur, West Bengal, India

Aditi Nag (2022)

International Journal of Indian Culture and Business Management Vol. 26, No. 2, June 20, 2022pp 204-233 <https://doi.org/10.1504/IJICBM.2022.123591>

Abstract: The cottage industrial sector has been both a concern and of importance over the years, however, significant intervention has not been seen towards its inclusive development facilitation over several decades. India, ranked 68 in 141 on GCI, is one of those countries which have numerous cottage enterprises and SSI but lacks resources, policies and practices to support their growth and development. The SDGs have formed the baseline for development but has a long way to go from acceptance to implementation. Cottage industries form the backbone of rural areas and have optimal opportunities for job creation; locally sourcing SSI has probable advantage for sustainable development over raw material importing SSI and cottage enterprises. Major obstacle areas include financial development, infrastructural growth and inclusion, technological innovation and integrated development facilitation. The paper explores past and recent developments in policies specialising in cottage industries and forms a stepping stone for further research and development.

Keywords: cottage industry, policy framework, sustainability assessment, socio-economic impact, SDG 9, industrial infrastructure, India

13. Integrating Digital Mission and Sustainable Development Goal-9 for Building Technologies: A study of Navratna Companies of India

N Mahajan, V Singh, N Kaur and A Gupta (2022)

IOP Conf. Ser.: Earth Environ. Sci. 1084 012010

Abstract: The study focuses on 10 Navratna companies based in India that come under the central public sector enterprises. The study focuses on the Digital Mission by the Government of India, its impact on the industries operating in India and how technologies have affected the overall productivity of Indian enterprise with their approach to achieve SDG-9. The study finds that the Navratna companies have been successfully working towards achieving the goals of SDG-9 for building resilient infrastructure, sustainable industrialisation and fostering innovation but still they need to use the technologies to their maximum potential in terms of improving their overall productivity and delivery. The data for the study has been collected through secondary resources like websites, annual reports, research materials and company websites. The implication of the study is that other companies operating in India and abroad can learn about implementing the sustainable development goal in their day-to-day practices to increase productivity and improve infrastructure, thereby fostering innovation and growth. This will help India reach its goal of becoming a major manufacturing hub and a digitally advanced nation.

Keywords: SDG-9, Navratna companies, Digital Mission

14. Accelerating Progress in SDG 9 (Sustainable Industrialization) in South and South-West Asia Region.

Kumar, Nagesh., Chatterjee, Shiladitya. & UN.ESCAP 2023.

<https://hdl.handle.net/20.500.12870/6498>

Abstract: The sustainable Development Goal 9 (SDG 9) focuses on industrialisation, innovation, and infrastructure. This goal holds significant relevance for South and South-West Asia (SSWA) since the subregion has not yet fully realized its potential in these domains. Compared to the East Asia and the Pacific, the proportion of manufacturing to GDP in SSWA is noticeably lower. However, it's worth noting that countries such as Bangladesh and India are making commendable progress, predominantly in the textile sector. Despite these advancements, there exist challenges that hamper the swift progression of this goal in the subregion. Among these challenges are the global Covid-19 pandemic and the ongoing Russia-Ukraine conflict. This paper dive deeper into some of the existing challenges facing the subregion and offers policy suggestions to advance SDG-9 and points out the untapped potential of Regional Value Chains (GVC) in enhancing manufacturing. It further emphasises improving intra-regional trade and optimising transport and border facilities in accelerating progress towards achieving the SDG9. The importance of developing cross-border renewable energy infrastructure and strengthening Science Technology and Innovation (STI) capabilities is highlighted as sustainable path to industrialisation in the subregion. By adopting these approaches and promoting subregional partnerships, the SSWA subregion can achieve sustainable prosperity for its people.

Keywords: Sustainable Industrialisation, Innovation, Covid-19, SDG-9 and South and South West Asia

15. A narrative review on use of biomaterials in achieving SDG 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation

Rajat Gera, Priyanka Chadha, Sonali P. Banerjee, Mona Sharma, Amit Kumar Pandey, Shivani Kampani, Saurav Dixit, Suresh Kumar Tummala and M. Abdulfadhil Gatea (2023)

E3S Web Conf., Volume 391, 2023, 4th International Conference on Design and Manufacturing Aspects for Sustainable Energy (ICMED-ICMPC 2023),
<https://doi.org/10.1051/e3sconf/202339101180>

Abstract: This study aims to address the gaps in the existing literature on the use of biomaterials in achieving SDG 9, identify gaps in current knowledge, and provide insights for future research directions. A narrative review of 62 papers published between 1996-mid 2023 in which use of biomaterials in achieving SDG 9 (build resilient infrastructure, promote sustainable industrialization and foster innovation) shows that biomaterials have great potential to transform the construction and infrastructure industries by providing sustainable, biodegradable, and cost-effective alternatives to traditional materials. The use of biomaterials and new technologies in various industries has the potential to create significant economic, social, and environmental impacts. However, realizing these benefits requires investment in research and development, improving production processes, and creating policies that support the use of sustainable biomaterials. There is a need to consider the sustainability and environmental impact of biomaterials in various applications, including medical devices, orthopedic biomaterials, and biofuels, among others. Their development and implementation may require supportive policy and governance frameworks. Future research directions can focus on several areas such as optimization of biocompatibility and biodegradability of biomaterials, developing scalable and cost-effective manufacturing processes for sustainable biomaterials.

Keywords: biomaterials, literature review, environmentally friendly products, sustainable technologies, SDG - 9

16. Sustainable Tourism Perspective in the Sustainable Development Goals: A Case Study of Heritage Sites in Uttarakhand

Sujay Vikram Singh, Rashmi Jha, Ajit Kumar Singh Rajeev Ranjan (2024)

In Implementing Sustainable Development Goals in the Service Sector, (Editors) Vipin Nadda, Pankaj Kumar Tyagi, Rubina Moniz Vieira, and Priyanka Tyagi, IGI Global Scientific Publishing Pg (97-107). DOI: 10.4018/979-8-3693-2065-5.ch007

Abstract: The present study attempts to make a meaningful contribution to both the academic dialogue and the practical comprehension of how the Sustainable Development Goals can be utilised as a catalyst for profound change within the distinct socio-cultural and environmental context of Uttarakhand. Three heritage sites have been discussed in this context: Natural (Nanda Devi National Park), Built (Kedarnath), and Riverscape (Har ki pauri).The study discovers significant insights that will resonate with policymakers, practitioners, and communities all around the world by conducting an exhaustive study of the complexities of sustainable development in this particular region.

Keywords: SDG – 9, Tourism, Uttarakhand

17. Industry, Innovation, and Infrastructure: Contribution of SMEs in the Developing Economies

Zakia Tasmin Rahman, Ruhi Lal, Ravinder Rena (2024)

In Entrepreneurship in the BRICS, Routledge (ebook 9781003475606 2024 first publication)

Abstract: Small- and medium-sized enterprises (SMEs) have been recognised as the main force behind economic expansion. SMEs' contributions to the global economy can largely eradicate poverty in societies because they guarantee capital flow across various societal levels, offering various job opportunities to the different social strata and ensuring money flow. This study focuses on SME functions and achievements in developing nations, examining how they help to achieve Sustainable Development Goal No. 9 of the United Nations, "Industry, Innovation, and Infrastructure" in developing economies, differences between SMEs in India and China, and SMEs in developing economies' forward-looking outlook. The study adopted a qualitative, exploratory research approach, using secondary data and published documents related to Goal No. 9 of the United Nations Sustainable Development Goals; Government report records, published research papers, websites, and related documents. Content analysis was employed, and the findings show that the SME plans and strategies are designed in a pattern that enables developing economies and emerging nations to increase employment, capital formation, income generation, boost foreign exchange, infrastructural development, sustainable growth, and development. SME advantages help in nation-building.

Keywords: SDG – 9, SME, China, India

SDG 10 Reduced Inequalities

1. Reducing Inequalities: A Sustainable Development Challenge

Rémi Genevey, R. K. Pachauri, Laurence Tubiana (Editors) (2013)

TERI Press, ISBN 978-81-7993-530-9

Abstract: The volume represents a unique international initiative : it collects the work of many experts, researchers and development professionals who do not usually interact, The authors have grounded their work on conceptual and strategic thinking and empirical experiments, conducted on five continents and touching on multiple realities. The case studies in this volume demonstrate the complexity of the new systems required to accommodate each country's specific economic, political and cultural realities. These systems combine technical, financial, legal, fiscal and organizational elements with a great deal of applied expertise. Their durability depends on their ability to inspire collaboration among the stakeholders who frequently hold antagonistic interests, values and rationales.

Keywords: SDG – 10, empirical experiments

2. Reducing Inequalities Towards Sustainable Development Goals: Multilevel Approach

Medani P. Bhandari and Shvindina Hanna (Editors) (2019)

RIVER PUBLISHERS SERIES IN CHEMICAL, ENVIRONMENTAL, AND ENERGY ENGINEERING DOI: 10.1201/9781003339250, ISBN 978-87-7022-126-9 (print)

Abstract: This book provides factual evidence of increased inequality through country specific case studies and comparative studies. Transnational. In general notion, inequality is seen every sphere of human history, socially, politically, economically and environmentally. Inequality of any nature whether it is through social, economic, cultural, political or environmental strata, creates the division on humanity and has been one of the major causes of conflict throughout human civilization. In this edited book, authors have tried to find out the current state inequality, through economic point of view (mostly development economics). The results of this books chapter show, despite of so much efforts from all concerned stakeholders, inequality has not been reduced. In fact, mostly since 1980, inequality has been rapid growth in the world (both developing and developing world).

Keywords: SDG – 10, development economics

3. SDG 10—A Probe into the Factors Underlying Differences in Inequality: Evidence at the Sub-national Level in India

Roy, R.P., Sinha Roy, S. (2019)

In: Chaturvedi, S., James, T., Saha, S., Shaw, P. (eds) 2030 Agenda and India: Moving from Quantity to Quality. South Asia Economic and Policy Studies. Springer, Singapore.
https://doi.org/10.1007/978-981-32-9091-4_7

Abstract: This study is an endeavor to examine the causes of rising inequality in India at the sub-national level and thus to arrive at policy implications in order to achieve targets under SDG 10. In a country like India, with striking heterogeneity, examining inequality at the more disaggregated level and understanding its causes is essential for sound policy making. Since the beginning of the economic reform in 1991, there has been a rising income inequality in India has been a cause for concern. Owing to opening up of the economy, the growth rates in states output have increased rapidly especially after 1993. This seems to have widened the income gap. However, thus far only a few studies have attempted to analyze the causes of rising inequalities in Indian states. This study, analyzing data from 18 major Indian states, finds that, in the post reforms period, structural transformation and trade liberalization cause inequality to increase in Indian states. On the other hand, the evidence on infrastructure leading to rise in inequality has to be dealt with caution on account of the presence of outliers. These results are believed to have important policy implications.

Keywords: SDG – 10, Indian states

4. District level inequality in reproductive, maternal, neonatal and child health coverage in India.

Basant Kumar Panda, Gulshan Kumar, Ashish Awasthi (2020)

BMC Public Health 20, 58 (2020). <https://doi.org/10.1186/s12889-020-8151-9>

Abstract: As India already missed maternal and child health related millennium development goals, the maternal and child health outcomes are a matter of concern to achieve sustainable development goals (SDGs). This study is focused to assess the gap in coverage and inequality of various reproductive, maternal, neonatal and child health (RMNCH) indicators in 640 districts of India, using data from most recent round of National Family Health Survey.

A composite index named Coverage Gap Index (CGI) was calculated, as the weighted average of eight preventive maternal and child care interventions at different administrative levels. Bivariate and spatial analysis were used to understand the geographical diversity and spatial clustering in districts of India. A socio-economic development index (SDI) was also derived and used to assess the interlinkages between CGI and development. The ratio method was used to assess the socio-economic inequality in CGI and its component at the national level. The average national CGI was 26.23% with the lowest in Kerala (10.48%) and highest in Nagaland (55.07%). Almost half of the Indian districts had CGI above the national average and mainly concentrated in high focus states and north-eastern part. From the geospatial analysis of CGI, 122 districts formed hotspots and 164 districts were in cold spot. The poorest households had 2.5 times higher CGI in comparison to the richest households and rural households have 1.5 times higher CGI as compared to urban households. Evidence from the study suggests that many districts in India are lagging in terms of CGI and prioritize to achieve the desired level of maternal and child health outcomes. Efforts are needed to reduce the CGI among the poorest and rural resident which may curtail the inequality.

Keywords: Coverage gap index; Districts; India; Inequality; RMNCH; Spatial, SDG – 10

5. Reducing Inequalities Through Education and Skill Development Courses.

Tyagi, R., Vishwakarma, S., Rishi, M., Rajiah, S. (2021)

In: Leal Filho, W., Marisa Azul, A., Brandli, L., Lange Salvia, A., Gökçin Özuyar, P., Wall, T. (eds) Reduced Inequalities. Encyclopedia of the UN Sustainable Development Goals. Springer, Cham. https://doi.org/10.1007/978-3-319-95882-8_102

Abstract: Reducing inequalities through education and skill development prepares the learners to be able to live sustainably and establish continual sustainable development practices in whatever career they choose. Consequently, improving the capacity of individuals, communities, and societies across the globe to make informed judgments and promote sustainable development. It incorporates key themes of education for sustainable development including poverty alleviation, human rights, health, and environmental protection, climate change into the conventional education system of providing knowledge and skills necessary to succeed in the world of work.

Keywords: SDG – 10, Education for reducing inequalities; Education for sustainable development

6. SDG Target 10.1 Inequity and Inequalities: Measurement Choices and Building Blocks of Poverty Sensitising Indices

Pramod Kumar Anand Krishna Kumar (2022)

RIS DP 273 July 2022 Discussion Papers Series

Abstract: Widespread inequalities across the economies and within economies are a major policy concern. Over six years of the SDG era, lengthened by the ongoing COVID-19 shock, revealed how harshly inequalities impact on the lowest deciles. A stepping stone for any policy initiative is to

have a fair idea of the iniquitous elements across inequalities and dynamic insight mechanisms to ascertain whether these are deepening, and if so at what pace and to what extent. SDG Target 10.1 stresses on the need for a higher income growth of the four bottom deciles, which in turn necessitates tools to assess progress. An analysis of various prevalent indices is carried out in the quest for poverty sensitising (PS) indices. Moreover, some PS indices are put forth including one to evolve an inequity augmented Lorenz curve with the objective to end poverty while reducing inequities. Conclusions and way forward give prescriptions for equitable policies to attain target 10.1 in a lasting manner.

Keywords: Pigou-Dalton transfer, inequality, inequity, poverty sensitising indices, SDG - 10.

7. Does structural transformation in economy impact inequality in renewable energy productivity? Implications for sustainable development

Jing Zhao, Avik Sinha, Nasiru Inuwa, Yihan Wang, Muntasir Murshed, Kashif Raza Abbasi (2022)
Renewable Energy, Volume 189, April 2022, Pages 853-864

Abstract: Since the global economies are in pursuit of achieving the 2030 Sustainable Development Goals (SDG) agenda, it has become pertinent to undergo an energy transition and enhance energy use efficiency in tandem. This is creating a disparity in the renewable energy generation, which is arising out the structural transformation of the economies. Against this background this study aims to assess the impacts of structural transformation on inequality in renewable energy productivity across selected OECD countries between 1990 and 2019. This study is important from the perspective that due to inequitable economic growth trajectory attained by the OECD nations, the renewable energy consumption levels of the OECD nations display significant amount of disparity which can also be reflected in terms of unequal distribution of renewable energy productivity across these countries. Besides, since the OECD countries are gradually transforming their economies from being agriculture-oriented to service-oriented and are becoming more focused on energy innovation and energy efficiency aspects, it can be hypothesized that this structural transformation might reduce the inequality in renewable energy productivity among these nations. Using second-generation methods and dynamic elasticity analysis, this study finds that structural transformation helps to reduce the inequality in renewable energy productivity. Besides, technological innovation is also evidenced to exert inequality-reduction effects. In contrast, conflicts and economic conflicts are evidenced to generated adverse effects on inequality in renewable energy productivity within the OECD countries. Furthermore, the outcomes from this study have also identified the policy interventions responsible for the aggravation of inequality in renewable energy productivity. Based on these findings, a policy framework has been provided to help the OECD countries to attain the objectives of SDG 7 and SDG13.

Keywords: Theil index, Renewable energy productivity, Dynamic elasticity, OECD, SDG - 10

8. Inequality Among Social Groups in Accessing Improved Drinking Water and Sanitation in India: A District-Level Spatial Analysis

Pritam Ghosh, Moslem Hossein and Sanjit Sarkar (2023)

The Professional Geographer, 75(3), 361–382. <https://doi.org/10.1080/00330124.2022.2124181>

Abstract- Persisting wide inequality among various geographical spaces and social groups is a significant disincentive to India's healthy socioeconomic growth and human development. Therefore, arranging adequate safe drinking water and sanitation for all (United Nations Sustainable Development Goal [SDG] 6) and reducing inequality among social groups (United Nations SDG 10) by 2030 is a big challenge to one of the most populated and eco-socio-culturally diversified nations. We have tried to map the inequality among social groups and geographical space in accessing improved drinking water and sanitation (IDWS) facilities. Besides, we have classified Indian districts through the quadrant analysis technique, combining these two aspects of inequality (district-level geographical inequality and inequality between Scheduled Caste/Scheduled Tribe [SC/ST] and other groups). This might find inclusive, sustainable strategies, reducing inequality between social groups and geographical space. The study was carried out in about 46 percent to 60 percent of districts characterized by lower coverage of various IDWS facilities, with more SC/ST community deprivation in accessing these facilities. Despite having higher coverage of IDWS facilities, nearly 45 percent to 49 percent of districts showed a higher deprivation of SC/ST groups in this case. The study's findings demand more attention and investment to develop IDWS facilities among SC/ST groups and lower performing districts.

Keywords: drinking water and sanitation, India, schedule caste, schedule tribe and social inequality, SDG – 6, 10

9. Sustainable Development Goal 10: Reducing Inequality – Evidence from India and its States

Nilmadhab Das, Debasish Mondal (2023)

Sch J Arts Humanit Soc Sci, 2023 Dec 11(12): 328-335.

Abstract: The United Nations Development Programme (UNDP) embraced seventeen Sustainable Development Goals (SDGs) in 2015, recognising the global imperative to address societal challenges. Among these goals, SDG 10 focuses on reducing inequalities within and among countries. Instead of examining inequalities within and among countries, our study assesses within-group inequality (within rural and urban) and between-group inequality (between rural and urban) of all India and its fifteen major states from 1983 to 2011–12. Our findings indicate that within-group inequality contributes most to overall or combined inequality. To effectively achieve the sustainable development goal in India, it is crucial to prioritise efforts towards reducing within-group inequality (within rural and urban). Additionally, it is essential to monitor the between-group inequality (between rural and urban) so that it does not increase excessively. Also, we have suggested some policies to achieve SDG 10 while fostering a more inclusive society.

Keywords: SDG - 10, Consumer Expenditure Inequality, Within-group Inequality, Between-group Inequalities

10. SDG 10 and Long-Term Cost of Pandemic: Prospects and Challenges for India.

Saha, R., Thapa, N. (2024)

In: Leal Filho, W., Ng, T.F., Iyer-Raniga, U., Ng, A., Sharifi, A. (eds) SDGs in the Asia and Pacific Region. Implementing the UN Sustainable Development Goals – Regional Perspectives. Springer, Cham. https://doi.org/10.1007/978-3-030-91262-8_63-2

Abstract: In response to the spread of COVID-19 and the imperative to save lives, the implementation of lockdown measures and associated restrictions became a necessity. These actions highlighted the profound disparities engrained within Indian society. Following the lockdown measures, numerous businesses faced partial or complete closures. This has led to unemployment and reduced income, particularly impacting those employed in the informal sector. The pandemic had widespread effects across every section of society, with the impoverished and marginalized being the most vulnerable to the adverse consequences. The income losses in the short run could be expected to have irreversible effects in the form of long-term costs. This could impact human capabilities, including nutritional status and education, particularly for the economically disadvantaged population. This will not only have a significant impact on their development and lives but could also result in a vicious cycle of inequality. However, these long-term costs are often understated and tend to receive inadequate policy attention. Thus, drawing on existing empirical evidence on the distributional impacts of the pandemic, this chapter underscores the interplay between the pandemic and preexisting inequalities, particularly emphasizing its prolonged implications on nutrition and education for vulnerable populations. This undertaking serves a dual purpose. Firstly, it enables an assessment of the feasibility of attaining the Sustainable Development Goals (SDGs), specifically Goal 10. Secondly, it provides the government with insights to recalibrate its policies in alignment with the pursuit of SDG 10.

Keywords: SDG – 10, Pandemic

SDG 11 Sustainable Cities and Communities

1. Assessment of Progress Towards SDG 11 in India

Poorva Vaishnav (2003)

In Recent Advances for Sustainable Development in the Area of Management and Humanities and Law (Volume -2) Editors: Dr. Nandan Velankar, Nakul Singh Chauhan, Isha Joshi, Dr. Raja Roy Choudhury, PRESTIGE INSTITUTE OF MANAGEMENT AND

RESEARCH, INDORE (M.P.), Bharti Publications, New Delhi- 110002 (INDIA) pp 252-262.

Abstract: This article discusses the achievement of Sustainable Development Goal No. 11, “Sustainable Cities and Communities,” in the diverse Indian landscape, categorized by census data. While the goal itself is self-explanatory, it’s crucial to explore the potential challenges and opportunities when implementing this goal across various types of Indian cities. India’s national development agenda places great emphasis on achieving the United Nations’ Sustainable Development Goal 11 (SDG 11) – creating Safe, Inclusive, Resilient, and Sustainable Cities. Spearheading this mission is the Ministry of Housing and Urban Affairs (MoHUA). Nevertheless, it’s crucial that cities themselves play a pivotal role in implementing SDG 11 within their local contexts. Indian cities grapple with a multitude of issues, including congestion, pollution, climate change impacts, food security concerns, and haphazard urban sprawl, all stemming from disorganized urbanization. In light of these pressing challenges, this background paper by using secondary source of data aims to tackle several key points. Firstly, it delves into how SDG 11 objectives are being put into practice in India. Secondly, it assesses the current status of various SDG 11 targets within the country. Thirdly, it identifies the obstacles that impede the realization of

these targets. Lastly, it outlines proposed strategies to propel this agenda forward. Achieving SDG 11 in India hinges on effective implementation and monitoring by city governments and state agencies. These include a lack of localized SDG efforts, governance and financial fragility in city administrations, the existence of numerous governance entities, and a dearth of comprehensive, timely, and granular data. Historically, India has adopted a top-down approach, with national and state governments taking the lead in designing, executing, and overseeing SDG 11 initiatives. However, to genuinely realize SDG 11, a bottom-up approach and robust SDG localization involving local governments are imperative.

Keywords: SDG - 11, Classification of Indian Cities, Scope.

2. Developing and testing the Urban Sustainable Development Goal's targets and indicators – a five-city study

David Simon, Helen Arfvidsson, Geetika Anand, Amir Bazaz, Gill Fenna, Kevin Foster, Garima Jain, Stina Hansson, Louise Marix Evans, Nishendra Moodley, Charles Nyambuga, Michael Oloko, Doris Chandi Ombara, Zarina Patel, Beth Perry, Natasha Primo, Aromar Revi, Brendon Van Niekerk, Alex Wharton, and Carol Wright (2016)

Environment & Urbanization Volume 28, Issue 1 April 2016
<https://doi.org/10.1177/0956247815619865>

Abstract: The campaign for the inclusion of a specifically urban goal within the United Nations' Sustainable Development Goals (SDGs) was challenging. Numerous divergent interests were involved, while urban areas worldwide are also extremely heterogeneous. It was essential to minimize the number of targets and indicators while still capturing critical urban dimensions relevant to human development. It was also essential to test the targets and indicators. This paper reports the findings of a unique comparative pilot project involving co-production between researchers and local authority officials in five diverse secondary and intermediate cities: Bangalore (Bengaluru), India; Cape Town, South Africa; Gothenburg, Sweden; Greater Manchester, United Kingdom; and Kisumu, Kenya. Each city faced problems in providing all the data required, and each also proposed various changes to maximize the local relevance of particular targets and indicators. This reality check provided invaluable inputs to the process of finalizing the urban SDG prior to the formal announcement of the entire SDG set by the UN Secretary-General in late September 2015.

Keywords: LULC; change detection; LST; MODIS; Landsat; USGS; Earth Explorer; SDG-11

3. Analysing the Role of India's Smart Cities Mission in Achieving Sustainable Development Goal 11 and the New Urban Agenda

Anurita Bhatnagar, Triveni Prasad Nanda, Shilpi Singh, Kruti Upadhyay, Anil Sawhney & D. T. V. Raghu Rama Swamy (2018)

In: Leal Filho, W., Rogers, J., Iyer-Raniga, U. (eds) Sustainable Development Research in the Asia-Pacific Region. World Sustainability Series. Springer, Cham. https://doi.org/10.1007/978-3-319-73293-0_16

Abstract: India is in a state of significant urban transition and transformation, which has resulted in the share of the urban population increasing from 18% in 1960 to 31% in 2011. It is expected that this growth would further accelerate, centred around cities, which are the existing centres of economic, social and urban importance. Recognizing the significance of cities in its future, the Government of India (GoI), in June 2015, launched the Smart Cities Mission (SCM), which focuses on the sustainable and inclusive development of Indian cities. This research aims to assess and analyse the synchronisation achieved between the two global treaties namely Sustainable Development Goal 11 (SDG 11) and New Urban Agenda (NUA) and SCM, twenty months post the commencement of SCM. The research analyses secondary data from existing SCM statements and guidelines and assesses them with respect to SDG 11 and NUA. Subsequently, it focuses on top nineteen cities under SCM. The research examines synergies between SDG 11, NUA and SCM, benchmarks the achievements and lacunae of the mission in pursuit of developing safe, resilient and sustainable cities.

Keywords: SDG – 11, Smart City Mission

4. SUSTAINABLE DEVELOPMENT GOALS Localising SDGs for India Setting the Urban Context

Garima Jain, Aromar Revi, Jyothi Koduganti, Ana Abbas (2018)

Indian Institute for Human Settlements, Bengaluru. <https://doi.org/10.24943/sdgsindia.2018>

Abstract: Recognising the importance of Indian urbanisation, disaggregating the SDGs, targets and indicators for urban areas is necessary to enable localisation and to assist in implementation. This document is an attempt to recognise the current status of sustainable development in India, using select indicators that are largely representative and practical to gather. It situates Indian states and localises metrics for their urban areas in a national and regional context. Specifically, it aims to analyse the available information to estimate if India is pivoting appropriately to achieve these goals. This goal-based analysis suggests that urban areas in India are performing better on five out of ten goals (for which urban disaggregated analysis was possible due to availability of data), except Goal 3 (health) where it is performing worse. It is also evident from the comparisons that urban areas are only doing marginally better than the states' overall averages on Goal 2 (hunger), Goal 4 (education), Goal 8 (economic development), and Goal 10 (equality). This substantiates the development discourses on the growing challenges of urban development in the context of growing urbanisation. For 6 of the 17 goals (Goals 9, 12, 13, 14, 15, and 16), there is a paucity of relevant data available for urban areas to conduct the analysis. The analysis shows that urban areas in Himachal Pradesh, Goa, Sikkim, Delhi and Kerala are performing better than urban areas in other states. Bihar, Uttar Pradesh, Chhattisgarh, Madhya Pradesh (MP) and West Bengal (WB), on the other hand, are among the worst performing urban areas. Overall, Goa, Delhi, Kerala, Punjab and Sikkim are amongst the better performing states, and Bihar, Uttar Pradesh (UP), Jharkhand, Arunachal Pradesh and Assam are the most challenged across Indian States around sustainable urban development, and potentially require immediate attention.

Keywords: Urban context, SDG-11, Indian states

5. Making Cities Resilient

edited by Vishwa Raj Sharma, Chandrakanta (2019)

(eBook) The Urban Book Series, ISBN 978-3-319-94932-1 (ebook) <https://doi.org/10.1007/978-3-319-94932-1>

Abstract: The increasing burden of population on infrastructure, uneven urban development, deteriorating Central Business District, traffic congestion and emerging heat island are some immediate problems deserving the attention of planners and administrators alike. Urban centres of any country are the engines of economic and social development of the society and serve as “growth poles” of the economy. Specially in developing countries, every day a never ending stream of migrants from different parts of the country arrive at these urban centres in search of employment, education, training, better quality of life, health care, etc. Urban centres are the last hope of many people under distress and facing different types of social, political and economic hardship. Creating urban systems that meet a society’s particular requirements is one of the important objectives of any planning exercise. Monitoring the functioning of the country’s urban system and identifying the bottlenecks in serving a society’s socio-economic needs will help in achieving this objective in a better way. This book highlights various aspects in this direction and provide important recommendations through which Indian cities can be made more resilient and smart.

Keywords: Resilience, Urban infrastructure, Governance, SDG - 11

6. SDG 11 Sustainable Cities and Communities

Vaidya, H., Chatterji, T. (2020)

In: Franco, I., Chatterji, T., Derbyshire, E., Tracey, J. (eds) Actioning the Global Goals for Local Impact. Science for Sustainable Societies. Springer, Singapore. https://doi.org/10.1007/978-981-32-9927-6_12

Abstract: Recent global policy discourses orchestrated under the aegis of the United Nations, such as the Agenda for Sustainable Development (2030) and the New Urban Agenda of UN Habitat, stress upon the need for concerted focus at the city and the community scale – not only to achieve long-term developmental objectives but also to make direct tangible benefits to the quality of lives of the people. The world at large is gradually taking an urban turn, as more and more people are moving to the cities. Cities account for 55% of the population, produce 85% of the global GDP but also 75% of the greenhouse gas emissions. The issues of global sustainability cannot be addressed, without strongly addressing sustainability at the urban scale. This chapter focuses on SDG 11 as the analytical framework to explore how the transformative force of urbanization represents opportunity and challenge to meet several other sustainability challenges, such as SDG 1 (poverty reduction), SDG 4 (education), SDG 5 (gender equality), SDG 6 (clean water and sanitation), SDG 7 (affordable and clean energy), SDG 8 (economic growth) and SDG 13 (climate action). The research highlights research and action points for urban governance systems to mainstream sustainability concerns through their local planning and development mechanism.

Keywords: Urban governance, Analytical framework, Action points, SDG - 11

7. Role of Urban Planning in Achieving SDG - 11 in India

Chetan Vaidya (2020)

Institute of Town Planners, India Journal 17 x 1, January - March 2020

Abstract: Looking at the most recent literature on the evaluation of SDG 11, this paper presents a review of the sustainable goal, directly relevant to urban planning. The paper shows that some progress in detailing out SDG 11 is made in India including the efforts made by the NITI Ayog. The paper also shows that urban planners must change according to the changing contexts and focus on new areas of concern that did not exist few decades ago. These emerging areas include energy efficiency, climate change, urban economics, urban finance, etc. Participation, engagement and partnerships with citizens, community groups, public agencies, private sector, academic institutions, etc.; are claimed to help realize implementation of SDG 11.

Keywords: SDG – 11, energy efficiency, climate change, urban economics, urban finance, partnerships with citizens

8. SDG11, Sustainable Cities and Communities

edited by Shyama V. Ramani, Hiroshan Hettiarachchi (2022)

Routledge, (ebook: ISBN: 978-1-003-20597-5) doi: 10.4324/9781003205975

Abstract: The volume aims to provide insight on the enormous challenge of ensuring urban and urbanising regions with social, ecological, public and technical infrastructures that effectively serve local needs. This is done in three ways. First it brings readers up to the date with the findings of the scientific literature on pathways to attain the different targets of SDG 11. Second, it provides conceptual frameworks relating to systematic transitions and sectoral / behavioural transitions to SDG 11- that can serve as elements for policy and business tools as well as possible new research avenues. Third, the book gives readers a real taste of the dynamic processes involved in urban transformations in Asia, Europe and South America through detailed case studies of countries and critics and in Africa through a literature analysis.

Keywords: SDG 11, Mysuru, Governance, framework

9. Governance Challenges of SDG 11: Case studies from India, Japan and Brazil

Nicholas M. Holden, Sanae Okamoto, Claudia Coutinho Nobrega, Raja Venkataramani, Julia Lessa Feitosa Virgolino (2022)

In SDG11, Sustainable Cities and Communities Shyama V. Ramani, Hiroshan Hettiarachchi (Editors) (2022)

Routledge India, DOI <https://doi.org/10.4324/9781003205975>

Abstract: Urban sustainability and the transition required to achieve SDG 11 are daunting as they call for massive financial investment to improve infrastructure and public amenities and present the enormous challenge of formulating appropriate public programmes, effective regulation and building of governance capabilities. To explore some of the drivers and obstructers of good governance, this chapter presents national experience from three countries (Brazil, India and

Japan), each of which reflects the interaction of different scales of governance (local, regional national) and a different type of problem (waste, sanitation and disaster resilience) to capture information about the challenges of addressing SDG 11 Targets 11.5, 11.6 and 11.B. Key findings include the difficulty of small municipalities being able to afford and compete for technical resources, the value of competition and the need for cooperation through the hierarchy of governance from local communities to the national government.

Keywords: SDG – 11, India, Japan, Brazil, waste

10. Sustainable Urban Spaces: A Case Study of an Indian Smart City.

Mitra, N., Mehta, K. (2022).

In: Talapatra, J., Mitra, N., Schmidpeter, R. (eds) Emerging Economic Models for Sustainable Businesses. Responsible Leadership and Sustainable Management. Springer, Singapore. https://doi.org/10.1007/978-981-16-7614-7_7

Abstract: The 17 sustainable development goals backed by 169 targets drive each minute social, geographical sector to work towards sustainability so that no one is left behind. Goal 11 specifically speaks of making ‘cities and human settlements inclusive, safe, resilient and sustainable.’ Since 2016, multi-stakeholders including administrations as well as civic bodies have made conscious efforts to create self-sustaining urban spaces among many of their other initiatives. This paper specifically delves into understanding some of the projects undertaken in various parts of the world through secondary research and documents a case study of an Indian Smart City through interview technique backed by secondary research. Interestingly, some of these individual and/or collective ingenuities are replicable models that can easily be adopted in various other locations.

Keywords: Urban spaces, Smart City, SDG - 11

11. Understanding the Linkage between Urban Growth and Land Surface Temperature— A Case Study of Bangalore City, India

Shruti Kanga, Gowhar Meraj, Brian Alan Johnson, Suraj Kumar Singh, Muhammed Naseef PV, Majid Farooq, Pankaj Kumar, Asif Marazi and Netrananda Sahu (2022)

Remote Sens. 2022, 14(17), 4241; <https://doi.org/10.3390/rs14174241>

Abstract: Planning for a sustainable future involves understanding the past and present problems associated with urban centers. Rapid urbanization has caused significant adverse impacts on the environment and natural resources. In cities, one such impact is the unsettling urban growth, resulting in the urban heat island (UHI) effect, which causes considerable positive feedback in the climate system. It can be assessed by investigating the relationships between urban Land Use/Land Cover (LULC) changes and changes in land surface temperature. This study links the urban transformations in Bangalore, India, between 2001 and 2021, with the city’s changing average land surface temperatures. LULC classification was performed on Landsat satellite images for the years 2001, 2011, and 2021, using the support vector machine (SVM) classification algorithm. LULC change analysis revealed an increase in the built-up area coinciding with a decreasing trend of water bodies, vegetation, and the area under the others (wasteland/open land/barren land) category. The results show that built-up increased from 462.49 km² to 867.73 km², vegetation decreased from 799.4 km² to 485.72 km², and waterbody declined from 34.28

km² to 24.69 km² in 20 years. The impact of urbanization was evident in Bangalore's land temperature changes between 2001 and 2021, showing the average temperature increased by 0.34 °C per year between the highest UHI events, contrary to 0.14 °C per year in non-urbanized areas. It is hoped that the results of this study can help the urban planners of Bangalore city identify critical areas where improvement in urban dwelling could be planned sustainably according to the global smart cities concept, an offshoot concept of the Sustainable Development Goal (SDG)-11.

Keywords - LULC; change detection; LST; MODIS; Landsat; USGS; Earth Explorer; SDG-11, LULC; change detection; LST; MODIS; Landsat; USGS; Earth Explorer; SDG-11

12. The role of urban transport in delivering Sustainable Development Goal 11: Learning from two Indian cities

Darshini Mahadevia, Chandrima Mukhopadhyay, Saumya Lathia, Kanika Gounder (2023)

Heliyon, Volume 9, Issue 9, e19453

Abstract: The next wave of unprecedented urbanisation is expected to occur in South Asia and Africa, with India being the most populous country. India's urbanisation choices will influence the success of the three global agendas: New Urban Agenda, Sustainable Development Goals, and the Paris Agreement. Sustainable urban transport is vital in delivering United Nations Sustainable Development Goal 11 (SDG 11) on inclusive and sustainable urbanisation. SDG11 includes dimensions such as equity, gender equality, health, employment, and climate change. Through a mixed-methods approach, the paper develops an assessment framework to investigate: 'What are the roles of existing urban transport interventions in delivering SDG11?' in two Indian cities: Surat (an industrial city of 5.9 million) and Udaipur (a tourist city of 0.8 million) across three interrelated transport roles: providing Inclusive Access, delivering Climate-Resilient Development, and delivering Context-Sensitive Planning. Each urban transport interaction is assigned synergy (+1), trade-off (-1) or mixed impacts (-/+1). The paper finds that current transport interventions in Surat & Udaipur largely result in trade-offs across all three themes Inclusive Access (-1 for Surat & Udaipur), Climate Vulnerability (-1 for Surat & Udaipur), and Context-Sensitive Planning (-1 for Surat & +1 for Udaipur).

Keywords: SDG 11, Surat, Udaipur, Context-Sensitive Planning

13. Governance transformation towards localisation of sustainable development goal 11 in India

Richa Kandpal and Mahesti Okitasari (2023)

World Development Sustainability, Volume 2, June 2023, 100069

Abstract: Sub-national governments play an essential role in transforming existing governance to deliver on the Sustainable Development Goals (SDGs), with SDG 11 intrinsically linked to SDG localisation. The Indian government is reforming its existing institutional mechanisms, and a research gap exists in assessing these reforms and sub-national responses to changes at the national level. Drawing from a transition management approach, this study focuses on the localisation of SDG 11 in India through a systematic evaluation of the national-level changes,

which are then used as a reference to examine sub-national responses. Our findings indicate that the governance transformation for SDG 11 localisation in India is optimistic but has yet to generate deep transformational reforms given its developing stages. First, the Indian governance system attempts to make cooperative and competitive federalism work complementary to SDG localisation. Second, the political impact of the SDGs on sub-national governance has remained primarily discursive. Third, there is an advantage to exerting the overlaps between SDG 11 and existing government schemes to discern governance adaptiveness and reflexiveness in monitoring and evaluation systems. Fourth, there are limitations to the usage of the SDG India Index and risks of over-reliance on scheme-based monitoring and evaluation frameworks. In analysing different governance changes around India's SDG localisation across its cyclical process (strategic, tactical, operational, reflexive), this study provides a nuanced understanding of the transition of the governance system in India towards a governance model for achieving the SDGs.

Keywords: Development planning, Governance transformation, Institutional mechanisms, SDG 11, SDG localisation

14. Research trends, themes, and insights on artificial neural networks for smart cities towards SDG-11

Akshat Jain, Ivan Henderson Gue, Prateek Jain (2023)

Journal of Cleaner Production, Volume 412, 1 August 2023, 137300

Abstract: Smart Cities can promote economic growth, sustainable transport, environmental sustainability, and good governance among cities. These benefits can support cities in achieving the SDG-11 targets. Smart Cities entails the integration of smart technologies, including machine learning techniques, in cities. Among the machine learning techniques, Artificial Neural Network (ANN) is prominent. Literature revealed significant research interest on ANN for Smart Cities, resulting to several existing review works. Existing works revealed research interests on applications for structural monitoring, Internet of Things (IoT), transport systems, and cybersecurity among others. However there is a scarcity in understanding the implications of ANN for Smart Cities towards SDG-11. This work, therefore, reviews the research trends on ANN for Smart Cities towards SDG-11 through a systematic bibliometric methodology. This work utilizes a keyword-based search retrieving 743 documents for descriptive analysis and 131 documents for content analysis. The results reveal an exponential growth in research interest and cluster formation among pertinent themes. This work determined the prominent themes on Environmental Impact, on Transport Systems, and on Urbanization. This review highlights insights on research trends, on thematic prominence, and on specific SDG-11 themes.

Keywords: Digital cities, Artificial Neural Network, Neuron, SDG-11

15. Achieving Localization of SDG11: A critical review of South Asian region and learnings for India

Neeharika Kushwaha, Charu Nangia, Bhargav Adhvaryu (2023)

International Review for Spatial Planning and Sustainable Development Volume 11 (2023) Issue 3/Article overview https://doi.org/10.14246/irspsd.11.3_102

Abstract: Home to one-fifth of the world's population, South Asian countries act as loci for interlinked sustainability issues owing to rapid urbanization. Given the context of formidable problems that threaten to overwhelm the region's cities and towns, the localization of SDG 11 has become desirable for sustainability. This paper reviews the literature encapsulating the progress of developing economies such as China, Singapore, Thailand, Indonesia, and Malaysia towards SDG 11 and intends to extract substantiated strategies adopted for comprehensive localization of the goal through certain examples. The results conglomerate key enablers such as inclusive institutional and financial environment, stakeholder engagement for the reorganization of people-centered resource flows, efficient data ecosystems to promote social innovation, and adaptive policy reform measures for generating cross-cutting innovative solutions. These enablers serve as the initial step for informing the essential parameters required to prepare the contextual framework of SDG 11 for Indian cities and induce a paradigm shift with informed policy decision-making at the city level.

Keywords: SDG 11, Agenda 2030, South Asia, India, Urbanization

16. Co-production approach to ecosystem-based adaptation and urban green infrastructure efficiency in metropolitan city-regions of India

Shaleen Singhal and Meenakshi Kumar (2024)

In *City Innovation In A Time Of Crisis* Edited by Peter Karl Kresl, Pg 144-166, Elgar, Published: 03 Dec 2024, Print ISBN: 9781035327973, eISBN: 9781035327980, DOI: <https://doi.org/10.4337/9781035327980> Pages: 270

Abstract: This chapter has developed a co-production approach to EbS and UGI for climate change adaptation for metropolitan city-regions of India. The significance of adopting the research-led co-production approach and integrating scientific knowledge with expertise to produce new knowledge products is highlighted. A bottom-up approach for assessing the efficiency of EbS and UGI is advocated as a climate change action measure. There is a growing need for greater involvement and coordination between stakeholders and the integration of scientific inputs for the effective implementation of a multi-scalar approach that can strengthen the gap between science, policy and practice.

Keywords: Ecosystem; Green infrastructure; Co-production; City-regions of India; Ecosystem-based solutions; Efficiency analysis, SDG - 11

17. The Impact of SDG-11 on Building Sustainable Cities: PPP Project Scenarios for Urban Infrastructure Development in India

Nimisha Jha (2024)

In: Dutta, V., Ghosh, P. (eds) *Sustainability: Science, Policy, and Practice in India*. Sustainable Development Goals Series. Springer, Cham. https://doi.org/10.1007/978-3-031-50132-6_11

Abstract: The twenty-first century has been nicknamed the “urban century”, with urban responses to global challenges shaped by “smartness”. Scholars have spent the last several years trying to explain “why, how, for whom, and with what consequences” the smart city paradigm emerges in different urban situations (Evans et al. 2019). The traditional urban development debate focuses on

either urban development or sustainable cities and typically ignores people-centred development options. The former addresses economic growth challenges, whereas the latter emphasises environmental considerations at the expense of poor development concerns. India's urban population of more than 450 million people accounts for less than one-third of the country's total population. It is anticipated that by 2045, its cities will house 800 million Indians, more than the whole population of modern-day Europe. Cities are now confronted with the escalating negative consequences of society's unsustainable path. Climate change, biodiversity loss, and increasing geographical segregation are all indicators of this. The repercussions of these issues frequently outpace individual urban house developers' management abilities. As a result, collaborations such as public-private partnerships (PPP) must be developed to counteract the current neoliberal trend. This chapter examines the flaws and limitations of PPP and its potential to address the problem of unsustainable urban development. However, fundamental differences like difficulties that connect the global sustainability model to the harsh reality of the local environment must first be addressed. The chapter outlines such a vision for sustainable cities in India and actions to achieve it. This gap threatens both the city's social foundation and its ecological ceiling. The chapter investigates the inherent hurdles that restrict efforts and potential institutional strategies to overcome or avoid them. This chapter's unified content will assist current researchers and motivate future investigators to integrate SDG-11 in their planned study in India.

Keywords: SDG-11, PPP, Urban Infrastructure

18. Smart Cities Mission and the Role of Energy Efficiency in Urban Development

Shaleen Singhal and Pulkit Shrotri (2025)

Yojana, February 2025, 22-27 pg

Abstract: India's Smart Cities Mission (SC M), launched in 2015, seeks to integrate infrastructure and technology for effective urban growth. Cities account for 50–60% of global GHG emissions, raising the need for a low-carbon economy through efficient energy supply and consumption. Effective waste management relies on energy efficiency, which reduces heavy energy consumption during collection, processing, and disposal of waste. The shift from conventional frameworks such as the Energy Conservation Act (2001) towards greater industry- and consumer-oriented programs, reflects an evolving trajectory of energy efficiency focused policy paradigm. Taking cognisance of energy efficiency measures addressed through the SCM, there is a need to upscale these across cities in India.

Keywords: SDG-11, Smart City Mission

SDG 12 Responsible Consumption and Production

1. Analyzing sustainable manufacturing practices – A case study in Indian context

K. Madan Shankar, Devika Kannan, P. Udhaya Kumar (2017)

Journal of Cleaner Production, Volume 164, 15 October 2017, Pages 1332-1343

Abstract: Rising advancements in manufacturing sectors force manufacturers to rethink and redesign their existing systems in order to cope with the challenges that emerged with globalization

and environmental concerns. An increase in customer awareness and pressures from stakeholders shifted manufacturers' focus; no longer were financial benefits the primary concern in the contemporary business environment. As a result, many innovative strategies were brought into the realm of manufacturing systems, such as lean, green, agile, and sustainable manufacturing practices. Sustainable manufacturing has been praised in recent years for its significant benefits directed at triple bottom line factors (social, environmental, and financial), but the majority of manufacturing strategies remain limited to either one or two factors. No reliable guidelines exist to guarantee the successful implementation of sustainable manufacturing; available literature fails to explore such a complex research topic. Minding this gap, this study takes the opportunity to analyze and identify effective sustainable manufacturing practices that may help in a specific domain. This study proposes a framework to achieve the research aim in an Indian context, where sustainability issues are especially relevant. Initially, the common sustainable manufacturing practices are collected from literature resources and validated with focus groups. Then, the collected practices are compared with one another with the assistance of case industry decision makers. To analyze the practices, a multi-criteria decision making methodology was adopted, specifically DEMATEL. From the case results, we determine that among 22 common sustainable manufacturing practices, promoting 6R (reduce, reuse, recycle, recover, redesign, and remanufacture) concepts reveals the greatest influence on implementation. Clearly, focusing on 6R concepts will effectively improve sustainable manufacturing implementation in the organization. Finally, this study sheds some light on the future opportunities hidden in this research area by providing contributions towards both scientific and social means.

Keywords: Sustainable manufacturing practices, DEMATEL, MCDM, SDG - 12

2. The Framing of Sustainable Consumption and Production in SDG 12

Des Gasper, Amod Shah, Sunil Tankha (2019)

Global Policy Volume10, Issue S1, Special Issue: Knowledge and Politics in Setting and Measuring SDGs, January 2019, Pages 83-95

Abstract: This paper examines the processes of formulation of UN Sustainable Development Goal 12 (SDG 12) – 'Ensure Sustainable Consumption and Production Patterns' – and its targets and indicators. We argue that business interests have steered its narrative of sustainable growth. The outcome of the SDG 12 negotiations reflects a production- and design-centered perspective that emerged in the 1990s and has a business-friendly regulatory approach and faith in solutions through new technologies. We show how the targets and indicators emerged in debates between national governments, UN agencies, civil society and private sector organizations – and how they reflect both the political process and technical and practical considerations in translation of a broad concept into the SDG format. While the emergence of SDG 12 as a standalone goal stems from a push by developing countries to build pressure on developed countries, and its presence may open space for attention to this area in the future, many of its targets were watered down and left vague. The indicators to measure progress on the targets further narrow the scope and ambition of Goal 12, whose current content does not adequately reflect earlier more transformative conceptualizations of Sustainable Consumption and Production.

Keywords: SDG 12, indicators, targets

3. Sustainable Consumption Pattern in India

Sanchita Daripa and Soumyananda Dinda (2020)

In: Hazra, S., Bhukta, A. (eds) Sustainable Development Goals. Sustainable Development Goals Series. Springer, Cham. https://doi.org/10.1007/978-3-030-42488-6_12

Abstract: This chapter focuses on sustainable development goals 12 (SDG 12) highlighting sustainable consumption in India. SDG 12 ensures sustainable consumption and production pattern. The chapter provides evidence of fuel and material consumption footprint in India and shows the trends of domestic material consumption and assesses SDG 12. This study suggests reducing fuel consumption-related subsidies in urban India and providing clean fuel access to rural India. It is also suggested to adopt the circular economy model for reuse and recycle materials to minimize resource consumption footprint in India.

Keywords: SDG 12, fuel and material consumption, urban

4. Sustainable Consumption and Production in India and its Global Impact: A Complex System Approach to its Solution.

Sharma, K. (2020).

Journal of Resources, Energy and Development, 17(2), 19-30. <https://doi.org/10.3233/RED-170202>

Abstract: There are various facets that can play a telling role in mitigating the aspect of climate change and the linkages associated with it. While largely the global focus has been on energy transition and moving away from fossil fuel-based consumption, a lot needs to be explored on how we as a society need to move towards responsible production and consumption patterns and the elements that can enable it. The phenomenon of climate change and sustainability is rooted in the products/services and their eventual mass consumption that warrant their degradation. Given the wide range of interdependencies that exist within the ecosystem of sustainability, this paper brings to light the need for analysing our consumption and production patterns through the lens of complex system mechanism, and its subsequent impact on India and the world.

Keywords: SDG 12, global impact

5. Supporting India on SDG 12 Monitoring and Reporting: A Critical Appraisal

Kedia, S., S. Bhattacharjya, M. Juneja and M. Dutta (2021)

SWITCH-Asia RPAC -TERI (SWITCH-Asia Regional Policy Advocacy Component and The Energy and Resources Institute) Policy Output Supported by European Union

Abstract: India's National Environmental Policy (NEP) of 2006 highlighted the fact that unsustainable consumption patterns, particularly in industrialized countries have serious adverse impacts on the environment, both local and global. Along with the principle of the 'polluter pays', NEP underscored that efficiency of resource use may also be accomplished by the use of policy instruments that create incentives to minimize wasteful use and consumption of natural resources. The objective of the project is to strengthen the national reporting process on SDG 12 by harmonizing the national indicator framework with the global indicator framework to the extent possible. Rooted in research and consultative processes, this knowledge product aims to systematize critical appraisal on the National Indicator Framework for SDG 12 to make

recommendations for the monitoring and reporting of the different nationally defined indicators while considering aspects such as harmonization with targets, policy cycle, data limitations, and feasibility to report at sub-national levels.

Keywords: SDG – 12, Monitoring, National Environment Policy, 2006

6. The Kaleidoscope of Changing Values: Are We Heading Towards Responsible Consumption and Sustainable Society? Lessons from Pune, India

Mansi Kapoor, Taha Chaiechi, Shilpa Deo, Pooja Darda, Anjali Sane and Ravikumar Chitnis (2022)

In: Chaiechi, T., Wood, J. (eds) Community Empowerment, Sustainable Cities, and Transformative Economies. Springer, Singapore. https://doi.org/10.1007/978-981-16-5260-8_22

Abstract: Values are inherently personal constructs that influence individuals' choices and help navigate many personal and professional dilemmas. Using the Basic Human Values by Schwartz as the theoretical framework, the aim of this paper is to examine the substitutability of self-enhancement values by self-transcendence values in promoting responsible consumption behaviours in society. The paper further examines whether Self Transcendence values are instrumental in driving responsible consumption among individuals. The paper relies on Focus Group studies to explore the topic. To ensure the accuracy of our analysis, representative samples of 88 Generation Z (48 – Under Graduates; 40 – Post Graduates) college students, 25 Generation Y employees, and 25 Generation X home-makers were selected for focus group discussions. The interaction in each group was for 60 minutes. All interviews were recorded with permission and transcribed. Data thus obtained was manually coded and analysed using the thematic analysis technique. The findings of the paper provide meaningful insights about the changing human values and their influence on consumption behaviour. In addition to the contribution to the existing literature in intercultural and consumer behaviour research, this study also contributes to the current understanding of how changing values are encouraging individuals for responsible consumption. The findings of the study will be useful to both researchers and practitioners in the field of consumer behaviour.

Keywords: Pune, SDG – 12, consumer behaviour

7. Performance assessment of circular driven sustainable agri-food supply chain towards achieving sustainable consumption and production

Mukesh Kumar, Mahak Sharma, Rakesh D. Raut, Sachin Kumar Mangla, Vikas Kumar Choubey (2022)

Journal of Cleaner Production, Volume 372, 20 October 2022, 133698
<https://doi.org/10.1016/j.jclepro.2022.133698>

Abstract: Food organizations have seen pressure from stakeholders, consumers, governments, and other international agencies to adopt sustainable practices in their business operations. Sustainable development is the current need for the agri-food sector to achieve the sustainable development goals (SDG) established by the United Nations. Sustainable development improves social well-being, environmental well-being, and economic growth. Regular performance monitoring plays an important role in the adoption of sustainable practices. This study developed a sustainable performance assessment (SPA) framework through integrated triple bottom line (TBL)

and circular economy practice. The weights of sustainable dimensions and key performance indicators (KPIs) have been determined using the fuzzy analytic hierarchy process (F-AHP). A fuzzy technique for order of preference by similarity to the ideal solution (F-TOPSIS) has been used to evaluate sustainable performance and rank the alternatives. A total of 16 KPIs were used to develop the framework drawn from literature and experts' opinions. Food quality, revenue growth, and resource utilization are the top three KPIs obtained from F-AHP. The economic factors have the highest weights (0.4), followed by the environment (0.34), circulation (0.16), and social dimensions (0.1). Food quality is ranked first with a weight of 0.16, and human resources are ranked 16th with a weight of 0.01. Through recycling, waste reduction, and waste management, the circular economy in AFSC acts as a support or catalyst for sustainable development and reaching goals like sustainable consumption and production and zero hunger.

Keywords: Agri-food supply chain, Sustainable performance assessment, SDG - 12, Circular economy practice (CEP)

8. Using Lifecycle Assessment to evaluate responsible consumption and production (SDG goal 12) in fashion supply chains

Benton, Helen M.; Acevedo, Beatriz (2022).

Anglia Ruskin Research Online (ARRO). Conference contribution.
<https://hdl.handle.net/10779/aru.23769180.v1>

Abstract: Fashion supply chains have massive environment impact, producing 2-8% of global carbon emissions (UNEP, 2019), water pollution, waste and using micro-plastics. Fashion growth and the throwaway culture prevails, so how can fashion supply chains respond to the challenges of being responsible in consumption and production (SDG goal 12) by 2030. This paper using lifecycle assessment to examine the challenge for clothing supply chains. Brands were revealed to have made some improvements, e.g. sustainable product lines, reduced packaging and use of sustainable materials. However, a typical garment utilised micro-plastics, was dyed using toxic substances, made by workers treated poorly, over-packaged, generated excessive carbon during transport, laundered with toxic chemicals and releases micro-plastics into the waste water, before disposal. Circular fashion and digital fashion could help stem the tide of environmental destruction, however, it is difficult to envision this enough will be done to achieve responsible consumption and production by 2030.

Keywords: Lifecycle Assessment, SDG - 12, Net Zero, Carbon Footprint, Zero Carbon, Responsible Business, Environmental Management, Fashion

9. Sustainable consumption practices in Indian households: a saga of environment management linked to Indian ethos and generational differences

Jaspreet Kaur, Emmanuel Mogaji, Deepti Wadera, Sangeeta Gupta (2022)

Society and Business Review, Volume 17 Issue 3, 2022, ISSN: 1746-5680

Abstract: This study aims to investigate the domestic sustainable consumption practices in Indian households and the motivations to do so. These practices also contribute to environment management and its impact on Indian society through the action of reusing, reducing and recycling of consumed products for two generations, namely, the Baby Boomer and the Generation Z. An exploratory qualitative research was undertaken in which the data were collected through personal

interview technique with 64 respondents including males and females from the generations of Baby Boomers and Generation Z of Indian households.

Findings - The theoretical framework of the 3R was extended to inculcate broader themes like awareness, action and motivation for the domestic sustainable activities. The findings conclude that the domestic sustainable consumption practices of Baby Boomers in India were far more advanced than their Generation Z counterparts. These two generations differed in their awareness sources, actions of sustainability and the motivations for undergoing the domestic sustainable activities. Managerial implications have been framed for organisations like start-ups, sustainable firms, government organisations and second-hand product vendors. These practices in such organisations could help in the enhancement of circular economy through the domestic waste disposal.

Practical implications - Practical implications are for organisations that can consider the domestic sustainability consumption practices while planning their strategies to maximise stakeholder satisfaction through their corporate social responsibility initiatives and create more goodwill and growth avenues for their businesses.

Originality / value - Where most of the past literature concentrates on the supply chain and manufacturing initiatives of sustainability or sustainable consumption, very few studies look at the angle of domestic sustainability initiative and how they could be linked to the initiative of circular economy. This paper fills this gap in past literature.

Keywords: Society, Norms, Circular Economy, 3Rs, Domestic Sustainability. Indian values, SDG - 12

10. Impacts of sustainable consumption and production initiatives in energy and waste management sectors: examples from India.

Singhal, S., Thapar, S., Kumar, M. and Sourabh Jain (2022). *Environ Dev Sustain* 24, 14184–14209 (2022). <https://doi.org/10.1007/s10668-021-02026-3>

Abstract: Energy and waste management sectors are considered important for the country's progress towards adopting sustainable consumption and production (SCP) practices and achieving Sustainable Development Goals. However, the rapid pace of urbanization, energy-intensive growth approaches, and generation of large quantities of waste have led to severe environmental degradation of cities in India. While the government has taken several initiatives for increasing resource efficiency, limited research has been done in an Indian context to explore the policy and institutional factors. The paper focuses on challenges relating to policy enablers within the energy management in buildings and construction and demolition waste sectors; 28 semi-structured interviews were conducted with stakeholders associated with both these sectors. The findings indicate that though India has been integrating climate change measures into its national policies and enhancing the domestic market's readiness for a circular economy, successful implementation of policy framework(s) urgently requires lifestyle and behavioural changes in the society. The study further identified the role of key stakeholders including government, businesses, and consumers, for transition to a low-carbon economy for both these sectors. This paper presents a bottom-up approach to understand the changes required in the enabling environment for the uptake of SCP practices that can be adapted by other emerging economies in the Asia Pacific region for building resource efficiency. The importance of soft factors relating to institutional capacities and governance structure is raised by the analysis in this paper.

Keywords: SDG 12, circular economy, resource efficiency

11. Firms enabling responsible consumption: a netnographic approach

Bipul Kumar and Nikhilesh Dholakia (2022)

Marketing Intelligence & Planning Vol. 40 No. 3, 2022 pp. 289-309

Abstract: This study explores enablers that firms could use to motivate consumers toward responsible consumption behavior. Completing the loop of responsible consumption—linking firms and consumers—helps firms to attain responsible consumption targets as part of the sustainable development goals (SDGs). The study uses netnography as the qualitative research methodology. The important enablers of responsible consumption behavior are choice editing, design intervention, addressing consumers' environmental identity, brand assurance, promoting innovation mindset and consumer empowerment – at the level of consumers and at the cross level of interaction between firms and consumers. Such enablers can help the firms in nudging their consumers toward responsible consumption. Using the lens of the expectancy–value theory of achievement motivation, this study extends the theoretical domain of responsible consumption. The enablers of responsible consumption behaviors found here serve as a useful guide for the strategies to attain the SDGs. The SDG goal 12 of responsible consumption is the focus of this study. The entire fabric of responsible consumption is woven around anthropocentric views, and hence the findings of this study have clear social implications.

Keywords: Responsible consumption, Netnography, SDG 12, Co-creation, Choice-editing

12. The Status of Sustainable Development Goal (SDG) on Responsible Consumption and Production in India

Joseph, Tinu. (2023).

SDG Responsible consumption and production. Available at SSRN:

<https://ssrn.com/abstract=4917999> or <http://dx.doi.org/10.2139/ssrn.4917999>

Abstract: The SDG goal 12 aims at sustainable development on responsible consumption and production by raising awareness of consumers about their choices and producers about the process of production and the government about the regulations to create responsible and sustainable product lifecycle and consumption by 2030. The objective of the present paper is to identify the relation with economic theories and SDG 12 targets, to elaborate the measurement target variables of SDG 12 and to identify additional variables that will improve this goal in relation to India. United Nations (UN) has highlighted 11 targets under the framework of sustainable consumption and production. NITI Aayog has worked out a state level analysis of four out of these 11 targets as given by UN. The secondary data sources referred include UN SDG 12 HUB, UNSD environmental statistics, UNEP global matrices for environment, RBI, NITI Aayog etc. The analysis highlights that India accounts for 8 percentage of total material consumption and per capita domestic consumption was almost double of world average. The larger share of hazardous waste generation in manufacturing sector is a growing concern. The growth in per capita fossil consumption, hazardous waste generations, plastic wastes etc. is an important concern among Indian states. The policy priority should aim at shift towards renewable energy sources, hybrid energy sources, and 100 percent recycling of waste and treatment of hazardous waste.

Keywords: SDG12, responsible consumption and production, renewable energy. JEL classification: Q01, Q56

13. Changing values of millennials and centennials towards responsible consumption and sustainable society

Sahil Singh Jasrotia, Pooja Darda, Shailesh Pandey (2023)

Society and Business Review, Volume 18 Issue 2, 2023 ISSN: 1746-5680

Abstract: Purpose - The individual's set of values determines how they make decisions and navigate various personal and professional issues. This study aims to investigate the substitutability of self-improvement values for self-transcendence values in fostering responsible consumption behaviors in society, using Schwartz's Basic Human Values as the theoretical foundation.

Design/methodology/approach - Focus group discussions are used to investigate the research problem. Representative samples of 100 centennials or Generation Z college students (50 undergraduate and 50 postgraduate students) and 45 millennials or Generation Y working employees were chosen for focus group talks to ensure the findings' correctness. Using thematic analysis, the information gathered was coded and analyzed manually.

Findings - The paper looks into whether people's self-transcendence values play a role in getting them to act responsibly when they buy things. This study gives us much new information about how people's values change and how people buy things in today's world.

Research limitations/implications - This study explains how changing values make people want to be more responsible with their money and adds to the literature on sustainable consumption and consumer behavior. Using the lens of Schwartz's Basic Human Values, this study extends the theoretical domain of responsible consumption.

Originality/value - The concept of sustainable consumption is essential for the next generation's well-being. The sustainable development goal (SDG) 12 of responsible consumption is the focus of this study. This is a novel study to examine and understand factors that can facilitate consumers to consume responsibly to attain the SDGs. This is also one of the first studies on responsible consumption, using focus group discussions as the research methodology.

Keywords: Sustainable consumption, Millennials, Centennials, Values, SDG - 12

14. Responsible consumption and production: a roadmap to sustainable development

Naveen Kumar Arora and Isha Mishra (2023)

Environmental Sustainability (2023) 6:1–6 <https://doi.org/10.1007/s42398-023-00266-9>

Abstract: Transition towards sustainable consumption and production will reduce negative impacts on climate, environment as well as on people's health and is a pre-requisite to achieve green economy. SDG 12 is linked to the success of almost all other SDGs. The nexus between food loss/waste and zero hunger is well known and by transforming how the world produces and consumes food will be a game-changer for achieving food security (SDG 2). Moreover, sustainable management of natural resources will directly influence life below water (SDG 14) and life on land (SDG 15) by mitigating the over exploitation of terrestrial and marine ecosystems and its biodiversity as well restoring and conserving them. Managing chemicals and waste will further help in improving water efficiency and its quality (SDG 6). Shift from fossil fuels towards clean sources of energy will contribute towards use of reliable and sustainable energy (SDG 7), improve health and well-being of people (SDG 3) and will create new job opportunities thus mitigating poverty and inequality (SDG 1 and 10). This will also contribute towards success of SDG 9 i.e. promotion of

resilient infrastructure, SDG 11 i.e. sustainable urbanization and transportation and thus will enable economic growth (SDG 8). Quality education is another crucial aspect that will encourage behavioral change for both producers and consumers to promote a more sustainable pattern of consumption and production (SDG 4). With less than a decade remaining until the 2030 deadline, strong support and partnerships from governments, organizations, policy makers, stakeholders, business owners and NGOs (SDG 17) play a very crucial role. They can make a big difference to set the track record of SDGs on a right path and in capacity building. With all these concerted efforts and approaches it will become possible to use and produce in sustainable ways and restore the ecosystems of planet back to normalcy.

Keywords: SDG – 12, targets, interlinkages

15. FAMILY BUSINESSES ON A MISSION: Attaining the 2030 Sustainable Development Goal of

Responsible Consumption and Production

EDITED BY NAOMI BIRDTHISTLE and ROB HALES (2023)

Emerald Publishing Limited, Howard House, Wagon Lane, Bingley BD16 1WA, UK ISBN: 978-1-80455-840-9 (Online)

Abstract: This book makes an important contribution to research on family businesses by highlighting how businesses promote particular SDGs through their work. The book aims to contribute positively to providing evidence of the role of sustainable consumption and production in family businesses in effectively achieving SDGs on a global basis. The case studies on a family business display support and embody the principles of an SDG in their operations, culture, and/or business philosophy.

Keywords: SDG – 12, Family businesses

16. Attainment of Sustainable Development Goals through Responsible Utilization of Resources as Building Materials: A Case Study from Kerala State, South India

Subha Vishnudas and Lekshmi M S (2024)

In Civil Engineering Innovations for Sustainable Communities with Net Zero Targets, Sreevalsa Kolathayar, N Vinod Chandra Menon, Sreekeshava K S (Editors), Chapter 2 (eBook ISBN9781032686899)

Abstract: Unsustainable patterns of consumption and production are the root cause of the planetary crises: climate change, depletion of natural resources, biodiversity loss, and pollution and are still persisting. These crises, and related environmental degradation, threaten human well-being and achievement of the Sustainable Development Goals. We humans are responsible for this, and hence each individual should work together to improve resource efficiency, reduce waste and pollution, and shape a new circular economy. The construction industry is facing a number of challenges related to depletion of resources, accessibility to affordable materials, disposal of waste materials and generation of greenhouse gases. There is immense potential for natural resources such as earth, fibres, herbal extracts, animal dung etc. worldwide to be utilized as raw materials for building construction. On the other hand, the world is facing the global challenge of unscientific disposal of agricultural wastes. This chapter examines the effective utilization of earth and other

wastes from natural resources locally available in the State of Kerala, South India, for the attainment of sustainable development goals in the context of sustainable building materials.

Keywords: Kerala, SDG 12, agriculture waste, construction industry

17. Understanding the drivers of green consumption: a study on consumer behavior, environmental ethics, and sustainable choices for achieving SDG 12

Manjit Kour (2024)

SN Bus Econ 4, 97 (2024). <https://doi.org/10.1007/s43546-024-00691-w>

Abstract: This cross-sectional study investigates the relationship between consumer behavior, environmental ethics, and green consumption in the context of environmental concerns. Using survey data and drawing from the Theory of Planned Behavior (TPB), the research examines how factors like attitude towards green products, subjective norms, environmental ethics, and moral obligations influence consumers' willingness to use green products and their subsequent green consumption behavior. The study confirms that having a positive attitude towards green products significantly predicts the willingness to use them, aligning with previous research findings. Additionally, it reveals that social norms directly impact consumers' willingness to adopt green products, highlighting the role of societal influences in eco-conscious choices. Furthermore, the research establishes that moral obligation not only drives the willingness to use green products but also motivates actual green consumption, emphasizing the importance of ethical considerations in consumer decision-making. Environmental ethics also emerge as a significant factor influencing the willingness to use green products. Importantly, willingness to use green products acts as a key mediator, connecting attitudes, norms, ethics, and moral obligations to green consumption behavior. These findings have practical implications for businesses and policymakers looking to promote green consumption and align their strategies with Sustainable Development Goal 12 (SDG 12) - Responsible Consumption and Production. Understanding the drivers of green consumption can help stakeholders develop effective interventions to encourage responsible and sustainable consumer behavior.

Keywords: SDG 12, Theory of Planned Behavior, Environmental ethics

18. Multi-objective optimization of responsible sourcing, consumption, and production in construction supply chains: an NSGA-III approach toward achieving SDG 12

Bharadwaj, M., Patwardhan, M. and Sharma, K. (2025)

Asian J Civ Eng 26, 1305–1319 (2025). <https://doi.org/10.1007/s42107-024-01252-0>

Abstract: This study presents a multi-objective optimization approach for enhancing responsible sourcing, consumption, and production in construction supply chains, aligning with Sustainable Development Goal 12 (SDG 12). Using the Non-Dominated Sorting Genetic Algorithm III (NSGA-III), the research addresses complex trade-offs between environmental impact, cost-effectiveness, and social responsibility in construction projects. Data from industry case studies, including real-world construction projects, and simulations reflecting varying material costs, emissions regulations, and logistical challenges were used to validate the model. The findings reveal Pareto-efficient solutions, with up to a 9.4% reduction in carbon emissions and 3.3% cost savings while achieving a 7% improvement in social responsibility metrics. Sensitivity analysis demonstrates the model's robustness to changes in material costs and supply chain disruptions. These results

underscore NSGA-III's effectiveness in generating optimized solutions that minimize environmental footprint, enhance resource efficiency, and promote ethical practices. This research provides actionable insights for construction firms and policymakers, offering a scalable model to integrate sustainable practices into construction supply chains and advance SDG 12 objectives.

Keywords: SDG 12, NSGA-III, Sensitivity analysis

SDG 13 Climate Action

1. Climate Change Policy in India and Goal 13

Neha Sami, Chandni Singh and Amir Bazaz (Undated)

Indian Institute for Human Settlements, Bangalore.

Abstract: While India's urban regions have the potential to drive regional, national and global development, Indian cities need to develop successful climate mitigation and adaptation strategies to address national and global sustainable development concerns. This commentary explores how Goal 13 of the Sustainable Development Goals (SDGs) can help shape national and regional policy on climate change. It situates this discussion within the Indian policy context by assessing current efforts by the Government of India to tackle climate change at various levels. It also begins to identify key challenges and opportunities within the Indian policy framework that can help our cities become more resilient to a changing climate.

Keywords: SDG – 13, Climate policy

2. Climate Action-Based Policy Administration in India: Developments and Challenges

Priyadarshini Priya and Abhilash P. C. (2019)

Climate Change and Environmental Sustainability

Year: 2019, Volume: 7, Issue: 1 pg 102-107

Abstract: Climate change and sustainable development are presently global buzzwords receiving the unbridled attention of policymakers and governments for deciding the action agenda of development. The concern over impacts of climate change is evident in the fact that Goal 13 of the Sustainable Development Goals (SDGs) focuses entirely on it. The present communication therefore attempts to highlight the status of Climate Action-related policies in India and their coherence with the SDGs. The National Institution for Transforming India (NITI) Aayog has successfully established an initial framework through formulation of schemes and allocation of responsibilities. However, constraints in the form of cross-sector policy coherence, absence of definitive national indicators against SDG targets, limited budgetary dispensation and deficiencies in data acquisition hinder the advent of climate smart governance in India. Attainment of a nexus in terms of policy mechanisms among the major drivers of climate change in the Indian context along with stimulation of research activities fostering development of clean technologies would help in effective tackling of climate change-mediated concerns.

Keywords: SDG – 13, Climate actions, National action plan on climate change, Sustainable development goals, Policy coherence, NITI Aayog.

3. Localizing indicators of Sustainable Development Goals : A model in the context of Indian Himalayan States for SDG 13 and 15.

Rajlakshmi Datta and Bharti Jaiswal (2019)

Thematis Journal of Geography ISSN: 2277-2995 Vol-8-Issue-8-August-2019

Abstract: This paper argues the need and the mechanism to localize the indicators of SDG [Sustainable Development Goals] for Indian Himalayan States in the context of SDG Goal 13 and SDG Goal 15. Goal 13 of the SDG is to take urgent action to combat climate change and its impacts while Goal 15 of SDG aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. These two goals out of the seventeen goals are directly related to environment, ecology and climate change. The Indian Himalayan Region [IHR] being the life sustaining system of millions of people and vast species of flora and fauna in uplands and much more in lowland areas due to its vast bio physical diversity also acts as a climate regulator for the continent. This paper first develops the context arguing why Goal 13 and 15 should be topmost priority for the Indian Himalayan states. The paper then recommends some sequential suggestive steps to develop a schema for monitoring the indicators suggested by UN, MoSPI, NITI Ayog. The paper suggests that the same can be substantiated into actual monitoring mechanism by mapping the relevant Centrally Sponsored Schemes (CSS), State Schemes (SS) and EAP (Externally Aided Projects) in consonance with such indicators. The paper thus proposes the need for localized implementation of schemes for achieving the Goals and thereafter relevant monitoring of the same considering the basic characteristic of Himalayan states. The paper also insists for the research and study needs to identify the data gaps in each indicator proposed, by taking a case of Uttarakhand as a representative of Himalayan states of India and presents a model on how a Himalayan state should decentralize the monitoring mechanism of each indicator in different departments by following the model of the State of Uttarakhand. The paper finally presents policy asks for achieving those time bound targets by substituting SDG with HDG [Himalayan Development Goal]. Indicators of UN, MoSPI, NITI Ayog, DES of Uttarakhand and some other Indian Himalayan states and various state government level departments have been used to carry out the study.

Keywords: SDG 15, 13, Indian Himalaya, Uttarakhand, model

4. 'On the Horns of a Dilemma'! Climate Change, Forest Conservation and the Marginal People in Indian Sundarbans

Dayabati Roy (2020)

Development Studies, 47(2), 307–326. <https://doi.org/10.1080/08039410.2020.1786452>

Abstract: The marginal people of the Indian part of Sunderbans (SDB) do now subsist 'between two fires' – climate change and climate change adaptation and mitigation policies. They have already felt the fire of climate change in terms of loss of livelihoods, homelessness, and even life harm. They have begun recently to experience the fire of climate change adaptation and mitigation policies. The fallout of this situation, thus, comes in form of mass-exodus, and social and political conflicts at the margin. This article tells a story of how the postcolonial government in India, like its predecessor i.e. the British colonialists, would orchestrate a concerted effort in accumulation-based development in the name of conservation of SDB. Critically engaging the trajectory of policy

interventions including the Forest (Conservation) Act, 1980, the Draft National Forest Policy, 2018 and the Scheduled Tribes and other traditional forest dwellers (Recognition of forest rights) act, 2006, it explores the dynamic way in which the government uses the climate change and conservation excuse to evict the Scheduled Tribes and other traditional forest dwellers from the forestlands. In conclusion, this article argues why we should go beyond the capitalist 'growth' narrative in order to formulate a more grounded climate and social justice legislation.

Keywords: SDG – 13, forest conservation, forest rights, Sundarbans, development

5. Sustainable Development Goals and Disaster Risk Reduction, Targets and Challenges for India.

Mishra, H.S. (2020).

In: Malhotra, V.K., Fernando, R.L.S., Haran, N.P. (eds) Disaster Management for 2030 Agenda of the SDG. Disaster Research and Management Series on the Global South. Palgrave Macmillan, Singapore. https://doi.org/10.1007/978-981-15-4324-1_5

Abstract: Climate change is frequently occurring throughout the world. It is significantly altering the broad contours of global climate. The continuous rise in greenhouse gas emissions and the consequent global warming is causing glaciers to melt faster, leading to a rise in sea levels and more intense heat-waves. This is gradually altering weather patterns in different parts of the world, resulting in a significant increase in the frequency and scale of climate-related disasters. The formulation of United Nations Sustainable Development Goals (SDGs) in September 2015 marked a watershed in the global effort to combat the challenges posed by climate change. SDGs have outlined a fifteen-year comprehensive global action plan to address the impact of climate change, especially those leading to a rise in climate-related disasters. The Sustainable Development Goal number 13 (SDG-13) categorically states that the international community will have to mobilize \$100 billion annually by 2020 towards climate-related disaster mitigation measures alone. SDG-13 is especially significant for India, as it ranks sixth most vulnerable country to climate change impact in the Global Climate Risk Index 2018. This paper attempts to analyse the commitments made by India towards reducing the emission of greenhouse gas emissions in its Nationally Determined Contributions (NDCs) submitted before the United Nations Framework Convention on Climate Change (UNFCCC) and the challenges and policy hurdles and bottlenecks India faces towards achieving its SDG-13 related targets by 2030. The gradual rise in climate and weather-related disaster incidents makes it imperative and urgent for India to initiate institutional steps to combat this threat and strengthen its legislative framework. The unprecedented flood incidents in India's prominent cities in Jammu and Kashmir, Tamil Nadu and Kerala in recent years have shown their growing vulnerability to climate-related disasters, especially floods. The paper also tries to highlight the institutional weaknesses in India's disaster management strategy and offers a new 'Urban Floods Disaster Management' strategy to strengthen the capability of Indian cities to combat climate-related disasters. It is based on an in-depth empirical analysis of the SDG targets, the text of the international agreement reached at the 2015 Paris Climate Conference, the NDCs committed by India to reduce the emissions intensity of its GDP by 33–35% by 2030 from the 2005 level and the official policy documents tabled in Indian Parliament on climate change. The official steps initiated by India towards reducing carbon emissions and achieving its NDC targets, the information personally collected during Kashmir floods of September 2014 as a field correspondent have also been studied and analysed. India urgently needs to put in place a new institutional

roadmap to combat climate-related natural disasters, restructure its disaster governance strategy and expedite efforts to implement the SDG-13 related targets by 2030.

Keywords: SDG 13, disaster management, Urban floods, NDC

6. SDG 13 Climate Action.

Franco, I.B., Tapia, R., Tracey, J. (2020).

In: Franco, I., Chatterji, T., Derbyshire, E., Tracey, J. (eds) *Actioning the Global Goals for Local Impact*. Science for Sustainable Societies. Springer, Singapore. https://doi.org/10.1007/978-981-32-9927-6_14

Abstract: There is an increasing consensus that stakeholders at education institutions, specifically educators and students, face enormous challenges in translating climate education into effective action. Therefore, a better understanding of these issues – both within and beyond education institutions – is paramount. This chapter addresses such issues within education institutions, including teachers and students misconceptions regarding climate change, behavioural issues and social considerations such as peer pressure. This investigation worked to critically analyse issues with the current climate education scheme, whilst identifying key areas in which improvements should be made to effectively promote climate action and contribute to the achievement of the sustainable development goal related to climate action (SDG 13).

Keywords: SDG 13, climate education, climate action

7. Navigating the impact of climate change in India: a perspective on climate action (SDG13) and sustainable cities and communities (SDG11)

Sharfaa Hussain, Ejaz Hussain, Pallavi Saxena, Ashish Sharma, Pooja Thathola, Saurabh Sonwani (2024)

Front. Sustain. Cities 5:1308684. doi: 10.3389/frsc.2023.1308684

Abstract: Climate change is a global concern of the current century. Its rapid escalation and ever-increasing intensity have been felt worldwide, leading to dramatic impacts globally. The aftermath of climate change in India has brought about a profound transformation in India's environmental, socio-economic, and urban landscapes. In 2019, India ranked seventh, among the most affected countries by extreme weather events caused due to changing climate. This impact was evident in terms of both, the human toll with 2,267 lives lost, and the economic damage, which accounted for 66,182 million US\$ Purchasing power parities (PPPs). Over the recent years, India has experienced a significant increase in the number and frequency of extreme weather events, causing vulnerable communities. The country experienced severe air pollution problems in several metropolitan cities and was highlighted in the list of the world's most polluted cities. Additionally, India has become the most populous nation globally, boasting a population of 1.4 billion people, equating to ~18% of the global population, and experiencing an increased rate of consumption of natural resources. Owing to the country's current scenario, various climate mitigation strategies, including nature-based solutions, must be implemented to reduce such impacts and support India's target of achieving the Sustainable Development Goals (SDGs). This review tries to have a holistic understanding of the effects of climate change on different sectors to identify India's challenges in

achieving SDG 13 and SDG 11. Finally, it also highlighted the future recommendations for climate change-related research from an Indian perspective.

Keywords: SDG – 13, 11, PPP

8. Analyzing nonlinear impact of economic growth drivers on CO₂ emissions: Designing an SDG framework for India

Muhammad Shahbaz, Rajesh Sharma, Avik Sinha, Zhilun Jiao (2021)

Energy Policy, Volume 148, Part B, January 2021, 111965

<https://doi.org/10.1016/j.enpol.2020.111965>

Abstract: Several Asian countries are facing challenges regarding the accomplishment of the objectives of Sustainable Development Goals (SDGs), and India is facing a similar situation. Following this, this study talks about designing an SDG framework for India, which can be used as a benchmark for other Asian countries. In this pursuit, this study looks into whether per capita income, energy use, trade openness, and oil price have any impact on CO₂ emissions between 1980 and 2019. The nonlinear autoregressive distributed lag approach proves that the fluctuations in independent variables have an asymmetric long-term impact on CO₂ emissions. The results reveal that the prevailing economic growth pattern in India is environmentally unsustainable, because of its dependence on fossil fuel-based energy consumption and imported crude oil. Import substitution has been identified as one of the first stepping stones to address this issue, and accordingly, a multipronged SDG framework has been designed based on the direct and extended version of the study outcomes. While the Central policy framework shows a way to address SDG 7, SDG 8, SDG 12, and SDG 13, the Tangential policy framework shows the way to sustain the Central policy framework by addressing SDG 4.

Keywords: CO₂, Energy, NARDL, Oil prices, SDG -13

9. Integration of Multi-dimensional Rural and Urban Planning Efforts for Achieving SDG 13 – Indian Context

Bandyopadhyay, Piyali (2021)

CITIES 20.50 – Creating Habitats for the 3rd Millennium: Smart – Sustainable – Climate Neutral. Proceedings of REAL CORP 2021, 26th International Conference on Urban Development, Regional Planning and Information Society. pp. 433-444. ISSN 2521-3938

Abstract: Earth's climate is dynamic phenomenon subjected to change through natural cycle and anthropogenic influences. Rapid urbanization and industrialization have accelerated the process of climate change. During last few decades world has become more concerned about changes in climate, popularly known as Global Warming. Every sphere of life is affected through climate change. Prime anthropogenic reason for climate change is accumulation of Green House Gases due to burning of fossil and fuel. As per estimation of World Bank half of the world's population lives in cities, a share that is likely to reach 70 per cent in 2050 (World Bank 2010). Cities utilize as much as 80 per cent of worldwide energy production and account for a roughly equal share of global greenhouse gas emissions. Urban population is expected to be double by 2030 however; the global built-up area is expected to triple during the same period (Angel et al. 2005). Sustainable Development Goal 13 (SDG13) talks about climate change action plan, it is one of the 17 Sustainable Development Goals established by United National during 2015. SDG13 invites

Governments to “take urgent action to combat climate change and its impacts”. It emphasizes addressing and minimizing the risks arised due to climate change and is integral to the successful implementation of SDGs. Scope of SDG13 comprises multi-dimensional focus which inter alia includes adaptation and mitigation, mainstreaming climate concerns in development policies and discussing financial mechanisms to meet the targets. Cities are hubs of opportunities for livelihood, therefore, it attract population for migration. Cities are drivers of global climate change and at the same time it is most affected party. Rapidly growing cities in developing countries and emerging economies with limited infrastructure very often become unsuccessful to provide adequate protection from extreme weather events and changing climatic conditions. The urban poor are particularly most vulnerable towards extreme weather events as they are more exposed to these events. In many cities, unplanned and haphazard urban growth leads to rapid urban sprawl, pollution, and environmental degradation. To meet the demand of urbanization issues related to climate change is largely under estimated. Peri urban areas are the most dynamic space in the process of urbanization, encounter land use change, haphazard development without prefeasibility study. These areas need special attention for mitigation and adaptation for climate change. Rural ecosystem of India possesses unique physical, social and economic characteristics which make them uniquely vulnerable to the impacts of climate change. Impact of climate change in rural areas involves major questions of detection and attribution. Whilst having potential, there are complications with using traditional knowledge and farmer perceptions to detect climate trends (Rao et al., 2011; in IPCC 2014). Climate Change impact may be categorized into two segments, i.e. first sort involves extreme events, such as floods and storms, as they impact on rural infrastructure and cause direct loss of life and second sort will involve impacts on agriculture or on ecosystems on which rural people depend. Sustainable development, climate change impacts and disaster risk management are core issues for both rural and urban areas of India. Vulnerability due to climate change is a dynamic concept, varies spatially as well as temporally with sensitivity, exposure and adaptive capacity. In case of urban areas climate change responsive city plan should not be confined within city administrative boundary it should encompass peri-urban areas. Similarly for climate change responsive rural planning efforts may integrate climate change issues with rural employment, infrastructure development, natural resource management, basic need development programme, etc. Various initiatives like, Smart City Mission, National Urban Information System, Environmental Information System, National Spatial Data Infrastructure, Atal Mission for Rejuvenation and Urban Transmission, Rurban Mission, etc. are implemented by the Government of India toward sustainable rural and urban development. But in these rural and urban planning programmes issues related to climate change are not addressed. Details study of these programmes/ schemes reveals the scope of integration of climate change related issues with exiting planning initiatives. For achievement of SDG13 there is need to integrate these initiatives along with climate change responsive plan for both rural and urban areas. In this article an attempt has been made to develop a methodology for preparing cross sectoral and multi-dimensional planning model for climate change responsive planning for rural and urban areas.

Keywords: SDG -13, Rural, Urban, Missions, Programmes

10. Assessing corporate response to climate change: evidence from India

Lekshmi Kumar, Ashish Aggarwal (2022)

Management of Environmental Quality, Vol. 33 No. 5, pp. 1147-1166. <https://doi.org/10.1108/MEQ-09-2021-0215>

Abstract: This paper aims to understand the reported awareness and response of Indian corporates to climate change and explores how and why the approaches vary with ownership and industry types. The paper also evaluates whether companies' financial and climate performances are correlated. The authors collected data from the sustainability/integrated reports, websites and carbon disclosure project (CDP) responses of top-60 companies from the 2019 Fortune India 500 list against 52 indicators designed for the purpose. Descriptive statistics, ANOVA analyses, exploratory factor analysis (EFA) and linear correlations of climate responses with annual revenue and profitability were carried out. Private sector firms outperform public sector companies, and manufacturing industries surpass services industries. Organizations disclosing to CDP and detailing United Nations Sustainable Development Goals (UN SDGs) and SDG-13 in their reports score significantly higher (at 5%) than their counterparts. The number of positive responses is positively correlated to the revenue and profitability of the companies. EFA indicated the presence of two underlying factors responsible for the observed variances. Businesses constitute an essential driver of growth in large economies and hence are critical for addressing the issue of climate change. The study underlines the role played by the private sector in mitigating climate change and its impacts. This is among the first studies that comprehensively evaluate the climate responses of Indian corporates. The current study is also among the foremost studies in the Indian context that identify the underlying factors behind the observed variances and explore correlations between financial and climate performances.

Keywords: SDG-13, corporate response, economic performance correlation

11. Understanding the Role of India's Climate Policy in achieving the SDGs through Long-term Viability of CCS

Anwasha Aditi (2022)

<https://iris.uniroma1.it/handle/11573/1730157?mode=simple>

Abstract: In the fight to tackle the growing issue of climate change, Carbon Capture and Storage (CCS) is largely the ultimate policy solution available and negotiated upon right now. Climate change in India attributes to gradual changes in our human activities ranging from urban transitions (rural to urban) to energy transitions (non-renewable to renewable). Therefore, in order to achieve net-zero emissions in the coming future, a complete renewable energy-based system demands newer technologies such as Carbon Capture and Storage. This transition to a low-carbon pathway stems from its ability to avoid carbon dioxide emissions and sticking to the average global temperature increase to 2°C. The unabated use of non-renewable sources is on the rise and feeding the urban communities is already emerging as a challenge for a variety of reasons. Ergo, urban development is what most of the nation's development goals today stress upon. India followed by China and the USA is the third largest polluter through the emission of greenhouse gases (GHGs) and also responsible for 6.9% of total global emissions. Henceforth, it's active role in determining the course of global climate actions to achieve our Sustainable Development Goals through sustainable practices is worth paying attention to. Our traditional climate policies seek to target on reducing greenhouse gas emissions (SDG 13) along with the 'added-benefit' of improved air quality, good health and well-being (SDG3), facilitate clean and sustainable energy (SDG 7), boosts economic growth (SDG 8), sustainable cities (SDG 11) and many more – an emission mitigation strategy attributing to the achievement of our SDGs: 'killing two birds with one stone.' The impact intensifies when technology combined with our available sources leads to intended

policy outputs for the nation. The post-2007 period witnessed a gradual shift in India's climate change policy. The constitution of the high-powered Prime Minister's Council on Climate Change in 2007 to coordinate the national action for assessment, adaptation and mitigation was perceived as a pragmatic step. Eventually, the unilateral launch of India's National Action Plan on Climate Change on 30 June 2008 clearly exhibited India's solemn commitment to reduce greenhouse gas emissions. The 'National Action Plan on Climate Change' of 2008 seeks to identify measures that help us in achieving development objectives along with ensuring energy efficiency and use of renewable energy sources. This means that though development remains India's central priority, the focus has shifted to climate mitigation as a by-product of developmental activity. Every SDG goal is directly or indirectly related and climate co-benefits help in ameliorating poverty, hunger, improving health and hygiene which means that if we aim at climate action (SDG 13), the other goals eventually fall into place. The present article seeks to dive into India's current climate change policy and to integrate climate change measures such as CCS into federal planning policies and strategies. It initiates with an introduction to India's climate policy and enquires the necessity to incorporate CCS as a mitigation strategy in the current scenario. Due to its commercial availability and little or no progress on its deployment, the usability of CCS is not so profound in India as compared to its unabated counter-technologies. However, an integration of CCS technology into our climate change policy becomes absolutely necessary for us to align national policies with the Sustainable Development Goals.

Keywords: SDG – 13, Carbon Capture and Storage, National Action Plan on Climate Change

12. Sustainable development goal 13: recent progress and challenges to climate action

Naveen Kumar Arora and Isha Mishra (2023)

Environmental Sustainability (2023) 6:297–301 <https://doi.org/10.1007/s42398-023-00287-4>

Abstract: We need to understand that climate is a dynamic driver and is inter-connected with other catastrophes related to land use, water/oceans, biodiversity, food systems and energy access. In order to build resilience against climate change, a more comprehensive sustainable pathway along with radical and transformative changes are needed that work as a developmental package. This may include climate financing, progressive redistribution of carbon pricing revenues and access to modern and green energy. Also, identifying gaps in existing reduction plans, strong climate policy interventions at multiple dimensions with technological support as well as strengthened education and economic development are some other key actions. Quantifying these outcomes will substantially boost progress of climate action targets and also facilitate the achievement of many other aspects of SDGs. Nature based solutions are seen as most important approaches to tackle climate crises and are being used for ecosystem restoration, water and food security, human health as well as disaster risk reduction. Estimates indicate that nature-based solutions when implemented across all ecosystems can result in emission reduction and removals minimum of at least 5 GtCO₂e per year and maximum of 11.7 GtCO₂e per year. This estimate is projected to rise to at least 10 GtCO₂e per year and maximum to 18 GtCO₂e per year by 2050, which is a significant mitigation proportion.

Keywords: SDG – 13, targets, nature based solutions

13. Is #SDG13 Trending Online? Insights from Climate Change Discussions on Twitter.

Prabhsimran Singh, Surleen Kaur, Abdullah M. Baabdullah, Yogesh K. Dwivedi, Sandeep Sharma, Ravinder Singh Sawhney & Ronnie Das (2023)

Inf Syst Front 25, 199–219 (2023). <https://doi.org/10.1007/s10796-022-10348-4>

Abstract: Anthropogenic activities over the past few decades have led to increased vulnerability of environmental and ecological stability on this planet. Accelerated climate change is one such subset of the environmental problems that threatens the very existence of humankind in twenty first century. Governments, United Nations (UN) and other humanitarian agencies across the globe have developed and devised strategies for climate action that requires greater public awareness and actions. Social media has played a vital role in information dissemination and raising public awareness of climate change in the digital era. To this aid, an upsurge has been documented in recent times regarding discussions over climate change with #SDG13 (Sustainable Development Goals) at its epicenter. Following the principles of Actor Network Theory (ANT) we analyzed a large volume of Twitter data to understand general citizens' perception and attitude towards climate change. Our findings unveil people's opinion on causes and concerns related to barriers of adopting a more sustainable consumption and lifestyle practice. There is also a growing apathy towards sluggish government actions that makes little difference. People were also found to exchange innovative concepts and measures towards mitigating the effects of climate change.

Keywords: Actor Network Theory, Twitter, SDG – 13, citizens' perception, lifestyle

14. Nature-based Solutions (NbS) for Dryland Agriculture in Semi-Arid Regions of Maharashtra, India: A Short Review with Possible Approaches for Building Climate Resilience

Wasim Ayub Bagwan (2023)

In: Chatterjee, U., Shaw, R., Kumar, S., Raj, A.D., Das, S. (eds) Climate Crisis: Adaptive Approaches and Sustainability. Sustainable Development Goals Series. Springer, Cham. https://doi.org/10.1007/978-3-031-44397-8_15

Abstract: In this chapter, we will discuss the environmental issues related to semi-arid zones in Maharashtra and explore possible solutions that are easily accessible at the local level. The semi-arid ecosystem poses challenges for long-term residents due to its harsh conditions, making it unsuitable for habitation. To create a proper and habitable environment and prevent migration resulting from climate change in these regions, it is crucial to implement scientific and effective remedies to restore the natural ecosystem. There is an urgent need to implement measures to protect natural resources, reverse resource depletion, and ensure sustainability. Increased resource consumption and declining quality have significantly impacted the environment worldwide, jeopardizing livelihoods and economic well-being. To address these challenges arising from human activities and climate change, sustainable solutions are imperative. Nature-based Solutions (NbS) offer a promising approach to mitigate the impacts of extreme weather events and human influence. Through the adoption of nature-based climate-resilient technologies, we can achieve multiple benefits from socioecological and environmental perspectives. NbS enables the development of local ecosystem-based resilience, effectively addressing climate change while tackling social issues such as poverty and resource depletion. Ecosystem-based Adaptation (EbA)

further enhances this approach by incorporating cost-effective natural solutions into green infrastructure. Given that the semi-arid region of Maharashtra covers 67% of the total geographical area and is highly vulnerable to climate change, NbS emerges as the most effective and affordable approach to manage present and future climatic variability.

Keywords: SDG – 13, Nature-based Solutions, Maharashtra, semi-arid ecosystem

15. Barriers and opportunities in achieving climate and sustainable development goals in India: a multilevel analysis

Dhanapal, G; Gupta, Divya; Anjal Prakash (2023)

Journal of Integrative Environmental Sciences; Abingdon Vol. 20, Iss. 1, (Dec 2023): 1-16.
DOI:10.1080/1943815X.2022.2163665

Abstract: Climate action plans are essential for climate mitigation and adaptation as well as to achieve climate and development goals like the Paris Agreement and the Sustainable Development Goals (SDGs). However, the development and implementation of climate action plans at multiple levels involve decision-making processes. In this article, we examine the barriers and opportunities to decision making in climate action plans for adaptation at three different governance levels in India: national, sub-national and local. Through a literature review and analysis of case studies, we find that lack of usable climate information, institutional weaknesses and capacity of actors are critical barriers to decision-making at all three levels in India. We recommend that providing usable and accessible climate information, creating evidence and knowledge on adaptation, strengthening the science-policy interface and institutional mechanisms, as well as building the capacities of actors can contribute to better decision-making and achieving targeted climate action plans and SDGs.

Keywords: SDG – 13, decision-making, climate change, climate action, climate policy

16. SDG 13 and Climate Change in India

Chakravarty, T., Ghosh, P. (2023)

In: Dutta, V., Ghosh, P. (eds) Sustainability: Science, Policy, and Practice in India. Sustainable Development Goals Series. Springer, Cham. https://doi.org/10.1007/978-3-031-50132-6_13

Abstract: Climate change—one of the significant environmental issues in today's world—has caused tremendous impacts on earth's physical and human systems. The problems associated with climate change such as change in precipitation and temperature, frequent tropical storms, floods, droughts, forest fires, rising sea level, and melting of glaciers are visible throughout developed and developing countries. In order to combat such global problem, the United Nations has recognized the role of more developed and less developed countries in climate change mitigation and adaptation under Sustainable Development Goal (SDG) 13. As a United Nations member, India has also adopted measures toward combating climate change within the country as well as in the South Asia and has shown significant commitment to mitigation efforts. India had pledged to reduce its carbon intensity, increase the share of renewable energy in its energy mix, and enhance energy efficiency. The country has set ambitious targets for expanding its renewable energy capacity, particularly in solar and wind energy. India is actively involved in international

climate negotiations and has been part of global initiatives like the Paris Agreement. Moreover, India has recently moved away from its defensive traditional approach toward climate change issue and has adopted an active role in developing long-term strategies for mitigation and adaptation through bilateral, multilateral, and unilateral agreements with other nations. This chapter examines the climate change issue in India with a larger global context. Additionally, it demonstrates India's contemporary role in global climate diplomacy.

Keywords: SDG 13, carbon intensity

17. Unlocking synergies and managing trade-offs: how climate actions in Indian agriculture support the Sustainable Development Goals.

Some, S. (2024)

Discov Sustain 5, 207 (2024). <https://doi.org/10.1007/s43621-024-00379-z>

Abstract: This paper assesses four relevant climate actions in Indian agricultural sector through the lens of United Nation's Sustainable Development Goals (SDGs) to understand how climate actions (SDG 13) are linked with other SDGs and their targets and what measures can be taken to scale up these actions. Four broad categories of climate actions are considered for this exercise: shift to less-flooded paddy water management practices; minimizing overuse of nitrogen-based fertilizer, system of rice intensification and climate smart agricultural practices. A mixed method has been followed: first, scoping review of literature between 2010 and 2022 is undertaken to capture the growing body of literature and then a normalized weighted score is used to understand the net strength of the linkages. Scoping review helped in identifying 100 studies spanned across Indo-Gangetic Plain (IGP) and the eastern part of Peninsular India. Findings from the scoring method suggest that these practices have linkages with 15 SDGs and as many as 43 SDG targets. Almost all linkages are positive (synergy) but there are a few negative linkages (trade-offs) as well. Trade-offs include exacerbating inequalities including gender, high upfront cost, requirement of skilled labor, lack of access to information and finance. This paper provides a detailed description of these trade-offs and suggests measures to tackle and minimize them.

Keywords: SDG – 13, agriculture, trade offs, Indo-Gangetic Plain

18. Incentivising Agroforestry Through Carbon Revenue: Augmenting Farmers' Income in India

Singh Navdeep, Biswas Deepa, Gokhale Yogesh, Kumar Kapil

Agricultural Science Digest, Year: 2024, Volume: 44, Issue: 4 First page: (679) Last page: (683)

Abstract: The present study explores and assesses the potential of carbon revenue to augment the financial returns of farmers from agroforestry plantations. Government of India aims at doubling the farmers' income and this study can go a long way in achieving this aim. The income from carbon revenue will be over and above the market value of farm-grown wood and hence will be an additional incentive. Under the present study, the assessment of carbon stocks for Eucalyptus and poplar plantations was done in Yamunanagar district of Haryana using stratified random sampling and standard calculation tools explained under methodology. The results of this study and data from other existing studies, covering different parts of the country, were used for estimating the

carbon credits and carbon revenue for total area under agroforestry in India i.e. 28.4 MHA. The findings suggest that agroforestry, if incentivized with carbon revenue, has a potential of increasing the income of farmers by 40-50% (upto Rs. 25,000/ha/year). It could be achieved by developing agroforestry based carbon finance projects for Voluntary Carbon Markets (VCM) and by promoting agroforestry plantations for net carbon emission neutrality of corporate using their CSR funds. The additional returns could also act as a buffer and as an alternative like minimum support price (MSP) for farmers in case of “price-crash” of agroforestry produce due to various reasons. The study indicates that there is urgent need to have a policy in India for registering agroforestry plantations under carbon finance projects thereby contributing to net neutrality of corporates, ultimately benefitting the farmers through financial incentives.

Keywords: SDG 13, Agroforestry, Carbon credits, Carbon revenue, Carbon sequestration potential

19. Shaping India's climate future: A perspective on harnessing carbon credits from agriculture

Ananya Khurana, Dilip Kajale, Adeeth AG Cariappa, and Vijesh V Krishna (2024)

Outlook on Agriculture, 53(2), 113-130. <https://doi.org/10.1177/00307270241240778>

Abstract: Human activities are responsible for emitting greenhouse gases (GHGs) that contribute to global warming and climate change. As the world's second-largest producer of staple food and the third-largest emitter of GHGs, India has been witnessing an increase in demand for food and energy, resulting in increased emissions. Thus, to achieve net carbon neutrality by 2070, India must focus urgently on climate change mitigation. Its agriculture sector has the potential to transition from being a net emitter to a net absorber of GHGs by adopting sustainable farming practices such as zero tillage, laser-assisted precision land leveling, direct seeding of rice, intercropping, biochar application, use of solar energy, and more efficient management of irrigation water, soil nutrients, livestock feed, and manure. To incentivize climate consciousness, a voluntary carbon credit trading system could be utilized in agriculture, supported by a measurement, monitoring, reporting, and verification platform. This system would also bring about social, environmental, and financial co-benefits for its stakeholders. Specifically, the agriculture sector could substantially reduce the country's annual emissions by 84% from 2019 to 2070. But to realize their potential, the carbon markets must overcome the limitations currently set by policy, economic, cultural, and biophysical factors.

Keywords: SDG – 13, carbon credits, biochar, solar energy

20. Food Production, Diversity, and Safety Under Climate Change

Editors: Rakhi Chakraborty, Piyush Mathur, Swarnendu Roy (2024)

Publisher Springer Cham, DOI <https://doi.org/10.1007/978-3-031-51647-4> eBook ISBN 978-3-031-51647-4 Published: 01 April 2024

Abstract: This book presents a universal picture of the impact of climate change on food production, diversity, and concerns regarding food safety. The book also highlights the traditional and modern techniques for sustainably improving the production of food crops and their nutritional quality aligning with the “zero hunger” goal (Sustainable Development Goal 2) of the United Nations. The book holistically includes the contributions of scientists and academicians working in

the fields of Food and Nutrition, Plant and Microbial Sciences, Agriculture, etc. The book also offers insights into the strategies adopted worldwide for ensuring food availability and safety, taking the aid of advanced technologies like climate-smart agriculture along with nanotechnology and artificial intelligence in the event of climate change. Above all, the book transpires the subject matter using illustrative figures and outlines and therefore will be an asset for the post-graduate students, researchers, and faculties.

Keywords: SDG – 13, Ethnobotany, Crop Improvement, Food, Nutraceutical, Traditional Food, Underutilized Plants

21. Economy-wide impact of climate smart agriculture in India: a SAM framework.

Ananya Ajatasatru, Vishnu Prabhu, Barun Deb Pal & Kakali Mukhopadhyay (2024)

Economic Structures 13, 4 (2024). <https://doi.org/10.1186/s40008-023-00320-z>

Abstract: In the context of climate change, the Indian agricultural sector treads in a certain duality between promoting food security in response to the increasing population, but at the same time in ensuring environmental sustainability, and sustained economic growth, especially in developing countries like India. The concept of Climate Smart Agriculture (CSA) emerged from the recognition of this duality. Using the Indian Social Accounting Matrix (SAM) 2017–18, the economy-wide effects arising out of agricultural interventions were estimated, keeping accord with the impacts on sectoral outputs and household incomes from the adoption of varying CSA interventions such as Conservation Agriculture, System of Rice and Wheat Intensification (SRI-SWI) and Natural Farming, fitting the three-pillared criterion of CSA—(1) Productivity (2) Adaptation and (3) Mitigation. Additionally, a shift in cropping patterns from Paddy and Wheat to less emission-intensive crops was also studied. Results show that SRI-SWI provides the highest economy-wide impacts while accounting for lower GHG and water footprint. Alternative crops such as Maize, Sorghum, and Millet have minimal increase in income and output effects while having lower water and carbon intensity compared to rice and wheat. The current study would sensitize policymakers to prioritize suitable policy and institutional measures for upscaling climate smart interventions in India.

Keywords: SDG – 13, Social Accounting Matrix (SAM), Climate Smart Agriculture

22. The Struggle Against Climate Change-Induced Natural Disasters in India SDG 13: “Climate Change”

Krishna Khetani (2024)

International Advanced Journal of Multidisciplinary Research (IAJMR) ISSN: 3048-6157, www.iajmr.org Volume 01, Issue 01 (December, 2024), PP 23-32

Abstract: The concentration of carbon dioxide in the atmosphere is 412 parts per million and continues to rise. This was a dramatic 47 percent increase from 280 parts per million during the Industrial Age in the 19th century.¹ If temperatures keep rising, glaciers will melt, and sea levels will increase. This has resulted in floods and land submerging, especially in low-lying areas in various nations worldwide. Rising temperatures have also increased evaporation, causing droughts to occur more frequently and extensively in almost any region. These greenhouse gases have come from one source: humans. From driving gas vehicles to heating homes, humans are the

cause for polluting the Earth and can be blamed for increased droughts, air pollution, and floods. Around the world, climate change needs more government involvement and awareness in the world. The consequences of rapid industrialization and consistent carbon emissions must be addressed by nations worldwide. Government ignorance cannot be a practical solution to climate change as the severity of climate-induced natural disasters increases every day. This paper will focus on the causes and effects of climate change-induced natural disasters in India, specifically in the states of Assam and Uttar Pradesh, and how the government has worked to solve this issue. The paper will address the UNSDG Goal 13.1, which states, “Strengthen resilience and adaptive capacity to climate-related hazard and natural disasters in all countries.”

Keywords: SDG – 13, natural disasters, Assam, Uttar Pradesh

SDG 14 Life Below Water

1. Water Governance in India: Evidence on Water Law, Policy, and Administration from Eight Indian States

Masood Ahmed and Eduardo Araral (2019)

Water 2019, 11(10), 2071; <https://doi.org/10.3390/w11102071>

Abstract: Water governance is a widely acknowledged as an important factor for sustainable development. This study attempts to assess if the water governance in eight Indian states has improved after the announcement of the United Nations Sustainable Development Goals (SDGs). We utilize the Institutional Decomposition and Analysis (IDA) framework developed by Saleth and Dinar. Using survey data from two periods and 152 respondents, we calculate the scores on 17 indicators of water law, policy, and administration. We found that average scores on water law, policy, and administration have increased between the first and the second survey. We attributed this improvement to the fact that the Indian government is paying special attention to the provision of clean drinking water after the announcement of the SDGs. We also calculated nominal and weighted water governance indices (WGs) for eight Indian states. This study made an important contribution to the existing water governance literature by capturing improvements in the water governance scores of eight Indian states after the announcement of the SDGs.

Keywords: water governance; water law; water policy; water administration; sustainable development goals; water governance index; Indian states, SDG - 14

2. Connecting India's coastal monitoring program with UN Sustainable Development Goal 14

Sanitha K. Sivadas, C. Muthukumar, M.D. Bharathi, K. Ramu, Prashant K. Srivastava, M.V. Ramana Murthy (2021)

Ocean & Coastal Management, Volume 215, 1 December 2021, 105949

<https://doi.org/10.1016/j.ocecoaman.2021.105949>

Abstract: The UN Sustainable Development Goal (SDG) 14 sets targets for nations to reduce marine pollution, ocean acidification, and sustainable use of coastal and ocean resources, which requires data on nutrient load, litter/plastics, pH, and biodiversity. Monitoring programs with large-

scale and long-term data is an important source of environmental information and can play a crucial role in implementing the SDGs. This paper uses the Sea Water Quality Monitoring (SWQM), the coastal monitoring program of India, as a case study to examine the extent to which the monitoring program contributes to achieving the SDG 14 targets. The SWQM program is a multidisciplinary, long-term coastal monitoring program initiated by the Ministry of Earth Sciences (MoES), Government of India, in 1990 to assess the coastal water quality. The paper highlights the interrelationships between the SWQM and SDG 14 targets (14.1.1, 14.2, 14.3, and 14.5) and discusses the challenges and opportunities of linking the national program to SDGs. Strengthening the program by increasing monitoring locations, sampling additional environmental parameters and biodiversity components, and using advanced scientific tools can be an efficient and pragmatic approach to SDG 14 implementation through the SWQM program. Aligning the long-term monitoring program and other research programs of a nation to the SDGs could provide potential co-benefits and more efficient utilization of funds.

Keywords: COMAPS, Coast, India, MoES, Monitoring, SWQM, SDG - 14

3. Global Biodiversity Regime Complex and Sustainable Development Goals: Implications for India.

Kedia, S., & Anand, M. (2021).

Asian Biotechnology & Development Review, 23(2): 57-87.

<https://ris.org.in/sites/default/files/2022-03/ABDR%20July%202021.pdf>

Abstract: Regime complexes have been discussed in international literature as an intervening variable which bring about policy coherence at national levels. There is a dearth of literature which examines aspects related to the link between global biodiversity regime, national policy coherence and sustainable development goals (SDGs) reporting. By taking the case study of India and using liberal institutional approaches and critical appraisal, this paper seeks to analyse the role of SDGs reporting for promoting coherence between the international biodiversity regime complex and country level planning. This paper will have implications for praxis on biodiversity and sustainable development policy as well as have implications for theory related to liberal institutional scholarship. This paper argues that while the normative scope of the global biodiversity regime has evolved to encompass principles such as scientific enquiry as well as sustainable development, national level reporting on biodiversity related SDGs have to still catch up to facilitate better policy coherence at all levels. Further the paper also calls for a greater science-policy interface to supplement SDG reporting framework towards better understanding of conservation and ecosystem services aspects of biodiversity in India.

Keywords: Biodiversity regime, Sustainable development goals, Science-policy interface, India, Indicators, Public policy, SDGs - 14, 15

4. Impact of Blue Economy and Sustainable Development in India with correlation to SDG14: Life under water

Aditya Arora (2022)

Quest Journals Journal of Research in Humanities and Social Science Volume 10 ~ Issue 7 (2022)
pp: 133-140 ISSN(Online):2321-9467

Abstract: These recommendations aim to significantly enhance the contribution of the Blue Economy to India's GDP in the next five years, improve the lives of coastal communities, preserve our marine biodiversity and maintain the security of our marine areas and resources. Today, the Blue Economy holds the promise of being the next multiplier of economic growth and well-being, provided that the strategy places sustainability and socio-economic welfare at the center stage. With their enormous resources, oceans are the ultimate frontier that shall help to transform the economy of the society from scarcity to abundance. With the extended Exclusive Economic Zone, India's Ocean jurisdiction equals the land area. Hence an integrated approach with long-term vision, technology, management, monitoring, and time-bound regulatory reforms are essential for building a sustained blue economy for India. It is beyond doubt that the upcoming blue economy shall serve as a growth catalyst for the robust Indian economy envisioned reach US\$10 trillion by 2030. India's asset is its diversity of institutions and expertise available to deal with issues related to achieving SDG 14. While the current plans and approaches need an overhaul to effectively deal with achieving the goal and targets of this SDG, it is also important to take the responsibility and ownership of achieving the same to States, local bodies and the civil society including the corporate sector.

Keywords: SDG – 14, Blue Economy, Exclusive Economic Zone

5. Sustainable Development Goal 14 in the Western Indian Ocean: a socio-ecological approach to understanding progress

Mialy Andriamahefazafy, Grégoire Tournon-Gardic, Antaya March, Pierre Failler, Gilles Hosch, Deng Palomares (2022)

Western Indian Ocean Journal of Marine Science / No. 1/2022 (2022): Special Issue - Ocean and coastal governance in the Western Indian Ocean

Abstract: The Sustainable Development Goals (SDGs) intend to “achieve a better and more sustainable future for all people in the world”¹. They have become a key driver for policy and decision-making in many regions, including in the Western Indian Ocean (WIO) region. This paper analyses national and regional progress towards achieving SDG 14 in the WIO. Progress of four of the SDG 14 targets that were due in 2020 are analysed. SDG 14 has influenced regional and national policy agendas but current tools to measure this progress fail to provide a detailed picture of achievement towards each target for countries in the WIO. The paper highlights that the region has shown limited success in achieving the targets and SDG 14 targets are unlikely to be reached by 2030. The WIO region lags behind with regard to marine conservation related targets. More than half of the countries have low to average progress on SDG 14.2 on marine areas being covered by area-based management tools. Even more countries are far from achieving the 10 % coverage of marine protected areas under SDG 14.5. The region is performing better with regards to fisheries management targets with most countries classified as making average to good progress towards SDG 14.4 on sustainable stocks and SDG 14.6 on addressing harmful subsidies and IUU fishing. The diversity of the socio-economic and governance contexts in the WIO countries contributes to different levels of progress. The fairly positive ecological state of the WIO supports progress towards SDG 14. Understanding barriers to progress is fundamental to help with the prioritisation of the actions needed to meet the SDG 14 targets by 2030. Regional actors and policy-makers will need to increase their ambitions to meet the SDG 14 targets and ensure a healthy ocean and improved prospects for the region and its citizens. To account for barriers in

progress towards SDG 14, the WIO region needs appropriate reporting and monitoring mechanisms and it should follow a holistic regional approach of ocean governance integrating conservation and sustainable resource use. It needs to build capacity and knowledge sharing for implementation of SDG 14 and ocean governance at various levels. Improved implementation of SDG targets will have social, economic and environmental benefits within the region.

Keywords: SDG 14, area-based management, marine protected areas, fish stocks, IUU fishing

6. The impact of COVID-19 in curbing the goals of ensuring sustainable development of life on land (SDG 15) and below water (SDG 14)

Louis Anto Nirmal, Samuel Jacob (2022)

In COVID-19 and the Sustainable Development Goals, 2022, Pages 285-303

<https://doi.org/10.1016/B978-0-323-91307-2.00012-2>

Abstract: The widespread coronavirus pandemic has halted the progress of the sustainable development goals (SDG) proposed by the United Nations. This pandemic has already shattered the economy of not only the developing countries but also the developed nations. During this period, the primary focus was on the healthcare sector, while other developmental progress wasn't considered essential. Since the duration of the pandemic couldn't be predicted, the SDGs are now the second priority. This chapter emphasizes on the impacts which may have caused by COVID-19 on two specific SDGs, which involve the sustainable development of marine, coastal, terrestrial, and inland aquatic ecosystem. The improper disposal of COVID-19-associated wastes, such as medical equipment, plastics, masks, and gloves, is a threat to both the lives on land and below water. Complete lockdown led to improper treatment of wastewaters before being discharged into water bodies, and waterlog caused by COVID-19 wastes in beaches resulted in the damage of aquatic ecosystem. On the contrary, the revival of the marine ecosystem closer to the coastline due to the world's reduced economic activity is considered as an advantage. This pandemic provided a short-term success in preventing deforestation and reduced poaching, promoting the forest ecosystem. But in the long run, lack of jobs and unemployment might lead to increased cutting of trees to earn the living. Thus COVID-19 may have influenced bringing both positives and negatives to the SDGs, and these provide us with the challenges and opportunities to accomplish these goals.

Keywords: COVID-19, Terrestrial ecosystem, Marine ecosystem, SDG 14, 15, Waste management

7. SDG 14: life below water- viable oceans necessary for a sustainable planet

Naveen Kumar Arora, Isha Mishra, Pranay Arora (2023)

Environmental Sustainability (2023) 6:433–439 <https://doi.org/10.1007/s42398-023-00299-0>

Abstract: Healthy, resilient as well as productive marine ecosystem is not only essential to species living below water and to people whose livelihood rely on the 'Sustainable Blue Economy' but also for the species living on land, including humans. This can be achieved only when we use our ocean services in a sustainable manner. Only in this way, we can achieve targets of socio-economic benefits for marine sectors and communities, to global food security and resilience from impacts of climate change, which will be crucial to sustain life on earth.

Keywords: SDG – 14, Blue Economy

8. Unsustainable, Imperial Dreams: What India's Blue Economy Portends for "Life Below Water".

Jadhav, A. (2023).

In: Dutta, V., Ghosh, P. (eds) Sustainability: Science, Policy, and Practice in India. Sustainable Development Goals Series. Springer, Cham. https://doi.org/10.1007/978-3-031-50132-6_14

Abstract: Sustainability of Indian seas has been submerged almost entirely within a national Blue Economy discourse and politicized ambitions of limitless wealth beneath the waves. In this imaginary, shipping, fisheries, marine minerals, naval might, coastal commons, and even tourism serve to bolster national development in various ways. Such expansionary and even imperial aims, however, conjure doubts about India's engagement with international development policy and commitments to economic, social, and ecological sustainability. In this political economic context, this chapter interrogates India's performance at achieving the United Nation's Sustainable Development Goals (SDGs) and specifically Goal 14: "Life Below Water." First, I historicize sustainable development in order to unsettle a concept frequently deployed as though self-explanatory, uncontested, or ahistorical. I also briefly review the SDGs and their evolution into discursive objects and exemplars of development's fetishization of quantification. The analysis then turns to the specifics of India's performance of the SDG process which I argue produces an abstracted, flexible notion of sustainability made available for other projects, namely, the Hindutva-infused Blue Economy agenda. Contra this development imaginary, I present evidence of actually existing unsustainability at the scale of an estuary on India's southwestern coast. The chapter concludes with a provocation: India's oceanic agenda—underwritten by its performative embrace of "sustainable" development—appears in the process of articulating both ethnonationalism and neoliberalism into a neoimperial dream.

Keywords: SDG – 14, Blue Economy, southwestern coast

9. Knowledge Hierarchies in Policy-Level Translations of SDG14: Insights from Human-Salinity Relations in South India and Vietnam

Richard Pompoes (2024)

Higher Education and SDG14: Life Below Water ISBN: 978-1-83549-253-6, eISBN: 978-1-83549-250-5

Abstract: The study underlying this chapter investigates how diverse actors in the Cauvery Delta, India, and the Mekong Delta, Vietnam, understand and live with water salinity. In focusing empirically on river deltas, this chapter addresses some of the SDG14 targets, as SDG14.2 ('Protect and restore ecosystems') and 14.5 ('Conserve coastal and marine areas') refer to the sustainable management of coastal areas as crucial targets for SDG14. Based on interviews with land users in the two deltas, in tandem with analyses of salinity maps and other policy-level knowledge artefacts, this chapter shows how, in some cases, only particular forms of knowledge are represented at the policy level, while many of the diverse viewpoints of land users are rendered invisible. In this way, delta management only meets the concerns of a select few, often professional elites, and limits land users from taking ownership of their own realities. This chapter concludes with the recommendation for water professionals, scholars, and practitioners alike, to be more open-minded, modest, and attentive to difference, by engaging more seriously with interdisciplinarity and cultivating sensibilities for listening to 'smaller' water stories.

Keywords: SDG 14, delta management, Cauvery Delta, Mekong Delta

10. Mounting Legal-Driven Solutions for Plastic Pollution Focusing on Environment and Coastal Management: Eradicating Marine Pollution in Alignment With SDG 14 (Life Below Water)

Bhupinder Singh, Sahil Lal, Manmeet Kaur Arora, and Christian Kaunert (2025)

In *Societal and Environmental Ramifications of Plastic Pollution* Editors Nisha Gaur, Eti Sharma, Tuan Anh Nguyen, Muhammad Bilal, and Niranjana Prakash Melkania IGI Global Scientific Publishing, DOI: 10.4018/979-8-3693-9163-1.ch011

Abstract: The growing danger of plastic pollution and its catastrophic effects on marine ecosystems highlight the pressing need for creative approaches to water governance as well as a thorough legal framework. Marine pollution comprises a mixture of chemicals and debris, primarily originating from terrestrial sources and finding its way into the ocean through runoff or wind dispersion. Also, the typical forms of marine debris encompass a range of plastic items such as shopping bags, beverage bottles, cigarette butts, bottle caps, food wrappers and fishing gear. In line with the objectives of Sustainable Development Goal 14 (SDG 14) Life Below Water, this chapter explores methods that can be scaled up to mitigate and eventually eradicate marine pollution by integrates policy assessments, legal framework and water governance tactics via an interdisciplinary approach to suggest practical for addressing this worldwide water pollution issue.

Keywords: SDG 14, marine pollution, plastic

SDG 15 Life on Land

1. The impact of COVID-19 in curbing the goals of ensuring sustainable development of life on land (SDG 15) and below water (SDG 14)

Louis Anto Nirmal Samuel Jacob (2022)

COVID-19 and the Sustainable Development Goals. 2022:285–303. doi: 10.1016/B978-0-323-91307-2.00012-2. Epub 2022 Jul 29. PMID: PMC9335019.

Abstract: The widespread coronavirus pandemic has halted the progress of the sustainable development goals (SDG) proposed by the United Nations. This pandemic has already shattered the economy of not only the developing countries but also the developed nations. During this period, the primary focus was on the healthcare sector, while other developmental progress wasn't considered essential. Since the duration of the pandemic couldn't be predicted, the SDGs are now the second priority. This chapter emphasizes on the impacts which may have caused by COVID-19 on two specific SDGs, which involve the sustainable development of marine, coastal, terrestrial, and inland aquatic ecosystem. The improper disposal of COVID-19-associated wastes, such as medical equipment, plastics, masks, and gloves, is a threat to both the lives on land and below water. Complete lockdown led to improper treatment of wastewaters before being discharged into water bodies, and waterlog caused by COVID-19 wastes in beaches resulted in the damage of aquatic ecosystem. On the contrary, the revival of the marine ecosystem closer to the coastline due to the world's reduced economic activity is considered as an advantage. This pandemic provided a short-term success in preventing deforestation and reduced poaching, promoting the forest ecosystem. But in the long run, lack of jobs and unemployment might lead to increased cutting of trees to earn the living. Thus COVID-19 may have influenced bringing both positives and

negatives to the SDGs, and these provide us with the challenges and opportunities to accomplish these goals.

Keywords: COVID-19, Terrestrial ecosystem, Marine ecosystem, Sustainable developmental goals, Waste management, SDG – 15, 14

2. Land Degradation Neutrality: Achieving SDG 15 by Forest Management

Pankaj Panwar, Gopal Shukla, Jahangeer A. Bhat, Sumit Chakravarty (2022) (Editors)

Springer Singapore, <https://doi.org/10.1007/978-981-19-5478-8>

Abstract: This edited book covers all aspects of forest deforestation and degradation in detail and their link to land degradation. Poor natural resource management is often a contributory factor in the depletion of resources particularly like degradation of land which hinders the goals to achieve land degradation neutrality (LDN). Sustainable Development Goal (SDG) target 15.3 states: “By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought, and floods, and strive to achieve a land degradation-neutral world.” To achieve the set goals a comprehensive multidirectional approach is required involving policymakers, field functionaries, researchers, and above all educators. The book compiles the field experiences and wisdom of some of the best researchers and authors working in the field of land degradations for quite a long time. The objective of the book is to disseminate the status of land degradation, the importance of achieving land degradation and share success stories of reclaiming Land degradation, and suggests means and ways of achieving land degradation neutrality. This book act as a repository of knowledge on Land degradation neutrality for students, researchers and practitioners, and policy planners.

Keywords: Forest Resources, Ecosystem Service, Urban forestry, REDD+, Land Degradation Neutrality, Deforestation, SDG – 15

SDG 16 Peace, Justice and Strong Institutions

1. Sustainable Development Goals: Implementation of Goal 16 by India

Sanjay Upadhyay & Avani Dubey (2020)

In: Hazra, S., Bhukta, A. (eds) Sustainable Development Goals. Sustainable Development Goals Series. Springer, Cham. https://doi.org/10.1007/978-3-030-42488-6_16

Abstract: The adoption of sustainable development goals by 193 countries including India in September 2015 was another milestone in the environmental history of nations where nations moved ahead of the Millennium Development Goals and forged ahead to benchmark the new indices of human welfare. The Hon'ble Indian Supreme Court aptly captures the spirit of this shift when it says, ‘The traditional concept that development and ecology are opposed to each other is no longer acceptable’. The Supreme Court in this very case made the three important principles namely the precautionary principle, polluters pay principle and the concept of sustainable development as a part of the fundamental right regime under Article 21 of the Indian Constitution. It is therefore clear that the international commitment, as well as the concept of sustainable

development itself, is an integral part of the law of the land in India and therefore the SDGs themselves need to be read more than an international commitment. The real challenge is whether international goals backed up by judicial sanctity has resulted in the details of an executive framework to meet the SDGs or not. The SDG Goal 16, the focus of this paper dealing with 'Peace, Justice and Institutions' aims to 'Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels'. This chapter examines and perhaps deal beyond numbers to ascertain the challenges for meeting the SDG goals, especially Goal 16, and what could be added to the SDG Index in order to really assess the performance of India as a nation towards meeting the SDGs.

Keywords: SDG – 16, Implementation, Supreme Court

2. ALIGNING INDIA'S SANITATION POLICIES WITH SUSTAINABLE DEVELOPMENT GOALS (SDGs)

Girija K Bharat, Nathaniel B Dkhar and Mary Abraham (2020)

TERI Discussion Paper, 2020

Abstract: In 2015, the United Nations (UN) had set interconnected Sustainable Development Goal (SDG) with abroad and ambitious vision for the next 15 years. SDG 6 calls upon all Nations to "ensure availability and sustainable management of water and sanitation for all". It places water and sanitation at the core of sustainable development, cutting across sectors and regions. There are strong synergies between the targets of Goal 6 and 16 other goals of the Sustainable Development Agenda. The interventions to meet the targets of SDG 6 extend far beyond achieving SDG 6 because it also contributes to other SDGs, and specifically impacts eight SDGs, which include poverty eradication (SDG 1), ending hunger by improved nutrition (SDG 2), ensuring healthy lives and promoting well-being (SDG 3), education (SDG 4), gender equality (SDG 5), inclusive cities (SDG 11), life below water (SDG 14), and terrestrial ecosystem (SDG 15). This Discussion Paper dwells on the policies and programmes of the sanitation subsector and explores current Government policies in India for the linkages with sanitation component of SDG 6 as well as their implications for other SDGs. This paper includes both the 'rural' and 'urban' sanitation sectors in India. The recommendations emerging from this paper are for a more balanced approach to current and proposed urban and rural sanitation sector policies to ensure that in addition to SDG 6, the policies contribute positively to the achievement of other SDGs as well.

Keywords: SDG – 16, rural, urban, sanitation

3. India's Inclusive Policy Initiatives for the Implementation of Sustainable Development Goals: Selected Ruminations on SDG-16—The Way Forward

Nahida Begum N (2022)

Indian Journal of Public Administration, Volume 68, Issue 4, 2022,
<https://doi.org/10.1177/00195561221108560>

Abstract: The members of the United Nations are gearing up to realise the Sustainable Development Goals (SDGs) by 2030. The 17 goals practically seem a little complicated and complex to realise, yet the member-states are on the go towards its realisation. This article focuses on the SDGs. It focuses on the India's policy initiative towards SDG 16 that stands for Peace,

Justice and Strong Institutions. A brief summary on India SDG Index is also provided in the article, which provides information pertaining to the performance of the states towards the accomplishment of the goals. It highlights the various schemes, programmes and projects launched by the Government of India for the achievement of SDG-16. The schemes comprise of Poshan Abhiyaan, Gram Nyayalayas, Digital India, Aadhaar, and so on.

Keywords: SDG – 16, Inclusive Policy

4. Linking between Democracy and Sustainable Development Goals: Specific reference to Goals -16 in India

Omprakash Sahu (2024)

GSJ: Volume 12, Issue 2, February 2024, Online: ISSN 2320-9186

Abstract: Democracy is the most popular form of government. It provides a way of existence for prosperous and most humble life. It cannot be found in other form of government like authoritarian or monarchal etc. India is the largest democratic country of the world. The 17 SDGs goals of United Nations can be achieved through a democratic form of government more actively like in India. It is because, in democratic government free flow of information to the people can be easily available. People understand their rights and duties. The present research may explore Goals-16, that is Peace, Justice and Inclusive Institution. It may explore the Lower Suktel Irrigation Project, through which serious violation of human rights and undemocratic way decision were made. It is threat from the national interest of nation at national and international levels. It may also give the answer, how Goal 16 can be achieved through a democratic form of government. Government of India takes many policies to achieve Goals16. It can also depict different policies and their problems and also provide suggestions for achieving the goals by 2030.

Keywords: Democracy, Development, SDGs-16, Suggestions

SDG 17 Partnership for the Goals

1. Approaches to SDG 17 Partnerships for the Sustainable Development Goals (SDGs)

Kaustuv Chakrabarty Bharat Dahiya Carme Gual Thomas Jørgensen Akpezi Ogbuigwe Mahesti Okitasari Arnau Queralt Charles W. Richardson Orlando Sáenz Kazuhiko Takemoto Rajesh Tandon (2018)

A Publication by the GUNi Group of Experts in SDGs and Higher Education

Abstract: The increase in inequality and major asymmetries between regions and peoples, as well as the lack of global governance derived from the diffusion of power and the crisis of representation and legitimacy in many countries are important examples of the challenges that humanity is and will be facing in the years to come. Despite this, in recent decades new non-state actors have come onto the scene and are demanding a new role in governance. The 2030 Agenda is an excellent opportunity to review and re-distribute global governance and SDG 17 could be a key factor of this re-distribution. This publication intends to offer a first approach to Sustainable Development Goal 17: “Partnerships for the Goals”. It includes the perspectives and views of different networks, organisations, geographical regions and working cultures on what “partnership”

means, and how work should be done to implement SDG 17. This collection of articles offers a glimpse at different ways to embark upon SDG 17 and the 2030 Agenda and provides examples and recommendations for higher education stakeholders, policymakers and international organisations and networks.

Keywords: SDG – 17, Higher Education

2. India-EU strategic partnership: a new roadmap

Rajendra Jain Gulshan Sachdeva (2019)

Asia Europe Journal (2019) 17:309–325, <https://doi.org/10.1007/s10308-019-00556-0>

Abstract: This article examines the role of strategic partnerships in Indian foreign policy and the nature and perceptions of India and the European Union about the strategic partnership. It discusses how both sides look at global governance, normative divergence, and security cooperation. It assesses Prime Minister Narendra Modi's perceptions and engagement with Europe since coming to power in 2014. It analyses the economic dynamics of the partnership and assesses the reasons for the impasse in the conclusion of a Broad-based Investment and Trade Agreement. It discusses the salient features of EU's India Strategy (2018). In conclusion, the article argues that in a more volatile world, India is re-engaging Europe with greater vigour and that both sides seek to build and consolidate the strategic partnership on commonalities.

Keywords: SDG – 17, economic dynamics, Trade, Europe

3. Sustainable Developmental Goal 17 and Agriculture from an Indian Perspective

K. Priti, Prashant Kumar & Kaushlesh Singh Shakya (2024)

In: Yasheshwar, Mishra, A.K., Kumar, M. (eds) Recent Advancements in Sustainable Agricultural Practices. Springer, Singapore. https://doi.org/10.1007/978-981-97-2155-9_1

Abstract: Sustainable Development Goal (SDG) 17 emphasizes strengthening the means of implementing global partnerships through multisectoral and multinational approaches. SDG 17 aims to attain global partnership elements in financial capital, technology advancement, capacity building and skill development, trade and systemic issues at different constituencies (global, regional, national and local levels). The global partnership improves the sustainability of all types of development cooperation for the collective welfare of people, planet, prosperity and peace. Implementing and framing strong national and international policies, programs, schemes and action plans via collaboration of stakeholders, innovators, entrepreneurs and institutes is essential in promoting sustainability and achieving SDGs by 2030. The UN has defined 19 targets and 24 indicators for measuring progress toward SDG 17. The progress of all other 16 SDGs is dependent on and linked with goal 17th. Seventh goal will promote universal social, economic and environmental development through equitable trade, coordinating investment across borders, collaborative actions and improving and supporting coordination and collaboration among nation-states. To achieve 17th goal targets, it requires huge funding in infrastructure to empower different sectors like energy, agriculture, transportation systems and IT to ensure fair and equitable distribution of resources among the world's community. The agriculture sector accounts for 4% of global GDP, and in developing countries like India, it provides employment to over 50% of the

nation's workforce and contributes 17–18% to the India's GDP. The world states must take concrete actions for the agriculture sector to achieve Goal 17 of the SDGs by 2030. Strengthening and promoting five elements—capital, technology, skill-building, bilateral and multilateral trade policy and systemic issues such as storage facilities, climate change, stubble burning, irrigation facilities, etc.—is crucial to achieving global partnership. Today, progress has been made in several areas, but globally, action to achieve the sustainability in agriculture sector is not progressing at the required momentum or magnitude. This decade must bring concrete efforts in the agriculture sector to achieve global goal 17 by 2030. This work aims to understand the multiple risks associated with Indian agriculture and how global partnership in terms of finance, technology, trade, capacity building and skill can help handle the Indian agriculture risks and attain sustainability in the whole agriculture network.

Keywords: SDG -17, Agriculture

4. Sustainable Development Goals: An Indian Perspective, 2020

Anindya Bhukta, Somnath Hazra (Editors) (2020)

Springer International Publishing, 9783030424886, 303042488X

Page count:307

Abstract: This volume examines the practicality of achieving the UN Sustainable Development Goals in India, and includes policy analyses and statistical assessments of comparative data between India and different countries. With a focus on poverty and economics, the contributors offer sector and state specific performance analyses of each goal, determining the feasibility for different states and regions to implement a given goal under conditions of extreme poverty and economic distress. Readers will learn how to perform comprehensive economic performance analyses, and how to apply these methods at local and regional scales within the framework of sustainable development. The book will be of interest to students and researchers studying sustainable development, economics, and policy analysis, as well as NGOs and government agencies working towards achieving the SDGs in impoverished nations.

Keywords: GDP, climate change, Bihar, Chhattisgarh, Andhra Pradesh, Assam, Asia, economic growth, energy, Gujarat, human impacts, implementation, agenda

5. The Palgrave Handbook of Development Cooperation for Achieving the 2030 Agenda: Contested Collaboration

Sachin Chaturvedi, Heiner Janus, Stephan Klingebiel, Li Xiaoyun, André de Mello e Souza, Elizabeth Sidiropoulos, and Dorothea Wehrmann (Editors)

ISBN 978-3-030-57937-1 ISBN 978-3-030-57938-8 (eBook) <https://doi.org/10.1007/978-3-030-57938-8>

Abstract: This handbook is a collaborative effort of international researchers and practitioners across disciplines. The book features chapters that provide unique perspectives on the conceptual and practical challenges for achieving the SDGs. The findings are most relevant to the policy field of development cooperation, but they also address broader questions currently being discussed in global governance research. The chapters in this book examine different forms of cooperation and

contestation but also exemplify that contestation does not necessarily result in gridlock. In line with the current debates on the 2030 Agenda.

Keywords: SDG – 17, Global Governance

6. How sustainable are India's development partnerships?

Swati Prabhu (2022)

Expert Speak Raisina Debates Published on Jan 03, 2022 (ORF)

Abstract: The sustainability debate has been hastened in light of the raging COVID-19 pandemic as the international community, particularly the developing countries, reel under the threat of vulnerabilities and failing resilience against future outbreaks. Fostering cooperative links and partnerships have, undoubtedly, emerged as the lynchpin of the broader development discourse. Here, development partnerships can play a pivotal role in maximising the positives and offsetting the associated risks. In this context, India's development partnerships have emerged as a potential game changer in the larger aid architecture, given its key role in the development of several of the South Asian and African countries. Indeed, its development cooperation initiatives have elevated its position to a level where it can possibly reshape the global arc of international development. Before independence in 1947, India was deeply engaged in building effective partnerships with its neighbouring countries and also with Africa. Moreover, India's development partnerships could be termed as that one essential aspect of its overall development cooperation strategy. Since the beginning, New Delhi's stance has been clear: The international community was responsible for the economic development of all the nations, not translating as charity or a dole-out to the poor but rather a partnership for peace and prosperity, thereby, augmenting the idea of internationalism. Besides being a developing country itself, India has pushed its experiences towards promoting social and economic development of the newly independent countries in Asia and Africa. If we examine New Delhi's development partnerships on the Sustainable Development Goals (SDGs) in its neighbourhood during the early 1950s, it is observed that India, though indirectly, contributed towards most of the sustainability targets. For instance, in Nepal, Bangladesh, Afghanistan, and Bhutan, it helped in capacity-building and technical training (SDG 17) under the Indian Technical and Economic Cooperation (ITEC) Programme in various sectoral areas, such as education (SDG 4) and health (SDG 3). It also provided infrastructural support (SDG 9) to these nations in the form of constructing hydropower plants, roadways, and transportation links, thereby, opening up new markets for trade.

Keywords: SDG – 17

7. Development Cooperation Towards the SDGs: The India Model

Malancha Chakrabarty (2022)

Occasional Paper No. 369, September 2022 Observer Research Foundation (ORF)

Abstract: The COVID-19 pandemic has caused a huge setback to the global quest for sustainable development. In 2020, for the first time since the Sustainable Development Goals (SDGs) were adopted in 2015, the global average SDG score declined. Analysts attribute the overall drop in the composite SDG score primarily to the increased poverty and unemployment rates during the pandemic. Even high-income countries such as Finland, Sweden, and Denmark—which rank first,

second, and third, respectively on the SDG index—are not on-track to achieve all the SDGs. The socioeconomic impacts of the pandemic on low-income countries, and particularly on their most vulnerable populations (such as migrant workers and women), were far more profound because they did not have the fiscal space to finance emergency response measures nor economic recovery plans.

Keywords: SDG – 17, Development Co-operation

8. Sustainable Developmental Goal 17 and Agriculture from an Indian Perspective

K. Priti, Prashant Kumar & Kaushlesh Singh Shakya

In: Yasheshwar, Mishra, A.K., Kumar, M. (eds) *Recent Advancements in Sustainable Agricultural Practices*. Springer, Singapore. https://doi.org/10.1007/978-981-97-2155-9_1

Abstract: Sustainable Development Goal (SDG) 17 emphasizes strengthening the means of implementing global partnerships through multisectoral and multinational approaches. SDG 17 aims to attain global partnership elements in financial capital, technology advancement, capacity building and skill development, trade and systemic issues at different constituencies (global, regional, national and local levels). The global partnership improves the sustainability of all types of development cooperation for the collective welfare of people, planet, prosperity and peace. Implementing and framing strong national and international policies, programs, schemes and action plans via collaboration of stakeholders, innovators, entrepreneurs and institutes is essential in promoting sustainability and achieving SDGs by 2030. The UN has defined 19 targets and 24 indicators for measuring progress toward SDG 17. The progress of all other 16 SDGs is dependent on and linked with goal 17th. Seventh goal will promote universal social, economic and environmental development through equitable trade, coordinating investment across borders, collaborative actions and improving and supporting coordination and collaboration among nation-states. To achieve 17th goal targets, it requires huge funding in infrastructure to empower different sectors like energy, agriculture, transportation systems and IT to ensure fair and equitable distribution of resources among the world's community. The agriculture sector accounts for 4% of global GDP, and in developing countries like India, it provides employment to over 50% of the nation's workforce and contributes 17–18% to the India's GDP. The world states must take concrete actions for the agriculture sector to achieve Goal 17 of the SDGs by 2030. Strengthening and promoting five elements—capital, technology, skill-building, bilateral and multilateral trade policy and systemic issues such as storage facilities, climate change, stubble burning, irrigation facilities, etc.—is crucial to achieving global partnership. Today, progress has been made in several areas, but globally, action to achieve the sustainability in agriculture sector is not progressing at the required momentum or magnitude. This decade must bring concrete efforts in the agriculture sector to achieve global goal 17 by 2030. This work aims to understand the multiple risks associated with Indian agriculture and how global partnership in terms of finance, technology, trade, capacity building and skill can help handle the Indian agriculture risks and attain sustainability in the whole agriculture network.

Keywords: SDG – 17, Agriculture

Cross-cutting references

1. Standardizing evaluation process: Necessary for achieving SDGs – A case study of India

Alok Srivastava (2018)

Evaluation and Program Planning, Volume 69, August 2018, Pages 118-124

Abstract: A set of 17 Sustainable Development Goals (SDGs) adopted by the United Nations General Assembly in September 2015 are to be implemented and achieved in every country from the year 2016 to 2030. In Indian context, all these goals are very relevant and critical, as India missed the target on many components of the Millennium Development Goals (MDGs). The author strongly feels that one of the key reasons was lack of an in-built robust system for measuring the progress and achievements of MDGs. Monitoring and Evaluation of programmes and schemes, aiming at different SDGs, in a robust and regular manner is therefore need of the hour. A National evaluation policy (NEP) would set the tone in the right direction from the very beginning for achieving SDGs. The paper taking India as a case study discusses different critical factors pertinent for having a well laid down national level policy towards standardizing evaluation. Using real examples under different components of an evaluation policy, the paper discusses and questions the credibility and acceptance of the present evaluation system in place. The paper identifies five core mantras or pre-requisites of a national evaluation guideline. The paper emphasizes the importance of an evaluation policy in India and other countries as well, to provide authentic data gathered through a well-designed evaluation process and take corrective measures well on time to achieve SDGs.

Keywords: Evaluation, national guideline

2. Sustainable Development Goals and India: A Cross-Sectional Analysis

Rajesh Panda, Madhvi Sethi, Shivam Agrawal (2018)

OIDA International Journal of Sustainable Development 11:11 (2018) Pg 79-90.

Abstract: This paper deals with the status of SDGs in India with the help of recent data. The analysis is based on the data collected from various sources for every Indian state. Every SDG has been attributed a variable which signifies the status of the specific goal. Preliminary analysis shows that India has grown substantially in last 15 years for few of the basic parameters and are on track of achieving the goals, but when we look deeply into the state-wise data a wide disparity is clearly visible. Some parameters which are acceptable overall is driven by few of the selected states whereas other states are substantially lagging. The paper attempts to rank each of the states based on the SDG Index. On the basis of the analysis, we find that the policy which may look sufficient on a national basis might not be appropriate on state level. The state-wise index also helps to understand the key areas where the policy makers should pay attention to. The index shows the clear disparity between India states and a lot must be done to achieve uniform success across states.

Keywords: Human development, Index, India, Policy, Sustainable Development Goals

3. Concerns of developing countries and the sustainable development goals: case for India

Khalid, A. M., Sharma, S., & Dubey, A. K. (2020).

International Journal of Sustainable Development & World Ecology, 28(4), 303–315.
<https://doi.org/10.1080/13504509.2020.1795744>

Abstract: The sustainable development goals (SDGs) were result of extensive stakeholder participation and global consensus. Despite large promises, there is an increasing concern among the member states whether SDGs address real problems of nations, particularly the developing world. This study discusses key issues raised by developing countries with respect to the SDGs. Using opinion of experts on SDGs regarding its implications and future, a case study for India is presented. The study with its findings and policy recommendations intend to benefit SDG implementation efforts and planning at the national and sub-national level in India and other developing countries, helping them redesign and investigate their national SDG implementation strategies on similar lines as India to improve its reach and effectiveness.

Keywords: policy, sub-national level, implementation

4. Corporate social responsibility and sustainable development goals: A study of Indian companies

Loknath Mishra (2021)

Journal of Public Affairs, Volume21, Issue1, February 2021, e2147 <https://doi.org/10.1002/pa.2147>

Abstract: India completing five years since mandatory CSR was implemented under Sec 135 of Companies Act, 2013 compelling Indian companies to contribute 2 % of their last three-year average net profit in few specified areas of CSR activities as mentioned in the seventh schedule of the Act. In the same period, United Nations outlined the 17 goals based on sustainable development that contains 169 objectives signed by various 193 countries around the globe contributing social, environmental causes to establish a glorious life and opportunities for everyone in the year 2015. The realization of sustainable development goals agenda 2030 lies with the Business sector, corporate as well as Government sector and also the civil society plays a significant role in this regard. The present study aims to map the CSR activities with sustainable development goals and review the mandatory CSR practices of 40 Indian companies and how companies are leveraging CSR thereby attaining sustainable and progressive target.

Keywords: CSR, SDGs

5. Research on Sustainable Development Goals: How has Indian Scientific Community Responded?

Aakash Singh, Anurag Kanaujia & Vivek Kumar Singh (2022),

Journal of Scientific & Industrial Research, Vol. 81, November 2022, pp. 1147-1161, DOI: 10.56042/jsir.v81i11.64456

Abstract: Since the adoption of Sustainable Development Goals (SDGs) in 2015, various countries across the world have started programmes to achieve the relevant targets under SDGs. The advancements in research and development play a crucial role in achieving these targets. Motivated by this a few studies have tried to map the research publications with their relevance to

specific SDGs. However, there are no existing detailed studies with reference to India. Therefore, this article attempts to measure the research activities on SDGs in India. It utilises standard bibliometric approach and textual analysis of data collected from Dimensions database for a five-year period (2016–2020). The results show a positive response from the Indian research community towards the SDGs. About 12 percent of the total research output from India is found directly related to SDGs. The three SDGs namely SDG 3 (Good Health and Well-being), SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Change) have received most attention from the Indian research community. Technical subjects such as, Engineering, Medical and Health Sciences, and Chemical Sciences are the main contributors. The major contributing institutions, authors and journals are identified.

Keywords: Global goals, Indian science, Research trends, Science & technology

6. Ideas, Innovation, Implementation: India's Journey Towards the SDGs

Jayashree B, Anirban Sarma, Vanita Sharma, Shoba Suri (2023)

September 2023, Reliance Foundation and Observer Research Foundation.

Abstract: As the world reaches the mid-point of the window for the achievement of the United Nations Sustainable Development Goals (SDGs), two questions confront global leaders and development stakeholders: Are we on track to achieve the SDGs? What can we do to accelerate efforts to meet them? For many countries, the COVID-19 pandemic was a shock that reversed decades of progress. Nonetheless, the world demonstrated remarkable resilience in making a recovery, and India managed the pandemic without allowing it to derail development and growth. A reason for India's resilience has been the wealth of lighthouse initiatives that bulwark the nation against external shocks. India's Presidency of the G20, and its leadership in crafting a development agenda for the Global South, has allowed the country to draw attention to many of these best practices and encourage their adoption. As we begin to look ahead to a world beyond the 2030 Agenda, this publication showcases 17 lighthouse case studies from India—each primarily addressing one specific SDG—which could bring about a potential transformation if scaled and replicated in other geographies. Implementing these ideas could hasten our journey to the SDGs, and provide a strong foundation on which a post-2030 agenda might build further.

Keywords: Resilience, G20

7. A systems thinking approach to navigate inter-linkages to achieve SDGs in India - Publications Repository (PURE)

Cheshta, Grover, and Singh, Naresh (2023)

Journal of Sustainability Science and Management, 18 (2). pp. 179-196. ISSN 1823-8556

Abstract: While there has been much talk about the integrative, indivisible, and interlinked strategies to achieve the SDGs (UN Sustainable Development Goals), the interactions and interdependencies are generally not explicit. Challenges remain to simultaneously capture the multilayered relationships among SDGs to strategically and coherently align national development plans. In this paper, we use systems thinking and systems dynamics modelling analysis to capture the cross-effects of intervention policies by taking one national indicator for each of the three

selected goals. These are budget inclusiveness (increase in public expenditure on health) in SDG 3 (on good health and well-being), literacy rates (literacy rate of youth in the age group of 15-24 years) in SDG 4 (on quality education) and equity (employment gender bias) in SDG 5 (on gender equality) together to assess their effect on the SDG 8 (of decent work and economic growth). A Causal Loop Diagram has been used to present the qualitative structure of the model. In our modelling, we logically draw interlinkages and then attempt to support them with existing evidence. Our main result is to confirm that reinforcing loops of such interventions exist, which are important for sustainable development policy. We have extended the causal loop diagram by proposing what effects could be realised in other SDGs related to poverty (SDG 1), sustainable consumption and production (SDG 12), and global partnerships (SDG 17). The paper concludes that such analysis will bring interlinkages to the foreground for prioritising the national goals and targets and hence implement policies in priority areas achievable by 2030 for India on a development strategy informed by systems thinking.

Keywords: Systems thinking, interlinkages

8. Identification and analysis of critical barriers for achieving sustainable development in India

Parida, R., Katiyar, R. and Rajhans, K. (2023),

Journal of Modelling in Management, Vol. 18 No. 3, pp. 727-755. <https://doi.org/10.1108/JM2-11-2020-0288>

Abstract: The major contribution of this study lies in the development of a contextual relationship model from the various identified critical barriers in Indian context, using interpretive structural modeling with MICMAC analysis. Of the 17 goals given by UN, considering the Indian context, the goals of building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation; promoting sustained and inclusive economic growth along with full and productive employment and decent work for all; and gender equality and empowering women at all levels seem to be the major challenges and the same are selected in this study for further analysis. To understand the major challenges in these areas and also to find the way forward, the study has set following three major objectives: to identify the critical barriers of urban sustainability and gender equality with reference to Indian context; to suggest the strategies to achieve sustainable development in the referred area; and to evaluate the relationship between them.

Keywords: Barriers, Urban sustainability, Gender equality

9. Sustainable Development Goals in Northeast India: Challenges and Achievements

Subhash Anand, Madhushree Das, Rituparna Bhattacharyya, R. B. Singh (Editors) (2023)

Advances in Geographical and Environmental Sciences. Springer, Singapore

Abstract: The NER consists of eight states—Assam, Arunachal Pradesh, Tripura, Nagaland, Manipur, Mizoram, Meghalaya and Sikkim—and they carry political, economic and social importance. The book integrates the past, present and future of geospheric attributes incorporating progress towards the Sustainable Development Goals (SDGs) to meet the demands for improving human wellbeing under diverse and challenging socio-economic, political and environmental

conditions. The key SDGs, as in food and agriculture, health, education, water, energy and other overarching goals of the region, have yet to incorporate providing sustainable jobs and promoting equality and inclusive development, although there have been a few studies in that regard. The challenges to achieve SDGs in the NER are formidable compared to the rest of India. The NER has put a great deal of effort into achieving the SDGs, mainly in poverty (SDG-1), good health (SDG-3), education (SDG-4), gender (SDG-5), decent work (SDG-8) and reduced inequalities (SDG-10), similar to the rest of the country. However, the standard development indicators such as road length, access to health care, power consumption and other measures are far below the national average. A multi-pronged strategy has played a pivotal role in the region, but development strategy to attain the SDGs 2030 must be more inclusive in empowering people with maximising self-governance, considering the resources, needs and aspirations of the people. This book evaluates the performance of the SDGs and fills in the gaps. It includes case studies focusing on different SDGs using advanced cartographic, statistical and GIS techniques and methods. It also provides unique findings that serve as valuable resources for planners and policy-makers so that a sustainable future in Northeast India can be achieved.

Keywords: North east India, SDGs No Poverty, Good Health and Well-being, Quality Education,5,8,10

10. Assessing Gujarat's sustainable development: A comprehensive analysis of the SDG India index

Prathem Parekh (2023)

Urban India • Volume 43, Issue (2) (I) • July - December 2023 pp. 126-133.

Abstract: The Sustainable Development Goals, or SDGs, cover a broad range of topics, including poverty eradication, gender equality, clean energy, sustainable cities and communities, and climate action, among others. These goals were adopted by all UN member countries in 2015 as part of the 2030 Agenda for Sustainable Development, and they are considered to be a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. The SDG India Index prepared by NITI Aayog is a valuable policy monitoring tool for tracking India's progress towards achieving the SDGs. The index measures the performance of Indian states and union territories on 16 SDGs, which are further divided into 54 indicators. The 16 goals cover a wide range of areas, such as health and well-being, education, water and sanitation, clean energy, sustainable cities and communities, and others. The study attempts to scrutinize the performance of Gujarat and India in terms of achievements made SDG attainment. The study depends on data published by NITI Aayog across 16 goals to make comparative analysis. According to the SDG India Index 2020-21 Gujarat was ranked as the top-performing state in India, with a score of 75 out of 100. The state performed particularly well in the areas of clean energy, industry, innovation and infrastructure, and sustainable cities and communities. However, there is still a long way to go for Gujarat and the rest of India to achieve the SDGs by 2030. The SDG India Index provides a useful roadmap for policymakers to identify areas where progress is lagging and take corrective action to accelerate progress towards achieving the SDGs.

Keywords: Gujarat, NITI Aayog, Public Policy.

11. Achieving the Sustainable Development Goals (SDGs) in the Indian State of Odisha: Challenges and Opportunities

Basanta K Pradhan, Sangeeta Yadav, Joydeep Ghosh, Anjali Prashad (2023)

World Development Sustainability Volume 3, 2023, 100078, ISSN 2772-655X,
<https://doi.org/10.1016/j.wds.2023.100078>

(<https://www.sciencedirect.com/science/article/pii/S2772655X23000368>)

Abstract: The United Nations Sustainable Development Goals (SDGs) form the edifice of sustainable future and an inclusive growth. Indian state of Odisha has made significant progress in human development in the recent years, however, in comparison to several other Indian states it still lags behind. This study aims to discern the future prospects and challenges for achieving the SDGs in the state of Odisha and the policy support that currently exists or is needed in this context. To achieve this objective, an econometric analysis was conducted to determine the relationship between public social sector spending and the Multidimensional Poverty Index (MPI) in order to assess the investment requirements for achieving the SDGs. The results of this study suggest that an increase in public spending on the social sector has a statistically significant effect on reducing the MPI and therefore could facilitate the achievement of the SDGs in the state. Given the substantial financial requirements and the current economic uncertainty the state might have to explore alternative means of financing. Better governance and higher efficiency in the implementation of policies/programs assume more importance in the current setting.

Keywords: Sustainable development goals; Multidimensional poverty; Odisha; Public social sector expenditure

12. Level of awareness on the sustainable development goals among Indian youth: Empirical evidence from Northern India

Shraddha Sharma, Preeti Manani, Monika Thakwani, Rupali Satsangi, Priti Sharma, Dolly Jamwal (2024)

Edelweiss Applied Science and Technology ISSN: 2576-8484 Vol. 8, No. 4, 2356-2368 2024

Publisher: Learning Gate DOI: 10.55214/25768484.v8i4.1626

Abstract: In India, government has made many policies and plans to contribute in the attainment of SDGs but being a developing nation with a large population and vast geographical expanse, the attainment of SDGs is a big task. In the 2022 Global Index of SDGs, India ranked 121 out of 163 countries. The present research's objective was to measure the awareness among universities students. Two stage cluster sampling was used for sample selection. In the first stage, 4 cities from the Northern part of India were selected and in second stage, from each city, selection of subjects was done. 546 subjects were contacted, and 335 participated. Survey was conducted using questionnaires (Odoom, Mensah, Dick Sagoe, Lee, Opoku & Obeng Baah, 2024). The scale has questions related to all the SDGs. Results showed that subjects had moderate awareness about SDG5, SDG6, SDG7, SDG9, SDG13 and SDG15 with the respective mean score (Mean 3.32, 3.77, 3.80, 3.27, 3.79, & 3.27) and had low awareness for SDG10, SDG11, SDG16, and SDG17 with the respective mean score (Mean 2.95, 2.86, 2.95, & 2.86). Results showed significant difference in the SDGs awareness among male and female. For SDG2, SDG3, SDG4, SDG9, SDG14, SDG15 and SDG17, the awareness was higher in male (respective mean rank score 182.80, 181.76, 176.29, 181.80, 217.26, 184.95, 194.08) than female (respective mean rank

score 152.01, 153.12, 159.04, 153.09, 122.42, 149.68, 139.81). For SDG5, SDG6, SDG7, SDG10, SDG11, SDG12, SDG13, SDG16, the awareness was higher in female (respective mean score 224.19, 224.19, 196.48, 198.99, 211.51, 205.13, 219.52, 205.25) in comparison to male (respective mean score 116.01, 115.01, 141.65, 139.32, 127.74, 133.64, 120.33, 133.53). Results of the present research also imply the role of social structure in SDGs awareness and highlight the need to introduce some programs to promote the discussion on SDGs in every classroom.

Keywords: Indian Youth, Level of awareness, SDGs

13. Sustainable Development Goals National Indicator Framework, 2024

Government of India, Ministry of Statistics and Programme, Implementation National Statistical Office

Abstract: The document is a compilation of all the National Indicators for all SDGs and the respective data sources and periodicity of monitoring.

Keywords: National Indicators, India

14. Mapping Welfare and Development Schemes to SDGs at Village Level in India

A Amarender Reddy, Anindita Sarkar, C Radhika Rani, Abhispita Das, C. Papi Reddy & Anjani Vajrala Sneha (2024).

SAARC JOURNAL OF SOCIAL SCIENCE Vol. 2, No. 1, 2024, pp. 27-59 • ISSN: 2583-9950

DOI: 10.2139/ssrn.3101247

Abstract: Achieving Sustainable Development Goals (SDGs) is a gigantic task given its 17 goals and 169 targets cutting across many areas. These have to be achieved in synergistic manner by central, state and local governments. Although, state and central level departments work in silos, their actual implementation at village level needs to be integrated to explore synergies. Keeping this in view, this paper examined the different government schemes working at village level which are linked to specific SDGs. The paper examined how many are benefiting, what was the extent of benefit from each scheme and at aggregate level. The study was done in Emped village of Telangana by collecting data on all schemes and from all 287 households in the village to get holistic picture. The average income of the households were Rs. 73,345 in the village. Although, more than 50 schemes are working in Telangana, the study examined a total of 29 schemes from which at least one household benefited. The average aggregate benefit from all government schemes is about Rs.58,095 per household. If we include double-bed-room housing scheme and Chief Minister Relief Fund, the aggregate support reached Rs.1,06,006 per household. Some schemes are benefiting landholding class more, while some are pro-poor and pro-socially backward classes. Majority of the households benefited from schemes like Public Distribution System (PDS), Rs.4000 input support per acre, MGNREGA, loan weaver, seed and fertilizer subsidy, mid-day-meal scheme but in modest amount. Schemes addressed to women like KCR Kits and Shadi Mubarak are working well. But very few are benefited from double-bed room housing scheme, Chief Minister Relief Fund but in huge sums. Overall, these schemes are helping to achieve different targets of SDGs, but needs more focus on identification of right beneficiary, reduction of leakages and inordinate delays in implementation

Keywords: welfare schemes; development schemes; local economy; impact, Telangana

15. Achieving Sustainable Development Goals: A Case Study of Dalmia Bharat Sugar & Industries Limited

Priyanka Singh, Pankaj Rastogi, Govind P. Rao Kuldeep Kumar Govind P Rao (Jan 2024)

Sugar Tech 26, 313–324 (2024). <https://doi.org/10.1007/s12355-023-01343-3>

Abstract: Sugarcane-based agro-industry in India is spread over 5.2 million hectare and employs around 12 million people. It has immense potential to create shared value for the people, communities, businesses, economies, and ecosystems. This sector is instrumental in positively influencing a number of key Sustainable Development Goals (SDGs). This study was performed at Dalmia Bharat Sugar & Industries Limited (DBSIL), highlighting important SDGs, which the company has achieved over the years. The DBSIL has five sugar units (600,000 tonnes sugar/annum), five co-generation plants (119 MW) and two distilleries (305 KLPD) producing bio-ethanol and hand sanitizer. The company's 36,500 TCD plants are supporting over 2500 employees, 1,50,000 farmers and their families with an annual turnover of USD 3.7 million (INR 2739 crore). The Sustainable Sugar Intensification project is capable of producing 4.5–5.0 million tonnes of quality sugarcane annually, with 30% saving of irrigation water. It has established 559 vermi-compost units, 948 farmyard manure units, and distributed 1358 solar-powered battery sprayers to promote green technology. The DBSIL has taken several initiatives to protect groundwater quality, rainwater harvesting, reducing greenhouse gases emissions, bio-recycling of wastes and effluents to minimize the carbon foot prints. During 2021, about 29 million KL of water was conserved through drip irrigation; constructed 1401 water harvesting structures and 9200 hectares of land were brought under watershed projects. The company has achieved Zero Liquid Discharge at all their plants and provided 8,01,910 m³ of recycled water to the farmers for irrigation. At present, 1179 self-help groups consisting of 14,000 women members and 12 training centers are active in income-generating and entrepreneurship development activities. Company's CSR funded programs include nine e-literacy centers, women and child education, rural health services, climate action, sanitation and potable water facilities, COVID-19 relief, prevention initiatives, and rural roads. The five co-generation plants are producing clean and green electrical energy, and around 60% of surplus renewable electricity is exported to grid for electricity supply to 145 villages. DBSIL has partnered with several NGOs to drive improvement in economic, social and environmental performance of growers and millers, contributing in achieving goals of SDGs.

Keywords: Sugar industry, Sustainable development goals, Corporate Social Responsibility Co-generation, Greenhouse gases

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Abstract of the publication not exceeding 300 words

Keywords should also include associated SDGs

The publication details can also be emailed to **Prof Yogesh Vinayak Gokhale**
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