CSD 20th Anniversary Publication

India's Sustainability @ 75

Achievements, Challenges and Prospects

CSD 20 YEARS of shaping a sustainable future

CENTRE FOR SUSTAINABLE DEVELOPMENT

Publication Title: India's Sustainability @ 75: Achievements, Challenges and Prospects (CSD 20th anniversary publication)
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Abbreviations

Chapter 1
CSD - Centre for Sustainable Development
WHO - World Health Organisation
IHME - Institute for Health Metrics and Evaluation
BMTC - Bangalore Metropolitan Transport Corporation
CPCB - Central Pollution Control Board
KBS - Kempegowda Bus Station
KSRTC - Karnataka State Road Transport Corporation
ETP – Effluent Treatment Plant
EMPA – Electron Microprobe Analysis
ELCIA – Electronics City Industries Assosiation
EWARDD – Electronic and Electrical Waste Recycling, Dismantling and Disposal
EWA – Earned Wage Access
MoEF – Ministry of Environment and Forest

Chapter2
EMTA - Embedded Multimedia Terminal Adapter
ELCIA - Electronics City Industries Association
EWARDD - Electronic and Electrical Waste Recycling Dismantling and Disposal
EWA - Earned Wage Access
MoEF - Ministry of Environment and Forests
SDG - Sustainable Development Goals
AMRUT - Atal Mission for Rejuvenation and Urban Transformation
KHB - Karnataka Housing Board
RWH - Rain Water Harvesting
BESCOM - Bangalore Electricity Supply Company Limited
MG – Mahatma Gandhi
MUs – Million units
DTS – Digital Theater System
GEF – Global Environment Facility
CSD – Communit Sanitation Development
ERC – Environment Report Card

Chapter 3
CSD – Centre for Sustainable Development
MNRE – Ministry of New and Renewable Energy
PV – Photovoltaic
IRENA – International Renewable Energy Agency
NREL – National Renewable Energy Laboratory
EVs – Electric Vehicles
WHO – World Health Organisation
SDG – Sustainable Development Goals
GW – Gigawatt
MW – Megawatt or One million watt
BESCOM – Bangalore Electricity Supply Company Limited
TEQIP – Technical Education Quality Improvement Programme
ESVC – Electrical Solar Vehicle Championship
BCIC – Bangalore Chamber of Industry and Commerce
CTC – Carbon Tetra Chloride
PPA – Power Purchase Agreement
SEA – Strategic Environmental Assessment
EIA – Environmental Impact Assessment
KUIDFC – Karnataka Infrastructure Development and Finance Corporation
REIA – Rapid Environmental Impact Assessment
MPN – Most Probable Number
EMP – Electromagnetic pulse
GIZ – German Agency for International Cooperation
ONGC – Oil and Natural Gas Corporation
UREDA – Uttarakhand Renewable Energy Development Agency
NCDC – National Cooperative Development Corporation
ISEC – Institute for Social and Economic Change
KBB – Kelley Blue Book
NLSIU – National Law School of India University
ECBC – Energy Conservation Building Code
BWWS – Bangalore World Water Summit
GRIHA – Green Rating for Integrated Habitat Assessment

Chapter 4
NCDC – National Cooperative Development Corporation
SEA – Strategic Environmental Assessment
EIA – Environmental Impact Assessment
KUIDFC – Karnataka Infrastructure Development and Finance Corporation
REIA – Rapid Environmental Impact Assessment
MPN – Most Probable Number
EMP – Environmental Management Plan
GIZ – German Agency for International Cooperation
ONGC – Oil and Natural Gas Corporation
UREDA – Uttarakhand Renewable Energy Development Agency
NCDC – National Cooperative Development Corporation
ISEC – Institute for Social and Economic Change
KBB – Kelley Blue Book
NLSIU – National Law School of India University
ECBC – Energy Conservation Building Code
BWWS – Bangalore World Water Summit
GRIHA – Green Rating for Integrated Habitat Assessment

Chapter 5
CSD – Centre for Sustainable Development
WHO – World Health Organisation
NCDC – National Centre for Disease Control
FSSAI – Food Safety and Standards Authority of India
FoSTaC – Food Safety Training and Certification
NABL – National Accreditation Board for Testing and Calibration Laboratories
FoSCoS – Good Safety Compliance System
PRIs – Panchayat Ray Institutions
ULB – Urban Local Bodies
ICDS – Integrated Child Development Services
PPPs – Public Private Partnerships
NGOs – Non Governmental Organisations

Chapter 6
CSD – Centre for Sustainable Development
NDCs – Nationally Determined Contribution
NAPCC – National Action Plan on Climate Change
NGOs – Non Government Organisations
EOP – End of Production
UNFCCC – United Nations Framework Convention on Climate Change
SDG- Sustainable Development Goals

Chapter 7
DIA – Defence Intelligence Agency
KSPH – Karnataka State Policy Housing
IDCL – Infrastructure Development Corporation Limited
SMART – Specific , Measurable , Achievable , Relevant , Time- bound
FGD – Focus group Discussion
IDI – International Development Interns
RWH – Rain Water Harvesting
BWSSB – Bangalore Water Supply and Sewerage Board
GoK – Government of the Republic of Kenya
DMA – Direct Memory Access
KLE Society – Karnataka Lingayat Education Society
CCs – City Corporations

Others:
CSD – Centre for Sustainable Development
BIA – Business impact analysis
BMTC – Bangalore Metropolitan Transport Corporation
SD – Sustainable Development
KSTIDCL – Karnataka State Textile Infrastructure Development Corporation Limited
KSHDCL – Karnataka State Handicrafts Development Corporation Limited
BCIC – Bangalore Chamber of Industry and Commerce

Foreword

This publication is compiled on the occasion of Centre for Sustainable Development (CSD)'s 20th anniversary on the theme 'India's Sustainability @75' and comprises of three sections- (i) India's progress in achieving its SDG goals and articles from some eminent experts, (ii) CSD's pioneering and impactful work in the field of sustainable development,(iii) Roundtable workshops on Sustainable Development Goals conducted in the cities of Hyderabad, Pune, Odisha and Bengaluru and Mock Conference of Parties named Youth Climate Conclave (Parliament) in the above mentioned cities bringing together youth, University students to understand the global progress on SDGs and to emphasise the role and importance of youth in the same.

CSD works in multi-disciplinary areas of sustainable development with relevant partners and stakeholders. From cleaner production to climate change to green buildings, CSD has pursued an integrated approach to foster a harmonious balance of environment, economy and society. Beginning in a humble way with a project from the Government of Andhra Pradesh on Cleaner Production for a leather tannery at Warangal (2003-2004), CSD has come a long way developing the first Citizen Environment Report Card for Bangalore city, preparing the Karnataka Climate Change Action Plan, embarking on the first pilot project on Food Safety in the country and also setting up an E-Waste Agency (EWA) to address the growing concerns of waste in the IT capital. CSD took a big step in 2016 when it started it's journey of establishing the Green Skills Academy. Having vast experience in skill development and training programs, CSD with support from National Skill Development Corporation and the Skill Council for Green Jobs set up the country's first accredited Green Skills Academy in 2017. The academy offers some unique courses such as waste water treatment for technicians, solar installation and maintenance, climate resilience, waste management and so on.

The organisation has partnered with some of the most prestigious institutions in the country and has leveraged the best minds to deliver its objectives. With a small and dedicated staff, CSD has to its credit, more than 150 projects and programmes in the last two decades. The source of its strength is a highly reputed and knowledgeable Governing Board whose members have unfailingly supported CSD's activities.

CSD has believed in core values that ensure credibility in how it works, transparency in what it does and quality in whatever it undertakes to do and this compilation of various works, thoughts and suggestions serves as an effort to showcase just that.

This publication will give a unique perspective into the achievements, challenges and prospects on sustainable development.

-Dr. Srinivas R
Executive Director
Centre for Sustainable Development

CSD's Profile & Achievements

Vision

"To enhance the quality of life by catalyzing the role of citizens, market forces and governance to invest in Sustainable development"

ABOUT CSD

Centre for Sustainable Development

is a non-profit organization established in the year 2003 headed by **Dr. A. Ravindra**, Former Chief Secretary of Karnataka as Chairman and is governed by a board of highly distinguished personalities. CSD has successfully gained credit for rendering qualitative service both in the field of sustainable development, environment protection and skill development through a range of activities from IEC to impact study.

CSD 20 YEARS
of shaping a sustainable future

FOUNDING MEMBERS

Along with Name and Occupation (at the time of incorporation) Designation

Dr. Ravindra A
IAS (Retd) Former Chief Secretary, Karnataka
Chairman

Mr. Attavar Manmohan
CMD- IAHS (I) Pvt. Ltd.
Member

Mr. Baljee C.K
M.D, Baljee Hotels
Member

Mr. Harish H.V
Director- A.F. Fergusson & Co.,
Member

Mr. Parthasarathy
M.A Environmentalist/ Corporate leader
Member

Mr. Prabhu P.P
IAS (Retd) Ex. Commerce Secretary, Govt. of India
Member

Mr M.K. Ramachandra
Industrialist
Member

The CSD team condoles the demise of three of its founder members,
Mr. P. P. Prabhu,
Mr. M. A. Parthasarathy and
Mr. M.K Ramachandra who are remembered for their yeomen contributions to CSD.

CSD BOARD

Dr. A Ravindra

Chairman

Prof H.P. Kincha

Member

Sri. H. V. Harish

Member

Mrs Meena Raghunathan

Member

Dr. Meenakshisundaram

Member

Dr Srinivas Ravindra

Member

Dr J Gururaja Rao

Member

Dr. Chaya Degaonkar

Member

Prof M.K Ramesh

Member

CORE ACTIVITIES

1.Research

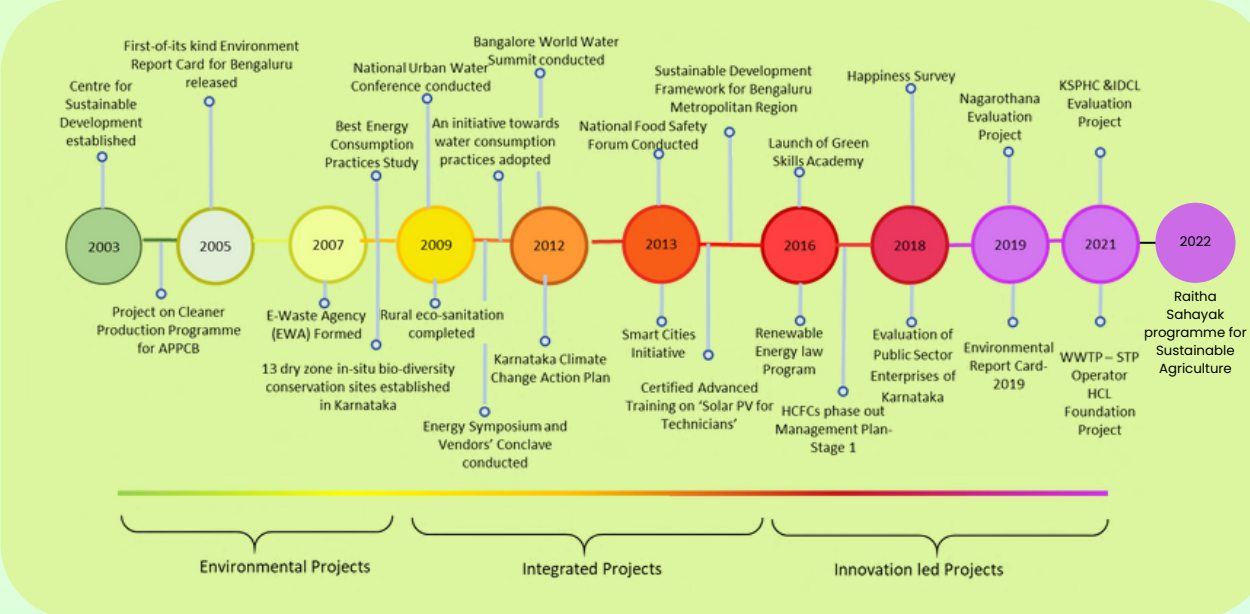
Natural Resource Management - Energy, Waste, and Water Climate Change and Cleaner Production

RWH Structure- Water collected in an open well

DTS and toilets built in Ancharahalli

2. Skill development

Training and Capacity Building



CORE ACTIVITIES

3. Project Management

Environmental Management and Environmental Governance
Pro Sustainable Urban Development

Waste Effluent from the Abattoir at Mangalore

Preparation of Environmental Impact Assessment and Environment Management Plan in Chitradurga Schist Belt, Karnataka

4. Events

Promotional Activities and Outreach Programs

Green Job Fair '22

His Excellency H.R. Bharadwaj, Governor of Karnataka and Mr. Rajendra Babu, former Chief Justice of India at the World Water Summit Awards 2012

5. Citizen Engagement

Campaigns and volunteering

Observing International Biodiversity Day with school children

Efforts and Commitments for Sustainable Development

Chairman's message

"The Covid-19 pandemic, apart from causing loss of human lives in large numbers and leaving many physically and mentally affected, exposed severe shortcomings in the way human beings have shaped modern civilization. While achieving economic growth and material progress, we have shown scant respect for the planet in which we live and have been exploiting nature's resources without restraint, resulting in serious damage to human health and environment. CSD visualized the importance of using resources wisely and set up a non-profit centre to promote sustainable development, two decades ago, in 2003.Over a decade later, in 2015, the United Nations announced a set of Sustainable Development Goals(SDGs) which were adopted by all its member nations.

On the occasion of its 20th anniversary, we thought it would be appropriate to review the progress we have made in moving towards the achievement of SDGs by the target date of 2030 fixed by the UN and deliberate on the issues that need to be resolved. We therefore planned to organize two programmes focusing on:
1) Reflection on these issues and the measures to be taken to accelerate the achievement of SDG goals,and
2) By creating awareness among the youth,mainly college students about sustainability issues,particularly on climate change,which has assumed tremendous significance,as lack of necessary action in dealing with it can lead to disastrous consequences.We have therefore organized a Students Climate Parliament where they will have real life experience on how nations deliberate and decide the future course of action at the annual Conference of Parties.We have completed three regional meets in western,eastern and southern regions and are now concluding with a national Sustainability Leadership Summit in Bengaluru on November 4,2023.

CSD hopes to continue its journey and contribute its mite in finding sustainable solutions to the problems India faces, particularly in the areas of Water and Wastewater management, Renewable energy, Waste management and Climate change, with a focus on green skills which we have pioneered. We seek the cooperation of government, corporate sector, academia and the community in fulfilling the mandate of Sustainable Development."

On the occasion of CSD 20th Anniversary

Roundtable workshop on Sustainable Development series and Youth Climate Conclave (Parliament)

Round Table Workshop Series on Sustainable Development Goals (SDGs)

The year 2022 marks as India's 75th Independence and 50th year of World Conference on Global Environment held in Stockholm, Sweden in1972 where the first report (Limits to Growth) on Sustainable Development was released. Considering the above landmarks in view, the Centre for Sustainable Development (CSD), Bengaluru will celebrate its 20th year of establishment in contributing to India's achievement towards SDGs. CSD is keen in considering the emerging and challenging issues to do research and evaluation to bring out possible mitigation and adaptation solutions to save the environment and society. The 2030 Agenda for Sustainable Development requires a comprehensive action at the global, regional and national levels therefore, CSD conducted a Round Table Workshop Series in different cities of India includes Hyderabad, Pune, Bhubaneshwar and Bengaluru to understand the status of achievements of SDGs and to provide recommendations for further implementation.

Hyderabad, Telangana

Date & Venue: October 22, 2022, Institute of Management Technology (IMT) Hyderabad

INTRODUCTION

According to India SDG Index 2020-21, Telangana state showed better performance in 12 goals, in whichSDG7:Affordable and clean energy indicate complete achievement with100 points. Overall, Telangana ranks at 11th with 69 points among other Indian states, it is well above the national average, 66 points and the state showing positive progress every year. But ,five goals such as SDG 2: Zero hunger, SDG 4: Quality education and SDG 9: Industry, innovation & infrastructure are showing poor performance and further SDG 5: Gender equality and SDG 13: Climate action are indicating very poor performance, well below the average in the state. Therefore, Round Table Workshop has been conducted in Hyderabad particularly to discuss on gaps and challenges of 3 SDGs such as 1. Climate resilience (SDG13), 2. Food security (SDG2) and 3. Sustainable industrialization & infrastructure(SDG9).

WORKSHOP BRIEF

The Round Table Workshop included participants of 35 eminent scholars, diplomats, policy makers, academicians, administrators, corporates, industrialists and students working on climate change, agriculture, industries and developments in India. Dr. SrinivasR, Executive Director, CSD welcomed the participants and Chief Guest Dr. S. K. Joshi IAS (R), Former Chief Secretary, Telangana and also Dr. Harsha Reddy, Director and Dr. Tulika, Professor of IMT. Dr. Joshi explained about the SGD Index which released by NITI Ayog, where States are classified into Achievers, Front runners, and Aspirants in achieving the goals of SDG. He highlighted that, according to Global Hunger Index, India had slipped its rankings from 101 to 107 therefore equality should be maintained among all income groups. He suggested to avoid the biasness, we should have our think tanks, alternate methodologies to assess and quality of information. With this brief note, the detailed discussion was held on 3 SDGs.

SDG 13 – Climate Action

Opening remarks for SDG 13 was presented that climate risks need to be minimized at first as he observed prolonged La Nina effect for four years and increasing number of hottest days as compared to last 100 years (recorded 5 hottest years in last decade). Moreover, thedelay and unusual rainfall during La Nina as well. Usually, 36 days out of 120 days should have 3mm of rain, but the average was 27 days in 2022. Further, he stated that, states such as Haryana, Punjab, and Uttar Pradesh falls under Indo-Gangetic plains are suffering lot with less rainfall which has factored farmers for high input costs also, delay in cultivation has reduced the reclamation time between Kharif and Rabi which leads to high prices and fluctuation in supply-demand. But, few southern states had normal rainfall.

SDG 2 - Food Security and Nutrition

India is in a growing phase in food production with a target of 315 tons of grains per year but its technology and genetic growth have improved and contributed a lot to India's revolution in food production. Integrated farming and multiple crop production such as pulses, vegetables and fruits, oil seeds poultry and fishery has improved significantly. In India, 90% of the population can afford to buy food and products but lacks in getting proper nutrition those items. In addition, it was also noticed that, lack of macro-nutrients leads to malnutrition and also cognitive inability among women & children. Therefore increasing the micronutrients in the food and its products which can be achieved through maintaining soil quality by using bio-fertilizers and practicing natural farming. In addition, spreading awareness and empowering people with adequate knowledge on diet. Hunger Index calculation can be replaced by the Nutrition Index which will measure the diet and nutrition.

The main talk was on the experiences of Telangana & Andhra Pradesh where average income of the farmers is Rs.10,000 per month. there was an increase in number of marginal landholders, farmers suicidal rate, land registration by non-agriculturist leading to tenancy, increase in use of chemical fertilizers leading to malnutrition and soil infertility. Keeping these changes in view, the transformation in both technology and mindset is required. In addition, farmers should focus on increasing their income which will in turn improve their nutrition levels. Changes in existing policies are required where malnutrition and food security needs to be combined additionally, a balanced supply of rice and wheat is required. Providing livelihood security and empowering people with adequate skills is an asset in addressing SDG 2.

SDG 9 - Industry, Innovation, and Infrastructure

The workshop presented on energy transition, where 40- 45% of the petroleum products are presently consumed by transport sector. Therefore, switching to renewable energies such solar and wind mill is necessary. In addition, shifting to electric vehicles will save lots of energy and minimizes greenhouse gas emissions which needs an infrastructure like installing minimum of 200 charging points and solar grids at Hyderabad. Moreover, government should bring decentralized policies on solar energy production with a target of 500 GW by 2030 which decrease the dependency on fossil fuels.

India is shifting from agriculture to service sector found that, usage of low-level technologies in manufacturing industries, using more raw materials to produce single units/pieces. Therefore, suggestion has been given to improve the R&D towards developing environment friendly technologies. In addition, imposing tax for hazardous emissions, combating air and water pollution and also supporting rural youths towards developing skills on agro-based industries which helps in sustainable industrial growth in future.

DISCUSSION

The workshop suggested the balanced diet needs to be addressed by hidden hunger i.e lack of micro nutrients intake and also encourage consumption of fruits and vegetables regularly. Moreover, changing behaviour, education on micronutrients, promotion of affordable technologies and adoption of push and pull policies as food security is concerned will support to achieve the targets of SDG 2.

Nutritional security is important and suggests to focus on hygiene & sanitation at microlevel, address hidden hunger and provide good diet for pregnant women to achieve SDG 2.

It was also observed that Anganwadis are not providing nutritious and hot food to children. Not enough research have been made in agricultural practices causing increased costs which indirectly influence the prices of the end products, therefore making farmers more self-sufficient to improve their income will address the issue of malnutrition and diet.

Training of farmers to reduce food waste and food loss is needed. The key point is that farmers are the decision-makers from planting seeds to packing and selling. But they fail in marketing therefore, they should be provide withlatest market linkages and paths to sell through online and supply organic products to temples like supplying organic chickpea to Tirupati Venkateshwara Temple, that this approach is picked up and other 11 temples located in Andhra Pradesh are coming forward to take organic produce from farmers directly. This will increase farmer's interest in farming and production which addresses the food insecurity and nutrition issues in India.

There is no enough workforce, India needs storage units for solar and wind energy also to prioritise solar hybrid system. In addition, production linked incentives should be given especially for medium and small industries (MSME). India needs to reduce its import dependence on China and should increase the budget for course training and skill development due to a greater number of drop-outs.

However, government should also make tie-ups with industries and understand required skills. Encouraging rural youths in shifting towards opening small shops and driving, which aids in achieving SDG 9 successfully.

To conclude with, decision on producing right crops , usage of coal v/s solar, giving choices to individuals to chose their interested field has to be ensured. The quality of interventions will be achieved with good governance and maintenance of reliable data.

KEY RECOMMENDATIONS

SDG 13: Minimization of climatic risks contributing to unusual rainfall pattern due to climate change in India.

SDG 9: Education and awareness among people with knowledge on importance of nutrition. Ensure balanced supply of food and bringing changes in existing policies with reference to food security.

SDG 2: Government should bring decentralized policies on renewable energies. Switching to electric vehicles can save energy and minimizes the green house gas emissions.

LIST OF DELEGATES

- **Dr. S. K Joshi IAS (R),** Former Chief Secretary, Telangana
- **Dr. Harsha Reddy**, Director
- **Dr. Tulika**, Professor of IMT
- **Dr. Steven Raj**, Associate Professor, IMT Hyderabad
- **Dr. Ashok Kumar** Are, Director, Regional Program Asia, ICRISAT, Hyderabad
- **Dr. G.V Ramanjaneyulu**, Executive Director, Centre for Sustainable Agriculture, Hyderabad
- **Sri Neelam Jaaniah**, Vice Chairman and MD, Telangana State Renewable Development Corporation, Hyderabad
- **Dr. Victor Afari Sefa**, ICRISAT, Hyderabad
- **Dr. Vineetha Kumar**, National Institute for Agricultural Management, Hyderabad
- **Ms. Nirmala Tamineni,** Social Activist, Hyderabad
- **Dr. Sandip Chattopadhyay**
- **Mr. Kashinath**, Hyderabad


Dr. Victor Afari-Sefa
Dr. Veenita Kumari
Dr. Ambika S.


'ROUND TABLE WORKSHOP'
INDIA SUSTAINABILITY @75
Achievements, Challenges and Prospects
Date: 22nd October, 2022

Pune, Maharashtra

Date & Venue: March 03, 2023, Marathwada Mitra Mandal's College of Architecture, (MMCOA) Pune, Maharashtra.

INTRODUCTION

According to India SDG Index 2020-21, Maharashtra shows good performance in 9 goals as a front runner, in which SDG 7: Affordable and clean energy indicate its achievement with 100 points. Maharashtra ranks 9th with 70 points among other states in India, the rank is above the national average, 66 points and the state is showing positive progress every year, (64 points in 2019 to 70 points in 2020). But five goals such as SDG 4: Quality education, SDG 5: Gender equality and SDG 8: Decent work and economic growth, SDG 13: Climate action and SDG 15: Life on land are indicating slow performance and further an SDG 2: Zero hunger shows very poor performance, well below the average in the state. In this regard, CSD had conducted a Round Table Workshop on important SDGs to address the gaps and challenges to contribute to India Sustainability Index.

WORKSHOP BRIEF

The Round Table Workshop was attended by 30 subject experts/panellists, chairs including eminent scholars, diplomats, policy makers, academicians, industrialists and students working on various fields in India. The workshop was started with opening remarks and briefing the concepts, themes and introducing the experts/participants The round table workshop was headed by the president Dr. Ramnath Jha. The major themes discussed are

SDG 13: Climate Resilience, SDG 8: Strengthening Policies and Institutions and SDG 12: Efficiency in Use and Reuse of Resources.

CSDs contributions towards achieving SDGs
Dr. Srinivas. R, Executive Director CSD, briefed about the achievements such as terrace farming, solar power plants, and rainwater harvesting, food safety implementation plan, several trainings on wastewater and waste management, helped 5000 people on various skills and developed 14 courses on solar photovoltaic training, smart cities, wastewater treatment, solid waste management, green building, and green entrepreneurship. The strategy involves programmes for Up-Skilling, Re-Skilling, and Fresh Skilling.

SDG 13: Climate Resilience

A report on carbon reduction was submitted in August 2022. By 2023, the carbon reduction must reach 40% from the present 30%. To achieve this, healthy and sustainable lifestyles must be adopted nationally.

India wants to be net zero by 2070, although no policies have been devised in this regard. By 2030, the Mission will probably produce the following results: Development of green hydrogen production, a capacity of at least 5 MMT (Million Metric Tonne) per annum. Further, focus is needed on reducing power consumption, and also increasing participation in low-carbon technologies. Cities in Maharashtra are affected by floods every year, but planning guidelines have not been updated. Groundwater is not considered when designing roads and sewers. There is no link between infrastructure development and policy implementation.

the Environmental Protection Agency has an important role to play, Air pollution data should be monitored. The Satara-Kolhapur highway is subject to massive flooding during monsoons no attention is paid for the development of such areas.

The Pune Municipal Corporation is trying to understand the SDG's and working on the same. Groundwater Cell and Climate Action Cell has been developed under Pune Municipal Corporation to monitor and take necessary action whenever needed. PMC is working on guidelines for maintaining air quality in cities

A climate action charter should be made available openly, mission is to save the groundwater and should consider aquifers planning the land use map in the cities.

The connection between LDC and NDC should be made. The city's environmental report should be published to raise public awareness which will help advance both the economy and development.

SDG 8: Strengthening policies and institutions

Sustainable infrastructure preparedness of cities are needed where Pune is in process of publishing ESR and formulated Climate Action Policy and Climate Cell were already in action. SDG 8, an inclusive sustainable growth as an eye opener to sustain the economic growth. There is a disparity observed in fund flow for example good amount of funds are giving to construct flyover and airport but least amount of funds is allocating to building bus stands, public toilets and their management and meagre amount for gram panchayat and zilla panchayat schools. It is suggested to maintain an equilibrium to achieve a comprehensive growth in the country.

SDG 12: Efficiency in use and reuse of resources

The importance and challenges of SDG 12 that Indian cities are facing today also touched upon the sustainable food production and consumption. Food may be an excellent instrument for raising awareness on SDG among the general public and cautioned about how to meet the basic demands of the modern lifestyle in order to build a sustainable future. additionally, need to lower the ecological footprint by altering the production and use of resources in order to achieve economic growth and sustainable development. Circular economy has also been highlighted.

KEY RECOMMENDATIONS

TAt the end of the workshop, it was suggested to have a network of all the stakeholders to create greater synergies between existing as well as need-based programmes to demonstrate the efforts to put up by the communities and establish linkages for newer markets. Below are the major recommendations evolved during the workshop.

SDG 13: Green Hydrogen policies should be prepared at various level and need to be implemented to achieve net zero emissions by 2070. The development of green hydrogen production capacity of at least 5 MMT (Million Metric Tonne) per annum is required in addition and an immediate action to lower the ecological footprint to achieve economic growth and sustainable development.

SDG 8: There is an good funds given to construct flyover and airport but least amount of funds is allocating to building bus stands, public toilets and their management and meagre amount for gram panchayat and zilla panchayat schools. It is suggested to maintain an equilibrium to achieve a comprehensive growth in the country.

SDG 12: Creating an awareness among the peer group is necessary, because active learning will help to articulate and pursue towards positive changes. , Integration and coordination of various institution at different level (ward level to state level) is must and all the interested organizations need to join and work together as a team to achieve the sustainable development goals to mitigate the climate change in the country.

LIST OF DELEGATES

- **Dr. Srinivas R,** Executive Director, CSD, Bengaluru
- **Dr. Ramnath Jha,** Observer Research Foundation, Mumbai
- **Dr. A Ravindra,** Chairman, CSD, Bengaluru
- **Shri. B. G. Jadhav**
- **Dr. Ujjwala Palsuley**
- **Mr. Amit Singh**
- **Mr. Mangesh Dighe,** Environmental officer, PMC
- **Vaishali Patkar**
- **Pournima Agarkar Samuchit**
- **Dr. Gurudas Nulkar**
- **Dr. Satish Awate**


Achievements, Challenges & Prospects


India Sustainability @ 75
Achievements, Challenges & Prospects ; 3rd March 2023


Round Table Workshop


Round Table Workshop'
India Sustainability @ 75
Achievements, Challenges & Prospects 3rd March 2023

Bhubaneswar, Odisha

Date & Venue: October 6, 2023, PG Department of Applied and Analytical Economics, Utkal University, Bhubaneshwar, Odisha

INTRODUCTION

According to India's SDG Index 2020-21, Odisha shows good performance in 9 goals as a front runner, but none of the goals are achieved 100 points. Odisha ranks 21st with 61 points among other states in India, it is below the national average, 66 points and the state is showing positive progress as a performer every year, (58 points in 2019 to 61 points in 2020).

But another seven goals in which SDG 16: Peace, justice and strong institutions is showing slow performance and other six goals SDG 1: No poverty, SDG 2: Zero hunger, SDG 4: Quality education, SDG 5: Gender equality, SDG 8: Decent work and economic growth and SDG 9: Industry, innovation and infrastructure are indicating very poor performance, well below the average in the state. Therefore, Round Table Workshop has been conducted in Bhubaneshwar particularly to discuss on gaps and challenges of 3 SDGs includes 1. Climate resilience(SDG13), 2. Good health and well-being(SDG3) and 3. Gender equality(SDG5).

WORKSHOP BRIEF

The Round Table Workshop includes participants of 40 eminent scholars, policy makers, diplomats, administrators, academicians, industrialists, corporates and students working on climate change, agriculture, industries and developments in India.

SDG 13: Climate Action

Different countries must foster inter connectedness and collaboration also a cooperative effort is required from all the countries to address the pressing global challenges that SDGs aim to overcome.

Climate change is undeniably one of the most critical global challenges we face today. A significant concern highlighted was the institutional disconnect in addressing climate change. It appears to be a lack of coordination, implementation and collaboration among various institutions and stakeholders at both national and international levels. In this regard, countries are advised to adopt specific output indicators such as installation of renewable energy and reduce GHGs, and outcome indicators like reduced climate-related disasters, improved air quality and public health and enhanced resilience to climate impacts. SDG 13 calls for immediate and ambitious actions to reduce GHG emissions through mitigation strategies such as transitioning to renewable energy, improving energy efficiency, and implementing carbon pricing mechanisms.

SDG 3: Ensure Healthy Lives and Promote Well-being for All at all Ages

India's health spending is lesser as compared to countries with similar per capita income. Health coverage in Odisha, the out-of-pocket expenditure on health spending declined from 75 % to 53% . With respect to SDG 3, the gap is closing in between India and Odisha as far as maternal mortality rates were concerned. Even the infant mortality rate saw a declining trend.Breast feeding, birth spacing and full immunisation had negative yet significant impact on IMR. Area of concern in maternal and child health was anaemia, unable to breast feed till six months, malnutrition, alcohol consumption, lower awareness among masses and inter- generational transfer of poverty. Keeping this in view, it was suggested that active health system targeting, multi sector collaborations and appropriate spending on health are the needs of the hour.

SDG 5: Gender equality and empower all women and girls

A comparative overview of the progress made in Sustainable Development Goals explained about Odisha's score on different indicators in comparison to India and a portrait of the gender scenario of Odisha and India. Incidences of poverty is more in women than men and its composite score is fluctuating. Women participation in labor force is low, gender equality is behind the targets and sex ratio is at 933 (women/men ratio). Many interventions are taken to improve gender equality but they have not reached the targets in Odisha.

Focus should be made on gender equity rather than gender equality. Considering this, suggested segregation of data according to gender is very important for attaining the gender equity also the targets of SDG 5 will help to improve the behavior of people.

DISCUSSION

SDG 13: Addressing climate change requires not only mitigation strategies but also a comprehensive approach that considers adaptation, local-level action, vulnerability assessment and improved institutional coordination. that help nations take meaningful steps toward mitigating climate change and safeguarding the future of our planet.

SDG 3: Escalation in disaster-related mortality, smoking and consumption of alcohol among children. As concerned to women, the forecast indicated that India is likely to remain relatively stable with minimal to no improvements in all three health indices.

Considering the SDGs pertaining to children, Arunachal Pradesh, Delhi, Goa, Haryana, and Kerala consistently outperformed the national average. In contrast, Bihar and Uttar Pradesh consistently scored below the national average across all three indices over the years. Looking ahead to 2030, a promising trend emerges: the majority of states are projected to surpass the national average in other SDG index, while nearly half of the states are expected to excel in the Total Health-Related SDG index. However, there remained a challenge, as most states were anticipated to lag behind the national average in the context of SDG 3. Odisha falls in the aspirant category and generally performs below the national average across various indices. The correlation analysis revealed a positive relationship between the SDI and the Total Health-Related SDG Index scores.

SDG 5: For both Odisha and India, the efforts are less than what was expected (with a low effort score of 47.5) to achieve agenda 2030. The efforts and commitment to achieve SDGs by India puts the country in 9th position from the bottom among 74 participating countries of the world.In terms of gender equality, both Odisha and India are far behind the target, which is due to static trend of ratio of female to male labour force participation and very lesser number of seats held by women in the political system.Recently, the government of India passed 33% reservation of seat for women in political system along with the other provisions in the fields like education, health, social security, etc. which is appreciated by women.

KEY RECOMMENDATIONS

SDG 13: An immediate and ambitious actions to reduce GHG emissions through mitigation strategies such as transitioning to renewable energy, improving energy efficiency, and implementing carbon pricing mechanisms.

SDG 3: Active health system targeting, multi sector collaborations and appropriate spending on health are of major concern.

SDG 5: Unconscious bias is a constraint for gender equity, therefore segregation of data according to gender is very important and effective in implementation of targets of SDG 5 will help to change the social behavior of people.

LIST OF DELEGATES

- **Smt. Chithra Arumugam,** IAS, Special Secretary, Planning and Convergence Department, Govt. of Odisha
- **Ms. Swayamprava Mohanty,** Govt. of Odisha (tbc)
- **Dr. Abha Mishra,** Head of UNDP - Odisha
- **Dr. Abinash Dash, IES,** Director, Development, Monitoring and Evaluation Office, NITI Aayog, Govt. of India
- **Dr. Sachidananda Satapathy,** Former Director, Climate Change, MoEF&CC, Govt. of India
- **Dr. Arabinda Mishra,** DEFT
- **Dr. Sarit Rout,** Health Economist, IIPH Bhubaneswar
- **Prof. Mitali Chinara,** Utkal university, Bhubaneswar
- **Prof Snigdha Pattnayak,** XIMB


DEPARTMENT OF ANALYTICAL & APPLIED ECONOMICS
UTKAL UNIVERSITY
VANI VIHAR, BHUBANESWAR, ODISHA


DEPARTMENT OF ANALYTICAL & APPLIED ECONOMICS
UTKAL UNIVERSITY
VANI VIHAR, BHUBANESWAR, ODISHA

Youth Climate Conclave (Parliament)

Hyderabad, Pune, Bhubaneswar, Bengaluru

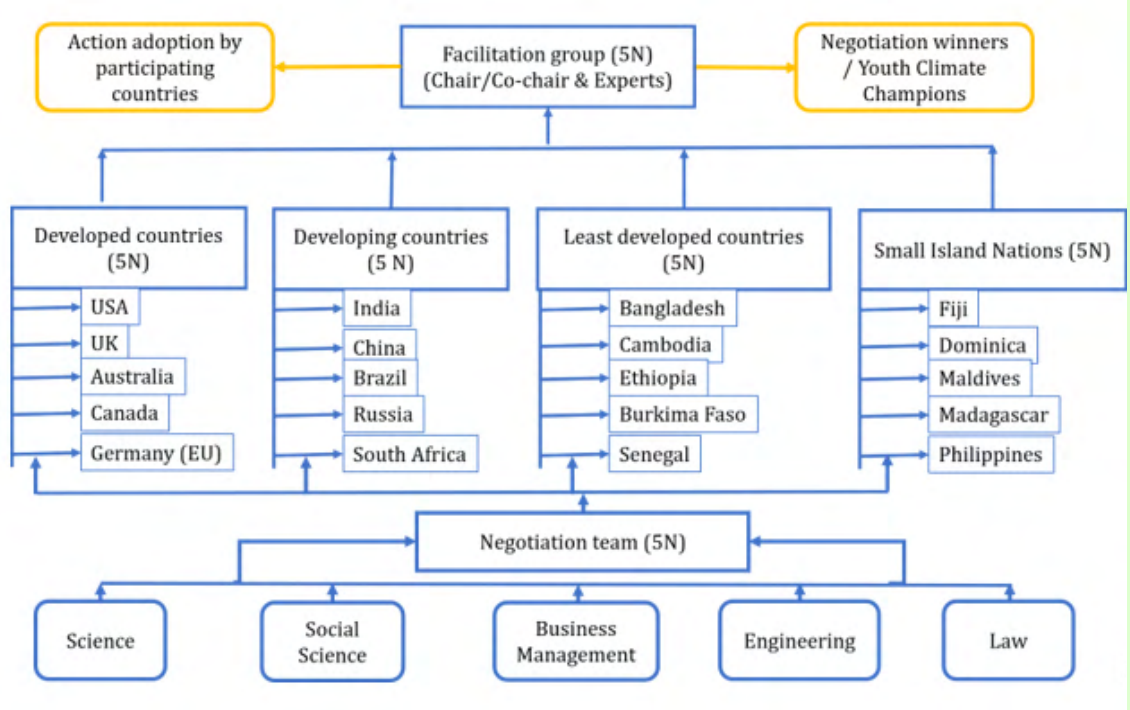
Concept

Climate change is real and most critical global challenge in the 21st Century. The adverse impacts of climate change include persistent drought, threatening food security, ocean acidification, human & animal health, extreme weather events, species extinction, sea level rise, coastal erosion, spread of vector-borne diseases etc. . The recent 6th Assessment Report (AR) of the IPCC (Intergovernmental Panel on Climate Change) clearly indicates rise in global temperature which will impact on food security severely, therefore it suggests curbing the emissions well below 1.50 C is necessary. Similarly, 5th Assessment Report of the IPCC was also caution about faster warming global temperature than expected. As per National Centers for Environmental Information, National Oceanic and Atmospheric Administration (NOAA), June 2019 has been recorded as warmest year with rising average temperature of +0.950 C since 1880 global records. The Switzerland, Austria, Spain and Norway have recorded highest average temperatures between +2.70 C to +1.70 C in recent times. Considering all these evidences, the COP (Conference of Parties) held in Glasgow in 2021 have signed the Glasgow Climate Pact which is aiming to turn the 2020s into a decade of climate action and support also approved the Paris Rulebook to tackle climate crisis by adapting long-term international goals and promote sustainable development.
The young people as envoys of climate action, drive the transformative changes and helps strengthen the society and governments to act upon impacts of climate change through various dialogues. Many international organizations such as UNESCO, FAO, UNEP, UNICEF, UNCC and UNDP promote long term and strategic approach to climate change education through promoting learning materials for both and informal contexts. They also support youths in intergovernmental climate change process, development of national climate change education programmes and policies.

Similarly, Centre for Sustainable Development (CSD) is working widely on developmental issues concerned with sustainable development of cities, transportation, energy, water, agriculture and environment, had an ideology of conducting an event on “Climate Conclave”, (a mockery of UN Negotiations) where a students from various institution participated as a team to discuss the roles of youth in climate change decisions. Climate Conclave is a youth platform especially those studying in various disciplines such as science, social science, engineering, business management, law and medicine in Graduation and Post-Graduation colleges across India to discuss climate change issues pertaining to urban, coastal, rural and others- as Ban-Ki Moon, the former UN Secretary General, at the 60th Annual DPI/NGO conference stressed that, youth should be given a chance to take an active part in the decision-making of local, national and global levels, they can actively support initiatives of far-reaching legislation. The proposed event of Climate Conclave was a mirror to the above mentioned agenda of providing youths the opportunity in decision-making with respect to increasing effects of climate change.

Organization of the event involves a facilitator group, UN leaders (mockery), students representing various countries and interest groups (NGOs/CSOs) and negotiation was headed by UN Chair, Co-Chair and Experts. Every team with 5 members from five disciplines such as Science which includes Environmental /Agricultural Science, Biological Science, Chemical /Medical Sciences, Energy and Sustainability Science, Secondly the Social Science covers Economics, Geography, Political Science, Sociology and Journalism thirdly the Business Management comprises Finance, Administration, Corporate Affairs, Strategic Management, and International Business. Fourthly, the Engineering which involves Environmental, Civil, Mechanical, Meteorology and Architect/Modeling and finally Law which encompasses International Law, Environmental Law, Corporate Law, Negotiations Law and Healthcare Law represented the countries categorized as developed, least developed, developing and small island nations with an theme of "Net Zero Emission". Each team was provided a topic on which position paper was prepared highlighting the climate change issues concerned with selected country and was presented. After each presentation, interjections are allowed by other groups including NGOs as decided by the Chair.

The team which got its demands or negotiations through the Facilitation Group, declared the top three winners and certified "Youth Climate Champions" and are selected to the final round of the Climate Conclave held as an 20th Anniversary of CSD.



Concept of the final round of The National Youth Climate Conclave

Introduction

According to the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement often referred as Paris Climate Accords is a legally binding international treaty on climate change which is designed during the 21st session of UNFCCC (Conference of Parties -21) held in 2015 at Paris, France and came to effective in 2016. The main goal of the agreement is to hold the global temperature well below 20 C as compared to pre-industrial levels and pursue efforts to limit the increasing temperature to 1.50 C and reduce greenhouse gases at least 43% by 2030. It is a Landmark event because it brings all nations (196 countries) together to combat climate change and adapt to its effects. Paris Agreement works on 5 years cycle of increasingly ambitious climate action known as Nationally Determined Contributions (NDCs) where each countries submit their actions on reduction of greenhouse gases and also submit much better ambitious plan to following period. The Paris Agreement mainly provides framework on financial aspects, technology development & transfer and also climate related capacity building.

Purpose of the dialogue

Centre for Sustainable Development (CSD), Bengaluru working on various aspects of climate change such as energy, transportation, greenhouse gas emissions, sustainable development goals, sustainable agriculture and environment is organizing the Youth Climate Conclave on the model of the UN Conference of Parties, which is the culmination of the preliminary rounds of Climate Parliament that were held in the 4 cities (Hyderabad, Pune, Bhubaneshwar and Bengaluru). The winning teams across the 4 cities have been selected to participate in the Youth Climate Conclave at Bengaluru on 3rd November 2023. The Conclave will witness a multilateral discussion on progress of Paris Agreement especially from six countries (USA, Australia, India, Brazil, Bangladesh and Senegal) which represent developed, developing and least developed regions of the world. Actually, Paris Agreement gives equal opportunities to all the member countries to reduce greenhouse gas emissions and build resilience. This multilateral discussion will focus on understanding the status of the Paris Agreement implementation by each country. This also provides an idea on strategies developed, implementation status, technology adopted, challenges faced in terms of financial and cooperation from other countries. This event is being organized prior to COP-28 (UNFCCC) which is going to takes place at Dubai, UAE (United Arab Emirates) from 30 November to 12 December 2023. During the COP-28, the first Global Stocktake of the implementation of Paris Agreement will take place. Global Stocktake is a two-year process that happens every five years, with aim of assessing the world's collective progress towards achieving its climate goals. .

Participation and Dialogue

Each team will be assigned a country from the shortlisted six countries chosen (mentioned above). After choosing the country, each team has to prepare their Synthesis Report (max 1200 words or 4 pages) on NDCs of their particular country. The Synthesis Report (refer to the content given below) will be evaluated by subject experts and gives marks accordingly. On the day of the event, each country will get overall 15 minutes of time to present the progress, question and answers (5 min) before moving into the negotiations. The Negotiation Chair headed by President and Experts will conduct the Negotiation proceedings. The successful negotiators and negotiations will be announced on the same day at the end of the event.

Hyderabad, Telangana

Institute of Management Technology (IMT), Hyderabad, Telangana, 21st October, 2022

INTRODUCTION

Criteria for selection of Hyderabad, Telangana

Hyderabad city of Telangana state, India has been selected to organize the Climate Parliament considering the faster urban expansion, industrialization (Information Technology and Bio-technology), infrastructure development and expansion of service sectors and educational institutions.

Background

Youth climate parliament was conducted at Institute of Management Technology (IMT), on 21st October, 2022 at Hyderabad, Telangana. The event was organized by CSD in association with IMT on Net Zero Emission. There was an 9 negotiation teams participated and represented 9 different countries such as developed (Germany, Australia, Canada), developing (India, China), least developed (Bangladesh, Cambodia) and small Islands nations (Maldives, Philippines). The negotiations teams were represented by different colleges such as IMT Hyderabad (3 negotiation teams), HRD Degree and PG College of Hyderabad (2 team), Sri Konda Laxman Telugana State Horticultural University, Hyderabad (3 teams) and St. Mary's College, Hyderabad, Telangana (1 team). Around 80 students from various disciplines (science, social science, engineering and law) were participated and negotiated on net zero emissions.

As per the schedule, each negotiation team made their presentations and the score was given based on the understanding of the subject, arguments building on Net Zero Emission, and credibility reporting /Negotiation skills, timely submission of position paper and presentation of valid points.

NEGOTIATION ON ACHIEVING NET-ZERO EMISSIONS

Developed Countries

Team 1: Australia

Team members & College:Uma Maheswari N, Bhavya Badalia, Aurobrata Behera, Arnab Chowdhury and Vanshika Maheshwari from Institute of Management Technology (IMT), Hyderabad, Telangana.

Key message from negotiation

Australia is close to attaining net zero emissions, but according to recent report from Intergovernmental Panel on Climate Change (IPCC), Australia is witnessing a greater temperatures, more severe droughts, fires, floods and other extreme weather conditions. It is already experiencing 1.40 C hotter as compared to last 100 years.

Further, mass bleaching of coral reefs thrice in last five years (2016, 2017 & 2020). Due to current global climate change, sea levels are rising by approximately 3mm per year affecting the significant population residing near the coast. Alliances like South Asian Association for Regional Cooperation (SAARC) and Western European and Other Groups (WEOG), which are resource-rich are helping other nations to tackle these problems. The countryvbelieves that it is a high time to act right and do necessary works to tackle climate change by creating ed several policies, laws and legislations at both local and national levels. In addition, it is an member of UN treaties.

Creation of synergy and alliances between member states for the transfer of technology as well as to support finance to tackle the climate change issues, particularly to achieve net zero emission. Laws has to be established at the national level by member states to equip their states with green technology and actions on achieving targets of Sustainable Development Goals (SDG). Member-states should consider including local actors in creating laws and legislation through the partnerships of UN.

Team 2 : Canada

Team members & College:

P. Haygreev, Komal, Farha, Sumiyya and Aryman Jaiswal from HRD Degree and PG College, Hyderabad, Telangana

Key message from negotiation

Droughts and climate change have been recorded all across Canada and made significant impacts on individuals and communities. Understanding the short-term and long-term impacts is necessary as health is considered. In this regard, Government of Canada is committed to achieve the targets of 2030 set out in its nationally determined contribution in accordance with the Paris Agreement. The country also wants to improve transparency and accountability with respect to greenhouse gas emissions reduction targets. Government committed to developing a plan to set Canada on a path to achieve a prosperous net-zero-emissions by 2050 with support of public participation and expert advice in mitigating climate change.

A number of climate change-related events such as the 2021 British Columbia Floods and an increasing number of forest fires have become an concern over time. Government should also invest in understanding and preparing the economic risks associated with climate change as it is affecting the Canada's economy . Other countries like Australia and India offer monetary and hydro fuel facilities, if required.

Team 3 : Germany
Team members & College:
P. Rukmini, Sahil, Manasvini, B. Deekshitha and Swarnagiri Chethana from Sri Konda Laxman Telugana State Horticultural University, Hyderabad, Telangana

Key message from negotiation
Currently, Germany is facing many issues such as rapid fluctuations in temperature , precipitation, high wind, energy crisis, food insecurity and reduction in agricultural output. Keeping in view these issues, Germany must commit to its 2020–2022 goals, abide by the National Climate Change Mitigation Law and concentrate on reaching the desired environmental standards by 2050. Atleast by 2038, the government will support renewable energy initiatives rather than coal-based energy. Further, government has made policies on Electricity Feed-In Act which encourages the use of other sources of energy (wind, hydroelectric, and biomass power) so as to reduce the costs up to 90% of the retail price. In addition, Germany agreed to the Montreal Protocol for working on ozone depletion and climate change issues. According to the UNFCCC, an annual quota of reducing 482 million metric tonnes of CO2 (17.2%) from 1990 to 2004. The country achieved its emissions reduction up to 21% between 2008 and 2012. Further, Germany holds COP23 in 2017 at Bonn to reduce much more carbon emissions in future.

Developing Countries

Team 4 : India
Team members & College:
Basudeb Moulik, Divya Nagi, Jatin Upadhyay, Khushal Purohit and Lepaxi Somit from Institute of Management Technology (IMT), Hyderabad, Telangana.

Key message from negotiation
India will soon be the most popular country in the world & will be home to the youngest populations in the world. India's decarbonization journey represents upwards of a $15 trillion economic opportunity by 2070 with the potential to create as many as 50 million new jobs. The energy sector accounts for 40% approximately of India's GHG emissions with coal being the dominant source of total CO2 emissions. Secondly, the mobility sector is highly relay on oil therefore, encouraging the sustainable use of fuels immediatly , electrification in the medium term and hydrogen-based high mobility in the long term. At the UN Climate Summit, India announced its goal to reach 450 GW by 2030 and announced a Hydrogen Energy Mission that has to be made for green and grey hydrogen and electrification of railways. Thirdly, the agriculture sector is the largest contributor to nitrous oxide (N2O) and methane emissions in India and will need a national campaign to empower, educate and enable more than 100 million farmers to adopt green energy to reduce agricultural emissions. Finally , society and citizens will need to play an integral role in India's green transition. by informing and educating g the public and continue informing the national discourse on climate change. Individual citizens need to switch to greener products, adopt more sustainable diets, reduce their mobility footprint and also support a greener agenda of the nation.

Team 5 : China
Team members & College:
K. Srilekha, Thanay Raj, Mohammad Farid, Karishma Begum and Nitin from Sri Konda Laxman Telugana State Horticultural University, Hyderabad, Telangana

Key message from negotiation
China is recognizing its vulnerability to climate change due to increased threats from sea level rise, severe weather events and melting glaciers which affecting the livelihood and economic conditions of China. It is being a top emitter of GHGs in the world resisted making commitments under the UN framework. According to Inform Risk Index 2019, China faces significant disaster risk levels, ranked 67 out of 191 countries and also known for exposing to floods, flash floods, tropical cyclones and droughts.
China's environmental crisis due to rapid industrialization is threatening the livelihoods and health of 1.4 billion people. It's carbon-intensive industries have caused the additional environmental challenges, including water scarcity and soil contamination. The climate crisis is accelerating like never before and has become a largest economy in the world established several industries which are polluting air and water continuously. Later in 2013, China released its first National Climate Change Adaptation Strategy, specifying the overall requirements, key tasks, regional patterns, and assurance measures for climate change adaptation from 2014 to 2020, providing the guidance and foundation for climate change adaptation work. China has set some goals like achieving carbon neutrality by 2060, giving importance to renewable energy like solar and wind by 2030, promoting forestry activities, electric vehicles, educating citizens on pollution and climate change and enhancing public transportation facilities.

Least Developed Countries

Team 6 : Bangladesh
Team members & College:
Kamya Kishore, Sumeet Kumar Mishra, Niharika Saraswathi, Rushi Panchal and Subham Kumar Dash from Institute of Management Technology, Hyderabad, Telangana

Key message from negotiation
The Delegates of Bangladesh stated about the current conditions of the country with a unique geographic, socioeconomic and physical characteristics. The nation's susceptibility to the effects of climate change is a result of a confluence of geographical elements such as low-lying, topography and socio-economic (high population density, poverty, and reliance on agriculture). Increased coastal flooding due to sea level rise will only get worse in the event of storm surges but due to the impacts of tectonic subsidence, sea level rise in Bangladesh is more than the mean of global average rate.

Frequent flooding caused due to monsoons affected 20 million people due to salinity in drinking water. The effects were worsen by increased freshwater evaporation and evapo-transpiration when temperatur e rises, as well as increased demand for freshwater in summer. It is predicted that 40% of productive land is expected to be lost in southern region because of the sea level rise by 2030.
Giving importance to implementation of renewable energy projects helps in reduction of greenhouse gas emissions which deplete Ozone layer. Adaptation of improved technologies in waste management and Focus on minimizing emissions from agricultural practices.

Team 7: Cambodia
Team members & College:
B. Sai Sree Nikhita, M. Madhuri, Shivam Kumar, Thanuja Patel and Saurabh Kumar Singh from Sri Konda Laxman Telugana State Horticultural University, Hyderabad, Telangana

Key message from negotiation
Cambodia is projected to experience warming of 3.1°C by 2090s, against the baseline conditions (1986–2005). Increases in annual maximum and minimum temperatures are expected to be higher which increase the pressures on human health, livelihoods and ecosystems. Climate change may also increase the likelihood of transmission of water and vector-borne diseases in the country. Therefore, Cambodia is actively participating in the various programs being launched by different global organizations to cope with problems arising due to climate change. USAID supports Cambodia to meet the international commitment to the UN framework convention on climate change and establish programs for reducing carbon dioxide emissions and also help in reducing over 25 million metric tonnes of GHGs which is equivalent to taking off almost 5 million cars from the road per year. At COP 26 US president announced 3-billion-dollar assistance to reduce climate change of the country. The government of Cambodia in the year 2013 launched the first-ever national policy document on responding to climate change issues known as CCCSP 2014-23 (Cambodia Climate Change Strategic Plan). Cambodia has a huge potential to achieve decarbonization by 2050. As a least developed country, Cambodia can benefit from financial and technical support and technology transfer from multilateral and bilateral agreements as well as direct foreign investment in climate-friendly technology.

Small Island Countries

Team 8 : Philippines
Team members & College:
Sangamesh Patil, Shivamani, J.Manish, M.Pavitra and Vani from HRD Degree and PG College, Hyderabad, Telangana

Key message from negotiation
The Delegates of Philippines stated about the Pacific Ring of Fire that is close to the equator is often prone to earthquakes and typhoons impacting the climatic conditions. The country has a variety of natural resources and is a home for globally significant level of biodiversity. . More than half of the greenhouse gas emissions in the Philippines are produced by the energy industry, forestry, land use change, waste and industrial activities. Further, Philippines' infrastructure is extremely vulnerable to rising sea levels, torrential downpours, flooding, and powerful typhoons. With shoddy infrastructure and a high risk of flooding and typhoons, 45% of the urban population in the Philippines lives in unofficial colonies belonging to 25 different coastal cities might be displaced if a massive storm decimated. To gain this momentum, negotiations are made that it focuses on the energy consumption as Philippines' energy consumption could rise while the country's energy supply declines due to climate change. The likelihood of extreme weather events would decrease hydropower output which supplies 20% of the nation's electricity as well as result in extensive harm to the nation's energy services and infrastructure. They also suggested strategies for companies and cities to collaborate to strengthen the climate resilience and to incorporate green transformation which would help them reduce the effects of climate change.

Team 9 : Maldives
Team members & College:
Srinija Lingala, G. Naveen Kumar, Satish Ganesh, Naina Mallika Reddy and Reddy Eesha Kumari from St. Mary's College, Hyderabad, Telangana

Key message from negotiation
Maldives being a small Island country facing the effects of climate change these days due to limited ecological, socioeconomic and technological resources. Natural disasters like floods, storms, droughts and wildfires are threatening the country. These difficulties include, but are not limited to, extremely high population density, high levels of poverty, dispersed communication challenges, difficult and expensive transportation and a small island economy that is physically isolated from global markets. The Maldives negotiated that the country has taken bold actions to address the climate issues and has been an active player on the global arena for more than a decade (example holding the Presidency of the United Nations General Assembly UNGA). It has committed to eliminate single-use plastics by 2023 and reaching net zero emissions by 2030, promoting children and youngsters for direct participation in climate debates and decisions, particularly in the context of COPs. Maldives also proposing Coral Restoration Project due to destroy of reefs from El-Nino effect.

WINNERS & PHOTOS

1 Australia
IMT Hyderabad

- Uma Maheswari N
- Bhavya Badalia
- Aurobrata Behera
- Arnab Chowdhury
- Vanshika Maheshwari

2 Bangladesh
IMT Hyderabad

- Uma Maheswari N
- Bhavya Badalia
- Aurobrata Behera
- Arnab Chowdhury
- Vanshika Maheshwari

3 Cambodia and Germany
Sri Konda Laxman Telangana State Horticultural University, Hyderabad

- B. Sai Sree Nikita
- M. Madhuri
- Shivam Kumar
- Thanuja Patel
- Saurabh Kumar Singh
- P. Rukmini
- Sahil
- Manaswini
- B. Deekshitha
- Swarnagiri Chethana

Pune, Maharashtra

Marathwada Mitra Mandal's College of Architecture, (MMCOA) Pune, Maharashtra, 3rd March 2023

INTRODUCTION

Criteria for Selection of Pune, Maharashtra

Pune, Maharashtra has been selected to organize the Climate Parliament, keeping its faster urban expansion, educational hub, technology, industrialization (Information Technology and Bio-technology) and infrastructure development. Climate externalities creates vulnerability in the city and the state due to its location and geophysical conditions.Hence, this city was considered for debating on climate issues.

Background

The climate parliament held in Marathwada Mitra Mandal's College of Architecture, (MMCOA) Pune in association with CSD and CEE (Centre for Environment Education) on Net Zero Emission. There were 10 negotiation teams from the different colleges such as COEP, Technological University, Symbiosis Centre for Management Studies Pune, Department of Journalism and Mass Communication (SPPU), Environment Science Department Savitribai Phule Pune University (SPPU), Environment Science Department Fergusson College, PVPCoA, Symbiosis School of Economics and Marathwada Mitra Mandal's College of Architecture Pune. Around 70 students from various disciplines were participated, among them 55 students represented 10 countries belonging to different categories mentioned below.

As per the schedule, each negotiation team made their presentations on net zero emissionin. Each team was evaluated by Chair, Co-Chair and Experts; accordingly, score was given to each team based on the understanding of the subject, arguments building on net zero emission, and credibility reporting/Negotiation skills, timely submission of position paper and presentation of valid points.

NEGOTIATION ON ACHIEVING NET-ZERO EMISSIONS

Developed Countries

Team 1: Bangladesh

Team members & College: Kanchan R Waghchawre, Aashna Abraham, Abhijeet H Dhamdhere, Shrirang Vaidya and Shruti Singh from Environment Science Department, SPPU, Pune, Maharashtra

Key message from negotiation

Bangladesh being a new and a least developed country, faces several challenges, which are exacerbated by its high population density, poverty, economic instability and vulnerability to natural disasters. Severe air pollution is further impacted the human health of the country due to sea level rise, it may lose 11 % of its land by 2050.However , financial situation of the government is under pressure. Bangladesh despite being a lowest carbon emitter, it bears the brunt of the crisis. It needs to invest in zero-carbon growth and green technology to implement a Climate Prosperity Plan effectively. Since, Bangladesh is a low economy country it needs massive investment to shift to renewable energies. To oversee it, some of the actions were taken by the government such as Mujib Climate Prosperity Plan, Renewable Energy Policy, Climate Change Trust Fund, Energy Efficiency and Conservation Master Plan up to 2030, Bangladesh National Action Plan for Reducing Short-Lived Climate Pollutants, National Adaptation Plan, Low Carbon Transport Initiatives and National Forest Policy. As Bangladesh is transitioning from least developed countries to developing countries, it may need support from developed countries especially in finances, technology and knowledge transfer.

Team 2 : Germany

Team members & College:

Geetika Chatarjee, Ruchit Kulkarni, Nidhi Darade, Nakul Deshmukh and Drishti Bhande from Environment Science Department, Fergusson College, Pune, Maharashtra

Key message from negotiation

Germany is well placed amongst other countries with respect to net zero emission but shifting to move away from fossil fuel is big challenge. Reduction of carbon emissions becomes a problem because, per capita emissions are rising since 2021. Poorly expansion of solar grids is becoming inaccessible and unpopular. Mass deforestation and poor curriculum on climate issues is also contributing to improper management of climate change. In considerastion with these, Germany has adopted Germany's Renewable's Energy Act, Combined Heat and Power Act, Climate Action Plan 2050, Climate Action Programme 2030 and Federal Climate Change Act 2019. In addition to this Acts, it has also brought out Carbon Capture and Storage (CCS) Policy. Besides, it is giving emphasis on renewable energy, increasing tax on coal and fossil fuel products, subsidization for geothermal and solar energy products to meet the target of net zero emission.

Team 3 : Australia
Team members & College:
Kathanika Singh/Ajay Matte, Diya Ostwal, Nidhi Bamhore, Shraddha Paranjape and Pallavi Uikey from Department of Journalism and Mass Communication, SPPU, Pune, Maharashtra

Key message from negotiation

Australia is witnessing the pressing climate change issues such as droughts, bushfires and floods which have caused significant damage to the environment, infrastructure and the economy. Land clearing for agriculture and urban development is another major problem to its environment which leads to loss of habitat. Being the driest inhabited continent, faces water scarcity In addition, waste management and marine conservation (great barrier reef) are also major issues of concern. In this regard, Australia has made number of commitments and policy decision to work towards achieving net-zero emissions by 2050 and has developed a number of climate policies such as Climate Solutions Package which aims to reduce emissions and increase investment in clean energy and technologies, imposing carbon tax or enacting emission trading scheme. The government has also announced plans to accelerate the uptake of electric vehicles, including providing funding for charging infrastructure and offering incentives for riders. Meanwhile it also faces criticism from international partners due to less ambition in reducing greenhouse gas emissions as compared to other countries. As a self-reliant it has established an Emission Reduction Fund (ERF) and National Energy Productivity Plan (NEPP) to achieve targets in energy sectors. Moreover, it needs to work on sustainable farming practices to reach the target of net zero emissions in the country.

Team 4 : UK
Team members & College:
Meera Ganjave, Mrunmayee Joshi, Maithili Pise, Kunal Chougule and Rushab Dandale from PVPCoA, Pune, Maharashtra

Key message from negotiation
The country is facing several climatic issues which are being addressed by the government in 2019 at parliament stating a climate change emergency. Moreover, country experiences increase in temperature, flood, heatwaves, sea level rise, drought, health and unstable economy. Therefore, UK should implement lower GHG emissions per person and should consider institutional development and technology transfer. UK government suggested the country to consider sustainable development addressing social progress and equality, environmental protection, conservation of natural resources and achieving stable economic growth. Finally stating, committing to net zero emissions will strengthen the country in future.

e

Small Island Countries

Team 5 : Maldives
Team members & College:
Vedant Khorgade, Nikhil Nimbalkar, Divesh Pande, Shalmali Sawant and Deepshikha Dhurve from Environment Science Department, SPPU,Pune, Maharashtra

Key message from negotiation
The Maldives is a small, low lying and land scarce country vulnerable to climate consequences. They are exposed to the risk of intensifying weather events such as inundation, extreme winds and flooding from storms leading to infrastructure damage, affect fishing economy, coral losses and creates ground water contamination. To overcome these issues, WHO provided technical assistance to the government, World Bank funded for sustainable energy projects and implemented some self-initiatives like The Smart Island Initiatives to encourage bicycling and walking to reduce motorized transport by 2023. In addition, it developed waste to energy projects. Maldives has set a target of achieving net zero emissions by 2030 for which it has developed a comprehensive plan towards a low-carbon economy which happens only with financial and technical assistance from other countries.

Team 6: Philippines
Team members & College:
Manasi Kale, Saloni Phadnis, Piyush Bhajekar, Benson Mathews and Kalyani Jadhav from Marathwada Mitra Mandal's College of Architecture Pune (MMCOA), Pune, Maharashtra

Key message from negotiation
Since 2020, Philippines is one of the worst affected nations with climate change including frequent hurricanes, depletion of mangroves and rising sea levels are posing threat to the nation which has adversely affected the tourism and country's economy. Moreover, Philippines is an archipelagic country close to the tropical typhoon belt, where a greater number of typhoons hit every year. Most of the greenhouse gas emission is a resultant of unchecked burning of coal and using motor transport. In this regard, it has started a National Disaster Risk Reduction and Management Council (NDRRMC) to monitor disaster risks and has set a target to reduce 50 % of coal burning and moving towards renewable energy like solar and wind power. Philippines government has planned to reduce at least 70% of present greenhouse gas emissions by 2030. Additionally, countries economy is not self-sustained and therefore multilateral cooperation in terms technology transfers and climate fund is essential to Philippines.

Developing Countries

Team 7 : India
Team members & College:
Chesna Sorathiya, Hamzah Kalolwala, Arya Pingle, Hardi Chokshi and Aarsh Chadha from Symbiosis Centre for Management Studies, Pune, Maharashtra

Key message from negotiation

Coal is the major source of energy in India, essential in transforming to renewable energy to attain net zero emissions. Transportation uses fossil fuels, a significant contributor to greenhouse gas emissions, agricultural and industrial emissions also contributing more or less equal to GHG emissions. Therefore, it needs to enact policies and regulations that promote renewable energy, sustainable agricultural practices and low-carbon technologies and engage in international cooperation to access funding and technology transfer to achieve its emission reduction targets. India's Long Term Low Emissions Development Strategy is a roadmap to meet its net zero emissions target by 2070. India has unwrapped the Faster Adoption and Manufacturing of Electric Vehicles (FAME) Scheme to shift to electric vehicles and launch National Hydrogen Mission which aims to make India a green hydrogen hub. In addition, new construction projects and developments like Special Economic Zone (SEZs) should be carbon neutral mandatory to achieve net zero emissions in India.

India can import wind mill technologies from USA, switch to electric vehicles, LPG/CNG as alternatives. Modernisation & decarbonization energy-intensive industries through the adoption of green technologies & maintaining emissions standards, empowering, educating and adopting sustainable farming while using electric machineries and equipment will benefit the 100 million people in India which intern reduces the impacts of climate change.

Team 8 : China

Team members & College:

Key message from negotiation

China is offering economic support to many countries to develop their infrastructure to revive the country's economy. It is a major producer of EV which help reduce climate change. China plays a major role in export and import of agriculture inputs and machineries. Country spending huge amount of money for further development of the nation.

Team 9 : South Africa

Team members & College:

Sangharsh Hasnalkar, Swapnali Kalukar, Priyal Naik, Shahla Amiri and Prajakta Bansode from Environment Science Department, Savitribai Phule Pune University (SPPU), Pune, Maharashtra

Key message from negotiation

South Africa is responsible for 1.06% of the world's total carbon emissions and it is 13th highest emitter in the world and largest emitter in Africa. The major environmental issues in South Africa are pollution, lack of energy, deforestation and poorly regulated mining activities resulting in serious environmental damages. Maintenance of less standards in environmental quality and high pressure on limited sources leading to climate change.

Therefore, South Africa has set the net zero emissions by 2050 in its Low-emission Development Strategy. The country also framed the Presidential Climate Commission to oversee the equitable transitions towards a low emissions and climate-resilient economy. Further, proposed a carbon tax since 2022 to achieve net zero emissions.

Least Developed Countries

Team 10 : Cambodia (Belong to least developed countries)

Team members & College:

Zoyah, Nisarga, Vedant, Ishika and Manaswi from Symbiosis School of Economics, Pune, Maharashtra

Key message from negotiation

Cambodia's limited resources and development pose challenges in addressing carbon emissions, requiring high investment in sustainable infrastructure and carbon off setting. As one of the least developed countries, Cambodia emitted about 1 metric ton of carbon per capita in 2019, which doubled since 2015. The country relies on fossil fuels and faces social issues such as poverty, job creation and access to education and health . Climate change has also intensified the natural disasters straining the environment, forest, ecosystem and wildlife. The transitions to a net zero economy must prioritize both environmental issues and improving the quality of life for Cambodians. In this regard, shifting of energy sources from coal to solar and wind power is required. Further, development of infrastructure for the effective allocation, utilization and management of water is needed which will lead to successive growth of Cambodia.

WINNERS & PHOTOS

1 Bangladesh
Savitribai Phule Pune University

- Kanchan R Waghchawre
- Aashna Abraham
- Abhijeet H Dhamdhere
- Shrirang Vaidya
- Shruthi Singh

2 Germany
Dept. of Environment Science, Fergusson College, Pune

- Geetika Chatarjee
- Ruchit Kulkarni
- Nidhi Darade
- Nakul Deshmukh
- Drishti Bhande

3 India
Symbiosis Centre for Management Studies

- Chesna Sorathiya
- Hamzah Kalolwala
- Arya Pingle
- Hardi Chokshi
- Aarsh Chadha

Bhubaneswar, Odisha

Utkal University, Bhubaneshwar, Odisha, 7th October, 2023

INTRODUCTION

Criteria for Selection of Bhubaneshwar, Odisha

Bhubaneswar city of Odisha state, India has been selected to organize the Climate Parliament, keeping its exposure to natural disasters like cyclone, floods and other climate abnormalities throughout the year. Climate externalities creates vulnerability and havoc in the city and the state due to its location and geophysical conditions. Considering the facts, Odisha has taken early initiative to formulate Climate Change Action Plan for the State including 11 sectors in a holistic manner. Considering these, CSD chose Bhubaneshwar city to debate on climate change.

Background

The climate parliament at Utkal University, Bhubaneshwar, Odisha was organized by CSD in association with Utkal Universityon Net Zero Emission. There were 9 negotiation teams from different colleges participated from Utkal University, KIIT (Rural Management), BJB Autonomous, SOA (Siksha 'O' Anusandhan, RD Women's University, PN College from Bhubaneshwar. Around 60 students from various disciplines were participated, among which 45 students represented 9 countries which are belonged to developed (USA, Australia, Germany), developing (South Africa, India, Brazil), least developed (Bangladesh) and small Island nations (Maldives, Philippines). As per the schedule, each negotiation team made their presentations on Net Zero Emission in front of facilitator group followed by discussion. The score was given based on the understanding of the subject, arguments building on Net Zero Emission, data credibility and reporting /Negotiation skills, timely submission of position paper and presentation skills.

NEGOTIATION ON ACHIEVING NET-ZERO EMISSIONS

Developing Countries

Team 1: South Africa

Team members & College:Anish Patnaik, Sagar, Ashmita Thakuri, Sutapa Roy and Astha Thakur from KIIT (Rural Management), Bhubaneshwar

Key message from negotiation

South Africa is facing a formidable challenge, as it is striving to transform from fossil fuel to renewable energy to achieve net zero emissions. Key problems include inadequate infrastructure, such as electric vehicle charging stations and renewable energy storage systems, hindering the adoption of cleaner technologies. South Africa has undertaken several actions to address net-zero emissions, aligning with global and national conventions. In addition, prioritizing renewable energy can resolve South Africa's energy crisis, boost economic competitiveness, and diversify the economy. This transition can also foster new green industries, such as green hydrogen, synthetic fuels, and green steel, contributing to achieve global climate goals.

Team 2: Brazil

Team members & College: Satyajita Sarangi, Sonali Satpathy, Avipsa Sengupta, Saurav Kumar and Bikash Kumar Naik from KIIT (Rural Management), Bhubaneshwar

Key message from negotiation

Agriculture, transport, electricity and manufacturing sectors are the major GHG emitters in Brazil. It has been rated as environmental policies are inadequate. In addition, political unwilling and growing economy make the net zero emissions achievement slower. Government has brought Government Methodology to Empower the Practical Utilization of Biogas and Biomethane (Bureaucratic Procedure) to achieve net zero emissions, but they are still under progress. Therefore, transitioning to a low-carbon economy can create economic opportunities, development of renewable energy projects, sustainable agriculture practices, and green technologies also enhance the reputation in the global cooperations.

Team 3: India

Team members & College:Annie Rath, Rizwan Shaikh, Dibyadarshan Parida, Suryakanta Jena and Jaganath Panigrahi from Department of A & A Economics, Utkal University, Bhubaneshwar

Key message from negotiation

India lacks the infrastructure required for renewable energy sources like wind and solar electricity, also the transportation industry is primarily reliant on fossil fuels, which considerably contribute to greenhouse gas emissions. Further, the agriculture industry in India contributes significantly to greenhouse gas emissions. Deforestation, as well as the usage of chemical fertilizers and pesticides, add to the country's carbon footprint. In recent years, India experiences, heatwaves, floods, cyclones and glacier bursts as consequences of climate change. Keeping this in view, it had set aggressive renewable energy deployment objectives. By 2022, the government hoped to have 175 GW of renewable energy capacity, comprising 100 GW of solar, 60 GW of wind, 10 GW of biomass, and 5 GW of small hydro. In addition, the country has launched the Electric

Mobility Mission Plan, aiming for 100% electric mobility by 2030. India has negotiated that industrialized nations should take the lead in decreasing emissions and offer financial and technological assistance to developing countries to assist them in transitioning to a low-carbon economy also binging regulation on transaction of carbon credits is needed.

Developed Countries

Team 4 : Australia
Team members & College:Arpita Jena, Aman Archika, N Banishree, Binapani Saikrupa and Jhipipsa Mohanty from BJB Autonomous, Bhubaneshwar

Key message from negotiation
Fossil fuels remain a major source of energy in Australia, and phasing it out poses economic and political challenges. Moreover, it still experiences extreme weather events such as wildfires, droughts, and heatwaves, which highlighted the urgent need for climate adaptation and mitigation measures. The agriculture sector, a significant contributor to GHG emissions, faced difficulties in implementing sustainable and low-emission practices. Besides, frequent changes in leadership and policy reversals created an uncertainty in development of clean energy in Australia. Hence, it needs to take ambitious action to combat climate change such as upgrade to electric grids, electric vehicles and green technology also promote rooftop solar system, carbon farming initiatives, reducing ecological footprint of urban areas and circular economy to reach the set targets.

Team 5 : USA
Team members & College:Satyam Mishra, Akshyat Das, Kanyonyo J.V., Shruti Khuntia and Mitali Kishan from SOA, Bhubaneshwar

Key message from negotiation
United States faces a significant obstacle in implementing a cogent and sustained national strategy because of historical reliance on carbon-intensive industries, policy inconsistencies across different administrations, and a complex decentralized governance structure. Additionally, the nation's extreme geographic and socioeconomic diversity necessitates customized strategies, making it challenging to implement uniform emission reduction policies. A comprehensive, creative, collaborative strategy that aligns national interests is necessary to address these complex issues. Rejoining the Paris Agreement, it renewed commitment to global climate action and collaboration to limit global temperature increases. Secondly, it should advocate for ambitious, achievable emission reduction targets, financial support for developing nations, balanced adaptation and resilience-building strategies, and climate education and capacity building initiatives to achieve net zero emissions.

Team 6 : Germany
Team members & College:Anwesha Mishra, Kabuubi Sulaiman, Babirye Janefrancis Namukwaya, Ananya Mohapatra and Sriya Rudrani Padhy from SOA, Bhubaneshwar

Key message from negotiation
Ensuring emissions reductions in energy-intensive industries is challenging because these industries have few low-carbon alternatives. In addition, reducing emissions from agriculture sector while maintaining food security is a problem in Germany. Moreover, transition to renewable energy sources requires significant investments thus straining public finances. Germany's commitment to net-zero emissions is commendable, but addressing these concerns is vital for its successful realization by 2045 and global climate efforts by 2050. In this regard, it has planned to create a separate tax barrier for organisations that produce emissions beyond a certain degree and bringing change to raw material supply chains to make net zero emissions foreseeable.

Small Island Country

Team 7 : Philippines
Team members & College:Adyasha Mahapatra, Aliva Prusty, Gyanasweta Mohanty, Shibansee Nayak and Suchismita Samal from R D Women’s University, Bhubaneshwar

Key message from negotiation
A heavy reliance on coal and other fossil fuels for energy production impedes progress towards a sustainable, low-carbon economy. Inadequate infrastructure for renewable energy sources and their associated technologies further exacerbates the problem. Moreover, socioeconomic disparities and limited financial capacity hinder widespread adoption of green technologies and practices. In this regard, international assistance, private sector engagement, and robust policy frameworks will be crucial in the Philippines' journey towards a sustainable, low-carbon future. Transitioning to clean energy can stimulate economic growth through job creation and innovation. Investment in renewable energy infrastructure can make the Philippines a leader in the green technology sector. Moreover, Philippines seeks to promote capacity-building initiatives to facilitate sustainable development, reforestation, sustainable land use, and marine conservation as an integral components of climate action strategy to achieve the nations targets.

Team 8: Maldives
Team members & College:Sweta Saswati Rath, Debasmita Parida, Ashutosh Praharaj, Abhishek Naik and Archita Mahapatra from PN College, Bhubaneshwar

Key message from negotiation
Maldives exposing to increasing challenges of climate change, with more frequent soil erosion, loss of beaches and saltwater intrusion into land and

freshwater sources. Rising ocean temperatures are leading to reduce tuna catches as its economy depends on fishery. In addition, more frequent extreme weather events, including storm surges, floods and cyclones, are directly and indirectly impacting the health and well-being of the people. Despite these challenges, the Maldives has taken stronger global climate action and steps at the national level to reduce emissions and enhance resilience. This includes efforts to transition to renewable energy, protect and restore coastal ecosystems, and develop adaptation strategies also international partnerships and support are crucial for the Maldives to address its unique climate-related challenges effectively.

Least Developed Countries

Team 9: Bangladesh

Team members & College:Arunima Thakur, Banitapa Nath, Santosini Mallik, Anushka Jena and Divyashree Dash from Law College, Utkal University, Bhubaneshwar

Key message from negotiation

Bangladesh is vulnerable to floods, droughts and other extreme climatic events. It also faces the risk of sea level rise due to global warming. Moreover, climate change is putting a large share of Bangladesh's population at increased risk from heat stress-related health problems and is already having negative impacts on the labour force. To address these challenges, Bangladesh has assumed the presidency of the 48-nation Climate Vulnerable Forum (CVF) which has come up with "Mujib Climate Prosperity Plan" for Bangladesh, with international cooperation, for implementing renewable energy and climate resilience initiatives.

WINNERS And PHOTOS

1 Australia
BJB Autonomous

- Arpita Jena
- Aman Archika
- N Banishree
- Binapani Saikrupa
- Jhipipsa Mohanty

2 Bangladesh
Law College, Utkal University

- Arunima Thakur
- Banitapa Nath
- Santosini Mallik
- Anushka Jena
- Divyashree Dash

3 Philippines and India
R D Women's College and Dept. of Analytical and Applied Economics

- Adyasha Mahapatra
- Aliva Prusty
- Gyanasweta Mohanty
- Shibansee Nayak
- Suchismita Samal
- Annie Rath
- Rizwan Shaikh
- Dibyadarshan Parida
- Suryakanta Jena
- Jaganath Panigrahi

Bengaluru, Karnataka

SSMRV College, Bengaluru, Karnataka, 16th October,2023

INTRODUCTION

Criteria for selection of Bengaluru, Karnataka

Bengaluru, Karnataka has been selected to organize the Climate Parliament, keeping its quicker growth in urban expansion (as megacity), hub of Information Technology and Bio-technology, Educational Institutions, Science and Technology, Smart Technologies, Industrialization (start-ups & macro level), Transportation, and Infrastructure Development. Climate externalities associated with these developments creates vulnerability and havoc in the city and the state. Therefore, we have considered this city for debating on climate issues.

Background

The climate parliament event taken place at SSMRV College, Bengaluru, Karnataka. This was organized by CSD in association with SSMRV College on Net Zero Emission. There were 8 negotiation teams from different colleges participated, they are Christ University Bengaluru, SSMRV college Bengaluru, Adhiyamaan College of Engineering, BMS college from Bengaluru. Around 50 students from various disciplines were participated, among them 40 students represented 8 countries which are belonged to developed (USA, UK, Germany), developing (Russia, India, Brazil), least developed (Burkina Faso) and small Islands nations (Maldives). As per the schedule, each negotiation team made their presentations on Net Zero Emissionin in front of facilitator group followed by discussion. Each team performance was evaluated by Chair, Co-Chair and Experts; accordingly, score was given to each team. The score was given based on the understanding of the subject, arguments building on Net Zero Emission, and credibility reporting /Negotiation skills, timely submission of position paper and presentation skills.

NEGOTIATION ON ACHIEVING NET-ZERO EMISSIONS

Team 1: USA (Developed countries)

Team members & College: Tanush CP, Adarsh Berlia, Sidhanth Sujay W, Tejashvi Goyal and Sonakshi Varshney from Christ University Bengaluru.

Key message from negotiation

The USA is the highest emitter of green house gases in the globe and also facing several climate related problems such as, heat waves, tornado, extreme summer, winter and floods. In-spite of several active policies and programmes it needs many more actions to achieve the net zero emission.

The USA committed to reduce greenhouse gases for 50-52%, supports Glasgow climate pact on net zero, energy independence etc., They discussed mainly on implementing Inflation Reduction Act and also indirectly involving public to reduce carbon emissions, develop green infrastructure and develop the mechanism to communicate effectively to create awareness among the cities of USA. In addition, government should make provision in IRA and stock market implied to SDG, increase the source of internal energy, lend help to other countries with funds and data monitoring about NDC.

Team 2: Germany (Developed countries)

Team members & College: CG Kushal, Ashuthosh Srinivas, Harsha V, Anagha Dath and Manasa HS from Department of Commerce, SSMRV college, Jayanagar, Bengaluru

Key message from negotiation

Germany faces several challenges in achieving net-zero emissions. The some of the major issues are, continuous reliable on coal for energy production, balance economic growth with emission reduction and decarbonising the transport and industry along with maintaining sustainable growth to address the urgent climate crisis, meet international commitments, stimulate economic growth, enhance energy security, protect the environment, and promote social equity. On the other hand, Germany strongly believes that, carbon pricing and energy efficiency are two important aspects will help to achieve the net zero emissions in the country. According to delegates, achieving net zero emission is a priority in Germany and globally due to the climate crisis. It requires comprehensive changes in energy, industry, transportation, and construction sectors. In this regard, the committee made some major negotiations to achieve net zero emission by 2050, encourage recycling and waste reduction and promote eco-friendly resources for future generation. To achieve this target, Germany proposed financial justice and collaborations from the all-other developed countries.

Team 3: UK (Developed countries)

Team members & College: Zara Zafar, Abhishek M, Anjali K, Rakshita S R and K Sandyasree from SSMRV (BCA Department) College, Bengaluru.

Key message from negotiation

The United Kingdom faces several significant challenges in achieving Net Zero Emissions, they are political decisions, financial constraints, developmental set back, social, and environmental issues.

In addition, it experiences increase in temperatures, heat waves, rise in sea levels (Between 1900 and 2022, the UK's Sea level rose by 16.5 centimetres)). Keeping this in view, the United Kingdom has implemented a range of global and national policies to address Net Zero Emissions. Some of them are Climate Change Act, Committees of Climate Change, National Adaption Program, Clean Growth Strategy, Hydropower, Renewable Energy Infrastructure, Finance Strategy, Green Finance Strategy, Hosting COP26:- focus on securing more ambitious agreements to combat climate change, Reuse of lithium batteries, Lithium batteries can be recycled and reused (by smelting, using liquids and direct recycling) and Boycott plastic sanitary pads. In addition, it needs global cooperation, technology transfer and transparency in accountability of GHGs.

Team 4: Burkina Faso (Belong to lest developed countries)

Team members & College: Vagmi Yajurvedi, Purbasha Parui, Ananya Manvi, Ameya and Kruti from BMS college of Law Bengaluru

Key message from negotiation

Being the least developed country in the world, the Burkina Faso witnesses to climate change. Some of the major problems faced by the country are, security and terrorism, humanitarian crisis, political instability, economic struggles, limited access to education and healthcare, environmental concerns, drought and climate crisis. On the other hand, Burkina Faso also taken several actions to achieve the net zero emission which includes more ambitious and measurable NDC to reduce GHGs. Monitoring and evaluation for the medium- and long-term by National Adaptation Plan. It was negotiated promotion of energy efficiency, sustainable development, climate smart technologies, afforestation, international collaboration and setting a national mitigation and adaptation strategies.

Team 5: India (Belong to developing countries)

Team members & College: Loudas T, Sanya Motlani, Tia Sajeev, Abhinava Roy and Gokul Kannan S form Christ University Bengaluru.

Key message from negotiation

India faces a serious climatic challenge that have tangible and far-reaching impacts. These challenges include erratic monsoon patterns leading to droughts, floods, and crop failures, placing the nation's agricultural sector at risk. Severe heat waves, especially during the summer months, glacier melting from the Himalaya, widespread air pollution in major cities, cyclones at coastal regions, water scarcity issues, deforestation, desertification, soil erosion and rising sea levels. These climatic problems underscore the urgency to develop comprehensive strategies for climate adaptation and mitigation. On the other hand, India also working towards mitigating climate issues by adopting zero emission initiatives such as mitigation strategies, air quality improvement and energy independence. The India's major negotiation points are technology research and development, measuring carbon footprint and sustainable development.

Team 6: Russia (Belong to developing countries)

Team members & College: Anuraag, Shraishth, Daksh, Inavansh and Srikanth from SSMRV college Jayanagar Bengaluru.

Key message from negotiation

Russia's emissions are primarily driven by the energy sector, which heavily relies on fossil fuels like natural gas and oil. Reducing emissions from these sectors is a key challenge as the economy and people depend hugely since the Soviet era. The Russia's major negotiations are, seek to establish mutually beneficial partnerships to advance sustainable technologies, knowledge exchange, and joint ventures in renewable energy. At multilateral level, Russia advocates for a balanced and inclusive approach to global climate governance, respecting the principles of sovereignty and non-interference in domestic affairs. A significant focus is placed on adaptation and building resilience in communities, agriculture, and infrastructure development. We seek international collaboration in sharing expertise and best practices to build climate resilience.

Team 7: Brazil (Belong to developing countries)

Team members & College: Adil, Monith, Sharan, Saniya and Suhana from SSMRV (BBA Department) college, Bengaluru

Key message from negotiation

Brazil being the 6th most populated country in South America with 211 million inhabitants, the social issues like poverty, education, sanitation, health, and infant mortality have been a big concern to the country. With rising inflation, the country faces financial instability and unemployment, deforestation in the Amazon Forest, soil erosion, flooding, and desertification of land. But on the other hand, Brazil is also taken several measures to mitigate the climate change to achieve net zero emission, they are implementing the forest code, Sustainable Aviation Bio fuels of Brazil (SABB) as it is one of the leading producers of Sustainable aviation fuels (SAF). Use alcohol from sugar cane to replace gasoline in road transportation, cost-effective technologies and greater use of renewable, low carbon agriculture plans (ABC plan), and low carbon mining plan (PMBC). Brazil has made commitments to achieve Net Zero Emissions including signing Glasgow leader's declaration on the forest, global methane reductions, Paris Agreement 2015, taking role in UN climate change conference, and holding convention on biological technology. The major negotiations are, implementation of Net Zero Code by immediate halt of deforestation, investments in renewable power generation, transmission and storage, contribution to Sustainable aviation fuel and decarbonisation.

Team 8: Maldives (Belong to Island countries)

Team members & College: Sakthi Pooja V, Princy Eden S, Kaushik R, Karthic I and Anand J from Adhiyamaan College of Engineering

Key message from negotiation

Maldives is suffering from the adverse impacts of climate change such as coastal erosion, coral bleaching and higher sea levels. To achieve net-zero emissions, the government has adopted renewable energy transition, energy efficiency, sustainable transport, mangrove conservation, climate-resilient infrastructure, waste management, sustainable tourism practices, raising awareness, international collaborations and monitoring and evaluation. The major negotiations made are net-zero target by 2030, ASPIRE project and Photovoltaic Independent Power Producers (PV IPPs) with a total generation capacity of 6.5 megawatts (MW) in the Greater Maldives region. A comprehensive risk mitigation package was initiated to reduce risks and leverage private sector investment.

WINNERS and PHOTOS

e

1 USA

Christ University, Bengaluru

- Tanush CP
- Adarsh Berlia
- Sidhanth Sujay W
- Tejashvi Goyal
- Sonakshi Varshney

2 Brazil and Burkina Faso

SSMRV (BBA Dept.) and BMS College of Law

- Adil Arab
- Monith
- Sharan
- Saniya
- Suhana
- Vagmi Yajurvedi
- Prubasha Parui
- Ananya Manvi
- Ameya
- Kruthi D N

3 UK

SSMRV (BCA Dept.)

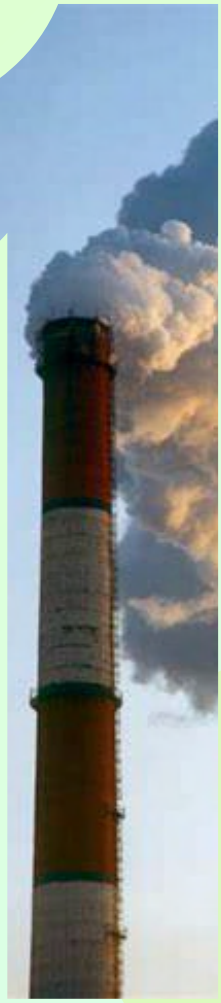
- Zara Zafar
- Abhishek M
- Anjali K
- Rakshita S R
- K Sandyasree

India's Sustainability @ 75

Achievements, Challenges and Prospects

Pollution & Risk Analysis

1



Chapter 1
Pollution and Risk Analysis

ABSTRACT

This is an overview of developments, challenges and solutions on pollution and risk analysis in India and outside. The review explores various types of pollution prevalent in India, including air, water and soil pollution. It also examines the associated risks and impacts on human health, environment and socio-economic development. Furthermore, this study explores the methodologies used to eliminate risk and assesses the effectiveness of policies and interventions in mitigating pollution and managing associated risks. The findings highlight the need for comprehensive strategies and collaborative efforts to address pollution-related challenges in India.

INTRODUCTION

India, with its rapidly growing population and industrialization, faces significant challenges related to pollution such as air and water, and its associated risks. India is currently undergoing significant pollution challenges across various forms, including air and water , , soil contamination, and waste management. Pollution refers to the release of harmful substances or contaminants into the environment, causing adverse effects on the natural ecosystem, human health, and the well-being of living organisms. The World Health Organization (WHO) estimates that outdoor air pollution causes approximately 4.2 million premature deaths globally each year (WHO, 2002). Air pollution is the 4thleading risk factor for premature deaths worldwide (IHME, 2019).

Addressing pollution requires collective efforts from governments, industries, communities, and individuals. It involves implementation of effective regulations, adopting cleaner technologies, promoting renewable energy, improving waste management practices, and raising awareness about the importance of environmental protection. Sustainable development practices that balance economic growth with environmental conservation are crucial to mitigating pollution and safeguarding the planet from future deterioration . There is a need for increased awareness, stronger enforcement mechanisms, capacity building, and periodic reviews to address emerging environmental challenges effectively.

Significant Challenges to India with regards to various forms of Pollution

India faces significant pollution challenges across various fronts. According to the Central Pollution Control Board (CPCB), around 21 of the world's 30 most polluted cities in terms of PM2.5 levels are located in India. The Global Burden of Disease Study estimates that the air pollution in India caused around 1.67 million deaths in 2019 alone.

Case study 1: Transporation system in Bengaluru

A study on transportation system in Bangalore, a city experiencing rapid population growth. The Bangalore Metropolitan Transport Corporation (BMTC) is responsible for providing transportation services to the city's residents. The BMTC operates a fleet of over 5,000 vehicles and collaborates with six different companies to manufacture buses. Waste management is a key concern for BMTC, a study conducted to provide recommendations for environmentally responsible waste management and cost-saving opportunities. The analysis reveals that approximately 24% of the waste generated by BMTC is hazardous, while 76% is non-hazardous- consisting mainly of metal scrap, tires, packing materials, foam, and faux leather from seats. Daily waste includes tires, metals, and lead-acid batteries. The report explores recycling methods used in the transportation sector globally to address waste reduction and material recovery.

The study identifies issues with the current waste management system, including inadequate waste fraction segregation, potential pollution and flooding risks in the scrap yard, and improper disposal of effluents. Recommendations include converting the scrap yard into a suitable waste storage facility with partition walls, preventing ground contamination, and addressing flooding risks. Upgrading the facility, installing a phosphating sludge collection system, and implementing an effluent treatment plant (ETP) are also advised. Furthermore, the report suggests auctioning foam separately from Rexine waste, as foam has recycling potential and value, while Rexine lacks a recycling market in India. Separating these materials could result in cost savings for BMTC.

(Source: Audit on Sustainable Waste Management and Waste Minimization at BMTC Workshops, (2008).Centre for Sustainable Development.)

.Water pollution is another major concern, with approximately 70% of surface water in India is being polluted. Additionally, inadequate solid waste management results in over 1.33 lakh metric tonnes of waste being generated daily, with only a fraction being properly treated. These challenges necessitate urgent action and comprehensive strategies to address pollution and protect human health and the environment.

The Government of India has taken several initiatives to address pollution, including implementation of air quality improvement plans, stricter emission standards, and promoting renewable energy sources. Efforts are also being made to improve waste management practices, promote water conservation, and encourage sustainable agricultural practices. However, addressing these challenges requires sustained efforts, technological advancements, public awareness, and collaboration among various stakeholders.

Pollution Analysis

Here's a brief overview of pollution and risk analysis:
Key steps in pollution analysis include:

- Source identification: Determining the primary sources of pollution, such as industrial emissions, vehicle exhaust, agricultural activities, or improper waste disposal.
- Emission estimation: Quantifying the number of pollutants released into the environment by different sources, using methods like emission inventories and monitoring data.
- Transport: Analysing how pollutants disperse, migrate, and transform in different environmental compartments, such as the atmosphere, water bodies, and soil.
- Exposure assessment: Evaluating how individuals or ecosystems come in contact with pollutants and estimating their exposure levels.
- Environmental monitoring: Collecting and analysing data on pollutant concentrations and trends over time to assess the effectiveness of pollution control measures.

Risk Analysis

Risk analysis involves evaluation of potential adverse effects of pollutants especially on human health and the environment. It helps in Identifying and prioritizing risks and assists in making informed decisions regarding pollution management.
Key components of risk analysis include:

- Hazard identification: Determining the potential harmful effects of pollutants based on available toxicological, epidemiological, and ecological data.
- Dose-response assessment: Establishing the relationship between pollutant exposure levels and the likelihood or severity of adverse health or environmental effects.
- Exposure assessment: Estimating the extent of exposure to pollutants for different populations or ecological receptors.
- Risk characterization: Integrating hazard and exposure information to quantify the risks and express them in terms of probabilities, severity, or other relevant metrics.
- Risk communication: Effectively conveying risk information to stakeholders, policymakers, and the public to facilitate understanding and informed decision-making.

Overall, pollution and risk analysis provide valuable insights into the nature, and magnitude of pollution problems, aiding in the development of effective pollution control strategies, regulations, and policies. They also contribute to the protection of human health and the environment by promoting sustainable and responsible practices.

Case study 2: Strategies to mitigate excessive noise levels at KBS

In a study Action Plan to mitigate excessive noise levels at Kempegowda Bus Station (KBS) of KSRTC Bangalore' by Centre for Sustainable Development, Bangalore, the main focus was on prevention than control strategies for excessive noise levels. The study also concentrated on identification of noise generation and its measurement contributed by individual sources (Example: whistle, TV, audio, vehicles and shouting of conductors and shopkeepers). To measure the noise level, the study has selected four sampling points at the KBS, which is the main entrance, platform no. 5 and 7 and final exit of the bus station. It was noticed that before implementing some of the solutions with business implications, a thorough investigation is needed and KSRTC should put its primary attention on creating a positive environment for the general public and the KSTRC employees who works at the KBS, through the solutions which study has provided. The report provides how loud the KBS is and it recommends quick action to reduce the noise level. The major recommendation of the study is in the whistle case when reversing the bus instead of blowing whistle, using alternative methods such as hand signals, light indicators or side & rear-view mirrors , whistles with milder sounds could be used instead of the present ones, and also unnecessary whistling by conductors within the KBS has to be strictly avoided. About TVs, it could be used to display the current departures schedules of buses and other important information, reduce the number of TVs, and it is also suggested that sound/audio level be maintained without causing annoyance to the public. In addition, programmes related to science & nature could be displayed, which do not require much of audio. Similar programmes have to be displayed on both display TV's and large screen TV's to avoid audio mixing on large screen TV's. A central control mechanism can be made such that, when announcements are made, audio of the large screen TV's can be muted. Unnecessary acceleration and honking inside the bus stand is to be avoided. Unwanted shouting of conductors and shopkeepers inside the KBS has to be strictly prohibited. To reduce the noise levels at the platforms, the study also suggested that re-organising the platforms keeping in view, uniform distribution of the people in correlation to the places of departure and schedules can be made.

Source: 'Action Plan to mitigate excessive noise levels at Kempegowda Bus Station (KBS) of KSRTC, Bangalore' (2004).
Centre for Sustainable Development, Bangalore.

Importance of Pollution and Risk Analysis to India

Studies on pollution and risk analysis are of paramount importance to India, considering the country's alarming environmental challenges and their potential implications for human health and sustainable development, with its rapidly growing population and expanding industrial activities, India faces significant pollution burdens.

Here are some key reasons why pollution analysis is crucial:

- Environmental Protection: Pollution analysis helps in understanding the sources, levels, and impacts of pollution on the environment.
- Public Health: Pollution analysis helps in assessing the risks posed by pollutants to human health.
- Policy Formulation: Pollution analysis serves as a foundation for evidence-based policy formulation. It enables the evaluation of the effectiveness of existing policies and the development of new strategies to address emerging pollution challenges.
- International Cooperation: Pollution is a global challenge that transcends national boundaries. Pollution analysis facilitates international cooperation and collaboration by providing a common understanding of pollution issues.
- Sustainable Development: Pollution analysis is crucial for achieving sustainable development objectives. It guides the adoption of cleaner technologies, sustainable practices, and resource-efficient approaches, leading to a greener and more sustainable future.

Overall, pollution analysis plays a vital role in guiding decision-making, raising awareness, and promoting actions to mitigate pollution at local, national, and global levels. It provides the necessary knowledge and tools to protect the environment, safeguard public health, and work towards a cleaner and more sustainable world. In collaboration with Government, academia, industry, private organizations, Centre for Sustainable Development (CSD), Bengaluru has undertaken several studies on these aspects in last 20 years. CSD is immensely working on these pollution and risk analysis issues, many of the studies have turned into policy making and developing rules and regulations to curb the pollution in Bengaluru and other parts of India.

CONCLUSION

This study highlights the multidimensional nature of pollution and risk analysis in India. It provides an overview of the different types of pollution prevalent in the country and their impacts on human health, ecosystems, and the economy. The review also explores the methodologies used for risk analysis and evaluates the effectiveness of policies and interventions. It emphasizes the importance of integrated approaches, stakeholder engagement, and evidence-based decision-making to address pollution-related challenges effectively. It suggests, future research should focus on evaluating the long-term impacts of pollution mitigation strategies and identifying sustainable solutions to protect the environment and public health in India.

Case Study 3: Successful e-waste management techniques

Report of E-Waste Management Activities explains that a successful outcome of the involvement of GTZ-ASEM and EMPA in the e-waste management activities in India and participation in the Indo-German Swiss E-Waste Initiative is reflected in the formal approval for the establishment and actual commencement of the e-waste collection center at ELCIA as well as the consent for setting up authorized e-waste dismantling units by the Informal Sector operators like EWARDD. Later, to solve the issues associated with e-waste, the key producers of e-waste, the electrical and electronic industry and their Associations must also work together. In order to improve the collection , recycling streams and effective disposal systems, they must unavoidably collaborate with the recycling industry. It would be a step in the right direction if the industry and their associations joined EWA, showing their support and engagement so that the issues surrounding e-waste management could be successfully brought up with relevant authorities in an effort to develop appropriate solutions. There is a need to work tirelessly and continuously in this field. Lastly, the report provides recommendations to make sure that the primary goals of the e-Waste programs are accomplished in a timely way. This includes encouraging the MoEF and National Working Group of the Indian government to complete the e-Waste Guidelines as soon as possible. Furthermore, immediate steps have to be taken to identify the method of collection of E-Waste by informal/unorganized recyclers and understand the methods of processing- disposal adopted by them.

Source: Report of E-Waste Management Activities, 1st November 2007 to 30th April 2008

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Sustainable Cities & Citizen Engagement

Chapter 2
Sustainable Cities and Citizen Engagement

ABSTRACT

This chapter examines the role of citizen engagement in promoting sustainable cities in the Indian context. It investigates how citizen participation can contribute to the development and implementation of sustainable initiatives, including urban planning, transportation, waste management, and energy efficiency. The chapter explores case studies from CSD and best practices from over the world that have successfully incorporated citizen engagement in their sustainability efforts. It emphasizes the importance of inclusive decision-making processes, community empowerment, and awareness campaigns to foster sustainable behaviours. The findings highlight the need for stronger collaboration between government, civil society, and citizens to create environmentally and socially resilient cities in India.

INTRODUCTION

ISDG 11 talks about Sustainable Cities and Communities, this goal is particularly relevant in the context of India, where rapid urbanization and population growth pose significant challenges to urban development. India is home to some of the world's largest and fastest-growing cities, which face pressing issues such as inadequate infrastructure, air pollution, insufficient access to basic services, and social inequality. Achieving SDG 11 in India is crucial for creating liveable, inclusive, and environmentally sustainable cities (Haughton and Hunter2004).

Sustainable cities, characterized by their commitment to citizen engagement and participatory decision-making, have demonstrated tangible benefits for both urban development and community well-being. A study conducted by the United Nations in 2020 found that cities that actively involve their residents in decision-making processes experience a higher level of social cohesion and increased satisfaction among citizens (UN Report on Sustainable Urbanization, 2020).

To address these challenges, the Indian government has been taking steps to promote sustainable urban development. Initiatives such as the Smart Cities Mission and Atal Mission for Rejuvenation and Urban Transformation (AMRUT) which was announced in the year 2015, these missions aim at improving urban infrastructure, enhancing the quality of life, and making cities more sustainable. These initiatives focus on areas such as affordable housing, sustainable transportation, waste management, and access to clean energy.

.In addition to government initiatives, various non-governmental organizations, community groups, and academic institutions are actively involved in sustainable urban development in India.

.These stakeholders work towards enhancing citizen engagement, advocating for sustainable practices, and promoting innovative solutions tailored to the local context. Their efforts range from promoting urban gardens and recycling programs to advocating for green building practices and sustainable transport alternatives.

Case study 1: Rain water harvesting

In the context of Karnataka, the report focuses on the implementation of rainwater harvesting (RWH) systems in three different layouts in Karnataka: Kalasapur in Gadag, Shettihalli in Tumkur, and Kelakote in Chitradurga. The Karnataka Housing Board (KHB) aims to provide adequate infrastructure for housing in the state and fulfill water requirements for their townships and layouts. For the Kalasapur layout in Gadag, where water scarcity is a major concern, RWH is seen as crucial for replenishing groundwater. Rainfall in the layout and adjacent hills is channelled into stormwater drains and diverted to proposed RWH buildings. It is recommended to recharge groundwater and construct water bodies like ponds or tanks to meet secondary water needs. The report suggests incorporating RWH structures into the layout design with an estimated investment of approximately Rs. 22,50,000, offering a one-year payback period.

In the case of the Shettihalli layout in Tumkur, water shortage is not a significant issue currently, as the existing borewells meet the water requirements. However, to address potential future water loss from subsurface sources, artificial recharge through captured rainfall is proposed. The report suggests injecting rainwater through existing borewells due to favourable ground conditions. The estimated investment for the RWH system is Rs. 2,65,000, with a three-year payback period.

The Kelakote layout in Chitradurga, despite its picturesque surroundings, faces challenges in meeting water needs. The existing two borewells can only fulfil 29% of the layout's water requirements and their longevity is uncertain due to the arid terrain. The report recommends integrating RWH as the lifeline for water supplies. It suggests recharging groundwater through existing borewells and capturing stormwater runoff from hill slopes by constructing an earthen barrier. The estimated investment for the RWH system is Rs. 5,90,000, with a projected payback period of two years and eight months.

In summary, the report highlights the significance of implementing RWH systems in the three layouts to ensure sustainable water supplies. Each layout faces different water challenges, ranging from extreme scarcity to potential future shortages. The proposed RWH strategies aim to recharge groundwater, store water, and address the layouts' specific water needs. The estimated investments and payback periods vary based on the layout and the extent of the RWH system implementation.

Source: Implementation of Rain Water Harvesting, CSD, 2005.

Sustainable Cities

In the current Indian context, sustainable cities play a vital role in addressing various challenges such as rapid urbanization, environmental degradation, resource scarcity, and social inequality. These cities prioritize the efficient use of resources, promote clean and renewable energy, prioritize public transportation, create green spaces, and involve citizens in decision-making processes.

Air Quality: Sustainable cities play a crucial role in addressing air quality concerns and implementing measures to reduce pollution levels. One such example that has successfully transformed itself into a sustainable model is Copenhagen, Denmark. Copenhagen serves as a remarkable example of how sustainable urban planning and transportation strategies can significantly improve air quality (Laumbach et al., 2015).

Water Management: Water scarcity and poor water management are significant challenges faced by many Indian cities. In this context, sustainable cities play a crucial role in addressing these issues by implementing effective water management practices. Singapore serves as an exemplary model for sustainable water management, showcasing innovative techniques that ensure water security for its residents.

India's status as one of the world's largest energy consumers highlights the importance of sustainable cities in reducing dependence on fossil fuels and mitigating climate change. Sustainable cities prioritize the adoption of renewable energy sources such as solar and wind power to meet their energy needs in an environmentally friendly manner. A prime example of a sustainable city that has achieved significant progress in this area is Masdar City in Abu Dhabi, United Arab Emirates.Masdar City stands out as a pioneering carbon-neutral city that operates on 100% renewable energy sources, primarily solar power(Praene et al., 2017)

To achieve these goals, Indian cities need to adopt favourable policies and regulations that incentivize renewable energy investments, facilitate the integration of renewable energy into urban infrastructure, and promote public-private partnerships in the renewable energy sector. Additionally, awareness campaigns and educational initiatives can help promote a culture of sustainable energy consumption and empower citizens to actively participate in the transition towards renewable energy.

Affordable Housing

Sustainable cities recognize the importance of addressing the housing needs of diverse income groups, and they strive to provide affordable and eco-friendly housing options in order to foster social inclusivity and reduce slum dwellings. An excellent example of such a city is Vienna, Austria, which has implemented successful social housing programs that cater to the needs of its population. Vienna's social housing initiatives have been instrumental in ensuring access to affordable and energy-efficient housing for a significant portion of its residents. By implementing sustainable practices and learning from successful examples worldwide, India can create cities that are environmentally responsible, socially inclusive, and economically vibrant, leading to a better quality of life for its citizens.

Case study 2: Lifestyle change approach

The project aimed to assess the effectiveness of a lifestyle change approach in promoting responsible and efficient electricity consumption among customers of the Bangalore Electricity Supply Company Limited (BESCOM) in three areas of Bangalore city. The study involved the monitoring the residential and commercial electricity consumption patterns of BESCOM customers in Brigade Road, Residency Road, and Mahatma Gandhi (MG) Road. Out of the total BESCOM customers in these areas, 2,382 customers were contacted, and 1,128 customers actively participated in the study.

The lifestyle change approach focused on modifying behavioural activities related to electricity use and changes in electrical appliances. Over a six-month period, various practices were adopted, such as utilizing sunlight instead of artificial light during the day, maintaining clean lamps and fixtures for better light emission, and other energy-saving measures. The continuous monitoring of lifestyle choices resulted in significant reductions in electricity consumption among both domestic and commercial customers.

The analysis showed that the lifestyle change approach successfully reversed the upward trend in energy consumption. Between 2004–2005 and 2008–2009, the annual increase in electricity consumption for BESCOM customers ranged from 5.15% to 21.6%. However, the adoption of energy-saving practices led to a decrease in electricity consumption. The study estimated that if the same approach was implemented across the entire BESCOM area, approximately 6 million units (MUs) of electricity could be saved.

The potential electricity savings were substantial. If the lifestyle change approach was applied to BESCOM's entire domestic customer base, estimated savings could reach 16.9 MUs, while the commercial customer base could save 69 MUs annually. The study concluded by suggesting ongoing awareness and education programs, the development of energy efficiency strategies, and the need for consumers to adapt their behaviour in response to variable electric rates, known as the smart grid, to ensure reliable electrical service during times of high demand.

In summary, the project demonstrated the positive impact of a lifestyle change approach in reducing electricity consumption among BESCOM customers. By adopting energy-saving practices and modifying behaviour, substantial electricity savings were achieved, highlighting the importance of promoting energy efficiency and conservation measures among consumers.

Role of Citizen Engagement in Planning a Sustainable City.

Citizen engagement plays a crucial role in transforming cities into sustainable cities. When residents actively participate in decision-making processes and contribute to sustainable initiatives, it fosters a sense of ownership, collective responsibility, and empowers communities to create a positive change.

Following are the ways in which citizen engagement can contribute to making a city more sustainable:

- Participatory Planning: Involve citizens in urban planning processes, allowing them to contribute their ideas, concerns, and aspirations. This can be done through public consultations, workshops, and citizen advisory committees.
- Education and Awareness: Promote education and awareness campaigns to inform citizens about sustainable practices, energy conservation, waste management, and other environmental issues.
- Community-Based Projects: Encourage and support community-led projects focused on sustainability. These can include initiatives such as community gardens, recycling programs, renewable energy cooperatives, and neighbourhood clean-up campaigns.
- Sustainable Transportation: Involve citizens in designing and implementing sustainable transportation solutions, such as public transit improvements, cycling infrastructure, and pedestrian-friendly initiatives.
- Collaborative Governance: Foster partnerships between local government, businesses, community organizations, and residents to collectively work towards sustainable goals.
- sData Sharing and Transparency: Promote transparency by providing access to relevant data and information related to sustainability initiatives.
- Volunteering and Civic Action: Encourage citizens to actively participate in volunteering opportunities and civic actions related to sustainability.

By integrating citizen engagement into the fabric of urban development, cities can harness the collective wisdom and efforts of their residents. Through collaboration and shared responsibility, sustainable cities can be created, where citizens are not only beneficiaries but also active participants in building a better future for their communities.

CONCLUSION

This paper delves into the critical role of citizen engagement in advancing the cause of sustainable cities within the context of India. It meticulously examines how active involvement of citizens can significantly contribute to the formulation and execution of sustainable initiatives encompassing urban planning, transportation, waste management, and energy efficiency. Drawing on case studies from the Center for Sustainable Development (CSD) and global best practices, the paper underscores the successful integration of citizen engagement in sustainability endeavours. It emphasizes the pivotal role of inclusive decision-making processes, community empowerment, and awareness campaigns in nurturing sustainable behaviours.

Case study 3: Implementation of eco-sanitation

The report investigates a rural eco-sanitation project implemented in Ancharahalli Village, Doddaballapur Taluk, Bangalore Rural District, Karnataka, from October 2008 to December 2009. The project aimed to improve sanitation facilities by constructing individual toilets, establishing sewerage lines, constructing chambers and implementing a decentralized treatment plant. The report highlights the activities carried out under the project, including the construction of 44 individual toilets and 4 school toilets, all of which are linked to the operational Decentralized Treatment System (DTS). The beneficiaries of the project have embraced the use of the toilets.

The report also discusses the project's challenges and the actions taken to address them. The community's utilization of toilets led to the emergence of issues that were resolved through the efforts of the Community Sanitation Development (CSD) organization. The report emphasizes the importance of creating awareness and involving the local community in decision-making processes for project sustainability. The lessons learned from the project include the need for informed and participative teams at the local level. The eco-sanitation committee of the village played a crucial role in convincing the community to cooperate in the construction of sewer lines and chambers. Strengthening the capabilities of the village institution and motivating residents about the importance of personal sanitation facilities were identified as key factors for the project's success. Furthermore, the report evaluates the project's impact in the Global Environment Facility (GEF)'s focus areas. It highlights improvements in soil fertility, reduced usage of inorganic fertilizers, energy production from waste, environmental disaster protection, and a decrease in carbon dioxide (CO_2) emissions.

In summary, the rural eco-sanitation project successfully implemented sanitation infrastructure in Ancharahalli Village. The report emphasizes the importance of community involvement, highlights the challenges faced during implementation, and underscores the positive impact of the project in various environmental aspects.

Source: Meeting of Gram Sabha at Ancharahalli (Doddaballapura) on eco-sanitation facilities provided by CSD, 2009.

Projects/Activities Undertaken by CSD related to Sustainable Cities and Citizen Engagement

- Annual Day Competition for School children in painting, quiz and skits on sustainable development cities (2002)
- Rapid Environmental Impact Assessment of Modern Abattoir Project at Mangalore (2004)
- Two-day Cleaner Production Orientation Program to the Andhra Pradesh Pollution Control Board Employees (2004)
- Environment Report Card (ERC) of Bangalore (2005)
- Establishment of Dry-Zone Bio-Diversity In-Situ Conservation Sites Network in Karnataka (2009)
- Training IBM employees on the Citizen Survey for Environment Report Card (ERC) (2012)
- Leadership and Capacity Building Programme - Senior and mid-level officers of the Government Departments (2013)
- Smart cities talk: Smart travel by Managing Director of Bangalore Metro Rail Corporation Limited (2014)
- Smart Grid Awareness Program for Citizens of Indiranagar (2016)
- Training Program on Climate Resilient Cities & Disaster Management (2017)
- Smart Cities Concept and Implementation (2017)
- GSA Participated in TV9 Education Fair at Palace Ground (2018)
- Green Jobs Conclave - Hyderabad (2018)
- Happiness Survey (2019)
- Parisarothana- A green rating system presented for Mysuru City Corporation (MCC) (2019)
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Role of Sector Council for Green Jobs

"It's both a privilege and a pleasure to be contributing an article in CSD's publication "India's Sustainability @ 75" as part of its 20th Anniversary. The Centre for Sustainability Development, under the visionary leadership of Dr A. Ravindra, focused on the integration of sustainable development into policies as well as practices, well ahead of its time."

From the mid-20th Century, there has been recognition of the need to address issues of Environmental degradation caused by Economic development, as well as the rising socio-economic inequities between developed and developing nations, with Climate Change flagged as concern at Rio in 1992. There were multiple development programs that sought to address these issues but lacked the holistic approach of sustainable development as we understand it today. It's only in 2015 that the UN adopted the Sustainable Development Goals, articulated as 17 SDGs, recognizing need for integrated implementation and that development must balance social, economic and environmental sustainability, which has been CSD's mission.

Skills Council for Green Jobs (SCGJ), incorporated in 2015 by MNRE and CII, under aegis of MSDE, has mandate for skilling and entrepreneurs' development for entire spectrum of green jobs, aligned with UNFCC's Paris Agreement and UN SDG's. SCGJ has trained over 500,000 candidates & implemented projects for World Bank, GIZ, FCDO, UNDP as well conducted multi-lingual training, in over 40 African countries, on behalf of International Solar Alliance. Recently, SCGJ signed an agreement with German Solar Industry Association, BSW (Bundesverband Solarwirtschaft) to help integrate Indian workers into German solar industry.
CSD, continuing its visionary approach, established Green Skills Academy (GSA) in affiliation with the National Skills Development Corporation and SCGJ.

India is poised to become a global leader in the transition to green economy, through its national missions, its NDC's with enhanced ambitions during COP26 and Long Term Low Emissions Development Strategies (LT-LEDS) during COP27 as well as in the Delhi Declaration during its presidency in the G20 Summit.
Recently, Skill Council for Green Jobs and Sattva Consulting, supported by J.P. Morgan, mapped the landscape of green jobs in India, identifying vibrant sectors creating green jobs, needs and challenges of vulnerable groups and required skilling ecosystem. This study report titled "Gearing up the Indian Workforce for a Green Economy" was released on 18th May 2023 by Secretary MSDE.

This Report provides revised perspective for defining the mission of Sector Skills Councils. In their formative years, the emphasis was on Skilling and Entrepreneur Development, with the basic premise being that jobs existed within Industry & Businesses and that there was a shortage of appropriately skilled manpower. Hence, the approach of "Skills Gap Analysis", establishing National Occupation Standards and developing training modules across all levels of activity performers/ managers.
However, this approach addressed, primarily, the organized workforce, which constitutes only 10.6% of the total working age population of 900 million in 2020, as per India Economic survey 2021-22. Industry 4.0, evolving from automation to robotics to AI/ML, is reducing demand for traditional skilled workers & eliminating the need for semi-skilled workers. A large portion of working age population are unemployed or underemployed, dependent on welfare schemes and employment guarantee schemes. Definitely, an unstable socio-economic scenario for India with 2030 working age population projected as 1 billion. Hence, the criticality to focus on the availability of the "Indian Workforce" and its potential deployment in Green Economy.

SCGJ's focus, till now, has been on Renewable Energy, Waste Management, Water Management. Green Economy would encompass the above as well as the multiple pathways under LT-LEDS as well as for compliance with SEBI mandated BRSR. These encompass deep decarbonization of Energy, Transport, Industry, Buildings and Agriculture, including Supply Chain, which will spawn many new green businesses & create millions of green jobs.

Furthermore, transition to Green Economy requires, apart from Policy/ Technology/ Finance, active engagement with the community, to embed green values and get green practices & processes adopted voluntarily, including by MSME's. Such engagement must extend to High Schools, Polytechnics & Colleges, to create awareness of green jobs/ entrepreneurial opportunities, along with correlated education.
SCGJ, through its Bangalore Centre of Excellence, is focusing on the above and looks forward to widespread implementation in collaboration with CSD/GSA.

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Clean Energy & Technology

Chapter 3
Clean Energy and Technology

ABSTRACT

Urban areas that leverage advanced technologies and data-driven solutions to improve the quality of life for residents while promoting sustainability and efficient resource utilization. Centre for Sustainable Development (CSD) play a crucial role in advising the developing smart cities by addressing energy challenges, enhancing resource management, and ensuring environmental sustainability. This study aims to explore the intersection of clean energy and technology, highlighting the key findings and insights from relevant studies undertaken by CSD.

INTRODUCTION

IClean energy and technology have gained significant attention and importance in recent years. India faces numerous environmental challenges, including air pollution, carbon emissions, and shortage of reliable and affordable energy sources to support its growing population and economy. The country has recognized the potential of clean energy sources and has been actively promoting their adoption through policy measures and technological advancements.

India has made substantial progress in the deployment of renewable energy technologies. Solar energy has been a particular focus, with the country witnessing a rapid increase in solar power installations. This has led to the establishment of large-scale solar parks, rooftop solar projects, and innovative financing models, making solar energy more accessible and cost-effective. Similarly, wind energy has seen significant growth, with India being one of the top countries in terms of installed wind power capacity. Hydropower has long been a source of clean energy in India, with the country utilizing its vast river systems for power generation. In recent years, there has been a focus on small-scale and micro hydropower projects to promote decentralized energy generation in rural areas. Geothermal and bioenergy technologies are still in the nascent stage in India, but there are efforts to explore their potential.

Clean Energy and Renewable Energy

Clean energy refers to energy sources and technologies that have minimal or no negative impact on the environment and human health. It encompasses a broader concept that includes both renewable and non-renewable energy sources. Clean energy sources aim to reduce or eliminate greenhouse gas emissions, air pollution, and other harmful pollutants associated with energy production and consumption. Renewable energy, on the other hand, specifically refers to energy derived from naturally replenishing sources that can be used indefinitely without depleting their resources. Renewable energy sources include solar, wind, hydroelectric, geothermal, and biomass.

ADVANTAGES OF CLEAN ENERGY AND TECHNOLOGY

Environmental Benefits: Transitioning to clean energy sources is crucial for mitigating climate change and reducing pollution. Fossil fuels are the primary source of greenhouse gas emissions, which contribute to global warming. By shifting to renewable energy sources like solar and wind power, we can significantly reduce carbon dioxide (CO2) emissions. For instance, the International Renewable Energy Agency (IRENA) estimates that by doubling the global share of renewable energy to 36% by 2030, CO2 emissions could be reduced by about 4.9 gigatonnes per year.

Energy Security: Dependence on fossil fuels can expose countries to geopolitical risks and price volatility. Investing in clean energy technologies enhances energy security by diversifying the energy mix and reducing reliance on imported fuels. A study by the National Renewable Energy Laboratory (NREL) found that increased deployment of renewable energy in the United States can significantly reduce the vulnerability of the power system to disruptions caused by natural disasters or cyber-attacks.

Economic Growth and Job Creation: The clean energy sector offers substantial economic opportunities. According to the IRENA, the renewable energy sector employed over 11 million people globally in 2018, with the potential for further job growth. Investments in renewable energy projects and technologies can stimulate economic growth through job creation and infrastructure development.

Energy Cost Savings: Renewable energy costs have significantly declined over the years, making them increasingly competitive with fossil fuels. IRENA states that the levelized cost of electricity for solar photovoltaic (PV) power has dropped by 82% since 2010, and onshore wind costs have declined by 39% during the same period.

Technological Advancement: Clean energy and technology development foster innovation and technological advancements. Research and development in renewable energy, energy storage, and energy efficiency have led to breakthroughs that benefit various industries. For instance, advancements in battery technology, driven by clean energy demand, have accelerated the development of electric vehicles (EVs) and grid-scale energy storage systems.

Health Benefits: Fossil fuel combustion releases air pollutants such as sulphur dioxide (SO2), nitrogen oxides (NOx), and particulate matter, which have severe health impacts. The World Health Organization -

(WHO) estimates that outdoor air pollution causes 4.2 million premature deaths annually. Transitioning to clean energy sources can significantly improve air quality and reduce health risks.

International Cooperation and Diplomacy: Clean energy initiatives foster international collaboration and cooperation. The Paris Agreement, signed by 196 countries, aims to limit global warming to well below 2 degrees Celsius above pre-industrial levels. The agreement encourages nations to work together to combat climate change, promote clean energy deployment, and strengthen environmental cooperation. It provides a platform for sharing best practices, technology transfer, and financial assistance to developing countries.

Sustainable Development: Clean energy plays a vital role in achieving sustainable development goals. Access to affordable and reliable energy is crucial for eradicating poverty, improving healthcare, education, and overall human well-being. Clean energy technologies enable the provision of electricity to remote and underserved regions, supporting economic activities and improving living standards. The SDG 7 aims to ensure universal access to affordable, reliable, and modern energy services by 2030. Keeping this in view CSD has conducted Round Table Workshops in various cities in India, particularly on SDG 7.

In summary, clean energy and technology offer a wide range of benefits, supported by facts and data. By transitioning to clean energy, we can combat climate change, reduce pollution, enhance energy security, drive economic growth, create jobs, save costs, foster technological advancements, improve public health, encourage international cooperation, and contribute to sustainable development. These advantages highlight the critical importance of embracing clean energy and technology for the well-being of both individual countries and the world as a whole.

Case study 1: Skill development on renewable energy

Case study 1.1: The report provides a summary of various training programs conducted by the Centre for Sustainable Development (CSD) in collaboration with the Ministry of New and Renewable Energy (MNRE) and other institutions. The first program focused on solar photovoltaic (PV) technology and renewable energy law and management held at the Government Polytechnic for Women's Campus, the training took place between January 27th and 30th 2015, with 54 students attending from different engineering branches. The program aimed to educate students on solar PV technology and renewable energy regulations.

Case study 1.2: The second training program, also supported by MNRE, took place at BMS College of Engineering. It ran from February 5th to 7th, 2015 with a field visit on February 10th. This program focused on theory sessions related to solar PV and included 55 students from the Mechanical Engineering Branch. The valedictory program was chaired by Dr. A Ravindra, former Chief Secretary to the Government of Karnataka, who emphasized the significant role of the energy industry in the state and the country.

Case study 1.3: Furthermore, CSD, in collaboration with the National Law School of India University, organized a two-day program on Renewable Energy Law and Management with funding from MNRE held on February 19th and 20th, 2015 in Bangalore. The program aimed to educate government officials, energy regulators, industrialists, and legal professionals about renewable energy policies and laws. Around 40 participants from various sectors attended the program and found it helpful in understanding the conceptualization and application of renewable energy policies and laws.

Case study 1.4: The report also mentions a solar PV training program conducted by CSD at RV College of Engineering from February 21st to 24th, 2015. The training had 51 participants, including faculty, students, and consultants. Keynote speeches were delivered by Dr. Gururaja, highlighting the value of the Indian workforce in the solar energy sector and Dr. Satyanarayana, discussing ongoing projects related to silicon plasmonic solar cell development and carbon nanocomposites.

In summary, the report highlights the successful implementation of multiple training programs focusing on solar PV technology, renewable energy law and management and the importance of skill development in the renewable energy sector. These programs aimed to educate and equip participants with knowledge and practical insights, fostering the growth and adoption of renewable energy technologies in India.

Source: A Brief Report on Four Day Advanced Training on Solar Photovoltaic Technicians and Renewable Energy Law and Management (2015). Centre for Sustainable Development

Case study 2: Efficient use of energy

According to CSD's study the most widely used forms of energy is electricity, which is a fundamental component of nature. Power consumption per person in India was 612 units in 2009, and by 2012, it is expected to reach 1000 units annually. In 2009, India had 147 GW of installed power generation capacity. The installed capacity of the Karnataka state's thermal, wind, and hydel energy is approximately 9646.73 MW (as of May 31, 2009), with another 4000 MW under construction. About 7% more load is anticipated to be carried in the state of Karnataka each year. It would take double the state's installed capacity if all of the additional peak demand (MW) were to be met by its generation. The distribution of electricity in 8 districts, including Bangalore Urban and Rural, Ramanagara, Kolar, Tumkur, Chitradurga, Chikballapura, and Davanagere, has been given to Bangalore Electricity Supply Company Limited (BESCOM). BESCOM has 7 million customers and a population of over 139 lakh people spread across an area of 41,092 square kilometers.

The adoption of a more responsible and efficient consumption pattern by consumers is the practical solution to securing enough electricity for the future. The BESCOM consumers' adoption of these practices to conserve electrical energy for future consumption is evaluated in this project. Knowing the current status of electricity generation, consumption patterns, and the shortage, as well as potential interventions to save and conserve energy, is crucial in this context. Keeping this, CSD suggested ongoing awareness and education programs on energy efficiency using multimedia, different ways of energy-saving practices and shift to more energy-consuming electrical appliances should be widely publicized. The development of different energy efficiency strategies should be pursued or supported by the electricity supply companies through research and design. In order to benefit from reliable electrical service during times of high demand, consumers must adapt their behaviour around variable electric rates or face paying significantly higher rates.

Source: A Lifestyle Change Approach for Assimilating Best Energy Consumption Practices by the Consumers (2009). Centre for Sustainable Development.

Projects/Activities Undertaken by CSD related to Clean Energy and technology

- Cleaner Technology Assessment in Foundry (2005)
- Energy Audit (2008)
- Study on Sustainable Bioenergy systems in developing Sustainable Smart cities in India
- Advanced Solar Photo-Voltaic technician training under the TEQIP Scheme (2013)
- "PRERANA" Energy Conservation Awards (2011)
- Inauguration of Energy Symposium and Vendors' Conclave (ESVC) (2011)
- The Bangalore Chamber of Industries and Commerce (BCIC) - SWM Awards (2013)
- Strategies for a Green Growth Model: New Perspectives on Corporate Sustainability
- UNDP & Workshops - Study on Carbon Tetrochloride (CTC) usage for Feedstock & Lab Applications (2019)
- Online Programme on Solar Energy (2020)

CONCLUSION

CSD had conducted numerous studies on progress in adopting clean energy and technology. Accordingly, it suggests, India should establish ambitious renewable energy targets aligned with its commitment under the Paris Agreement. Continuity and stability in renewable energy policies are crucial to attract investment and provide confidence to developers. Long-term Power Purchase Agreements (PPAs), feed-in tariffs, and other support mechanisms should be implemented to incentivize renewable energy deployment.By adopting these recommendations, India can further accelerate its clean energy transition, promote sustainable economic growth, improve energy security, and contribute to global climate goals.

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Strategic Environmental Assessment & Developments

Chapter 4

Strategic Environmental Assessment and Developments

ABSTRACT

The Strategic Environmental Assessment (SEA) is an essential tool for integrating environmental considerations into policies, plans, and programs to promote sustainable development. This paper provides a comprehensive overview of SEA, its objectives, process, and significance and also contributions made by Centre for Sustainable Development (CSD) in the Indian context. It explores the evolution of SEA in India, highlighting key policy developments, sector-specific guidelines, and the role of stakeholders. Furthermore, the paper examines the challenges and opportunities in implementing SEA and discusses potential strategies to enhance its effectiveness. Through a critical analysis of case studies conducted by CSD as a proactive approach to sustainable decision-making. It concludes by emphasizing the need for continuous refinement and improvement of SEA processes to address emerging environmental challenges and promote effective environmental governance in India.

INTRODUCTION

SEA is a systematic and comprehensive process used to assess the environmental implications of proposed policies, plans, programs, or large-scale development projects. SEA is conducted at the strategic level, typically during the early stages of planning, to identify potential environmental impacts and opportunities associated with the proposed development. It helps decision-makers understand the environmental consequences of their actions and make informed choices that minimize adverse impacts and maximize positive outcomes (Kumar and Singh 2020). Further, SEA ensures that environmental considerations are integrated into the decision-making process by identifying and assessing the potential impacts of proposed actions.. This allows for the consideration of alternatives, modification of plans, and mitigation measures to minimize adverse effects. Also, exchange of information, consultation, and involvement of affected communities, NGOs, experts, and other relevant stakeholders to consider their perspectives and incorporate their input into the decision-making process.

The introduction of SEA in India was influenced by the principles established in the Rio Declaration on Environment and Development in 1992 and Agenda 21. These international agreements emphasized the need to integrate environmental considerations into decision-making processes. In India, the Environmental Impact Assessment (EIA) process was already in place under the Environmental Impact Assessment Notification of 1994, focusing on project-level assessments. Recognizing the importance of incorporating environmental considerations at higher levels, SEA was introduced as a complementary tool to EIA.

SEA Process and Implementation

The SEA process involves four main steps:

·Scoping: define assessment boundaries, objectives, and baseline data.

·Impact assessment: Evaluate environmental effects and explore alternatives.

·Mitigation measures: identify actions to minimize adverse impacts with stakeholder input.

·Monitoring and evaluation: track environmental performance and review the SEA process.

Empirical Studies of CSD

Empirical studies have shown that SEA helps decision-makers gain a better understanding of the potential environmental implications of policies, plans, and programs, leading to improved decision-making. SEA provides valuable information and insights into the environmental consequences, trade-offs, and opportunities associated with proposed actions. It enables decision-makers to make informed choices, consider alternative options, and integrate environmental considerations into their decision-making processes. Empirical evidence also suggests that SEA enhances transparency, public participation, and accountability in decision-making, promoting more sustainable and equitable outcomes (Partidario and Clark, 2012).

The Karnataka Urban Development and Coastal Environmental Management Project aims to promote social and economic development in coastal urban districts of Karnataka, India, by investing in urban infrastructure and services. As part of this project, a new abattoir/slaughterhouse is planned to be built in Mangalore, to assess the environmental impact of establishing the new abattoir, the Karnataka Urban Infrastructure Development Corporation (KUIDFC) has commissioned a Rapid Environmental Impact Assessment (REIA) study conducted by the Centre for Sustainable Development in Bangalore.

The REIA study differs from a traditional Environmental Impact Assessment (EIA) as it focuses on the necessity of the project considering the current state of the existing slaughterhouse and the actual demand for meat in Mangalore. The study reveals that only 32% of the city's total meat consumption comes from the existing Kudroli slaughterhouse, while the remaining 68% is sourced from covert or illegal production. The current slaughterhouse at Kudroli lacks basic amenities, such as water, light, ventilation, proper flooring, overhead rails, and waste disposal facilities. Moreover, untreated effluents and solid waste are being

dumped into the nearby Gurupur River, raising environmental concerns.

The REIA study outlines the objectives, scope, and methodology employed, focusing on environmental aspects like air, water, noise, socioeconomic factors, and terrestrial/aquatic environments. Three potential sites for the new abattoir were investigated, including the current slaughterhouse location, Pachanady, and Kannur. After careful consideration, the Kannur site was identified as the most suitable for the project and was selected for the REIA study in consultation with stakeholders.

Baseline data on environmental characteristics within a 7 km radius of the site were collected to establish the pre-project baseline status. Air quality investigations revealed that the ambient air quality at the project site is generally good, with slightly higher levels near the National Highway. Water samples from wells and rivers were examined according to standards, indicating the need for filtration due to the presence of MPN bacteria. Noise levels were measured and found to be acceptable. The land surrounding the project site is covered with bushes and various tree species, providing habitat for domestic animals, reptiles, and avifauna but lacking significant wildlife.

The Environmental Management Plan (EMP) is a crucial component of the REIA study and addresses the project's environmental concerns and proposed strategies for minimizing adverse effects. The EMP encompasses both pollution prevention through adopting cleaner production principles and pollution control through implementing end-of-pipe technologies.

In summary, the REIA study assesses the necessity of establishing a new abattoir in Mangalore, evaluates the current state of the existing slaughterhouse, identifies the Kannur site as the most suitable location, establishes the pre-project baseline status of environmental characteristics, and proposes an Environmental Management Plan to mitigate potential adverse impacts. The study highlights the need for improved facilities, waste management, and environmental safeguards in the abattoir sector to ensure sustainable development in the coastal region of Karnataka. The training programs included a variety of interdisciplinary session components that assisted the participants of various backgrounds, including law students, entrepreneurs, and government line departments (energy, law, environment, and engineering) in understanding various MNRE programs, the significance of switching to renewable energy sources, and the status of current policies on renewable energy sources. All training courses address topics including energy law, climate change regulations for energy law in India, energy security, socio-ecological development, and renewable energy, contractual matters and law power purchase agreements incentives for renewable energy in India. Electricity Act of 2003, Renewable Energy Conservation Act of 2001, Electricity Regulatory Commission Act of 1998 and other laws specifically boosting renewable energy power purchase agreements, tariff policies, renewable purchase obligations, certified emission reduction status, solar plant designs, solar project-related issues, Energy Conservation Building Codes (ECBC), building envelopes, various renewable energy incentives and environmental impact assessment requirements for renewable energy projects are just a few of the topics covered.

CONCLUSION

Based on the studies conducted and programmes held, it is essential to revise and strengthen the legal and policy frameworks governing SEA, ensuring clear mandates and guidelines for conducting SEA across sectors. This includes expanding the scope of existing legislation, such as the Environment Impact Assessment Notification, to explicitly include SEA requirements. Investing in capacity building and training programs is crucial to equip practitioners, government officials, and stakeholders with the necessary skills and knowledge for effective SEA implementation. Efforts should be made to improve data collection mechanisms, promote data sharing and employ advanced analytical tools. Enhancing data availability, quality, and analysis will support evidence-based decision-making and improve the accuracy of environmental assessments. Foster multi-stakeholder collaboration by creating platforms for meaningful engagement throughout the SEA process. Engaging diverse stakeholders, including government agencies, local communities, NGOs and industry representatives can lead to more comprehensive and inclusive assessment.

In another programme by CSD held five training sessions with 170 participants on environmental law, energy policy, and management at five separate locations throughout India. Participants in the training program were from a variety of departments and institutions with interdisciplinary subject backgrounds, including GIZ, ONGC, UREDA, Dehradun, GMR Energy Group, Carbon Mines India, MS Ramaiah College of Law, ISEC, University of Kassel, Germany, Oxford Law College, Sholapur University, Andhra University, NCDC, Ministry of Health, GoI, KBB and NLSIU Bangalore, UREDA Dehradun, Himarja Him. The primary goal of the training programs is to inform and prepare the target populations, which primarily consist of government employees working in the energy sector, energy regulators, businesspeople investing in and driving development in this sector, and legal professionals.

Projects/Activities Undertaken by CSD related to Strategic Environmental Assessment and Developments

- Environment Report Card (ERC) of Bangalore (2005/2012)
- Establishment of Dry-Zone Bio-Diversity In-Situ Conservation Sites Network in Karnataka (2009)
- Inauguration of National Urban Water Conference (2009)
- Observing International Biodiversity Day with school children (2010)
- Bangalore World Water Summit (BWWS) (2012)
- World Water Summit Awards 2012
- Solid Waste Management - BBMP Pourakarmikas Training Programme (2018)
- Rooftop Gardening for Jyoti Nivas College (2019)
- World Environment Day at Cubbon Park "Exploring Activities" (2019)
- Dept. of Public Enterprises - Environmental Law and Compliance for PSUs in the Government of Karnataka (2020-21)
- Workshops on Green Rating for Integrated Habitat Assessment (GRIHA) for the Ministry of New and Renewable Energy, Govt. of India
- Action Plan for Total Environmental Management

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Food Safety & Security

Chapter 5

Food Safety and Security

ABSTRACT

Food safety and security are crucial aspects of public health and socioeconomic development in any country. For a nation like India with diverse population and a complex food system, ensuring the safety and availability of nutritious food is a significant challenge. . This study caters the disputes of food safety and security in India and work performed by Centre for Sustainable Development (CSD). It identifies the key challenges, explores the underlying factors contributing to these challenges and proposes a range of strategies and interventions to address them. According to studies of CSD, enhancing regulatory frameworks, strengthening infrastructure, promoting awareness, and leveraging technology in India can make significant strides in improving food safety and security for its citizens.

INTRODUCTION

Food safety refers to the practices and measures taken to ensure that food is safe for consumption and free from contamination or hazards that could harm human health. It involves proper handling, preparation and storage of food to prevent foodborne illnesses. On the other hand, food security refers to the availability, accessibility, and affordability of food for all individuals in a population, ensuring that they have an adequate and nutritious diet to maintain good health.

In India, food safety and security are of utmost importance due to: Firstly, India having a large population, ensuring the safety of the food supply is crucial to prevent widespread outbreaks of foodborne diseases that could lead to significant public health issues. According to a report by the World Health Organization (WHO), an estimated 9.4 million cases of foodborne illnesses occur in India annually, resulting in approximately 128,000 deaths. Common foodborne pathogens in India include Salmonella, E. coli, Staphylococcus aureus, and Vibrio cholerae.

Secondly, food safety and security play a vital role in reducing malnutrition and promoting the overall well-being of the population, especially among vulnerable groups such as children, pregnant women and elders.

Current Status of Food Safety and Security in India

Foodborne illnesses pose a significant public health concern in India. According to a report by the World Health Organization (WHO), approximately 100 million cases of foodborne diseases are reported in India each year, resulting in around 1.5 million hospitalizations and 5,000 deaths. The National Centre for Disease Control (NCDC) reported that between 2013 and 2017, there were over 100 major foodborne disease outbreaks, affecting thousands of individuals across different states.

The Food Safety and Standards Authority of India (FSSAI) conducted a nationwide survey in 2019, which revealed that 15% of food samples tested were found to be adulterated or substandard. Commonly adulterated food items include milk, edible oils, spices, and packaged food products.

Contamination with heavy metals, pesticides, and microbial pathogens is another issue affecting food safety in India. Limited access to safe and nutritious food, poverty, inadequate social safety nets, and climate change-induced challenges contribute to food insecurity in India.

To tackle these challenges, the Indian government has implemented various measures to improve food safety and security. The FSSAI plays a crucial role in formulating and enforcing food safety standards. The authority conducts inspections and audits of food businesses and imposes penalties on non-compliant entities. Additionally, initiatives like the Mid-Day Meal Scheme and the National Food Security Act have been introduced to enhance food security and improve access to nutritious food for vulnerable populations.

Institutional interventions address various aspects of food security, including availability, accessibility, and affordability of food. They aim to enhance agricultural productivity, improve nutrition, and uplift the socio-economic conditions of vulnerable populations. Continued efforts and effective implementation of these interventions are essential to achieve food security for all in India.

Case Studies and Best Practices of CSD

FSSAI has launched the Food Safety Training and Certification (FoSTaC) program which aims to train and certify food handlers and supervisors in various aspects of food safety including hygiene, food handling and storage. FoSTaC has been instrumental in improving the knowledge and awareness of food handlers, leading to better adherence to food safety practices. Additionally, FSSAI has implemented a robust surveillance and monitoring system which includes regular inspections, audits, and sampling of food products to ensure compliance with safety standards. FSSAI has also established a centralized online platform known as the Food Safety Compliance System (FoSCoS) which allows real-time monitoring and reporting of food safety-related activities. In this regard, FSSAI has given a study to CSD to understand the food safety and quality in Karnataka and India.

The study conducted by CSD focuses on evaluating the implementation of food safety in the state of Karnataka and suggesting ways to improve its effectiveness. It was undertaken in four cities of Karnataka namely, Bangalore, Mysore, Gulbarga, and Hubli. The findings reveal that the food safety implementation strategy in Karnataka includes pilot studies in selected areas to evaluate effectiveness and gather data. However, there is a shortage of manpower with 72.7% of posts remaining unfilled, leading to insufficient testing and lack of oversight. The study also identifies the discrepancies between information provided by the officials and that on the website and National Accreditation Board for Testing and Calibration Laboratories (NABL). Additionally, consumer and producer protection are highlighted as an important concern and the need for awareness training programs for food establishments to comply with FSSAI guidelines is emphasized.
Comparative analysis with other states such as Gujarat, Maharashtra, Tamil Nadu, and Telangana revealed that Karnataka falls behind with respect to food safety practices. Gujarat stands out with the highest number of tested samples and the lowest number of non-confirming samples. Other states have dedicated to food safety departments as part of relevant government departments.

Comparative Analysis of Food samples

Sl. No	State/ UT	Total Samples Analysed		Non- Conforming samples found		No. of penalties		Penalty Amount (in Lakhs)	
		2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
1	Gujarat	9576	9884	713	822	382	37	259.82	195.89
2	Karnataka	3257	3945	426	456	236	146	40.27	9.5
3	Maharashtra	9022	4724	1532	1036	141	529	17.34	119.96
4	Tamil Nadu	7383	5730	2461	2601	-	1485	224.66	501.11
5	Telangana	823	1760	175	168	20	15	-	2.48

Source: Food Safety Impact Implementation Assessment

Further, this study highlights various issues and loopholes in Karnataka's food safety department including inconsistent leadership, inadequate staff, insufficient funds, and infrastructure. Recommendations were provided to address these challenges including, administrative corrections and Adoption of best practices and techniques from other successful states. Overall, addressing these issues and implementing corrective measures can lead to the effective functioning of Karnataka's food safety department, ensuring safer and higher-quality food for the population.
In another case study, Centre for Sustainable Development was given the task of performing the pilot project in Jayanagar complex and its surrounding areas (Ward No. 168 and 169), Ward no 28 and 29 in Kammanahalli division in Banaswadi range in an urban area and Mavanahalli Panchayat in Gubbi Taluk, Tumkur District. The purpose of the report is to create a food safety plan for Panchayat Raj Institutions (PRIs) and Urban Local Bodies (ULBs) which includes identifying of parameters that can be monitored, who is responsible, how resources are allocated and the available funding sources. Identifying capacity-building initiatives is needed for the implementation of food safety plan in rural and urban areas and also determining the role of non-governmental organizations and Panchayat Raj Bodies in implementing the food safety plan. The study also aims at how PRIs and ULBs can be outfitted to handle licensing and registrations along with creation of manual on food safety for panchayats. According to the project, assisting the trainers for BBMP was a crucial step where in the instructors are now able to guide additional employees who are in charge of carrying out the Food Safety Act. The new Act is becoming more eminent among different food traders and giving traders guidance on how to perform their business cleanly. Further, the report clearly executed the need for food safety and identification of common food adulterants by raising awareness among teachers and students who were in turn able to spread it to different citizen groups. Thanks to the creation of awareness among Anganwadi workers, women's groups, and medical staff. The Food Safety Act is more effective when policymakers and practitioners are more informed. The report recommended: firstly, there should be an importance and necessity for awareness among food traders and consumers. Secondly, the necessity for a separate implementing body, and the necessity for recognizing the best practices. Thirdly, the necessity for involving school children and teachers, there should be a demonstration of identifying food adulterants. In addition, there must be an interaction between consumers/ implementers/ food operators and the role of ICDS. Finally, facilities in Anganwadi's, ICDS centres, and schools in rural areas

Table 2: Survey Results in Jayanagar, ward 168, 169

Total Number of Establishments	281
Number of establishments with low risk	116
Number of establishments with medium risk	120
Number of establishments with high risk	34
Number of establishments that are licensed	190

RECOMMENDATIONS

Community-based food safety initiatives have played a crucial role in improving food safety at the grassroots level in India. These initiatives involve active participation and collaboration between communities, local authorities and non-governmental organizations (NGOs). This initiative not only ensures the safety of street food but also improves the livelihoods of vendors by instilling consumer confidence.

Further, Public-Private Partnerships (PPPs) have proven to be effective in addressing food safety challenges in India. These partnerships involve collaboration between government agencies, private sector entities, and research institutions to improve food safety practices and standards.

The case studies demonstrate the importance of multi-stakeholder collaboration and targeted interventions to improve food safety in India. By implementing these practices and by adopting a comprehensive approach, India can make significant strides in ensuring a safer and more secure food supply for its population.

CONCLUSION

Addressing the challenges of food security requires concerted efforts from the government, regulatory bodies, industry stakeholders, and consumers. Strengthening food safety regulations, enhancing infrastructure and resources, improving coordination among the supply chain, promoting hygiene and sanitation practices, increasing awareness, and investing in sustainable agriculture are important steps to overcome these challenges and ensure food safety and security in India.

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Climate Action & Low Carbon Development

Chapter 6
Climate Action and Low Carbon Development

ABSTRACT

Climate change is one of the most significant issue currently faced by the humanity, with far-reaching impacts on ecosystems, economy and society. There is a need for urgent and ambitious climate action to mitigate greenhouse gas emissions, adapt to changing climatic conditions, and promote low carbon development. This study provides an in-depth analysis of climate action and low carbon development that are conducted by Centre for Sustainable Development (CSD). It delves into the role of international agreements, national policies, and technological advancements in fostering a sustainable and low carbon future. The study highlights CSDs successful case studies, best practices, and recommendations for effective climate action, emphasizing the importance of collective efforts from governments, businesses, communities, and individuals.

INTRODUCTION

IClimate change is a defining challenge of our time, with far-reaching consequences that threaten the well-being of both present and future generations. As global temperatures continue to rise, extreme weather events, rising sea levels, and disruptions to ecosystems become more frequent posing unprecedented risks to economies, societies, and the environment. In response to this urgent threat, the call for climate action and low carbon development has become imperative to steer the world towards a sustainable and resilient future (Dahan and Kocaman, 2017).

Low carbon development, on the other hand, is an approach that seeks to achieve economic growth and development while minimizing the carbon emissions and environmental impact. It encompasses a shift away from carbon-intensive practices and the adoption of sustainable technologies and practices that lead to reduced greenhouse gas emissions. Low carbon development is a pathway towards building climate resilience, promoting resource efficiency and fostering green economy that balance human needs with environmental preservation (Gupta J and Gupta S, 2018).The Paris Agreement, a landmark international accord signed in 2015 unites nearly all nations in a shared commitment to limit global warming to well below 2 degrees Celsius above pre-industrial levels. This agreement emphasizes the importance of individual countries, Nationally Determined Contributions (NDCs) to collectively achieve this ambitious goal. However, substantial challenges lie ahead. Financial barriers, technological constraints, political obstacles and societal resistance must be overcome to accelerate the transition towards low carbon development. The importance of climate action and low carbon development has gained increasing recognition due to the urgency of addressing climate change and its potential . devastating impacts on ecosystems, economies, and societies worldwide

The Role of CSD in Climate Action and Low Carbon Development

A national action plan to combat the effects of climate change was developed by the Prime Minister's Council known as National Action Plan on Climate Change(NAPCC) to address the risks that climate change poses to natural resources and human livelihoods in India. As part of the action plan, eight national missions were established: In response, the Indian government suggested that each state create a state action plan to combat climate change. As a result, the State Action Plan was being created by the Karnataka government.

According to CSD report, state governments must have action plans as well, even though the Indian government continues to play a major role in determining the nation's climate change policy to ensure greater coherence between the national and state-level strategies. Furthermore, states have more experience with adaptation and mitigation difficulties. This is why the state of Karnataka has a climate action plan. An initial workshop was held to gather input from the various stakeholders before the action plan preparation process began. After the foundation was established, the state's twelve most important sectors were determined. The twelve sectors are Agriculture, Forestry, Industry, Power, Urban, Water, Coastal, Fisheries and Animal Husbandry, Health, Mining, Transport, and Waste. Next, a step-by-step analysis of climate change issues was done for each of the identified sectors. The ten agroclimatic zones in the state had their vulnerability assessed. The Karnataka Climate Change Action Plan was created while taking into account the climate change issues, the state's vulnerability index and the government's response to these issues. Further, a private organization (Bangalore Climate Change Initiative-Karnataka) established more recently, to study the effects of climate change on Karnataka's natural environment, forecasted an increase in temperatures and a decrease in monsoon rains across the state. Given that, Northern Karnataka is the second-driest area of the state, predicted climatic variations will be harmful to the ecology and environment unless proactive measures are taken to protect them. The adaptive and mitigating strategies for the twelve sectors' respective climate change issues have been identified in the synopsis of the Karnataka Climate Change Action Plan. The report also demonstrates the Key Actions-2020.

BCCI-K was asked by the government to assist with research and analytical studies. Due to the vast differences in agroclimatic zones, provincial policy

decisions must be supported by region-specific and realistic approaches. Climate change projections at the national level reveal that Karnataka is extremely vulnerable and could have a significant impact on millions of people in both rural and urban areas. The impact on food production, water resources, fisheries, biodiversity and community livelihoods that depend on natural resources will be devastating. Thus, a thorough identification and analysis of the ecosystems, dependent communities, production systems and cultural and traditional ways of life that are either vulnerable to climate change or require change was carried out.

Concerns about climate change have facing a variety of difficulties. For instance, the agriculture industry supports more than 50% of the state's population and more than 80% of farmland is rain-fed. As a result, droughts and floods have a disastrous impact on farmer's ability to make a living. It is necessary to develop and spread adaptation strategies to help people deal with the effects of climate change. Similarly, options for adaptation or mitigation in other industries, in particular to Energy, Cement, Agriculture and Transport should be considered as a part of the consultation process leading to the identification of opportunities for mitigation through the spread of energy-efficient and renewable technologies. The report explains the most crucial factors are the overall strategy and planning for growth. This must be done with care to guarantee that those who are economically disadvantaged are represented in the growth narrative. It is important to carefully plan for environmentally sustainable inclusive growth. The government's rural development and social welfare departments, NGOs that assist the poor and Women's Self-Help Groups must be consulted adequately regarding this social dimension. Karnataka is divided into ten agro-climatic zones for the micro-level comparative study and suggested better strategies for sustainable rural, urban and peri-urban landscape development and conservation of biodiversity. In addition, it is crucial to inform the stakeholders about scientific assessments and scientific/technological options to address climate change because, it's projections and impact assessments are characterized by uncertainty and model limitations. All decisions should be made with input from and with consultation of parties who will be directly impacted by the effects of climate change, as well as their elected representatives.

Capacity Building for a Cleaner Production

The study demonstrates the overview of cleaner production including techniques for low carbon development. Current environmental problem-solving strategies concentrate on management of waste and emissions that have already been produced. It examines solutions only after the waste has been produced and is sometimes referred to as the End-of-Pipe method (EOP). In actuality, this entails investing in and maintaining, sometimes at great expense, wastewater treatment facilities, air scrubbers, trash Incinerators, detoxification facilities and safe landfills. EOP alone continued to be well-liked by the industries since the management of the waste was attainable. After realizing the necessity to reverse their production sequences due to receiving environment's nearing depletion of its ability to absorb pollutants, companies developed the proactive method to waste reduction at source in waste management. In other words, it became clear that cleaner production was necessary today. The goal of cleaner manufacturing is to stop or reduce the generation of waste and pollutants. Cleaner production's fundamental tenet is preventing problems before they arise makes more sense than trying to solve them after they arise.

In addition to the financial savings from using less energy and raw materials, cleaner production also has additional advantages like improved working conditions and a better business reputation. Cleaner production may not (in fact, won't) solve all environmental issues at a plant, but it helps to reduce the requirement for end-of-pipe treatment, equipment installation and operation as well as the amount of hazardous waste that has to be treated and disposed of. The frequency and severity of accidents and chemical releases are frequently reduced as a result of cleaner production modifications.

Furthermore, cleaner production options or measures could be grouped into three major categories namely; Waste reduction at source, Recycling and Product modification. In addition, recycling is the process of recovering and reusing waste energy and materials on-site. The components recovered can either be utilized again in the same process or put to another use, such as making beneficial by products like ligno sulphates from black liquor or recovering lignin to use as a soil conditioner. Cleaner production leads to better efficiency and lower waste treatment costs. Additionally, cleaner production projects a positive environmental image for the borrower and thus improves the accessibility to financing. The market requirements are met and a company’s ability to compete and get access to the green market increases. It also improves the quality of the environment and better compliance with environmental regulations. Therefore, adopting cleaner production is a proactive and positive measure which can help the concerned company build confidence with the public regarding its environmental responsibility.

RECOMMENDATIONS

International Agreements and Commitments play a crucial role in addressing climate change on a global scale. These agreements are essential for fostering international cooperation, setting emission reduction targets and collectively working towards a sustainable and low-carbon future. One of the most significant and widely recognized international agreements are the Paris Agreement, adopted on December 2015 under the United Nations Framework Convention on Climate Change (UNFCCC).

Overall, international agreements and commitments, especially the Paris Agreement and NDCs serves as the critical mechanisms for driving global climate action. By fostering cooperation, setting collective goals and ensuring accountability, these agreements offer hope for a sustainable and resilient future for our planet. Moreover, the introduction of carbon credits and emissions trading offered an innovative way for countries to meet their reduction targets. Additionally, the strict focus on developed countries' emission reduction is required.

Top of Form the SDGs, adopted in 2015, include Goal 13, which specifically calls for urgent action to combat climate change and its impacts by implementing policies and strategies to reduce emissions and increase resilience to climate-related hazards. The SDGs aim to end poverty, protect the planet and promote prosperity for all. The CSDs Round Table Workshop Series conducted in different cities considered its challenges and suggested possible recommendations (refer Round Table Workshop Series)

The studies conducted underscores the importance of global cooperation in addressing climate change and promoting low carbon development. They emphasize the need for collective action, ambitious targets and sustainable practices to safeguard the planet and ensure a resilient and sustainable future for all.

CONCLUSION

Climate change is a complex and multifaceted challenge with far-reaching impacts on both the world and India. Rising temperatures, extreme weather events and disruptions to ecosystems threaten human livelihoods, biodiversity and the overall well-being of the planet. CSD studies highlight an urgent and concerted action required at global, national and local levels to mitigate greenhouse gas emissions, adapt to changing climatic conditions, and build resilience to foster sustainable development.

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- Training Programme on Cleaner Production for Key Resource Persons (KRPs), Karnataka Cleaner Production Centre (KCPC).
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Projects/Activities Undertaken by CSD related to Climate Action and Low Carbon Development

- Karnataka Climate Change Action Plan Workshop (2012)
- Roundtable on the outcome of Paris Summit (COP 21) on Climate Change and its implications for India (2016)
- Training Program on Climate Resilient Cities and Disaster Management - St. Joesph College (2018)
- Green Buildings - Design and Construction - Adhiyamaan College of Engineering (2019)
- Climate Resilient Cities and Disaster Management (REVA university) (2019)
- Verification of enterprises participating in Hydro Chlorofluorocarbons (HCFCs) Phase out Management Plan (HPMP) Stage 1 - Foam Manufacturing Sector
- Reporting Local Initiatives on Climate Change
- Awareness on cleaner production at Mysore

ACCELERATING sustainability

Nearly everyone who has thought about sustainability would have, at some stage, come upon the Keeling curve, which charts atmospheric carbon dioxide in parts-per-million-by- volume (ppmv) over the years. When we first encountered it, this measure was at 350 or so. Now, it has risen steadily year on year to cross 450. And it seems we have been curve-watching and despairing, rather than deterring this onward march.

This has been the tragedy of the human response to the climate crisis. The challenges we face in creating and maintaining a live-able environment for ourselves and for future generations were largely known in the early 1990s. Indeed, to our shame, it could even be said that many of the solutions to the challenges were also known 20+ years ago. We've quite simply failed to take this seriously enough.

There have been some advances. Innovations in every aspect of living are popping up all around us, and the pipeline for these appears very long. In many fields like energy conservation, waste recycling, traffic management, there are constant efforts ongoing to improve life in the cities. And across the world, there are thought leaders, entrepreneurs, architects and urban designers and public officials who can point to successful interventions they have been part of.

What's missing? **Speed.**

We are surrounded by good ideas that are taking hold slowly. Rainwater harvesting in cities - even those that face water deficits - is painfully slow. Switching to energy-efficient devices is similarly gradual. Only a very small portion of urban waste is properly collected and recycled. And tons of goods are wasted because of gaps in supply chains and logistics. In these, and other areas affecting sustainability, we find that the adoption of what is already known is far from what it should be.

Looking back over the last 30 years, it is clear there were always two goals within the phrase 'accelerating sustainability'. However, nearly all our attention has been focused on the second word, and in the process, we've not sufficiently paid attention to the first one - acceleration. Moreover, in choosing to focus on sustainability, we have put all our marbles in the small basket of educating more and more people about its importance, hoping that by their informed choices they will help arrest the runaway destruction of the planet. That has not worked.

What if we instead looked at acceleration, seeing it as a technical goal rather than the moral and ethical goal of sustainability? If we can bring speed to the learning, adoption and celebration of sustainable living, we would be doing the planet, and our species, a great deal of good. The question is 'how'? What will bring warp speed to zero waste and energy, and dramatically increase the number of people choosing to live and work this way?

This has to be an important question - and quest - for those seeking sustainability.

Article by,

Dr. Ashwin Mahesh

Dr. Ashwin Mahesh is a climate scientist-turned-social technologist and urbanist. He founded and leads LVBL Accelerator, a neighbourhood improvement company focused on quickening the adoption of sustainable products and services. Previously, he founded the electric vehicles-based transportation service, Lithium, the social technology lab, Mapunity, and the development magazine, India Together. His interests are in 'increasing the number of problem solving people', and building 'peer-to-peer relationships between state, market and society' as necessary responses to large public challenges. He teaches a graduate course based on these themes at Kautilya School of Public Policy. He was Urban Strategist for the Government of Karnataka for a brief period, and has advised several initiatives of state and national governments. He was awarded the Ashoka Fellowship for social entrepreneurship in 2009.

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Sustainability
A Policy approach in India

CONTEXT

The Vedic, Jain,Buddhist, and Kautilya's Arthshashtra established the principles of sustainability centuries ago. The pre-human and post-15th century baselines target the two extremes of temporal scale in examining human impacts on ecosystems, understanding the sociopolitical systems in which they occurred, and establishing baselines from which to assess historical contexts of sustainability. For more than 50 years, scientists, educators, and policy makers around the world have debated how best to address the sustainability crisis.

Sustainability is often thought of as a long-term goal, while sustainable development refers to the many processes and pathways to achieve sustainability. Sustainability is a social goal for people to co-exist on Earth over a long time. Sustainability is having three dimensions (or pillars): environmental, economic, and social aspects. Environmental sustainability is responsible for conserving natural resources and protecting global ecosystems. Social sustainability that identifies the negative and positive impact of business processes on people. Economic sustainability is a crucial aspect of sustainability that supports long-term economic growth. Global responses and India's approach towards sustainability and sustainable development is narrated as below:

GLOBAL RESPONSES

TThe worldwide concern for environmental degradation found expression in 1972 at the U.N.Conference on Human Environment. It was truly observed by our late Prime Minister Smt. Indira Gandhi, that environment cannot be developed in the condition of poverty, the major cause and effect of global environmental problems. Hence the development paradigm is based on growth with equity, stability and sustainability. Later, it was the Brudtland Commission's report titled "OUR COMMON FUTURE" (1987) - concluded that, the relationship between economic growth and environmental conservation should be one of the complementarity and interdependence.

The idea of growth at all costs was replaced by the idea of sustainable development. 'Sustainable Development'became a key word and its importance was reemphasized at the 'Earth Summit' held at Rio in 1992. The prime concern in all countries at present is to make environmental dimensions an integral part of their developmental plans. These two International events helped Governments to have global consensus on development and environment protection and mandated States to participate in improving, protecting and better managing ecosystems, and taking common responsibility for the future for sustainable development and to attain sustainability. Link has also been established between economic growth, environment degradation relating to the well-being of people around the world.

At the historic Rio conference, three Environmental treaties got adopted addressing the issues on Climate Change, Biodiversity and Desertification. These Treaties are the United Nations Framework Convention on Climate Change(UNFCCC) and the Convention on Biological Diversity(CBD)and the Convention to Combat Desertification(CCD). In the mean while In 1993, the UN General Assembly established a Commission on Sustainable Development (CSD).

Later, in 2000, the Millennium Summit established the eight Millennium Development Goals (MDGs) with eight Goals to be achieved by 2015. In September 2015, the United Nations Summit on Sustainable Development gave birth to Agenda 2030 and its seventeen sustainable development goals. The SDGs are global goals, built upon the erstwhile Millennium Development Goals in 2015. They are exhaustive, universal and integrated and emphasize on core areas of poverty and inequality, economic growth, innovation, sustainable consumption and production, climate change, peace and justice and partnerships.

Fact is that the three Rio Conventions (CBD, UNCCD and UNFCCC) are well known in the context of the sustainable development, while most other multilateral environmental agreements address the sustainable use of natural resources and the environment or the protection of the environment in such a way as to ensure its sustainable use.

The UN Environmental Program, in its "Making Peace With Nature" Report in 2021, found addressing key planetary crises, like pollution, climate change and biodiversity loss, was achievable if parties work to address the Sustainable Development Goals. In current regime, sustainability and sustainable development guide policy makers at global, regional, national and local level for societal state or development.

INDIA'S RESPONSES/ POLICY ACTIONS

The independent India much before to the Stockholm Conference in 1972 established legislations to control felling of trees, destruction of forests, unplanned town growth etc. and promulgated The Factories Act, 1948 ,that the liquid effluents, gases and fumes generated during a manufacturing process should be treated before their final disposal to minimise the adverse effects.

During this period stress on economic development was greater and environmental considerations took a back seat in policy making. Further in 1957 The Mines and Minerals (Regulation and Development) Act was enacted to protect the land.

However, the Stockholm Conference on Environment and Development had largely influenced on environmental policy making leading to an amendment of the Constitution, followed by important legislations such as the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 and creation of institutions such as Central and State Pollution Control Boards for implementing the provisions of the Acts.
The National Council for Environmental Policy and Planning within the Department of Science and Technology that same year. It was later transformed into the Ministry of Environment and Forest (MoEF) in 1985, which is an apex body to regulate and ensure environmental protection in India. Later In 2014, the Subramanian Committee – set up by the Ministry of Environment, Forest and Climate Change (MoEFCC). This Ministry became nodal agency and responsible for compliance of the provisions of various Environment Conventions /Protocols/treaties to protect the Environment and the Earth of which India is the Party .

The protection of environment has been mandated in the Constitution in Articles 48 A and 51 A (g), strengthened by judicial interpretation of Article 21. (42nd Amendment of the Constitution in 1974).The water Act,1974, The Wild Life Act 1974 and Air Act 1981 enacted to prevent pollution and protect wildlife in India. Further, The Environment (Protection) Act, 1986 defines environment as “environment includes water, air and land and the interrelationship which exists among and between airs, water and land and human beings, other living creatures, plants, micro-organism and property”. There are some other regulatory and policy measures have been adopted in India to directly or indirectly support in protecting the Environment and conserving the natures and its resources, since 1972 at national and subnational level. The country has moved from reacting to environmental conventions as an obligation to setting an example in sustainability efforts in many ways. The Environment protection Act ,1986 ,further supported by various rules under the act and The National Green Tribunal Act 2010 for effective enforcement.

The government of India has taken steps ahead to safeguard the environment, combat climate change, to achieve the Sustainable Development Goals and attaining the sustainability, prepared National Environment Policy 2006, National Action Plan on Climate Change,2008 with ten Nation Missions and State Action Plan on Climate Change and District Environment Plan. In response to the Paris Agreement on Climate Change, National Determined Contribution has been prepared in 2015 and updated in 2022 based on the declaration made by Our Prime Minister in the COP26 held in Glasgow.
India's commitment to decoupling economic growth from environmental degradation is seen in the country's decision to adopt strengthened NDCs. These don’t obligate any sector-specific mitigation measures. The country aims at gradually lowering its total emission intensity and to boost its economy's energy efficiency while also safeguarding the weaker sections of the economy and society.

In January 2018, MoEFCC launched the Green Good Deeds (GGDs) movement as a social movement with the aim to bring about mass environmental awareness in the society at all levels. GGDs are simple, practical steps that every individual may perform in day-to-day life in order to adopt an environment-friendly lifestyle. A compilation of such deeds has also been published under the title ‘Green Deeds & Habits for Sustainable Environment’. Promotion of GGDs among school and college students has been taken up under the National Green Corps (NGC) “Eco-club” programme. Cleanliness drives, plantation drives, awareness on waste management, minimizing use of single-use plastic, eco-friendly celebration of festivals, etc. are some of the activities undertaken by Eco-club students.
India has welcomed the adoption of the 2030 Agenda for Sustainable Development Goals (SDGs) by the United Nations Organisation this agenda .The NITI Aayog, the think tank of the Indian government, has been entrusted with the responsibility to coordinate the targets of these comprehensive goals.
India follows a holistic approach for achieving the SDGs by implementing a comprehensive array of schemes. Current flagship policies and programmes of Government of India such as Satat Bharat – Sanatan Bharat (Sustainable India), Swachh Bharat Mission (SBM), Beti Bachao Beti Padhao (BBBP), Pradhan Mantri Awas Yojana (PMAY), Pradhan Mantri Jan-Dhan Yojana (PMJDY), Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY) and Pradhan Mantri Ujjwala Yojana (PMUY) Sashakt Bharat – Sabal Bharat (Empowered and Resilient India), Ayushmaan Bharat (Universal Health Coverage) and Samagra Bharat – Saksham Bharat (Inclusive and Entrepreneurial India) are the steppingstones for the execution of the broader sustainability agenda. These initiatives are reflective of reforms in economic empowerment, climate action, infrastructure development, renewable energy, hygiene and healthcare
In the above line States have also been advised to undertake similar mapping, including visioning, planning, budgeting, and developing implementation & monitoring systems for the state-sponsored schemes that are being implemented to fulfil the SDGs.
While India is celebrating Amritkal, has identified seven priorities, the Saptarishi, which are guiding India into its Amrit Kaal,The Indian budget has narrative in favour of decarbonisation and encouraging green energy as a significant component of transformational changes.
To facilitate India’s journey towards Green and sustainable growth the national budget2023-24 has announced five schemes namely: a)The National Green Hydrogen Mission is a core lever to catalyse meaningful change in the economy. b)The “Sustainable Cities for Tomorrow” are being forged through urban planning reforms that are set to be implemented through the length and breadth of the country. c)A critical pillar for achieving sustainability is enhancing battery energy storage. The government announced its support for setting up a battery energy storage of 4,000MwH through viable gap funding “to steer the economy.” Driving behavioural change, a Green Credit Programme has been notified under the Environment (Protection) Act.

This will incentivize environmentally sustainable and responsive actions by companies, individuals and local bodies, and help mobilise additional resources for such activities. d)The PM-PRANAM (PM Programme for Restoration, Awareness, Nourishment and Amelioration of Mother Earth) Scheme is set to promote alternate fertilisers and the balanced use of chemical fertilisers.e)A key enabler of the circular economy model is the GOBARdhan (Galvanizing Organic Bio-Agro Resources Dhan) scheme that sets out to create 500 new 'waste to wealth' plants. f)Urging farmers to adopt natural farming, Bhartiya Prakritik Kheti Bio-Input Resource Centres were announced. g)The Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI) builds upon India's afforestation successes and prioritises mangrove plantation along the coastline and on salt pan lands through convergence between MGNREGS, CAMPA Fund and other sources. h) As wetland preservation drive, the Amrit Dharohar scheme will be implemented to assimilate unique local conservation values to sustain biological diversity. The budget also promoted energy efficiency in coastal shipping. Lastly, furtherances in the vehicle scrapping policy were announced in an initiative to go green.

India is pushing the LiFE — lifestyle for environment — Mission to the global forefront, drawing on the country's heritage of knowing how to live in peace with nature. These concentrated efforts will make a significant contribution to India's climate action goals. To achieve net-zero goals by 2070, India needs meaningful short-term goals till 2030 that would further help the country achieve its long-term goal. The actions under this mission are listed under 7 categories namely energy saving, water saving, reduced use of single-use plastic, sustainable food systems, waste reduction (swachhata actions), adopting healthy lifestyle and e-waste handling

India has also initiated additional measures for promoting Resource Efficiency and Circular Economy, including for prevention and management of waste. MoEFCC is the Nodal Ministry for Circular Economy Action Plan for Tyre and Rubber and has notified on 16.02.2022 'Guidelines on the Extended Producer Responsibility (EPR) for Plastic Packaging' under Plastic Waste Management Rules, 2016. The government has also implemented rules to achieve sustainable economic growth through controlling plastic waste such as Plastic Waste Management Rules, e-Waste Management Rules, Construction and Demolition Waste Management Rules, and Metals Recycling Policy. These rules have been formed

Despite the fact that India is taking various initiatives for successful implementation of SDGs, National Statistics office, under the Ministry of Statistics and Programme Implementation, in June 2023 brings down the weight of major challenges that sustainability initiatives face in India, except the financing part of the SDGs. The major challenges for attaining SDGs in India are, Defining the Key Indicators Financing Sustainable Development Goals: Monitoring & Ownership of Implementation Process and Measuring the Progress.

India is one of the few countries in the world where Environmental laws that support sustainable development, that mandates CSR reporting and expenditure at corporate level. The Companies Corporate Social Responsibilities Policy Rules (2014) and Companies Act (2013) hold certain businesses (i.e., with a certain net worth, turnover, or net profit) to sustainability reporting standards. Yet India is still one of the most polluting countries.

I Like its expansion of labor protection and revision of chemical management, the country plans to address this issue through a broader scope of environmental protection.

.In India, sustainability reporting by corporates has evolved over the years, reflecting a growing commitment to sustainability practices and , reporting will remain a key tool for businesses to showcase their commitment to a greener, more inclusive future. It is inclusive and comprises important aspects like Sustainability Strategy & Framework, Environmental Performance: Social Performance: and economic performance. Sustainability Reporting is significant in India because it mandates, Transparency and Accountability; Risk Mitigation; Competitive Advantage and Regulatory Compliance.

Increasing the awareness of sustainability by offering a sustainability unit in educational institutions, awareness programs such as training, workshop, education, seminar, financial support from management, and proper knowledge of benefits and risks associated with sustainability before adopting sustainability in business areas, are some recommendations.

Recently concluded G20 Summit in India as Chair addressed a broad spectrum of issues, encompassing poverty and inequality, financial stability, and debt relief, among others—all of which fall under the broad umbrella of the United Nations (UN) Sustainable Development Goals (SDGs) Agenda 2030 and navigate the intricate landscape of these pressing issues and steer the G20's collective efforts towards advancing the three pillars of sustainable development: People, planet, and prosperity.

CONCLUSION

It is, however, noteworthy that India's measures since 1947 and beyond 1972, include various legislation, policy and fiscal measures and other t policy interventions to protect environment, nature, human being and their wealth including socioeconomic development strategies ensures sustainability. These call for poverty alleviation, food, water and good health for all , proper education, decent job, clean and efficient energy systems, disaster resilient infrastructure, and planned eco-restoration.

India's path to prosperity is rooted in sustainability told by Hardeep Singh Puri, Union minister of housing & urban affair on the Environment Day ,2022 This has the supportof 'LiFE Movement' for Adoption of Environment-Conscious Lifestyle Global Leaders Applaud India for Focusing on Individual Behaviour Change towards Climate Change. The idea promotes an environmentally conscious lifestyle that focuses on 'mindful and deliberate utilisation' instead of 'mindless and wasteful consumption'.

Sustainability as a practice should extend beyond the sole efforts of the government. To attain sustainability a diverse set of stakeholders at play. It is important for individual stakeholders to contribute their share towards the achievement of SDGs. The private sector has also important stake on this revolution and is facilitating sustainability in practice.

As India looks to the future, it seeks to pursue an inclusive and sustainable growth trajectory by ensuring responsible consumption and sustainable resource management.

Development Impact Assessment & Communications

Chapter 7

Development Impact Assessment and Communications

ABSTRACT

This chapter explores the critical role of Development Impact Assessment (DIA) and Communications in the context of development projects and programs. DIA helps in evaluating the potential social, economic, and environmental impacts of proposed projects, ensuring sustainable and inclusive development. Effective communications play a pivotal role in engaging stakeholders, fostering transparency, and building trust throughout the project lifecycle. This chapter discusses the principles, methodologies, and best practices of DIA, as well as the strategies for successful project communications. It also highlights the outcomes of studies conducted by Centre for Sustainable Development (CSD) and empirical evidence to illustrate the significance of DIA and Communications.

INTRODUCTION

IDevelopment Impact Assessment (DIA) and Communication are two integral components that play a pivotal role in shaping sustainable and inclusive development projects and programs. DIA involves a systematic process of evaluating the potential social, economic, and environmental impacts of proposed development interventions before their implementation. This assessment helps decision-makers understand the potential consequences of their choices, enabling them to make informed and responsible decisions that align with development goals.

Effective communication is essential in engaging stakeholders, fostering transparency, and building trust throughout the project lifecycle. Communication strategies facilitate meaningful dialogue with affected communities, local authorities, civil society organizations, and other stakeholders, ensuring that their perspectives are considered in project planning and implementation. Transparent and participatory communication processes contribute to enhanced project acceptance, ownership and positive outcomes (Dalal-Clayton and Sadler, 1999)

Development projects and programs are essential for economic growth, poverty alleviation, and improving the quality of life for communities worldwide. However, they also have the potential to create adverse social, economic, and environmental impacts if not carefully planned and executed. To mitigate potential risks and enhance development benefits, the integration of DIA and Communication has become increasingly crucial (Glasson and Therivel, 2013).

Role of CSD in DIA

CSD has taken up several development impact evaluation projects to identify the challenges and suggest possible strategies to sustainably use and manage resources. In the evaluation report (Evaluation of Functioning of Karnataka State Police Housing and Infrastructure Development Corporation Limited (KSPH & IDCL) in Karnataka State (2010 – 2021, an ambitious plan to build 11,000 quarters with an estimated total cost of Rs. 1818 crore) four variables were chosen for the literature review as part of the evaluation process: Performance issues, Policy issues, Role of the Government, and Study possibilities. The final sample comprised a total of 1034 police force members, which was drawn from 13 different districts. 26 units from a sample of 26 units relevant to other works done by the Corporation as well as a 104-unit control sample were also examined. The study used both the secondary data from the Police Housing Corporation and the primary qualitative and quantitative data gathered from the field. The study's goals were examined using a multilevel methodology. Additionally, throughout all thirteen districts, a dual-level data analysis of focus group discussions and in-depth interviews was conducted. To increase the validity of the results, the FGD and IDI data acquired were also combined with the primary data as part of the triangulation technique. After identifying the numerous inputs, activities involved, outputs, and outcomes based on the scope of the study, a purposeful model of the theory of change was structured on "SMART" goals. The third step was to create an evaluation framework for the study based on the following standards: relevance, effectiveness, efficiency, impact, and sustainability.

Finally, several suggestions had been made that could enhance the Corporation's overall performance and governance, which would help to provide police officers with high-quality housing and raise their level of residential happiness in the State. The suggestions have been made by a five-point plan strategy, including the functional protocol, project planning and execution, business management process, policy measures, and capacity building & human resources for both the Police Housing Corporation and the Police Department.

In another study, (Evaluation of Rain Water Harvesting in Bangalore City) examined the rainwater collection system in Bangalore City. The key findings of the study were that, despite there being more than six lakhs BWSSB water connections, only roughly 25000 household units, and 5000 non-domestic units have implemented RWH. BWSSB and BBMP, two government agencies, have been instrumental in raising awareness about RWH throughout Bangalore. In addition, the media has also been quite influential. Further, more than 90% of respondents acknowledged their dependence on groundwater in addition to BWSSB water, even though BWSSB is the city's primary water supply. For the installation of RWH Structures, more than half of the participants paid between Rs. 5000 and Rs. 10,000. At a school (KLE Society) in Nagarbhavi, the installation of a RWH cost a maximum of Rs. 5,50,000. It is not possible to classify cost as a barrier. The study also shows that the recharge of groundwater is a more widely used method of implementing RWH at the household level.
Moreover, meeting on water shortages and RWH's eco-friendliness are two of the main benefits noted at the home level. The ability to reuse saved water is one of the key benefits mentioned among governmental and industrial groups. The study also reveals that few government and industrial organizations had concerns about RWH. However, 61% of home respondents stated that the main issue with RWH is that there aren't enough rains, which prevents groundwater from being recharged.

The Mukhya Mantrigala Nagarothana Yojane (Nagarothana), introduced by the Government of Karnataka (GoK), is the subject of a research study being conducted by CSD on behalf of the Directorate of Municipal Administration (DMA). The major goals of this study are to evaluate the Nagarothana Scheme's effects on various urban sector segments in particular and society in general, as well as to examine the scheme's advancements. The report also assesses the Nagarothana Scheme across Karnataka, focusing on phases 2 and phase 3 of implementation, finds difficulties and limitations, and suggests policy changes to enhance the scheme's success. To comprehend the Nagarothana scheme's implementation in various levels of Municipalities and City Corporations, the records and reports have been examined.

It is concentrated on several aspects, such as the degree to which the scheme managed to achieve its objectives, the extent of delivery of different components to the beneficiaries, problems and constraints faced during the scheme's implementation process, and the degree of satisfaction among beneficiary municipalities and City Corporations (CCs), to assess the overall performance of the scheme in terms of process, outcome, and impact. It also covers how the plan will be put into action, the quality standards that will be used in building the infrastructure. Finally, ideas and recommendations are made for the authorities and officials to complete the work promptly and with minimal difficulty.

Communications in Development Impact Assessment
The CSDs study on Commuters' Perception on Vayu Vajra Services in Bangalore, assesses the passenger perception of the Airport Shuttle Service in terms of its accessibility and conform level and to document passengers' expectations through feedback on Airport Shuttle Service. The survey shows that there has been a positive public perception to the program. In 900 journeys to BIA, approximately 22,500 passengers used Vayu Vajra buses. While there are nearly 23,000 seats available on 730 trips of Vayu Vajra services in a span of 24 hours, the average occupancy has been more than 6,200 seats. The average occupancy in Vayu Vajra services was just 20% when the service started, but it has reached nearly 30% within three weeks. Many airport travellers have benefited from this cost-effective means of transportation; rather than spending close to Rs 700 on a cab, travellers can go to the airport for about Rs 200 by taking a Vayu Vajra. Additionally, the BMTC personnel has proven to be very effective in providing information to customers, and the BMTC call centre has been very helpful in responding to all questions from customers. In light of these findings, BMTC has upgraded its website to make it more technologically advanced.

Nearly 80% of commuters are happy with the services provided by Vayu Vajra at the airport. If the BMTC can create a specific incentive to cover these individuals, it will be a value-added service to the BMTC as many private sector employees prefer to utilize their corporate vehicles over BMTC airport services. If BMTC can create a unique incentive program, it may be able to draw in a sizable number of clients.

CONCLUSION

In the context of India, DIA and effective communication are essential tools to address the country's unique developmental challenges while safeguarding its environment and ensuring social equity. According to CSD studies, as India continues to pursue its ambitious development agenda, integrating DIA and robust communication practices is vital to achieve sustainable and inclusive growth for all.

Projects/Activities Undertaken by CSD related to Development Impact Assessment and Communication

- Sustainable Development (SD) Framework for Bangalore Metropolitan Region (2016)
- Launch of Green Skills Academy (2017)
- National Green Skills Conference (2018)
- Green Skills Academy participated in NSDC Skill India - International Exhibition Centre (2018)
- Evaluation of Public Sector Enterprises (2019)
- Rooftop Gardening for Mount Carmel College (2019)
- Green Entrepreneurship Orientation Program (2019)
- Training Program Orientation Sessions - Jain University Centre for Management studies (2019)
- Training Program Orientation sessions - Gopalan School of Architecture (2019)
- Training Program Orientation sessions - Jain University Global Campus (2019)
- Visioning Workshop - To discuss on the growth plan and strategy of CSD (2019)
- Inter-collegiate Green Skills Competition (2019)
- Green Skills Annual Awards (2019)
- CSD has received the 51st Year SKOCH Award for Best Initiatives in Skill development (2019)
- Centre for Sustainable Development ranked in the top 50 amongst 75 Sustainability blogs/websites in the world (2019)
- Online Session on Data Science and Analytics (2020)
- Rethinking Police Reforms in India (2021)
- Evaluation of green Building Status in Bangalore
- Ease of doing business in Karnataka - BCIC
- Evaluation study of the Karnataka Public Sector Enterprises - Karnataka State Textile Infrastructure Development Corporation Limited (KSTIDCL)
- Evaluation Study of the Karnataka Public Sector Enterprises - Karnataka State handicrafts Development Corporation Limited (KSHDCL)

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Environmental Regulations in India

CATALYSTS FOR SUSTAINABLE DEVELOPMENT

Concerns about Environmental Conservation and the Demands for Development are viewed as antithetical to each other. The 1992 Policy Statement of Government of India, in this regard, clarified that the two can complement each other and that the regulatory apparatus put in place, in India, is to promote the same. The Indian Environmental Law Regime, is a testimony to this policy pronouncement.

Right to Development is a Human Right. The idea of Development in a Sustainable way, as conceptualised in the Brundland Report (-"Our Common Future") was endorsed by the Community of Nations in the Earth Summit, on Environment and Development, in 1992. It is the strategy for facilitating Economic Development without affecting the integrity and the quintessential value of the resource that is put into application, for the purpose, for now and for generations to come . India, as part of this global consensus and commitment, has internalised this Principle, in the Laws concerning Pollution Control & Waste Management and the Laws in relation to Natural Resources Management.

The thrust given to Conservation and Protection of the environment, is essentially intended to instil a sense of responsibility and to better inform and guide the process of decision-making, in the use of natural resources for various developmental purposes. The Pollution Control Regime, lays down the barest minimum Standards for one to observe and conform to. Ambient Air and Water Quality standards are prescribed, that only require one to take care, while engaging in any entrepreneurial activity, that everyone breathes easy and their access to and use of potable water remains unhindered. It is, indeed, a Pollution Control Regime that facilitates, to paraphrase the words of our Prime Minister, *"Ease of Doing Business, with Zero effect on the Environment".*

Among the laws concerning Natural Resources, the Wildlife Act, 1972, creates ecosystems for the conservation of wild varieties of Plants and Animals and imposes severe restrictions on the trade in relation to them. Since the Wild Population, are indicators of richness of quality and abundance in natural resources, any loss of them would affect the availability of resources for development. Food security and sustenance of life on earth. Provisions are made for responsible development, at a safe distance, away from the abode of wildlife which, while promoting economic progress would ensure safety and security of the wild and endangered varieties of flora and fauna.

Biodiversity Act, 2002, is yet another illustrative example, for this thread of thought. It is a law, a very progressive one , that epitomises , a kind of a "crossover regime between Conservation and Commerce", in relation to life and life forms. It stands on three solid pillars of, safety and security of Bioresources and knowledge associated with it; sustainable use of them and ensuring equity in the sharing of benefits derivable form their commercial utilization.

For the effectiveness and successful working of these laws, individuals and communities have a very significant role to play. In addition to many avenues open for their engagement, in the working of laws, adoption of environmentally benign lifestyle by every one would go a long way in both the triumph of the law and in achieving the Goals of Sustainable Development. It is with this objective in mind, a clarion call was given from India, to the global community of People, in the recent Conference of Parties on the Global Climate Change Arrangement, that they should engage in the Mission for, " LiFE"- Lifestyle for Environment. It is about Consumer Choices for products and services that have very minimum adverse effect on the Environment. The good news is that there are a number of Organisations and Research entities, that are engaged in the noble service of guiding the consumer to make a well-informed choice. The Green Skills Academy, in the Centre for Sustainable Development, Bengaluru, is one such Research and Training Outfit engaged in this Yeomans service.

The law and the contributions of these Research entities, teach a lesson of life- to attune our lives to the rhythms of nature- that would ensure wholesome development and happiness for all without anyone being left out!

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Former Professor of Law at NLSIU Bengaluru. He holds the Professorial Chair on Urban Poor and the Law, instituted by the Ministry of Housing and Urban Poverty. He is currently a member of the National Biodiversity Authority.

Journey of Sustainable Development

In the early 80's as a young manager in an era of limited access to multiple mediums of communication I was oblivious to the negative changes happening at a pace which was foreseen by the group of the Club of Rome in the 1968, that human beings use, or abuse of resources will cause immense damage to the eco systems.

Then in 1984 a gas leak at the Union Carbide India Limited (UCIL) pesticide plant in Bhopal led to the deaths of about 4000 people and adversely affected the health of lakhs of people.
This was a wakeup call for many stakeholders and GOI, and then the ministry of environment and forest was established to keep an eye on industrial practices and to make new laws to reduce the adverse effect on air, water and soil the foundational resources for our well being.

In 1988 I was transferred from Chennai to Port Blair to operate a small hotel. It was a very challenging posting, as the infrastructure of the island was very weak and practically everything had to come from the mainland and we could not take any resources for granted to operate the managed property those days.

Port Blair being a small place, I was a big fish in a small pond, as one got to know all the officials of the island. The islands were slowly getting popular with the tourists and their negative footprint in the form of littering, breaking of corals went unnoticed under my nose.

A month after my posting there I was fortunate to receive a call from the late admiral Govil, who was the Commander & Chief of the navy, to do something about the behaviour of the tourists to avoid littering the pristine islands with the packed lunch boxes.

Similarly I was nudged by the conservator of forest to tame the tourist so that they do not break the coral, or harm the mangroves, both the valuable biomes in the aquatic world which are nursery for small fish which is part of the valuable marine food chain.

We made a humble beginning in addressing both stakeholders' concerns by eliminating card board lunch box and posting messages for the tourists in all important areas of the islands to educate the tourists, the reasons for protecting corals and mangrove. (I was happy to see recently that Ministry of tourism has released a booklet for tourists called - Travel for LiFE' which is detailed list of things to do by all tourism players)

Thereafter we intuitively went deep into waste, water and energy management in the hotel and moved from conspicuous consumption to conspicuous conservation of resources.

In the recent years a wonderful vocabulary has been articulated like 0 waste enterprise, net 0 water, moving from linear production process to a circular production process. In spite of all the knowledge in the public domain conspicuous consumption is depleting all resources at a breathe taking pace.

In 1996 ILO requested me to write a case study of the sustainable development hotel model, and they shared the case study with many stakeholders globally.

In early '90s a chamber started environment division to sensitise the industry in resource optimisation, but the industry was amused with this new initiative, at a time when quality in industry was not part of their DNA.

Gradually tools like ISO 9001 started graduating to ISO 140001.Such tools helps industry to improve quality and resource efficiency.

We did not know in Port Blair about the emerging ISO rating system? Our work was done heuristically and comprehensively and in 2015 when I compared the 17 indicators of the UN sustainable development goals. I was pleasantly surprised to see we had conformed to all the 17 indicators.

Today we are at the cusp of great threat to humanity on account of climate change. Numerous COP meetings have taken place by global leaders in order not to cross the guardrail of exceeding 1.5 degree C. temperature.
As we all know climate ferocity will disrupt the farming and food supply chain create more floods, fires and drought and will affect everyone one, however the marginalized people are being affected severely during weather events.

Today we need disruptive thought leaders who will focus on the principle of less is more and ensure that the vast numbers of underserved people are given their rightful share of their basic needs.

Transformative change has to become mainstreamed vocabulary in all discourse.

Our forefathers were visionary and said that the earth is my home - ***"Vasudhaiv Kutumbakkam"***

Refer to: Travel for LiFE - A program under MIssion LiFE for Tourism Sector (May, 2023)

Article by,

Mr. Niranjan Khatri

Former Head of Sustainability
ITC

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Bengaluru Metro Rail Corporation Limited (BMRCL)

Bangalore Metro Rail Project

Bangalore City, known for its pleasant climate, green parks, and the status of being the IT capital of the country, takes pride in being the first city in South India to have a successful metro rail system.

The Phase-1 of the Bangalore Metro Rail Project, spanning over 42.3 km with 40 stations, was constructed at a cost of Rs 14,133.17 Crore. It consists of two corridors: The East-West corridor, called the Purple Line, with a length of 18.1 km and 17 stations, and the North-South corridor, called the Green line, covers 24.2 km with 24 stations. Both these lines intersect at Nadaprabhu Kempegowda station, also known as Majestic, serves as an underground interchange station. Phase-1 was commissioned in stages from 2011, and the entire Phase-1 was dedicated to the nation in June 2017.
Phase-2 of the Bangalore Metro Rail Project includes an Eastern extension of 15.81 km with 13 stations, Western Extension of 9.58 km with 7 Stations, Southern extension of 6.12 km with 5 stations, and Northern extension of 3.14 km with 3 Stations. It also features two new lines: Reach 5, with a length of 19.15 km and 15 stations, and Reach 6, covering 21.26 km with 17 stations. The complete Phase-2, spanning a total of 75.06 km with 61 stations (49 Elevated and 12 Underground), is built at an estimated cost of Rs 30,695 Crore. With the completion of Phase-2 by 2025, the cumulative operational network will reach 117 km.
The Eastern, Western, and Southern extensions have been opened for public use, and as of the current date, the operational network spans 73.81 km with 66 stations.
Phase-2A of the Bangalore Metro Rail Project covers a length of 19.75 km with 13 stations, from Central Silk Board (CSB) junction to K.R. Puram, at an estimated cost of Rs. 5,204.56 Crore. Phase-2B spans 38.44 km with 17 Stations, connecting KR Puram to the International Airport, and is estimated to cost Rs. 9,583.54 Crore. The combined Phase-2A & 2B of the Bangalore Metro Rail Project, referred to as the ORR-Airport Metro corridor, will cover a total length of 58.19 km with 30 stations. The project is expected to be completed by June 2026, expanding the total operational Metro network to 176 km.

To keep pace with the city's growth, the Karnataka government has approved the construction of 317 km of metro lines under the Comprehensive Mobility Plan (CMP) by the year 2031. A Detailed Project Report (DPR) for Phase-3 of the Bangalore Metro Rail project, covering a length of 45 km at an estimated cost of Rs 15,611 Crore, has been submitted to the Government of India for approval. Additionally, DPR is under preparation for Phase-3A of the Bangalore Metro Rail project, extending from Sarjapura to Hebbal, spanning 37 km. Feasibility studies will be undertaken for the remaining 60 km in due course.

BMRCL has successfully completed 12 years of Metro Rail Service with faultless operations. It operates at an efficiency rate of 99.85%, considered one of the best among metro systems. With digitalization of fare media and the introduction of contactless smart cards, day passes, mobile QR tickets, and National Common Mobility Cards, along with the convenience of easy recharges, the system serves over 7.5 lakh passengers per day. In addition to reserving the first coach for women passengers, stations and trains are under surveillance to ensure the safety of all passengers.
The Bangalore Metro, popularly known as Namma Metro, is providing an Affordable, Convenient, Fast and Safe public transport system, contributing towards Green and Sustainable Mobility for the City of Bangalore.

ಹಟ್ಟಿ ಚಿನ್ನದ ಗಣಿ ಕಂಪನಿ ನಿಯಮಿತ

(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಉದ್ದಿಮೆ)

ಶ್ರೀ ಸಿದ್ದರಾಮಯ್ಯನವರು
ಸನ್ಮಾನ್ಯ ಮುಖ್ಯಮಂತ್ರಿಗಳು

ಶ್ರೀ ಎಸ್. ಎಸ್. ಮಲ್ಲಿಕಾರ್ಜುನ್‌ರವರು
ಮಾನ್ಯ ಸಚಿವರು ಗಣಿ ಮತ್ತು ಭೂವಿಜ್ಞಾನ ಹಾಗೂ ರೇಷ್ಮೆ ಇಲಾಖೆ

ಹಟ್ಟಿ ಚಿನ್ನದ ಗಣಿ ಕಂಪನಿಯ ವೈಶಿಷ್ಟ್ಯತೆ

- 2021–22ನೇ ಸಾಲಿನ ಚಿನ್ನದ ಉತ್ಪಾದನೆ–1.23 ಟನ್‌ಗಳು.
- ಇದುವರೆಗಿನ ಚಿನ್ನದ ಉತ್ಪಾದನೆ–89.65 ಟನ್‌ಗಳು.
- 2021–22ನೇ ಸಾಲಿನ ವಾರ್ಷಿಕ ವಹಿವಾಟು: 625 ಕೋಟಿ ರೂ.ಗಳು, 111.16 ಕೋಟಿ ರೂ.ಗಳ ಲಾಭದ ಸಾಧನೆ.
- ನವೀಕರಿಸಬಹುದಾದ ಇಂಧನ ಅಳವಡಿಕೆಯಿಂದ ವಿದ್ಯುತ್ ಸ್ವಾವಲಂಬನೆ. ಚಿನ್ನದ ಗಣಿಯ ಒಟ್ಟು ಕಾರ್ಮಿಕರ ಸಂಖ್ಯೆ 3795.

ಕಾರ್ಮಿಕ ಕಲ್ಯಾಣ ಸೌಲಭ್ಯಗಳು

- ಸುಸಜ್ಜಿತ 120 ಹಾಸಿಗೆ ಸಾಮರ್ಥ್ಯದ ಆಸ್ಪತ್ರೆ.
- ಸಂಸ್ಥೆಯ ಪ್ರಾಯೋಜಿತ 'ಕೇಂದ್ರೀಯ ವಿದ್ಯಾಲಯ'.
- ಪೌಷ್ಟಿಕ ಆಹಾರಕ್ಕಾಗಿ ಕ್ಯಾಂಟೀನ್.
- ಕುಟುಂಬ ನಿರ್ವಹಣೆಗೆ ಮಾಸಿಕ 'ಆಹಾರ ಕಿಟ್' ವಿತರಣೆ.
- ಕ್ರೀಡಾ ಉತ್ತೇಜನಕ್ಕಾಗಿ ಸುಸಜ್ಜಿತ ಆಟದ ಮೈದಾನ ಹಾಗೂ ಒಳಾಂಗಣ ಕ್ರೀಡಾಂಗಣ

ಸಾಮಾಜಿಕ ಕೊಡುಗೆ

- ನಿಯಮಿತವಾಗಿ ಮುಖ್ಯಮಂತ್ರಿ ಪರಿಹಾರ ನಿಧಿಗೆ ಅನುದಾನ. ಕೋವಿಡ್ ಸಂದರ್ಭದಲ್ಲಿ ರಾಯಚೂರು ಜಿಲ್ಲಾ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಸಾರ್ವಜನಿಕರಿಗೆ ಆಹಾರ ಪೊಟ್ಟಣಗಳ ವಿತರಣೆ.

ಕಂಪನಿಯ ಚಿನ್ನದ ಗಣಿಗಳು:

- ಹಟ್ಟಿ ಚಿನ್ನದ ಗಣಿ, ಲಿಂಗಸುಗೂರು ತಾಲ್ಲೂಕು
- ಊಟಿ ಚಿನ್ನದ ಗಣಿ, ದೇವದುರ್ಗ ತಾಲ್ಲೂಕು
- ಹೀರಾಬುದ್ದಿನ್ನಿ ಚಿನ್ನದ ಗಣಿ, ಮಾನ್ವಿ ತಾಲ್ಲೂಕು

ಉದ್ದೇಶಿತ ಯೋಜನೆಗಳು:

ಹಟ್ಟಿ, ಊಟಿ ಮತ್ತು ಹೀರಾಬುದ್ದಿನ್ನಿ ಚಿನ್ನದ ಗಣಿಗಳಲ್ಲಿ ಅನ್ವೇಷಣೆ ಮತ್ತು ಪರಿಶೋಧನಾ ಭೂ ಕೆಳಮೈ ಗಣಿ ಅಭಿವೃದ್ಧಿ ಯೋಜನೆಗಳು. ಟೇಲಿಂಗ್‌ಗಳಿಂದ ಚಿನ್ನ ಮತ್ತು ಇತರ ಖನಿಜಗಳ ಮರು ಸಂಸ್ಕರಣೆ ಮತ್ತು ಟೇಲಿಂಗ್ ವಿಲೇವಾರಿ

ಹಟ್ಟಿ ಚಿನ್ನದ ಗಣಿ ಕಂಪನಿ ನಿಯಮಿತ

ನೋಂದಾಯಿತ ಕಛೇರಿ: ಮೂರನೇ ಮಹಡಿ, ಕೆಎಚ್‌ಬಿ ಶಾಪಿಂಗ್ ಸಂಕೀರ್ಣ, ನ್ಯಾಷನಲ್ ಗೇಮ್ಸ್ ವಿಲೇಜ್, ಕೋರಮಂಗಲ, ಬೆಂಗಳೂರು–560 047
Web: huttigold.karnataka.gov.in | E-Mail: regdoffice-hgml@ka.gov.in | Tel: +91-080-28055007/ 25710501

ಭಾರತದ ಅಗ್ರಗಣ್ಯ ಚಿನ್ನ ಉತ್ಪಾದಕರು

Vision

The Vision of the Bengaluru Smart City Limited states that "Liveable Bengaluru- Healthy, Connected & Vibrant". The BenSCL will be guided by the following key operating principles in its vision and mission.

Citizen & stakeholder Focus: Provide service to citizens & stakeholders and respond to their needs and interests in a respectful, reliable, and professional manner.

Environmental Responsibility: Plan and manage the operations as responsible stewards of our natural resources and the environment.

Safety Awareness: Perform work with a high level of safety awareness for ourselves, our fellow employees and the public.

Employee Inclusiveness: Respect and value the contributions of employees because everyone is important to the success of the operations.

Bengaluru Smart City

Healthy, Connected & Vibrant

Smart Tender Sure Roads

Smart Digital Classroom

Medical Equipment

Integrated Command and Control Centre

Mini Auditorium

K.R market Building

Cubbon Park

EV Buses

REWARD-Rejuvenating Watersheds for Agricultural Resilience through Innovative Development: A Way Forward for Sustainable and Climate Resilient Agriculture

Commissioner
Watershed development Department (WDD)
Government of Karnataka

In a predominantly agri based economy like India agricultural growth is important for reducing persistent rural poverty, but faces several challenges accentuated by climate change. Agriculture accounts for 18.2 percent of Gross Value Added (GVA) and is the primary source of livelihood for 58 percent of rural households. Land degradation, soil erosion, water scarcity, climatic uncertainties and low productivity are key challenges facing the sector. Climate change is expected to further exacerbate these challenges.

An estimated 96 million hectares (ha), representing 30 percent of the total geographical area in India, is experiencing land degradation. Climate change is one of the main drivers of land degradation in India, majority of degraded lands (85 percent) are located in dry, rainfed land areas, and mainly in six states including Karnataka. The 140.13 million ha of net sown area in the country, about 51 percent (71.745 million ha) is rainfed. As a signatory to the United Nations Convention for Combating Desertification (UNCCD), the Government of India (GoI) has committed to restore 26 million ha of degraded land by 2030 calls for treating the degraded lands on war footing on scientific basis.

Karnataka is the pioneer State in Science based watershed management by Integrating Land Resource Inventory (LRI) and hydrological data in watershed planning and management demonstrated this concept successfully under World Bank supported Sujala-III Project. Government of Karnataka based on the successful implementation of Sujala-III and lessons learnt for efficient watershed management came up with REWARD Program to upscale the concept with the support of the World Bank with a budget of Rs.600 crores (State share - 30% and World Bank assistance - 70%)in 21 Districts of the State. The program will be implemented over a period of 5 years from starting from 2021-22. At National Level Dept. of Land Resources (DoLR), GoI is also participating as a Nodal Department aiming at formulating new guidelines at based on the experience of REWARD. It is a pride for the State, since Karnataka identified as Light House State to provide technical support to other participating States.

Objective of the Program: To strengthen capacities of National and State institutions to adopt improved watershed management for increasing farmers' resilience and support value chains in selected watersheds of participating States. Implementation of REWARD program is aimed at collection of Land Resource information scientifically to issue Land Resource (LRI) cards comprising recommendation of site specific technologies for farmers for adoption at field level, and for preparation and implementation of scientific Detailed project reports (DPR) for watershed development projects.

Major feature of the program is consortium of technical partners: Program aims at bringing the various technical partners together, so as to take the technologies to farmers. The National Bureau of Soil Survey and Land Use Planning (NBSS & LUP), Indian Institute of Science (IISC), all State Agricultural and Horticultural Universities, Karnataka State Remote Sensing and Application Centre (KSRSAC) and Karnataka State Natural Disaster Monitoring Centre (KSNDMC).

Major activities to be taken up under the program:

1. Carrying out Land resource inventory (LRI) in 19.98 lakh hectares rainfed area and collecting the data.
2. Watershed treatment on saturation mode in 1.0 lakh ha rainfed area (20 sub-watersheds) based on recommendations of LRI and Hydrological studies. In order to ensure the community participation, 3 best performing Executive Committees (Gram Panchayats) will be awarded annually at State and district levels.
3. Strengthening Farmer Producers organizations (FPOs) and development of Value chain in the program area for improving market linkages for agricultural produce.
4. Maintenance and up gradation of Digital library, Decision Support System (DSS) and LRI Portal developed under the Sujala-III.All the concerned line departments can utilize this data for effective planning and implementation of their projects
5. Establishment of Centre of Excellence (CoE) on science based Watershed Management at UAS Bengaluru to mainstream LRI approach for Watershed management in entire country and will Organize knowledge exchange trainings at national & international levels.

ನೋಂದಣಿ ಮತ್ತು ಮುದ್ರಾಂಕ ಇಲಾಖೆ
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ವಿಶೇಷ ಮತ್ತು ವೈಶಿಷ್ಟ್ಯಗಳು

ಸಮಯ ಉಳಿತಾಯ
ಸಾರ್ವಜನಿಕರು ತಮ್ಮ ದಸ್ತಾವೇಜು ಅರ್ಜಿಯನ್ನು ಆನ್‌ಲೈನ್ ಮೂಲಕವೇ ಸಲ್ಲಿಸಿ ಅಂತಿವಾಗಿ ನೋಂದಣಿಗಾಗಿ ಉಪ ನೋಂದಣಿ ಕಚೇರಿಗೆ ಆಗಮಿಸಿದರೆ ಸಾಕು. ಮೊದಲಿನಂತೆ ಕಾಯುವ ಅವಶ್ಯಕತೆ ಇನ್ನಿಲ್ಲ.

ತಪ್ಪಿದ ಅಲೇದಾಟ
ನೋಂದಣಿ ಶುಲ್ಕ ಮತ್ತು ಮುದ್ರಾಂಕ ಶುಲ್ಕವನ್ನು ಈ ಮೊದಲು ಚಲನ್ ಸೃಜಿಸಿ ಖಜಾನೆಗೆ ಸಂದಾಯ ಮಾಡಬೇಕಾಗಿತ್ತು. ಇದರಿಂದ ಸಾರ್ವಜನಿಕರ ಶ್ರಮ ಮತ್ತು ಸಮಯ ಅಪಾರವಾಗಿ ಪೋಲಾಗುತ್ತಿತ್ತು. ಕಾವೇರಿ 2 ತಂತ್ರಾಂಶದ ಮೂಲಕ ಆನ್‌ಲೈನ್ ಮೂಲಕ ಖಾಜನೆ ಶುಲ್ಕ ಸಂದಾಯ ಮಾಡಬಹುದಾಗಿದೆ.

ನಿಗಧಿತ ಸಮಯಕ್ಕೆ ಖಚಿತ ನೋಂದಣಿ
ಆನ್‌ಲೈನ್ ಮೂಲಕ ಶುಲ್ಕವನ್ನು ಸಂದಾಯ ಮಾಡಿದ ನಂತರ, ಸಾರ್ವಜನಿಕರು ತಮಗೆ ಬೇಕಾದ ಸಮಯದಂದು ನೋಂದಣಿಯನ್ನು ಮಾಡಿಕೊಳ್ಳಬಹುದು. ನಿಗಧಿಮಾಡಿಕೊಂಡ ಸಮಯಕ್ಕೆ ಸರಿಯಾಗಿ ಕಚೇರಿಗೆ ಬಂದರೆ ಕೆಲವೇ ನಿಮಿಷಗಳಲ್ಲಿ ನೋಂದಣಿ ಖಚಿತತೆಯೊಂದಿಗೆ ನೆರವೇರುತ್ತದೆ.

ಸರ್ವರ್ ಸಮಸ್ಯೆಯಿಂದ ಮುಕ್ತಿ
ಈ ಮೊದಲು ಕಚೇರಿಗೆ ಒಂದರಂತೆ ಸರ್ವರಗಳು ಇದ್ದವು. ಆದರೆ, ಈಗ ಕೇಂದ್ರಿಕೃತ ಏಕಮಾತ್ರ ಸರ್ವರ್ ಇರುವುದರಿಂದ ಯಾವುದೇ ಕಚೇರಿಗೆ ಸರ್ವರ್ ತೊಂದರೆಯಾಗುವುದಿಲ್ಲ.

ವ್ಯಾಪ್ತಿ ಮಿತಿಯಿಲ್ಲ
ಸಾರ್ವಜನಿಕರು ಇಸಿ/ಸಿಸಿಗಳಿಗೆ ಇನ್ನು ಸಂಬಂಧಪಟ್ಟ ಉಪ ನೋಂದಣಿ ಕಚೇರಿಗೆ ತೆರಳಬೇಕಾಗಿತ್ತಲ್ಲ. ತಾವು ಇರುವ ಸ್ಥಳದಲ್ಲಿ ಅರ್ಜಿಯನ್ನು ಸಲ್ಲಿಸಿ ನಿಗಧಿತ ಸಮಯಕ್ಕೆ ಇಸಿ/ಸಿಸಿಗಳನ್ನು ಆನ್‌ಲೈನ್ ಮೂಲಕವೇ ಪಡೆದುಕೊಳ್ಳಬಹುದು.

For communications support email id :helpdsr@karnataka.gov.in

ಹೇಗೆ? ಎಲ್ಲಿ? ಯಾವಾಗ? ಮಾಹಿತಿಗಾಗಿ

HELPLINE
ಸಹಾಯವಾಣಿ
080 68265316

Karnataka State Seed & Organic Certification Agency

(Govt. of Karnataka Organisation)

ಕರ್ನಾಟಕ ರಾಜ್ಯ ಬೀಜ ಮತ್ತು ಸಾವಯವ ಪ್ರಮಾಣನ ಸಂಸ್ಥೆ

(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಒಂದು ಸ್ವಾಯತ್ತ ಸಂಸ್ಥೆ)

(K.A.I.C.) Premises, Opp.Baptist Hospital, Bellary Road, Hebbal, Bangalore-560 024

e-mail: dscbng@gmail.com Ph:080-23415505 website : www.kssoca.in Fax : 080-23415506

Publication Matter **Date: 31.10.2023**

Karnataka State Seed certification Agency was established in the year 1974 under the section - 8 of the Seed Act, 1966 as an autonomous body and registered under the Karnataka Societies Registration Act, 1960.

In 2013, it expanded its scope by incorporating the Organic certification division, and renamed as "Karnataka State Seed and Organic Certification Agency".

"KSSOCA is a service-oriented organization responsible for seed and organic certification.

KSSOCA provides the following four services:

1. **Seed Certification Services (IMSCS - Indian Minimum Seed Certification Standards)**
2. **Seed Certification Services - OECD - Organization for Economic Cooperation and Development**
3. **Organic Certification Services (NPOP - National Program for Organic Production)**
4. **Organic Certification Services (PGS - Participatory Guarantee System)**

- During 2022-23, total 55,037 hectares area registered for seed production out of that 4,87,161 quintals of seeds certified.
- Furthermore, during Kharif 2023, total 15,013 hectares of seed production area in progress.
- Looking ahead to 2023-24, KSSOCA registered 159 seed producing agencies and 116 seed processing plants, including KSSC, NSC, UAS, UAHS, KOF, KMF, and private producers.
- KSSOCA is also actively engaged in the organic certification of 21,649 hectares belonging to 24,445 farmers under NPOP and PGS.
- The agency is headed by Director, overseeing its vital role in Seed Certification within Karnataka and Organic Certification at National level.

Director

Director
Karnataka State Seed and
Organic Certification Agency
Bengaluru.

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SHRI SIDDARAMAIAH
Hon'ble Chief Minister
Government of Karnataka

DEPARTMENT OF SKILL DEVELOPMENT, ENTREPRENEURSHIP AND LIVELIHOOD (SDEL)

KARNATAKA SKILL DEVELOPMENT CORPORATION (KSDC)

DR. SHARANAPRAKASH RUDRAPPA PATIL
Hon'ble Minister of Medical Education and Skill Development Entrepreneurship & Livelihood

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Government of Karnataka's flagship scheme for free short-term vocational training in every district, under which more than 60,000 students are trained annually.

KARNATAKA SKILL CONNECT PORTAL

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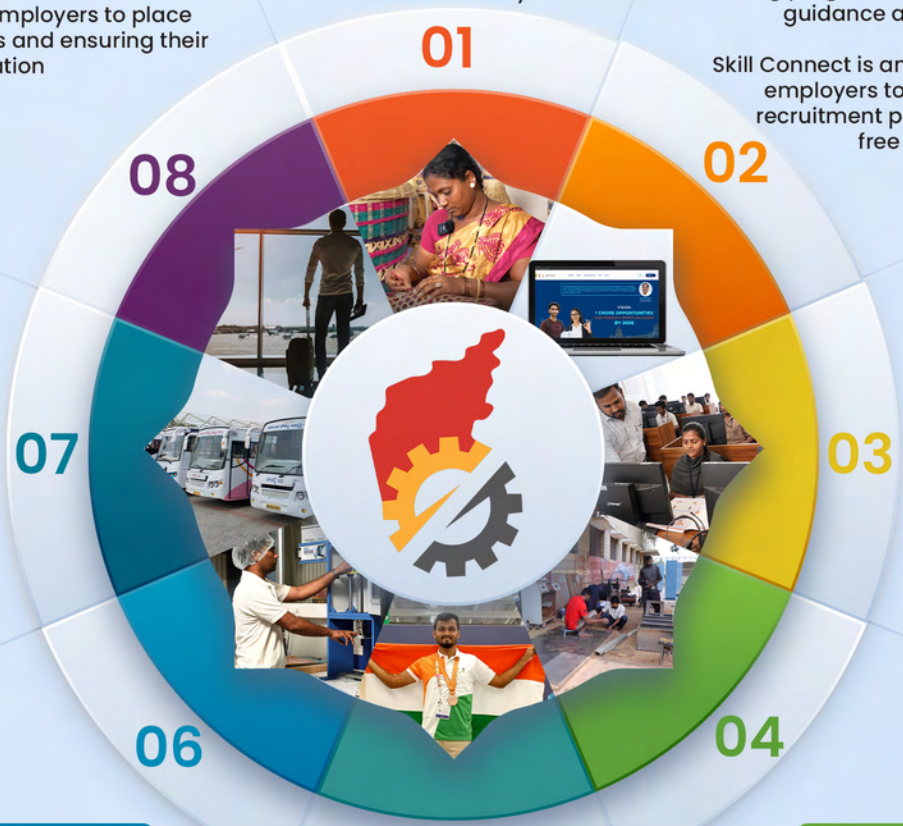
Online platform for connecting job seekers and skill aspirants to the right job opportunities, e-skilling programmes, and mentors for career guidance and development.

Skill Connect is an integrated platform for employers to conduct the entire recruitment process on the portal free of charge.

INTERNATIONAL MIGRATION CENTRE – KARNATAKA (IMC-K)

Connecting with foreign employers to place candidates in overseas jobs and ensuring their safe emigration

01 02 03 04 05 06 07 08



SKILL ON WHEELS

Skilling rural youth at their doorstep by deploying well-equipped buses as mobile training centres to train aspirants for self-employment and entrepreneurship

LANGUAGE LABS

More than 1,000 students have undergone communications training for enhancing language proficiency in the 5 Language Laboratories set up across the state.

INDUSTRY LINKAGE CELL (ILC)

To bridge the skill gap and deliver market-oriented training for youth, KSDC has instituted a green channel for companies to double up as accredited CMKKY training partners for facilitating job placements and ensuring quality vocational training

WORLD SKILLS COMPETITION

With the support of KSDC, 6 skill champions from Karnataka have secured silver, bronze and medallions of excellence representing the nation at World Skills Competitions.

SKILLING PRISON INMATES

In collaboration with the Department of Prisons and Correctional Services, 736 male & female inmates in 8 central prisons of the state have been imparted vocational training

Industries accredited by K.S.D.C

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SKILL COUNCIL FOR GREEN JOBS
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SCGJ SECTOR-WISE QUALIFICATION FOR TRAINING

Sector	NSQF Job Levels (L)								Total
	L2	L2.5	L3	L3.5	L4	L5	L6	L7	
Solar	1	1	3	1	10	6	0	2	24
Green Hydrogen	0	0	4	0	1	1	0	0	6
Wind	0	0	1	0	3	2	0	0	6
Small Hydro	0	0	0	0	1	0	0	0	1
Bio-Energy	0	0	3	0	3	1	2	1	10
Clean Cooking	0	0	1	0	2	1	0	0	4
Paper	0	0	1	0	1	0	0	0	2
Waste Management	0	0	3	0	3	0	0	0	6
FSSM	0	0	2	0	1	0	0	0	3
Waste Water	0	0	1	0	1	0	0	0	2
Rain Water	0	0	1	0	1	0	0	0	2
Total	1	1	20	1	27	11	2	3	66

SCGJ TRAINING & ASSESSMENT CAPACITY

- Certified Trainers: 3481*
- Certified Assessors: 646*
- Trained and Certified Candidates: 527535*
- No. of States and UTs Covered: 28*
- Affiliated Training Centers (PAN INDIA): 528*
- Skill Gap Studies: 10*
- Industry Member's: 521*

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(A Government of Karnataka Undertaking)

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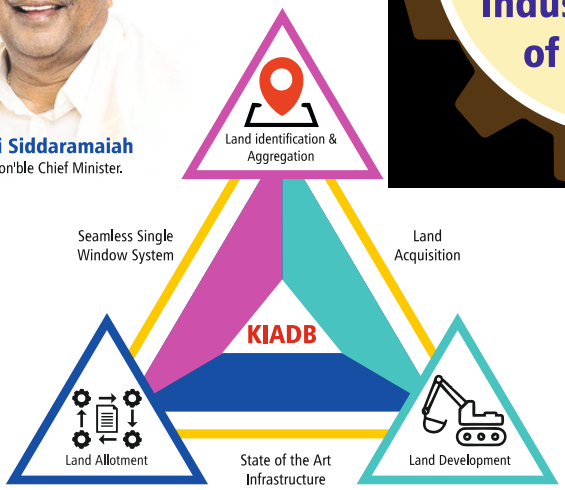
Sri Siddaramaiah
Hon'ble Chief Minister.

Sri M.B. Patil
Hon'ble Minister for Large & Medium Scale Industries and Infrastructure Development.



ACHIEVEMENTS

- Developed more than 207 Industrial Areas (IAs') across the state covering an extent of 78,796 plus acres and developed land has been allotted to more than 23,462 plus to various industries.
- Allotted more than 79,020 acres for 625 plus Single Unit Complexes (SUCs').
- Board also acquires land for Government Infrastructure projects and Private enterprises on SUC basis viz: Airports, Railways, Industrial corridors, KPCL, GAIL, BMRCL, MMLP, MSEZ, NICE, Power Grids and oil PSUs etc..

Other major Projects

Chennai Bengaluru Industrial Corridor Tumakuru Industrial Township Limited (CBIC TITL), Tumakuru
8313 Acres

Electronics Manufacturing Cluster
Dharwad
224.5 Acres

Multi-Modal Logistics Park (MMLP)
Dabaspet, Bengaluru (Rural)
400 Acres

Tumakuru Machine Tool Park (TMTP)
Vasanthanarasapura
Tumakuru, 530 Acres

Bengaluru Mumbai Industrial Corridor
Dharwad Node, Dharwad
6042 Acres

Hi-Tech Defence and Aerospace Park
Phase - I & II, Devanahalli, Bengaluru
4084 Acres

Japanese Industrial Township
Vasanthanarasapura
Tumakuru, 519 Acres

Women Enterpreneurs Parks:
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