

# NEETI VAARTA

NEWSLETTER of the DST CPR, NISER, Bhubaneswar

Volume 1

March 2024



DST - CENTRE FOR POLICY RESEARCH  
NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH  
BHUBANESWAR, JATNI, KHORDHA, PIN-752050, ODISHA, INDIA

<https://dstcpr.niser.ac.in>





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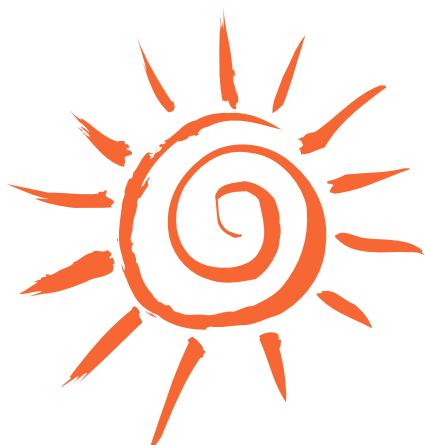
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## ABOUT

DST- Centre for Policy Research,  
National Institute of Science Education and Research, Bhubaneswar,  
Odisha

In December 2021, the Ministry of Science and Technology, Department of Science and Technology (Policy Research Programme) made an open call for the submission of Expressions of Interest in STI Policy Research towards the Establishment of the Center for Policy Research (CPR) by the academic and research Institutes In India. After multiple rounds of consultations and review, the DST-CPR at NISER received the final sanction order from the Government of India, Ministry of Science & Technology, Department of Science & Technology, bearing the letter No DST/PRC/CPR/NISERBhubaneswar-2023 (G)(PCPM) dated 29/03/2023.

The primary focus of the DST-CPR at NISER is to study the Energy Transition and the secondary focus is to study the Tribal Education, and Innovations for Tribal Education in Eastern India covering Odisha, Bihar, Chhattisgarh, Jharkhand and West Bengal.

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# PEOPLE

III



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**MAHESH KUMAR T.**  
SENIOR PROJECT ASSOCIATE  
DST-CPR



**DR. JOHN KUJUR**  
PROJECT SCIENTIST -I  
DST-CPR (UPTO JAN 28, 2024)

# PROJECT TEAM

## INTERNS



**RISHITA JENA**  
SIKSHA 'O' ANUSANDHAN  
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**ISHANI DAGA**  
SIKSHA 'O' ANUSANDHAN  
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# PROJECT TEAM

VI



**KOUSHAMBI SAMAJPATY**  
**CHRIST UNIVERSITY**



**SOURADEEP GHOSH**  
**CHRIST UNIVERSITY**



**ABHISHEK K. GUPTA**  
**IIPS, MUMBAI**

## COLLOQUY#1

# UNPACKING INDIA'S ENERGY TRANSITION AND ITS COMPLEXITIES

**Dr. Gopal K. Sarangi**  
TERI School of Advanced Studies, New Delhi

Dr. Gopal K Sarangi's presentation started with an introduction to the characterization of energy transition. The presentation emphasized the imperatives for energy transition, highlighting the unsustainability of current energy systems on various fronts, including social, economic, environmental, and geopolitical aspects. These systems are primarily reliant on non-renewable energy sources, prompting the need for a shift towards renewable energy sources and raising questions about the rate of this transition. However, our concern is at what rate we should be moving?

To illustrate the importance of energy transition, Dr. Sarangi provided a comparative analysis of annual CO<sub>2</sub> emissions in different countries and per capita CO<sub>2</sub> emissions in select countries from 2000 to 2020. India's per capita CO<sub>2</sub> emissions were shown to be 1.69 tCO<sub>2</sub> in 2020, which is much below the global average of 4.39 tCO<sub>2</sub> per capita. The presentation also depicted India's GDP per capita alongside changes in CO<sub>2</sub> emissions per capita from 1990 to 2019. Both production-based and consumption-based CO<sub>2</sub> emissions are increasing in India, while the United Kingdom is experiencing a decline.



Dr. Sarangi outlined the need and roadmap for achieving net zero. He argued that the existence of technologies in various sectors can reduce emissions to net zero. He emphasized the interconnectedness of different sectors, such as electricity and transportation, in achieving this goal. The presentation also differentiated between carbon avoidance and carbon removal from the economy and noted that some countries have already achieved net zero while others are in the process of doing so, exemplified by Madagascar and Gabon.

In his concluding remarks, Dr. Sarangi emphasized the distinction between radical and incremental changes in the context of energy transition. He also touched upon market segmentation due to structural issues and the importance of sectoral integration. Addressing institutional and policy-level inconsistencies and misalignments is essential for a successful transition. Dr. Sarangi advocated for a contextual approach to decouple climate change from energy concerns, recognizing the need for tailored solutions that take into account the specific challenges and opportunities in each region or country.



## COLLOQUY#2

# STAKEHOLDER PERSPECTIVES ON JUST TRANSITION IN INDIA

**Professor Pradip Swarnakar**

Department of Humanities and Social Sciences, IIT Kanpur



Dr. Pradip Swarnakar reflected upon the Just Transition in India from the research done by the Just Transition Research Centre, IIT Kanpur. He explained the energy transition as the shift from the coal-based energy system to the renewable energy system over time. Moreover, the just energy transition as taking care of the people who suffer due to the transition.

The transition in India is a difficult task as the Indian economy, particularly the coal sector has a large number of informal workers, and the coal industry is very much embedded into the economy. In FY 2019-20, India produced 716 million tonnes of coal and imported about 215 million tonnes. Coal India Limited supplies 83 per cent of India's total coal and has over US\$10 billion CSR spending. The major stakeholders are the power sector wherein 7,000,000 people are dependent, the iron and steel industry which contributes 2 per cent of GDP and employs 2.6 million people, the brick industry, and the Indian railways which earn 44 per cent of the total revenue from the coal industry. The states of Chhattisgarh, Jharkhand, Odisha, and Madhya Pradesh produce 80 per cent of the total coal in the country.

Many power plants in India are solely dependent on coal. For example, Uttar Pradesh has 28 units, followed by Chhattisgarh (22 units), Maharashtra (21 units), and Madhya Pradesh (20 Units). His ongoing research provides stakeholder's perception on just transition. There are three levels of stakeholders of just transition; (1) workers, trade unions, non-workers, women, (2) Power plant, coal mines, others, and (3) central and state government, district administration. In this study, the level 1 stakeholder has been primarily taken into account. Primary data were collected from 400, 500 and 170 respondents from the coal mines and power plant-dependent communities in Uttar Pradesh, West Bengal and Assam respectively.

The study shows that the trade union members are more concerned or have a better perception towards environment protection and community livelihood as they access information on climate change from various sources. The workers in the coal mines have a better understanding of the importance of community livelihood. Similarly, men have better knowledge of coal's downside than women. Furthermore, the workers in power plants are affected by air pollution and thus have a positive perception towards environmental protection.

## COLLOQUY#3

# CARBON PRODUCTIVITY IN THE INDIAN MANUFACTURING SECTOR

**Dr. Santosh Kumar Sahu**

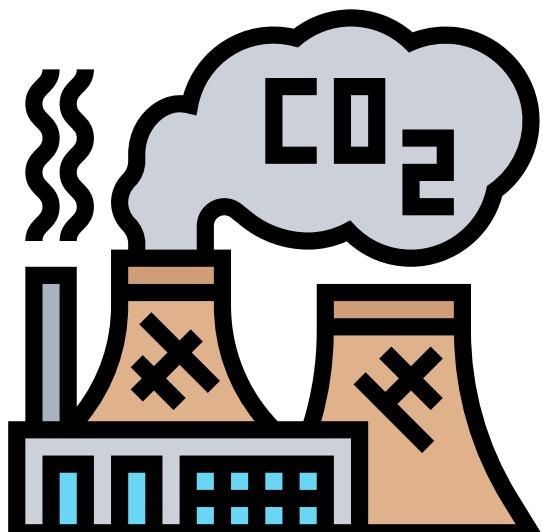
Department of Humanities and Social Sciences, IIT Madras

Climate change has emerged as a much-discussed topic in recent times. To address it, many agreements, starting from the Kyoto Protocol to the Paris Agreement to net-zero targets, have been signed among countries across the world. The countries are differentiated in terms of carbon emissions. The high-income countries produce more carbon than that of the low-income countries. India is the third highest global emitter of CO<sub>2</sub>. It emitted 2.62 billion tons of CO<sub>2</sub> in 2019 which is around 7 per cent of the global emission. To reduce carbon emissions across the world, an increment in carbon productivity has been considered an urgent need while maintaining or boosting economic prosperity simultaneously.

Given the measurement issues and methodological constraints, the research of Dr Sahu aims to estimate emissions at the firm level, measure carbon productivity, and analyse the convergence. The firm-level panel data for the manufacturing sector for the period 2004 to 2021 was derived from CMIE Prowess. The study uses IPCC's (2006) methodology to estimate CO<sub>2</sub> emissions. For the convergence in carbon productivity  $\delta$  and  $\beta$  convergence are used.  $\delta$  convergence shows that industries such as basic metal, chemical and chemical products, fabricated metal, machinery and equipment have achieved cost efficiency and technological upgradation during 2004-2021, however, their carbon productivity has remained stagnant. On the other hand, industries such as coke and refined products, computer, electronic and allied, electrical equipment, food products, motor vehicles, and paper and paper products have also achieved cost efficiency and technological change, but their carbon productivity convergence has declined.



Industries such as pharmaceuticals, rubber and plastic, and textile have achieved both cost efficiency and technological upgradation and have also increased their carbon productivity i.e., these industries are using less energy and emitting less.  $\beta$  convergence is of two types, absolute  $\beta$  convergence and conditional  $\beta$  convergence. In short, the results show that, as a whole, the carbon productivity of India's manufacturing industry does not exhibit obvious convergence or divergence over time. The sectors with low carbon productivity grow faster than those with high carbon productivity.



## COLLOQUY#4

# POWERING A SUSTAINABLE FUTURE: DOES ECONOMIC STRUCTURE INFLUENCE THE ECOLOGICAL FOOTPRINT?

**Dr. Malayaranjan Sahoo**

Institute of Energy Policy and Research, National University of Tenaga (UNITEN), Malaysia

The ecological footprint measures the environmental impact of human activities, expressed in terms of the amount of biologically productive land and water required to support those activities. In the case of India, the ecological footprint reflects the demand on its ecosystems and natural resources to sustain the country's population and lifestyle. The concept of biocapacity is closely related to the concept of an ecological footprint. While biocapacity measures the Earth's capacity to sustain human activities, the ecological footprint measures human demand for nature's resources and ecosystems. When a region or country's ecological footprint exceeds its biocapacity, it means that it is consuming resources and generating waste at an unsustainable rate in the long term. It is effectively running an ecological deficit. India represents approximately 6 per cent of the world's Ecological Footprint, 4 per cent of the world's biocapacity, and 17 per cent of the world's population.

The main objective of the study is to investigate the impact of agricultural, industrial, and service sectors, technological innovation, and renewable energy on India's ecological footprint by conducting dynamic Auto Regressive Distributed Lag (ARDL) simulation. The study used time series secondary data for India from 1990 to 2021. The findings of the Dynamic ARDL Simulation showed that the agricultural and industrial sectors have positive impacts on the ecological footprints both in the long-run and short-run.



The use of chemicals, pesticides, and fertilisers in agriculture has adverse effects on the environment. Run-off from fields containing these chemicals can enter water bodies, causing pollution and further contributing to the ecological footprint. The examined outcome of the service sector indicated a negative and insignificant effect on the ecological footprint in the long run but not in the short run. Similarly, technological innovation showed similar results. Renewable energy revealed a negative relationship in the long and short run with the ecological footprint. Besides, in line with the expectations, the value of the Error Correction Term (ECT) was negative. The impulse response functions of dynamic ARDL simulations were conducted to expose specific independent variable shock on the outcome variable by keeping others constant. The plot signified that 10 % positive changes in the agricultural sector and industrial sector increases the ecological footprint. An increase or decrease in ecological footprint will result in negative or positive shocks to agricultural and industrial sectors. However, 10 % increase in the service sector and renewable energy will reduce the ecological footprint.

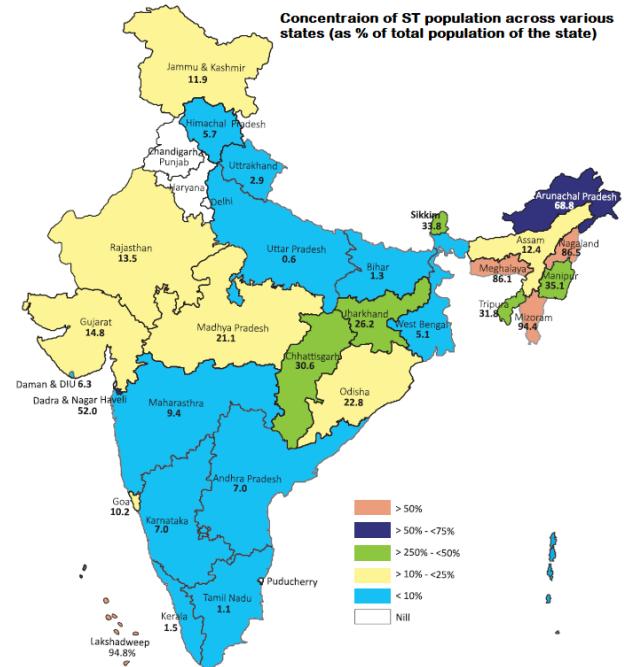
## COLLOQUY#5

# EDUCATIONAL DEPRIVATION AMONG SCHEDULED TRIBES IN EASTERN INDIA

**Dr. John Kujur**

Project Scientist, DST-Centre for Policy Research, NISER, Bhubaneswar

Educational deprivation among Scheduled Tribes (STs) in Eastern India is a complex issue influenced by various socio-economic, cultural, and geographical factors. This deprivation manifests in lower enrolment, high dropout rates, and limited access to quality education for tribal communities. The study explored the key factors contributing to educational deprivation among Scheduled Tribes in Eastern India. Among the eastern states, the proportion of tribal population to total state population is higher in Chhattisgarh (31%), followed by Jharkhand (26%), Odisha (23%), West Bengal (6%) and Bihar (1.3%). In terms of tribal literacy, Chhattisgarh outperformed other eastern states. Bihar and Jharkhand have the lowest tribal literacy rates at 51 per cent and 52 per cent respectively. Moreover, Odisha has a wide gap between the state literacy rate and tribal literacy rate in the state i.e., 21 per cent, while Jharkhand has a low gap at 9 per cent. It is also found that the dropout rate increases with increase in educational level. The secondary dropout in Odisha is exceptionally higher for all social groups i.e., two times the national average except general caste. The secondary dropout among tribals in all other states are hovering around at 15 per cent while Odisha has 33 per cent.



Considering the transition rate at secondary to higher secondary, Odisha continues to lag behind other states. The tribal students' transition from secondary to higher secondary at the national level is 73.52 per cent. The same for Odisha is just 40 per cent. This indicates that a large percentage of students are withdrawing themselves from education after matriculation to join the labour force. The major reasons highlighted in the presentation were the differences in schooling structure, lack of school infrastructure, pupil teacher ratio and low availability of ST teachers at higher secondary schools which contributed the major disparities in tribal education between Odisha and Chhattisgarh. Dr Kujur suggested that Odisha government needs to increase the availability of higher secondary schools and recruit more tribal and general teachers to improve the pupil teacher ratio. More number of residential schools need to be established particularly for higher secondary education.



## COLLOQUY#6

# CURRENT STATE OF THE SCIENCE AND TECHNOLOGY ECOSYSTEM IN INDIA AND WAY FORWARD

**Dr. Rabindra K. Panigrahy**

Scientist-E

Policy, Coordination and Programme Management Division  
Department of Science and Technology (DST)

Dr. Panigrahy shed light on the India's position in terms of research and quality, resident patent filling, Global Innovation Index 2022, research and development, and participation of women in R&D activities. India ranked 40 in Global Innovation Index 2022. Similarly, India ranked 7 in Resident Patent filing. Share of women in the R&D is only 18.6 per cent which is very low compared to most of the developed countries. Dr Panigrahy discussed some key challenges and priorities in the progress of science and technology in India. Despite the progress, India's science and technology ecosystem face challenges such as inadequate infrastructure, funding constraints, and the need for skilled workforce. There is an inequitable participation in terms of gender, social, regional and economic diversity. Limited access to scholarly knowledge and research data are major challenges in most of the state and central universities, even in national institutes like NITs, IIITs etc. Collaboration with international partners, including governments, research institutions, and multinational corporations, is essential for leveraging global expertise, accessing cutting-edge technologies, and addressing common challenges.



Collaborations in areas like space exploration, climate change mitigation, and scientific research can accelerate India's progress in science and technology. Recent initiatives like 'Atmanirbhar Bharat', establishment of Anusandhan National Research Foundation, accessible science and technology infrastructure: I-STEM, new Geospatial Policy have accelerated India's progress in science and technology. Dr Panigrahy then suggested for a vision for future R&D in India: a) profound risk-taking R&D; b) Quality and relevance; c) Prioritization-National aspiration; d) Speed of implementation; and e) Optimization of resources. India needs to focus on strengthening its research infrastructure, promoting interdisciplinary collaborations, fostering a culture of innovation and entrepreneurship, investing in education and skill development, and creating an enabling policy environment to unleash the full potential of its science and technology ecosystem.

DST-Centre for Policy Research  
NISER Bhubaneswar  
**Colloquy#6**  
November 20, 2023

**Rabindra K. Panigrahy**  
Scientist E,  
Policy, Coordination and Programme  
Management (PCPM) Division  
Department of Science and  
Technology.

**Current state of the Science & Technology Ecosystem in India & Way Forward**

## COLLOQUY#7

# TRANSITIONS TOWARDS LOW-CARBON AGRICULTURE IN ASIA

### DR. ARCHITESH PANDA

Senior Scientist,  
Wyss Academy for Nature,  
University of Switzerland

The talk covered a brief background of global warming and how different sectors such as industry, agriculture, and waste cause greenhouse gas (GHG) emissions, and raise Earth's temperature. The speaker also highlighted the background of the Paris Agreement, aiming to check the rise in Earth's temperature within 1.5 °C. The two approaches to mitigate carbon or GHG emissions are (i) reducing human-caused emissions and (ii) removing remaining traces through carbon removal or sequestering (e.g., restoring forests). They were briefly discussed.

- A sectoral distribution of GHG emissions worldwide was shown through mapping/color coding. Additionally, the top 10 countries in GHG emissions are discussed, with China leading, followed by India and the United States, etc.
- The percentage share of GHG emissions from agriculture in India is slightly higher than in any other top 10 countries. The agricultural sector in India is a large contributor to CH4 (methane) emissions, which is the strongest GHG.
- Mitigating GHG emissions and setting targets is challenging due to the global increase in population. By 2030, the challenge is to feed an additional 1.5 billion people globally, 90% of whom belong to developing countries.
- Agriculture accounts for 29% of GDP and 65% of jobs in developing countries like India.



### Transition towards Low-carbon Agriculture in Asia

- Specifically for India, the speaker indicates that enteric fermentation from the livestock sector and rice cultivation are the two largest contributors to GHG emissions, accounting for around 21.2% of total emissions from the agriculture sector.
- The speaker expressed concern about the Indian and Bangladesh regions, highlighting them as the largest contributors to CH4 emissions due to rivers and paddy rice areas.
- While discussing the technical and economic potential, the speaker suggests a shift in fertilizer use and meat derived from ruminants by at least 30%, which would lead to a reduction in GHG emissions.
- In addition, challenges in reducing GHG emissions in the agriculture sector are discussed, such as farmers' unawareness of technologies, investment, and other related issues.
- The speaker concluded that the speed and effectiveness of reaching net zero emissions will be determined by how these mitigation channels affect and interact with several factors.

## COLLOQUY#8

# JUST ENERGY TRANSITION: A FOCUS ON GREEN ECONOMIC DIVERSIFICATION

**Gunjan Jhunjhunwala**

Programme Lead, Council on Energy, Environment & Water, New Delhi

**Just Energy Transition:**  
A Focus on Green Economic Diversification

**Friday**  
December 15, 2023

03:00 - 03:45 pm (IST)

**Speaker**  
**Gunjan Jhunjhunwala**  
Programme Lead,

Google Meet Link

The talk covered a brief background of CEEW, New Delhi followed by the topic of discussion Just Energy Transition (JET) and the green economic diversification with a brief background at local and national level. Ms. Jhunjhunwala divided her lecture in three major parts:

- Contextualizing the JET debate in India for energy security
- Umbrella transition and what it means for JET
- Green Economic Diversification

Just Energy Transition (JET) is a transition in energy sector from conventional to renewable energy technology and this transition is positive in terms of mitigating the impact of climate change and global warming but has a negative impact also.

How a policy making can help to mitigate the negative impact of the JET need to be considered. The negative impact could be local as well as on the whole nation. At national level it is broadly concerned as 'what are the terms on which we are negotiating with international cooperation for energy transition?'. What should be the policy in terms of international collaboration for the critical mineral which are not domestically available in India. There are concerns over the incentives and the policies of the government to deploy maximum RE potential at its best. Do we have suitable RE policy and technology which mitigate the negative impact of JET and do we really have mature RE technology for JET?

The speaker highlighted that for achieving net zero emission by 2070 India needs to achieve the peak in coal-based power generation by 2040 and slowly reduce it to 99% by 2070. There are serious concerns over the rapid reduction in the coal mining activity especially for the coal rich region. Ms Gunjan presented a roadmap for the economic diversification which has six components. She discussed the Green economic Diversification particularly highlighting green Odisha initiative in which many private and state govt body collaborate. In conclusion Ms Gunjan spoke about the green economic growth with the deployment of clean energy technologies.

## COLLOQUY#9

## ROADMAP FOR VIKSHIT BHARAT

**Professor Pravakar Sahoo**

Senior Lead, Economics and Finance Cell, NITI Ayog


**ROADMAP FOR  
VIKSHIT BHARAT @2047**
TUESDAY  
FEBRUARY 06, 2024TIME  
11.00 AMVENUE  
SHSS, CONFERENCE  
ROOM, NISER

## SPEAKER

PROFESSOR PRAVAKAR SAHOO  
SENIOR LEAD, ECONOMICS & FINANCE CELL NITI AYOG

Professor Pravakar Sahoo presented the roadmap for India to become a developed country (Vikshit Bharat) by 2047. As per the estimates, Indian economy may reach around \$ 30 trillion by 2047. For that to happen India needs a sustained growth of nearly seven percent per annum.

Indian economy will reach the target of \$ 5 trillion by 2027. Compared to 2014 Capital expenditure has increased by four times. Capex has a multiplier effect of 2.45 against the revenue expenditure of 0.99.

India has emerged as an undisputed leader in digital transaction, accounting for 46% of all global real-time transactions in 2022. This is estimated to hit 235 Billion transactions by 2027. The market size of digital payments is expected to triple from \$3 trillion to \$10 trillion by 2026. In start-ups India ranks third only after USA and China.

Indian economy is going to enjoy the demographic dividend, for more than two decades. With strong economic fundamentals Indian economy has all potentials to become a developed economy.



Professor Pravakar Sahoo delivering the lecture in the conference room of SHSS, NISER



Professor Pravakar Sahoo along with the faculty members and research scholars of SHSS, NISER

## Addressing the Barriers to Early Education of Tribal Children in Remote Locations

POLICY BRIEF #1

2024



**Amarendra Das**  
Coordinator, DST-CPR,  
NISER, Bhubaneswar  
**Jayashree Parida**  
Project Scientist-I, DST-CPR,  
NISER, Bhubaneswar  
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This policy brief provides actionable policy recommendations to address the challenges of early education in tribal hamlets in remote locations. Based on a comprehensive review of literature and field experiences, it provides the current situation of tribal education, challenges faced by tribal children, and ongoing government initiatives for improving tribal education. Following the provisions of the NEP 2020, we make two recommendations to improve the early education of tribal children in remote locations. a) Anganwadi centers can be merged with the primary schools if both operate within a one-km radius. (b) If primary schools are far from the Anganwadi centers, the latter should be strengthened to provide education up to class two. Most of the tribal hamlets in remote locations face the second scenario. We recommend that all Anganwadi or mini Anganwadi centers in tribal hamlets be upgraded to class two if a primary school is unavailable within a one-km radius. The Anganwadi teachers from the same hamlet should be trained to teach up to class two in their mother tongue.

This policy brief highlights the gaps between the overall literacy rate and tribal literacy rate in independent India. Although Chhattisgarh and Odisha have more or less similar socio-economic status of tribals, Chhattisgarh has outperformed Odisha in terms of tribal education, i.e., dropout rate, gross enrolment rate, and transition rate. Schooling structure seems to be the primary reason behind the difference between Chhattisgarh and Odisha. Chhattisgarh has more schools that provide continuous education up to higher secondary than Odisha. In Odisha students have to go to a new school, and in most cases at a distant place, after the completion of secondary school. This becomes a hurdle to the transition to higher secondary education. The pupil-teacher ratio, representation of ST teachers, school infrastructure, and quality education have also contributed to the reasons. The Policy briefs recommends having continuous education up to higher secondary levels in all high schools of Odisha and appointment of more tribal teachers to improve the education of tribal children.

POLICY BRIEF #2

## Can Odisha Learn from Chhattisgarh to Improve the Tribal Education?

**Amarendra Das**  
Coordinator, DST-CPR NISER,  
Bhubaneswar  
**John Kujur**  
Project Scientist-I, DST-CPR NISER,  
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**Jayashree Parida**  
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DST-CPR@NISER, Policy Brief#2

Tribal Education

**POLICY BRIEF #3**

**ACCELERATING ROOF-TOP SOLAR PHOTOVOLTAICS DEPLOYMENT IN THE EASTERN STATES OF INDIA**



Shutterstock

**Amarendra Das\***  
Co-ordinator, DST-CPR, NISER, Bhubaneshwar

**Avritti Srivastava**  
Senior Project Associate, DST-CPR, NISER, Bhubaneshwar

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DST- CENTER FOR POLICY RESEARCH@NISER



This policy brief examines the deployment of Rooftop Solar Systems (RTS) in eastern India. Various policy recommendations are proposed to enhance the solar market and expedite RTS installation. These include suggestions for modifying policies to encourage solar power use in government offices. It proposes to set a mandate for government offices to fulfill 30-50% of their total electricity consumption through RTS in a time-bound manner. It also advocates for larger solar installations over multiple smaller units for grid-connected systems to minimise the noise in the grids. Every Panchayatiraj Institution and Urban Local Body should spend at least 10% of their annual grant for the installation of SPV. State governments should develop solar villages on a pilot project basis, in line with Gujarat's Modhera village, with public and private sector participation.

This policy brief presents the impacts of India's EV policy on the road transport sector in eastern India. It examines the implications of the Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles in India (FAME) scheme in two distinct phases: FAME India Phase I (2015–2019) and FAME India Phase II (2020–2023) on EV adoption. The study mainly discusses the energy transition in the eastern states' road transport sector, namely Bihar, Chhattisgarh, Jharkhand, Odisha, and West Bengal. The adoption of EVs is rapidly increasing at national scale. Nevertheless, this progress is not evenly distributed at the subnational level. Adoptions of EVs is contingent upon the socio-economic and geographic circumstances. Therefore, subnational policies should avoid one-size-fits-all policies to ensure an equitable transition in the road transport sector.

January 2024

**Policy Brief#4**

**Adoption of Electric Vehicles in Eastern India Policies and Prospects**

**Amarendra Das**  
Coordinator,  
DST-CPR-NISER, Bhubaneshwar

**Maheshkumar.T**  
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DST-CPR-NISER, Bhubaneshwar



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<https://dstcpr.niser.ac.in/>

Energy Transition |

# POLICY DIALOGUE ON ENERGY TRANSITION IN EASTERN INDIA: ISSUES AND CHALLENGES

January 23-24, 2024

The Policy Dialogue brought together energy scientists, social scientists, policy makers, and industry leaders to deliberate upon the issues and challenges involved in the energy transition of the eastern states and suggest roadmap for just transition. The DST-CPR, NISER, released two policy briefs on Rooftop Solar System and Adoption of Electrical Vehicles and a report on the low carbon pathway for Odisha: an Integrated assessment modelling approach prepared by NCAER, New Delhi.

## INTRODUCTION

Dr Amarendra Das, Coordinator, DST-CPR, NISER spoke on the needs for energy transition in eastern states covering Odisha, Bihar, Chhattisgarh, Jharkhand and West Bengal. Odisha has the highest per capita income among Eastern states. Mines and mineral industries are the major drivers. According to the CEEW report, Odisha has the 2nd highest per capita carbon emission, followed by Chhattisgarh and Jharkhand. The per unit economic cost of the thermal energy in Odisha is very low (~2.5 INR). However, the per unit social cost of electricity is very high (~800-1000 INR), as estimated by Environmental Protection Agency, USA and IPCC. The Carbon Border Adjustment Mechanism would affect the export of minerals and metal products from Odisha to the rest of the world. Odisha's rank in the NITI Ayog's State Energy and Climate Index is 16 among the 20 major states of India. Therefore, Odisha needs to take proactive measures for Just Energy Transition.

## PROF. H.N. GHOSH, DIRECTOR, NISER

Professor Ghosh spoke on the significance of the energy transition for the country, as the country aims for net zero emission by 2070 and expressed concern over the growing carbon emission in eastern India. He advocated for setting up nuclear power plants along with other cleaner energy sources in this region to fulfill the growing energy needs.



**Release of the Report 'Low carbon pathway for Odisha: an integrated assessment modelling approach' in the inaugural session**



## DR. SATYA PRIYA RATH, IAS, DIRECTOR (BUDGET), GOVT OF ODISHA

Dr Rath highlighted two major reasons for higher carbon emissions in Odisha. First, it's not just Odisha's consumption that contributes to the carbon emission burden, but also its role in fulfilling the needs of industries and applications across the country.

Second, the abundance of coal in Odisha has led to the establishment of numerous thermal power stations, with Odisha also producing electricity for neighbouring states. The major electricity consumers in Odisha are the mineral and mining industries, which contribute significantly to the state's GDP. Transitioning towards cleaner energy sources is necessary but it should be done gradually. Additionally, there's a need to carefully consider the appropriate energy mix for the eastern states like Odisha. Dr Rath opined that "Immediate switching from thermal power to renewable or nuclear power is not a viable solution because of the concerns over livelihood and economic dependence on the sector."

Dr Rath also suggested that no new thermal power plants should be added in the future. He illustrated that for Odisha, using solar PV along with Pumped Hydro storage Projects (PHPs) would be economical solutions for fulfilling the peak demand. Odisha government has started the work on carbon budgeting.

### **DR RAVI B. GROVER, MEMBER OF ATOMIC ENERGY COUNCIL, GOVT OF INDIA**

Professor Grover spoke on the region-wise energy transition plans for achieving net-zero targets. Achieving Net Zero would require the use of all low carbon technologies for energy production. He pointed out gaps in academic studies regarding achieving net zero by 2070, which should be addressed by integrating several perspectives, namely the development needs of the countries, resources profile, availability of technology, supply chain, trained human resources, future evolution of policies, and associating social impact. Development at the international level should be critically reviewed, including the recent carbon border adjustment mechanism (CBAM) by the EU, which will affect industry-concentrated states like Odisha. He added that hydrogen plays a key role in the decarbonization of steel, cement, and fertilizer industries. The total energy requirement of the country by 2070 will be three times that of today's demand, with 50-60% being used in the form of electricity and the rest in the form of hydrogen. Other countries are talking only about transition, but in India, we should talk about developing, transitioning, and decarbonizing. India should plan the energy mix of 2070 considering the HDI score of 0.9, like the other G20 countries. Professor Grover talked about the issues related to renewable power generation like storage, flexible demand, or peak demand, grid stability. He suggested that economists should think in terms of energy invested to energy return, which gives an indicative value of how much energy is used to make a technology and, in the full life of that technology, how much it will return.

### **DR AKHILESH GUPTA, SECRETARY, SERB AND SENIOR ADVISOR & HEAD, DST**

Professor Gupta raised concerns over global warming, climate change, and the need for renewable power generation. He mentioned the five targets that are supposed to be achieved: (i) 500 GW non-fossil-based electricity generation, (ii) 80% energy from renewable energy technologies, (iii) One million tonnes emission reduction, (iv) emission intensity to be reduced by 25-30%, and (v) net-zero emission. The last target is critical among all targets. The energy demand in 2070 is likely to be 3-6 times that of today's demand. India needs to find out the strategy to achieve Net zero for this high level of energy consumption.

Dr Gupta highlighted a few challenges related to emerging RE technologies like hydrogen energy technology and storage, and long battery charging time in electrical vehicles or swapping of batteries. Dr Gupta also talked about the funding promises of UNFCCC and fund release till date, which is also a limiting factor for RE technology deployment in the country. Dr Gupta admitted that for the eastern states' energy needs will increase manifold in the near future. Considering this fact, we should work on research and development/innovation to improve the efficiency of technologies, whether it is solar, wind, or any other renewable energy technology.



**Prof. R. B. Grover, Member of Atomic Energy Council, Govt of India & Prof. H. N. Ghosh, Director, NISER during inauguration of Policy Dialogue on Energy Transition in Eastern India**

**PANEL 1****GLOBAL CLIMATE CHANGE NEGOTIATIONS,  
AND ODISHA'S CHALLENGES AND OPTIONS  
FOR NUCLEAR ENERGY****MODERATOR: DR. CHANDRA S. BAHINIPATI****MR. MANJEET SINGH PURI,  
FORMER DIPLOMAT, TERI**

Mr Puri discussed the north versus south negotiation agenda of the climate action plan at the global level. He addressed the twist in history from 1992 to 2022. Quoting economists, he mentioned that "Reducing reliance on fossil fuels will ultimately depend on making them uncompetitive," which is a problem for those countries that rely on fossil fuels.

**MR. SURESH CHANDRA MAHARANA,  
EIC ELECTRICITY AND STATE  
DESIGNATED AUTHORITY ON ENERGY  
EFFICIENCY**

Mr. Maharana spoke about the efforts taken by Odisha such as establishing charging stations, RE policy, and various awareness programs. He also mentioned that the Bureau of Energy Efficiency is going to transition into the Bureau of Energy Transition and will take responsibility for energy transition.

**DR. A.K. NAYAK, HEAD NCPW, DAE,  
GOVT. OF INDIA**

Dr. Nayak highlighted the growth of India in per capita income and the crucial role of the energy sector in making India a developed country. Currently, India is emitting approximately 60 billion tonnes of CO<sub>2</sub> and to reach the 1.5 °C target, we have only 8-10 years. He showed that the total RE potential of India is around 3826 TWh/annum. Dr Nayak strongly advocated for nuclear power to fulfill the future energy demand. He introduced the concept of Small Micro-Nuclear Power Plants (SMPP) as an option for India in the near future. He also suggested using waste heat from nuclear power plants by industries.

**PANEL 2****NATIONAL ACTION PLAN ON ENERGY  
TRANSITION****MODERATOR: DR. BIBHUNANDINI DAS****MRS. ULKA KELKAR, WRI,  
BENGALURU**

Mrs. Kelkar presented India's emissions by 2050, estimated via a simulation model, and emphasized that most emissions by 2050 will be from the industrial sector. However, it is noteworthy that for net-zero emissions by 2070, there is a need to maximize renewable power generation. Considering the transition from fossil fuel to green energy, Mrs. Kelkar gave glimpses of the employment effects of this energy transition.

**DR. ARABINDA MISHRA,  
DEVELOPMENT AND  
ENVIRONMENT FUTURES TRUST,  
BHUBANESHWAR**

Dr. Mishra addressed the energy transition as a development project of India for social scientists and gave his remarks on the energy transition as industrial competitiveness rather than a climate action plan. He added remarks on the carbon sector, financial security, and technology, advocating for a people-centric energy transition in the country.

**DR. GOPAL K SARANGI, TERI, NEW  
DELHI**

Dr. Sarangi talked about the intersectoral and inter-scalar nature of energy transition. He showed concerns for the global market exchange of carbon emissions and advocated for a regional renewable energy market in India. Additionally, he advocated for transformation instead of transition to minimize the negative impact of the transition.



**PANEL 3****LOW CARBON PATHWAY FOR ODISHA: AN INTEGRATED ASSESSMENT MODELLING APPROACH****MODERATOR: DR. SUBHANKAR MISHRA**

**Prof. Sanjib Pohit, from NCAER**, talked about the top-down and bottom-up macro model through which sector linkage and trade-offs among different policies can be accessed considering technology, investment, and the energy model.

**Dr. Anindya Bhattacharya** presented a model to understand technologies in transition and advocated that one model does not clearly give a picture of the transition and all linked sectors. He proposed integrating models as a solution. He gave his thoughts on carbon sequestration, either mechanically or naturally, which could be a possible solution for overall net-zero emissions because relying on technology alone may not serve the purpose.

**Dr. Chetna Chaudhary** presented other aspects to minimize the usage of fossil-based energy by taxing it and giving incentives to energy-efficient renewable energy technologies. She discussed the employment aspect of the transition.

**PANEL 4****READINESS OF INDUSTRY FOR ENERGY TRANSITION AND CARBON EFFICIENCY OF INDUSTRY****MODERATOR: DR. PRANAY K SWAIN****DR. P. CHANDRASHEKHAR, IIT BHUBANESHWAR**

Dr. Chandrashekhar spoke on the issues related to the grid load with increased renewable energy feeds and increased consumer throughout the country. He talked about the affordability, reliability, and sustainability of the sources. He provided estimated data from different agencies about the RES target, unelectrified villages in India, per capita energy consumption of India, and electricity generation capacity addition. Additionally, he addressed challenges like security issues, short-duration voltage sag, frequency stability, and isolated mode failure of RE generators.

**MR. A. P. SAMAL, HEAD, NTPC LTD.**

Mr. Samal talked about the milestones achieved by the NTPC in terms of power generation from renewable to non-renewable sources. He also presented the carbon emission involved for every unit of electricity generation in the country and illustrated that technology evolution will reduce carbon emissions in conventional power plants.

**MR BIBHU SWAIN  
CHAIRMAN, ELECTRICITY & POWER COMMITTEE OF UCCIL**

Mr Swain stated that industries perform well under any given mandate, but it is the responsibility of researchers to focus on areas where policy research and technological needs intersect. Industries comply with the mandates outlined in the Energy Conservation Act of 2011-12, pertaining to both electrical and thermal energy conservation.

Mr Swain discussed the potential for utilizing waste heat as a form of renewable energy. He suggested the implementation of displacement methods or virtual metering of solar photovoltaic (SPV) generation, particularly for industries with larger capacity. He emphasized the necessity of policy interventions in this regard.

He highlighted the need for Indian researchers to address technology gaps such as low heat Rankine cycle engines, small wind turbines, and low stream pump storage and power generation systems.

**PROF. V. SANTHAKUMAR, AZIM PREMJI UNIVERSITY, BENGALURU**

Prof. Santhakumar spoke on the social impact of energy transition on Eastern India. He suggested that some compensation mechanism must be developed for these states for the costs these states are going to bear due to the energy transition. He encouraged researchers to estimate carbon reduction in Odisha and its possible ways. Finance Commission and carbon credit mechanisms can play role in providing compensation.

**PANEL 5**

**CARBON CAPTURE, USE AND STORAGE,  
SOLAR PV, FUTURE OF GRIDS, HYDROGEN  
MODERATOR: DR. GOPAL K. SARANGI**

**DR. ASHOK SREENIVAS,  
PRAYAS FOUNDATION, PUNE**

Dr. Sreenivas showed concern about the challenges in the energy transition of India, including the recent carbon border mechanism. He covered three major topics: (i) planning for the future, (ii) optimal utilization of coal capacity, and (iii) the future of state-owned generating companies.

**MRS. SAUDAMINI SETHI,  
STEEL AND MINE DEPARTMENT,  
GOVT. OF ODISHA**

Mrs. Saudamini talked about the mining activities of Odisha and their contribution to CO<sub>2</sub> emissions. She discussed the 'Energy Vision document 2023-24' for sustainable development of steel and mines.

**DR SANTOSH KUMAR SAHU,  
IIT MADRAS**

Dr Sahu gave insights on industrial Energy Economics, Carbon Exchange, Social Cost, and Policy concerns related to industry. He talked about carbon emissions from the power sector and manufacturing sectors. Additionally, he suggested looking into carbon exchange policies or pricing on emissions. He suggested policy options like carbon tax, estimation of social cost of carbon emission at sectoral or regional levels, heterogeneous policies for sectors, technology-led approaches with economic policies, and increasing fuel mix and energy substitution.



Ms. Priyambada Pattanaik, Scientist, Odisha Climate Change Cell, Forest, Environment and Climate Change Department, Govt of Odisha making her point at the Policy Dialogue

**DR. SATYAPRASAD P SENANAYAK,  
NISER, BHUBANESWAR**

Dr Senanayak talked about the solar radiation potential of India and the technologies available till date, followed by the issues related to these technologies. He also talked about high efficiency perovskite solar cell technology for energy generation and supercapacitor technology for efficient storage as game-changing future technologies.

**DR. BISHNU PRASAD BISWAL,  
NISER, BHUBANESWAR**

Dr. Biswal talked about the hydrogen generation, separation (purification), and storage. He addressed the use of hydrogen for electricity production as well as in the transport sector. He gave insights about his work on hydrogen production in the presence of sunlight using a catalyst. He also discussed the technology developed for hydrogen storage with a sponge-like material at relatively high temperature and pressure required for the normal case.

**PANEL 6**

**ROOFTOP SOLAR ENERGY AND ELECTRIC  
VEHICLES**

**MODERATOR: DR. PRANAY K SWAIN**

**DR. AVRITTI SRIVASTAVA, DST-CPR,  
NISER, BHUBANESWAR**

Dr. Srivastava talked about the solar PV potential and growth in eastern states of India and the issues related to the further deployment of rooftop solar PV. She discussed Policy Brief #3 released by the DST-CPR in terms of concerned sections and possible policy recommendations.



Smt. Lipsa Das, Additional Secretary, Energy Department, GoO, making her point at the Policy Dialogue

## **MR. T MAHESH KUMAR, DST-CPR, NISER, BHUBANESWAR**

Makesh Kumar talked about the present status and challenges prevailing in the electric vehicle deployment in eastern states of India. He discussed Policy Brief #4 released by the DST-CPR and discussed the related to lack of awareness, upfront cost, EV battery, low manufacturing, availability of minerals, EV charging stations, financing, and electricity for charging batteries.



**Sri Suresh Chandra Maharana, EIC(Electricity)-PCEI and State Designated Authority on Energy Efficiency, presenting his views at the Policy Dialogue**

## **MS. KHULANA MALLIK, SHSS, NISER, BHUBANESWAR**

Ms Khulana discussed the five targets set by India at COP26 and showed the mix of electricity generation from 1971 to 2022, followed by the contemporary energy policies. Ms Khulana proposed policy recommendations like imposing a carbon tax on coal, eliminating subsidies for fossil fuels, and introducing incentives for cleaner energy, etc.

## **DR. DUKHBANDHU SAHOO, IIT BBSR**

Dr. Sahu discussed the basics of energy transition and showed the energy consumption pattern of India from 1990-2021. He also discussed the energy transition index, i.e., the numerical value of the transition for any country. He showed the ETI for India from 1990-2021. He gave insights into the key policies implemented in India for energy transition, the progress achieved to date, followed by some policy recommendations.

## **PANEL 7 ROOFTOP SOLAR ENERGY AND ELECTRIC VEHICLES MODERATOR: DR. PRANAY K SWAIN**

### **DR. DWARKESHWAR DUTT, IIT DELHI**

Dr. Dutt discussed energy policy with an interesting approach, explaining why energy policies sometimes work and sometimes don't. He divided his talk into two parts: implementation and policy formulation. Based on case studies, he discussed the challenges in policy formulation as well as implementation.

### **MR. NITISH, CIM, PATNA, BIHAR**

He discussed electric vehicle adoption in Bihar or eastern India as an initiative for energy transition. He discussed the context problems or challenges, suggested policy measures, examples available globally, and made some suggestions. He suggested financial incentives, charging infrastructure development, research and development support, including the recycling ecosystem.

### **MR. NISHIKANTA MANGANG, JUST TRANSITION CENTER, IIT KANPUR**

Mr. Mangang talked about the social impact of energy transition, which is a major concern for the eastern states. He suggested including trade unions in policy formulation for just energy transition as they are major facilitators of the transition.



**Mr Bibhu Swain, Chairman, Electricity & Power Committee of Utkal Chamber of Commerce and Industry Ltd. preseting the perspective of Industry on Energy Transition**

## THE WAY FORWARD RESEARCH, INDUSTRY AND POLICY

**Mrs. Lipsa Das, Secretary Energy Department, Govt of Odisha** talked about the government initiatives taken for energy transition. She talked about the chief minister energy conservation program, Energy Club, energy efficiency program, and RTS, Floating Solar, etc., which are ongoing projects in Odisha state.

**Ms. Priyamda Patnayak, Department of Forest, Environment and Climate Change, Govt of Odisha** discussed the climate change plan of the state, which is aligned with national commitments.

**Mr. Ashok Choudhury, OREDA, Govt of Odisha** talked about the upgradation of energy transition from the history of firewood to coal to oil and now moving towards solar and other renewable energy. He also added that renewables have their own limitations in terms of intermittency, technology, and inconsistency in providing at the time of peak load. He suggested we should go along with coal and oil until the technologies are well developed for energy transition.

### DR. JUGAL K. MAHOPATRA, FORMER CHIEF SECRETARY, ODISHA

Dr. Mahopatra admired the initiative taken by the DST-CPR for the dialogue, which helps trigger the actions of concerned members for change. He said that just energy transition of Odisha is both a challenge and an opportunity. Challenge is in terms of reducing carbon emissions, as the state is rich in coal and other minerals like iron and bauxite, which add to the carbon emissions.



Dr Jugal K. Mohapatra, former Chief Secretary of Odisha, speaking at the Policy Dialogue

He suggested renewable power purchase obligation for industries on a voluntary basis. He said Odisha has a very large RE potential ~34,000 MW, and Odisha has the opportunity to install RE power. He addressed that floating solar PV and Pumped Hydro Storage Projects (PHPs) are the best available technologies for Odisha, which could be game-changer. He also advocated for the promotion of rooftop solar by the households and the PM-KUSUM scheme of solar PV for agriculture.

### DR RAVI B. GROVER

*"Focus should be on development led transition rather than transition led development paradigm"*

Dr Grover discussed that past energy transitions were slow and now the transition is very fast because those transitions are based on the need, and now it is completely based on regulations. Renewable power supply needs resources which should consider availability required infrastructure, and the supply chain as well. Grid feeding of RE power is not only a challenge for the concerned persons but also a challenge for the future generation of students who pursue electrical engineering. The social impact of energy transition is also an important field of research. For low carbon emission, hydrogen power and storage are viable solutions for the intense carbon emission states like Odisha. As per geographical conditions, a concentrated nuclear power plant is a better option than the micro-power plant. Research is required to assess the advantages and disadvantages of new renewable energy technologies when placed in outdoor working conditions. Dr Grover suggested *"Go for a portfolio of energy mix, do not rely on a single energy source."*



Mrs. Saudamini Sethi, Additional Secretary, Steel and Mine Department, Govt. of Odisha, speaking at the Policy Dialogue

# POLICY DIALOGUE ON TRIBAL EDUCATION IN EASTERN INDIA: ISSUES AND CHALLENGES

January 25, 2024

The policy dialogue on "Tribal Education in Eastern India: Issues and Challenges" brought together social science researchers, government officials, development practitioners, activists and tribal leaders together to discuss the challenges faced by the tribal communities for availing education. Two Policy Briefs on 'Barriers to early education of tribal children in remote locations' and 'Can Odisha learn from Chhattisgarh to improve the tribal education?' were released by the dignitaries.

## INTRODUCTION

Dr. Amarendra Das, Coordinator, DST-CPR, NISER welcomed the delegates and presented an overview of the status of tribal education in eastern states. Chhattisgarh has a substantial tribal population (30.6%) followed by Jharkhand (26.2 %) and Odisha (22.8%). Compared to Chhattisgarh, the dropout rates for tribal children at the secondary level remain higher in Odisha. The tribal students' transition to higher secondary education in Odisha is 40 per cent, while in Chhattisgarh, it is 84 per cent.

## PROF. H.N. GHOSH, DIRECTOR, NISER

The policy dialogue was inaugurated by Professor H.N. Ghosh, Director, NISER. He emphasised the significance of quality education for tribal children by sharing his own experiences in West Bengal. He stressed that language barrier is the major challenge that affects the quality of education and learning outcomes for tribal children. When children are taught in a language that is unfamiliar to them, they may struggle to understand the lessons, leading to poor academic performance, disengagement, and eventually dropout. He recommended that government should take initiatives on this particular issue and that should be at the primary level of education.

## PROF. V. SANTHAKUMAR, AZIM PREMJI UNIVERSITY

Prof. V. Santhakumar opined that the demand for education is a major problem for tribal communities in India. He shed light on the status of indigenous communities all over the world. He categorised the status of indigenous communities into four phases such as i) colonial subjugation, ii) nationalism, iii) liberation theology and iv) controlled by themselves.

Colonialism inflicted widespread violence, exploitation, and trauma on indigenous peoples through warfare, enslavement, forced labour, and systemic discrimination.



**Release of Policy Briefs during inauguration of Policy Dialogue on Tribal Education in Eastern India**

Professor Santhakumar reflected how indigenous communities took control over the education in the last decade through political mobilization in Colombia, Brazil and Mexico. In these countries most of the teachers belonged to the indigenous communities and took autonomous decisions on what is needed for them. In India, the situation in the North-east comes under fourth category. But rest of the parts of the country including Odisha are in the second and third stage. Some of the major challenges for tribal education are distance to school, lack of teachers, not enough political empowerment, lack of control or total opposition against the use by tribal communities. National Education Policy should focus on elementary and foundational stages of education.

## MS. LALITA PATNAIK, UNICEF, INDIA

Ms. Patnaik highlighted the initiatives like the Sarva Shiksha Abhiyan (SSA) and the Right to Education (RTE) Act, which aim to provide free and compulsory education for all children aged 6 to 14. The Odisha government has also established Ekalavya Model Residential Schools (EMRS) and Ashram Schools to enhance access to education for tribal children. She appreciated the role of government of Odisha in tribal education with respect to multilingual education, language policy, and capacity building of teachers. She raised the issue of operationalization of Multi-Lingual Education (MLE) programme in Odisha. Standardizing indigenous languages for educational purposes can be challenging due to dialectal variations, regional differences, and linguistic complexities. Standardization efforts need to be culturally sensitive and respectful of linguistic diversity. She stressed on the existing educational qualifications and the multiple responsibilities of Anganwadi workers. Anganwadi workers can't handle the foundational education of children. For small hamlets and nomadic communities, UNICEF has introduced mobile schools. Community members along with teachers can reach to those remote locations to teach those children. Efforts should be taken for mapping of resources and evidence. The convergence and coordination among the governments, educators, researchers and civil society need to be revitalized. More scalable interventions are needed for foundational and primary stage of education. .



**Ms. Lalita Patnaik, UNICEF India and other participants during discussion at Policy Dialogue on Tribal Education in Eastern India**

### PANEL 1

#### TRIBAL EDUCATION IN ODISHA, CHHATTISGARH AND JHARKHAND

MODERATOR: DR. AMARENDRADAS

#### DR. MAHENDRA DAS, CHHATTISGARH

Dr. Mishra discussed the status of MLE in Chhattisgarh and Odisha. He explained that Odisha lags behind in MLE due to a lack of continuity of monitoring and coordination. Both Chhattisgarh and Odisha have recognized the importance of multilingual education as a means to address language barriers and reduce educational

#### MR. ANIL PRADHAN, SIKSHA SANDHAN

Mr. Pradhan supported the views of Dr. Mahendra Mishra on the problems and challenges involved in MLE. He emphasized that limited resources, including funding, teaching materials, trained teachers, and infrastructure, pose significant challenges to implementing MLE programs in tribal areas. Inadequate language policies and planning frameworks at the regional, and local levels hinder the development and implementation of MLE programs in tribal languages. He also pointed out that limited availability of culturally and linguistically appropriate materials, text books pose challenges to MLE education in Odisha.



**Shri Narayan Majhi, and Dr Birendra Suna speaking at the Policy Dialogue**

## MR. BIJOY K.UPADHYAY ASHRAM SCHOOL TEACHER

Mr. Upadhyay stated that while Multilingual Education (MLE) programs have shown promise in improving learning outcomes and preserving indigenous languages and cultures in some contexts, their success can be influenced by various factors like implementation challenges, resource constraints. He shed light on Koya tribe of Malkangiri district. Though some of the schools don't have language teachers, the local community tribal members became the language teachers to help the students. The tribals have the feelings that non-tribals can't teach them as they don't know the tribal culture and knowledge. Trainers of teachers' education should have the knowledge how to train the teachers particularly on tribal education. Teachers should be properly oriented towards tribal education with tribal knowledge and culture. Lack of schools and teachers in most of the tribal panchayats of Malkangiri district are major hurdles to the education of tribal children. .

## MR. BINAY PATTNAYAK CONSULTANT, THE WORLD BANK

Mr. Pattnayak deliberated on the MLE in Jharkhand where dropout rate is high among the tribal children. He talked about the M-Tall akhra for research and innovations in children's languages. He discussed the nature of mother languages used, use of mother languages in school and homes, issues and challenges to children's foundational learning and possibilities for children's foundational learning and quality education. Children of classes 1 and 2 faced learning challenges due to difference in home and school language. Around 97 percent of teachers didn't receive any training on pedagogy for multilingual context for working with children. Hindi is the medium of instruction used in schools for non-Hindi speaking children. In such a situation Children mostly rely on pictures and peers for understanding the subject. He also suggested that language maps for each district should be prepared and training modules for teachers and community members should be prepared. Baal Sansad organisations should be recognised.

## DR. BIKRAM KESHARI JENA CARD, KORAPUT

Dr. Bikram Keshari Jena, CARD discussed the problem of colonial mindset prevailing in India. This is the major hurdle to tribal education. There are number of gaps in policy implementation. We need to emphasise upon the awareness programme for tribals on various issues.

## DR. SUBHASH CHANDRA DASH SCSTRTI, ODISHA

Dr. Dash talked about the scenario of tribal education in Odisha. He presented the major barriers of tribal education such as road connectivity, poverty, geographical isolation, health conditions, lack of infrastructure, and language barrier. He stressed on the unavailability MLE at secondary and higher secondary level of education. He recommended that there should be a creation of directorate of education in SC and ST development department in each state. He suggested that more residential schools up to Post Graduate should be established in the state.

## MS. MADHUSMITA SAHOO SCSTRTI, ODISHA

Ms Sahoo added that there is a gap between policy and practice. Linguistic survey must be undertaken before implementation of any educational policy for tribals. Government should establish and follow a common and universal pattern of education. The quality of education needs special focus at the foundational and primary level of education.



Dr Subhash C. Dash and Prof. Rabi N. Patra speaking at the Policy Dialogue

**DR. AUROBINDA BEHERA  
FORMER PRINCIPAL SECRETARY,  
GOVT OF ODISHA**

Dr. Behera posited that the nomenclature 'tribal education' should be reformed to 'education for tribal children'. He also advocated that there should be uniformity in the pattern of schooling in Odisha. He also suggested that there should not be any residential schools at the primary level of education because children at the early age need to stay with their parents and in the community. More primary schools will be built near to the habitat of the tribal communities. Particularly under Anwesha programme, tribal children from Class I are sent to urban residential schools for getting quality education, that needs to be reconsidered. He also added that there should be vocational education for tribal children at schools. Implementation of MLE in a mixed tribal community is a major challenge for the government. .

**PANEL 2  
TRIBAL EDUCATION IN  
REMOTE HAMLETS AND  
RESIDENTIAL SCHOOLS  
MODERATOR: DR. PRANAY K. SWAIN**

**DR. BRATINDI JENA, ACTIONAID INDIA**

Dr. Jena advocated that attitude towards the tribal community needs to change. She highlighted the problems encountered by the tribal children at residential schools. Residential schools particularly for girl child is must. But the accountability of school governance system is a challenge in most of the schools. Safety of girl children needs to be looked at the policy level. Introducing skill training along with education can offer numerous benefits to students equipping them with practical skills, enhancing their employability, and preparing them for future careers. Conducting an audit for assessing the quality of education, access to educational opportunities, utilization of resources, and alignment with policy goals related to tribal education can facilitate dialogue, advocacy, and action for improving tribal education.

**MR. NARAYAN MAJHI, HEAD  
SEVAK, DEOPATTANGI ASHRAM  
SCHOOL, POTTANGI, KORAPUT**

Mr. Majhi highlighted the situation of tribal education in Koraput district of Odisha. He pointed out two main issues of tribal education in the district a) high dropout rate and b) poor learning outcomes. The key contributing factors behind the issues he discussed were the high pupil-teacher ratio, engagement of children in economic activities. Mr Majhi recommended that there is a need to engage more teachers at the tribal areas. School monitoring committees need to be empowered to educate the parents and students the essence of education and its benefits.

**DR. AMARENDRADAS  
DST-CPR, NISER, BHUBANESWAR**

Dr. Das discussed in detail the policy brief # 1 on the barriers to early education of tribal children in remote locations. He recommended that in small tribal hamlets, Anganwadi centres need to be merged with the primary schools if both are operating within a one-km radius. If primary schools are far from the Anganwadi centres, the latter should be strengthened to provide education up to class two. The Anganwadi workers from the same hamlet should be trained to teach up to class two in their mother tongue. Anganwadi workers should be provided specialized training on effective teaching methods for tribal children, including understanding their learning styles and needs.



**Delegates of the Policy Dialogue on Tribal Education**

## **DR. JOHN KUJUR DST-CPR, NISER, BHUBANESWAR**

Dr. Kujur discussed the policy brief #2 on why Odisha is lagging behind Chhattisgarh in tribal education. He highlighted that Chhattisgarh has outperformed Odisha in terms of tribal education, i.e., dropout rate, gross enrolment rate, and transition rate. Chhattisgarh imparts secondary education and higher secondary education in the same schools, while in Odisha, these two stages of education are segregated based on school buildings. The pupil-teacher ratio, representation of ST teachers, school infrastructure, and quality education have also contributed to poor educational achievement of tribals. He suggested that government of Odisha needs to increase the availability of higher secondary schools and recruit more teachers. More number of residential schools need to be established..

## **DR. BISWAJIT APAT SHSS, NISER, BHUBANESWAR**

Dr. Apat talked about current situation of residential schools in the tribal areas. He raised the issues of sexual exploitation, corruption, poor maintenance and lack of facilities available at residential schools. He suggested for the establishment of bigger schools at Panchayat level providing day boarding and residential facilities for children from remote villages of the Panchayat. Panchayats should play active roles to reduce the dropout rate and increase the enrolment ratio ensuring involvement of parents.

### **PANEL 3 WAY FORWARD**

## **DR. BIRENDRA SUNA MAA MANIKESHWARI UNIVERSITY**

Dr. Suna suggested that the Mission Shakti team can be regulatory body for improvement of tribal education in remote locations. Communities can establish and support community-based education initiatives that cater to the specific needs and aspirations of tribal children and youth. Recruitment of teachers at the district level can be helpful for reducing the language barrier in getting education.

Teachers from the same communities or district understand the issues and can communicate the students in their own language. He also suggested to recruit more female teachers in schools. He also emphasised the importance of mother tongue-based education in tribal schools. Dr Suna suggested that Anganwadi should be named as 'Tribalwadi' so that tribal people can feel the belongingness to the centre.

## **DR. CHITRASEN BHUE MAA MANIKESHWARI UNIVERSITY**

Dr. Bhue suggested to strengthen the infrastructure of educational institutions in tribal areas. He cited the examples of schools with poor infrastructure facilities available at Bhabanipatana in Kalahandi district. Attitude towards tribal languages by the ordinary people needs to be change. He also suggested the preservation and documentation of tribal languages. The perspective of education needs to be understood. Policy mapping should be done on the aspects of channelization of funds, structure of line departments and skill education. Decentralization and participation of community members is a must to improve the tribal education.



**Dr. Chitrasen Bhue, Assistant Professor, Maa Manikeshwari University delivering his talk**

## **DR. KUMUD CH. NAIK MAA MANIKESHWARI UNIVERSITY**

Dr. Naik discussed the barriers to tribal education like teacher-pupil ratio, lack of infrastructure in tribal schools. He advocated for the establishment of residential schools in the tribal areas. The National Education Policy (NEP) 2020 in India does emphasize the integration of early childhood care and education (ECCE) with the formal schooling system as part of its holistic approach to education. But due to distance to school, children will not be interested to go to school. He also recommended that at the policy formulation level, communities should be involved and consulted with. He also pointed towards the poor attitude of nontribal teachers towards tribal children with stereotypes or biases. Teachers should have positive attitude towards all students.



**Dr. Himanshu S. Rout, Utkal University, Prof. Rabi Narayan Patra, COATS Koraput, and Professor Saudamini Das, IEG, Delhi**

## **PROFESSOR RABI N. PATRA COATS KORAPUT**

Prof. Patra opined that four aspects of tribal education are enrolment, attendance, dropout and performance of tribal children. He argued that language barrier is the major challenge for most of the tribal children. And teachers in tribal schools are mostly non-tribals. For them, teaching is not a mission but profession. He also emphasised that documented and codified language books are not available in many tribal languages. Lack of community involvement hinders the effectiveness of educational initiatives and perpetuate disparities in educational outcomes for tribal children. He recommends economic amelioration of tribal communities using District Mineral Foundation fund. There should be collaborative policy making involving a diverse range of stakeholders: bureaucrats, civil society, local political leaders, community members and also parents in the process of policy development. He also advised that there should be capacity building with attitudinal change among all stakeholders. At last, he suggested language mapping at districts level so that MLE programme can be implemented as per needs and priorities of the concerned tribal communities.



**Dr. Amarendra Das, Convenor and Co-ordinator, DST-CPR alongwith other participants at the Pathani Samanta Auditorium, NISER**

# POLICY DIALOGUE ON ENERGY TRANSITION

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## CPR Urges Eastern States, Including Odisha, to Spearhead Electric Vehicle Revolution and Sustainable Energy Practices

By JP Mishra - ⏰ January 24, 2024 - 💬 No Comments

In a bid to catalyse sustainable energy practices and bolster the adoption of electric vehicles (EVs) in the eastern states, the Centre for Policy Research (CPR), affiliated with the School of Humanities and Social Sciences at NISER, Bhubaneswar, issued key recommendations during a policy dialogue on ‘Energy Transition in Eastern India: Issues and Challenges.’

## Promoting Solar Energy Producer Organisations:

CPR proposed the establishment of solar energy producer organisations in every panchayat and urban local body across eastern states, including Odisha. These organisations are envisioned to operate in a public-private partnership mode, fostering the generation of solar energy at the grassroots level. The move aligns with the broader objective of decentralising energy production and promoting sustainable practices.

## Accelerating Electric Vehicle Adoption:

Addressing the lower adoption rates of electric vehicles in the eastern states compared to the rest of India, CPR emphasised the need for the states, particularly Odisha, to facilitate the creation of more charging stations. The policy briefs released during the dialogue underscored the importance of awareness campaigns to educate the public about the benefits of EVs and to encourage their widespread adoption.

## **Environmental Concerns in Eastern States:**

The discussions highlighted environmental challenges in the eastern region, with Odisha recording the second-highest per capita carbon emissions, according to estimates by the Council of Energy, Environment and Water (CEEW). The carbon emissions are predominantly attributed to the mining and metal-based industries prevalent in the area. Despite this, the distribution of benefits from the mining industry remains low due to limited employment opportunities, while pollution

# ପ୍ରଦୂଷଣମୁକ୍ତ ପରିବେଶ ଏକ ଆହ୍ଵାନ

ଜଣ୍ଠା, ୨୦୧ (ଆସ୍ତି): ପୂର୍ବ ଭାରତର ଡେଡ଼ିଶ୍ଵର  
ସମେତ ପର୍ବତଙ୍କା, ବିହାର, ଓଡ଼ିଶା  
ଏଥିଶମତରେ ପରିବର୍ଷ ପଦମ୍ଭାବନ



ହୋଇଛି । ଉତ୍ତରା ଶକ୍ତି ଦିବାର, ଜୀତାର  
ପ୍ରମୋଦାରକ ଅଞ୍ଚଳାରି ରାଜସନ୍ଧ  
ପରିଷକ ସହଯୋଗରେ ନାଲାକର ତେ  
ଭାରତ ସରକାରର ଏକ ପରିଷକ ଯୁଦ୍ଧକ  
ଦିବ୍ୟା(ତ୍ରୀସତି) ପରିଷ ଏହି କର୍ଣ୍ଣାଳ  
ଆମ୍ବାଦାର କରାଯାଇଛି । କର୍ଣ୍ଣାଳ  
ବ୍ୟାଙ୍ଗକ ତ, ଅମ୍ବାରେ ଦାବ କହିଥୁଣ୍ଡ

କରିବା ଦିଇ କରିବାର ସମ୍ବନ୍ଧ ଆସିଥି  
ବୋଲି ଏହି ମନ୍ତ୍ରରୁଷିତ୍ୟେଣେ । ଭାବରୁ  
ଅବଳମ୍ବନ କରିବାରୁ ଏବଂ ଏହି କାର୍ଯ୍ୟ  
ବସନ୍ତ ପ୍ରଦେଶର ଅଳ୍ପକୁ କ୍ଷେତ୍ର,  
ଦୃଷ୍ଟିଗତି ଦର୍ଶିତ କରିବାରୁ ପ୍ରଦେଶର  
ଅନ୍ତର୍ଗତ ଦ୍ୱୀପ, ନିର୍ମାଣ କରିବାରୁ  
ପ୍ରଦେଶର ଏହାର ଗୋଟିଏ, କ୍ଷେତ୍ରକୁ  
ନିର୍ମାଣ କରିବାରୁ ଏବଂ ଏହାର ପାଇଁ  
ଏହାର ବସନ୍ତ ପ୍ରଦେଶର ଦ୍ୱୀପ  
ଦ୍ୱୀପରୁ ବସନ୍ତ ପ୍ରଦେଶର କାର୍ଯ୍ୟରୁ  
ଏଥରେ କାର୍ଯ୍ୟରୁ ଏଥରେ କାର୍ଯ୍ୟରୁ  
ଏହାର କାର୍ଯ୍ୟରୁ ଏହାର କାର୍ଯ୍ୟରୁ  
ଏହାର କାର୍ଯ୍ୟରୁ ଏହାର କାର୍ଯ୍ୟରୁ  
ଏହାର କାର୍ଯ୍ୟରୁ ଏହାର କାର୍ଯ୍ୟରୁ



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**‘ଓଡ଼ିଶାରେ କାର୍ବନ ଅଭିବଳି ରୋକିବା ଆବଶ୍ୟକ’**



Dharitri, January 24, 2024

# POLICY DIALOGUE ON TRIBAL EDUCATION

Prameya January 29, 2024

ଭିଏସ୍ଟି-ସପିଆର ପକ୍ଷରୁ ନୀତି ନିର୍ଣ୍ଣାରଣ ଆଲୋଚନା

# ମାଧ୍ୟମିକ-ଉଚ୍ଚ ମାଧ୍ୟମିକ ବୋର୍ଡ ମିଶ୍ନ୍ଶ ହେଉ

ଭୁବନେଶ୍ୱର, ୨୨୦୧ (ବୁଝୋ): ରାଜ୍ୟରେ ଆଦିବାସୀଙ୍କ ମଧ୍ୟରେ ସାକ୍ଷରତା ହାର ୪୯% । ଛତିଶଗତରେ ଏହା ୫୦% । ମାଧ୍ୟମିକଙ୍କରରେ ରାଜ୍ୟରେ ଆଦିବାସୀ ଛାତ୍ରାତ୍ମକ ମଧ୍ୟରେ ହୃଦ୍ୟାଳ୍ପତ୍ତ ହାର ଥାଣା% । ଛତିଶଗତରେ ଏହା ୩୮% । ଉଚ୍ଚ ମାଧ୍ୟମିକ ପ୍ଲଟରେ ଛତିଶଗତରେ ମୋଟ ଉପସ୍ଥିତ ଅନୁପାତ (ଜିଲ୍ଲାର) ୨୭.୯୯% ଥିବା ବେଳେ ତୃତୀୟାଂଶେ ଏହା ୩୦% । ମାଟ୍ରିକ ପରେ ଅଧିକାଙ୍କ ଆଦିବାସୀ ଛାତ୍ରାତ୍ମକ କାମ ଅନୁଷ୍ଠାନରେ ବାହ୍ୟରୂପବାବୁ ଉଚ୍ଚ ମାଧ୍ୟମିକ ପ୍ଲଟରୁ ଯାଇନାହାନ୍ତି । ଏହା ଚିପାନନ୍ଦକ । ମାଧ୍ୟମିକ ଓ ଉଚ୍ଚ ମାଧ୍ୟମିକ ଗୋର୍ତ୍ତ ମିଶ୍ରଣ ହେଲେ ଅଧିକ ସଂଖ୍ୟକ ଛାତ୍ରାତ୍ମକ ଆଗକୁ ପଡ଼ିବା ସୁଯୋଗ ପାଇବେ ବୋଲି ବିବସ୍ଥା-ସିରିଆର ପକ୍ଷର ଜଣାସ୍ଥିତ ନାଇଜରିଆରେ ଅନୁଷ୍ଠାନ ନାଟି ନିର୍ଭାରଣ ଆଲୋଚନାରେ ଅତିଥ ମତବ୍ୟକ୍ତ କରିଛନ୍ତି ।

ଛତିଶଗଡ଼ରେ ଗୋଟିଏ ସ୍କୁଲରେ ମାଧ୍ୟମିକ  
ଓ ଉଚ୍ଚ ମାଧ୍ୟମିକ ଶିକ୍ଷା ପାଉଛନ୍ତି ଛାତ୍ରଛାତ୍ରୀ ।



ମାତ୍ର ଓଡ଼ିଶାରେ ଏଇଳି ବ୍ୟକ୍ତୀ ବ୍ୟାପକ ହୋଇନି । ଫଳରେ ଶାତରାତ୍ରୀ ସ୍ଥଳ ବିଶେଷରେ ଭିନ୍ନ ସ୍ଥାନକ ପଢ଼ିବାକୁ ଯାଇଛନ୍ତି । ଓଡ଼ିଶାରେ ଗୋଟିଏ ସ୍ଥାନରେ ମାଧ୍ୟମିକ ଓ ଉଚ୍ଚ ମାଧ୍ୟମିକ ଶିକ୍ଷା ଦେଉଥାବୁ ସ୍କୁଲ ସଂଖ୍ୟା ୪୭୦୦ । ଯାହା ମୋଟ ସ୍କୁଲର ୮.୧୪% । ଓଡ଼ିଶାରେ ଏଇଲି ୪୮୯୩ ସ୍କୁଲ ରହିଛି । ଯାହା ମୋଟ ସ୍କୁଲର ୦.୮୭% । ଫଳରେ ଉଚ୍ଚ ମାଧ୍ୟମିକ ସ୍କୁଲରୁ

ଛତିଶଗଢର ୮୪% ଆଦିବାସୀ ଛାତ୍ରଛାତ୍ରୀ  
ମାଧ୍ୟମିକ ଶକ୍ତି ପାଇଁ ଏବଂ ୫୦% ହେଉଥିଲା।

ଶ୍ରେଣୀ ପାଦ ଶିକ୍ଷା ବ୍ୟକ୍ତୁ ହେବା ଉଚିତ ।  
ମାଧ୍ୟମିକ ଓ ଉଚ୍ଚ ମାଧ୍ୟମିକ ବେଳେ ମିଶ୍ରନ ଦିଗନ୍ତ  
ମଧ୍ୟ ବିଜାର କରାଯିବା ଆବଶ୍ୟକ । ସେହିଲିଙ୍କ  
ଅଧିକ ସ୍କୁଲରେ ୧୨ ଶ୍ରେଣୀ ଖୋଲିବା ଉଚିତ ।  
ଦିବ୍ୟାୟୀ-ଶିକ୍ଷକ ଅନୁପାତ ଏବଂ ଆଦିବାସୀ  
ଶିକ୍ଷକ ଶିକ୍ଷୟତ୍ରୀ ନିୟୁକ୍ତ ବଢ଼ିଲେ ଏହି  
ଭାଇହାତ୍ମା ମାନେ ଉପକର ହୋଇପାରିବେ ।

କାର୍ଯ୍ୟକୁମରେ ଅନ୍ୟାନ୍ୟକ ମଧ୍ୟରେ  
ଅଜିମ ପ୍ରେମଗା ବିଶ୍ଵବ୍ୟାଳୟର ପ୍ରଫେସର  
ଭି.ଶାହକୁମାର, ସୁନିଷେଷ ପକ୍ଷରୁ ଲାଇଟା  
ପଞ୍ଚମାଂକ, ନାଇଜର ନିର୍ଦ୍ଦେଶକ ହିତେହ ନାଥ  
ଘୋଷ, ଅବସରପାସ ପ୍ରଶାସକ ଡ.ଅରବିଦ  
ବେହେରା, ଶିକ୍ଷା ସାକ୍ଷାନର ଅନିଲ ପ୍ରଧାନ,  
ବିଶ୍ଵବ୍ୟାଙ୍କ ପରାମର୍ଶଦାତା ବିନୟ କୁମାର  
ପଞ୍ଚମାଂକ, ମା ମାର୍କୀକ୍ଷେଣା ବିଶ୍ଵବ୍ୟାଳୟ  
ପ୍ରଫେସର ମହେନ୍ଦ୍ର କୁମାର ମିଶ୍ର, ଡ. ବିନ୍ଦୁ  
ସୁନା, ଡ. ଚିତ୍ରପେନ ଗୋଲେ, ଡ. କୃମୁଦ କୁମାର  
ନାଥକ, ଏବିଏସ୍ଟି ଆରଟିଆର ଅଧ୍ୟକ୍ଷାଙ୍କ  
ସମେତ ୪୦ ଗବେଷକ ଉପର୍ତ୍ତିତ ଥିଲେ।

Prameya, January 29, 2024



**Delegates of Policy Dialogue on Energy Transition in Eastern India**



**Release of Policy Brief on 'Adoption of Electric Vehicles in Eastern India: Policies and Prospects'**



**Release of Policy Brief on 'Accelerating Roof-Top Solar Photovoltaics Deployment in Eastern States of India'**

**Prof. Akhilesh Gupta, Secretary, SERB and Senior Advisor & Head, DST addressing the august gathering through online mode**

**Dr. Satya Priya Rath, IAS, Director (Budget), Govt of Odisha and Dr. A. K. Nayak, Head NCPW, DAE, Govt. of India**



**Delegates and participants in the Policy Dialogue on Energy Transition in Eastern India**



**Mrs. Ulka Kelkar, World Resources Institute, Bengaluru presenting her study**



**Dr. Ashok Sreenivas, Prayas Foundation, Pune**



**Dr. Chandra Sekhar Bahinipati, IIT Tirupati**



**Mr. Manjeet Singh Puri, former diplomat, TERI**



**Prof. R. B. Grover, Member of Atomic Energy Council, Govt of India & Dr. Jugal Mahapatra, Former Chief Secretary, Odisha and other delegates during the concluding session**



**Dr. Satyaprasad P Senanayak, NISER, Bhubaneswar presenting his talk**



**Mr. A. P. Samal, Head, NTPC Ltd.**



**Participants during the discussion**

# PHOTOS OF POLICY DIALOGUE

30



**Release of Policy Briefs on ‘Barriers to early education of tribal children in remote locations’ and ‘Can Odisha learn from Chhattisgarh to improve the tribal education?’**



**Prof. V. Santhakumar, Azim Premji University delivering his talk**



**Mr. Binay Pattnayak, Consultant, the World Bank and Mr. Anil Pradhan, Siksha Sandhan**



**Mr. Bijoy K. Upadhyay, Ashram School Teacher sharing his experiences**



**Ms. Madhusmita Sahoo and other members from SCSTRI, Odisha**



Delegates and participants during Policy Dialogue on Tribal Education in Eastern India



Dr. Aurobinda Behera, Former Principal Secretary, Govt of Odisha



Dr. John Kujur, Project Scientist, DST-CPR presenting the policy brief on 'Can Odisha learn from Chhattisgarh to improve the tribal education?'



Dr. Kumud Ch. Naik and Dr. Chitrasen Bhue from Maa Manikeshwari University, Bhawanipatna



Dr. Bratindi Jena, ActionAid India delivering her talk



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