

WEBINAR SERIES (India)

INVESTING IN NATURE TO BUILD BACK BETTER

Partners Synthesis Report

June 2021



Photo: Pexels | Nothing Ahead

Webinar Series Partners



WRI INDIA



CLIMATE
POLICY
INITIATIVE



Webinar Series (India)

Investing in Nature to Build Back Better

Partners Synthesis Report

Disclaimer

This report is based on views expressed by speakers in the webinar series and do not necessarily reflect the views of the United Nations Environment Programme or partner organizations.

Webinar Series and Report Team:

Advisors: Atul Bagai, Country Head, UNEP-India and Divya Datt, Programme Management Officer, UNEP-India

Report (composition and design): Reuben Gergan, Consultant, UNEP-India

Section on Webinar 4: Labanya Prakash Jena, Anubha Prasad, Zeenat Niazi

Webinar leads:

- Climate Policy Initiative: Mahua Acharya, Labanya Prakash Jena, Angel Jacob
- Development Alternatives: Zeenat Niazi, Gitika Goswami, Stella George
- IUCN-India: Vivek Saxena, Aanchal Saxena
- The Nature Conservancy-India: Sushil Saigal, Minakshi Seth, Sunpreet Kaur, Karishma Vohra
- TEEB Initiative: William Speller, Simi Thambi
- TERI: Souvik Bhattacharjya, Dhriti Pathak
- Wetlands International-South Asia: Ritesh Kumar, Asgar Nawab
- WRI-India: Madhu Verma (*also provided guidance in conceptualizing series*), Ruchika Singh
- UNDP-India: Ruchi Pant, Parth Joshi
- UNEP-India: Divya Datt, Anubha Prasad, Karan Mangotra, Ananya Bal

For more information:

Divya Datt,
Programme Management Officer,
UN Environment Programme, India Office
55, Lodhi Estate, New Delhi – 110003
divya.datt@un.org

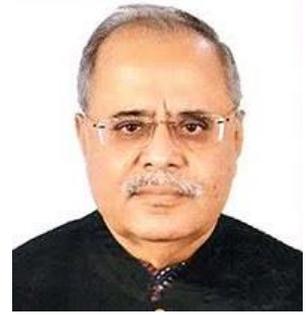
Table of Contents

Foreword	1
Introduction: Investing in Nature to Build Back Better Webinar Series	2
Webinar 1: Investing in Nature to Build Back Better	4
Introduction	5
Mobilizing public action towards biodiversity conservation and the environment	5
Investing in knowledge to invest in biodiversity conservation	5
Addressing agriculture sector concerns in India in the wake of the COVID-19 pandemic	6
Addressing concerns on illegal wildlife trade and the spread of zoonotic diseases	6
Bringing economic value of biodiversity into policy making and investment thinking	6
Summary of key messages	7
Webinar 2: Financing Nature Conservation as a Response to COVID-19	8
Introduction	9
Greening the economic relief package: evidence of its benefits from around the globe	9
Opportunities for India to invest in rebuilding nature	10
Potential of nature-based solutions (NbS) to meet challenges and support green and inclusive economic growth post the pandemic	11
Convergence of solutions and learning from past experiences with climate change	12
Taking responsibility for “climate refugees” and COVID migrants by investing in nature	13
The 15 th Finance Commission: addressing the new reality post COVID-19	13
Relooking at public and private finance available for mainstreaming biodiversity conservation: challenges and opportunities	14
Summary of key messages	15
Webinar 3: Valuing nature for sustainability in the agriculture and food sector	17
Introduction	18
Context: Agriculture, food and the natural environment – the prospect of containing, coping, restarting and building back better	18
The Economics of Ecosystems and Biodiversity (TEEB) Initiative	19
Adopting the TEEB Framework in Practice: Expanding Agricultural Income Calculus beyond Food and Employment	20
Priorities for a shift towards sustainable agriculture	20
Biodiversity mainstreaming in the agriculture sector	21
Other related Environment Accounting Initiatives	22
Suggestions from the webinar for scaling up the TEEB analysis	23
Summary of key messages	23
Webinar 4: Greening India’s Recovery Package – Ideas for Consideration	25
Introduction	26
Economic Stimulus Package	26
Will the economic stimulus measure enough to revive the economy?	27
The economic package is primarily directed at fixing supply-side issues	27
Unpaid receivables must be cleared on priority	28
Is it possible to green the package?	28
Summary of key messages: developing a green finance taxonomy	31

Webinar 5: Strengthening sub-national actions through robust SAPCCs	32
Introduction	33
Lessons from SAPCCs 1.0	34
Climate change: a multi-sectoral concern	34
Strengthening the institutional mechanism for resource allocation	35
Need for a financial roadmap in implementing action plans	36
Internalizing climate change finance into sectoral developmental plans	36
Strengthening the monitoring and evaluation framework	36
Linkages to SDG goals	36
Demystifying the SAPCC document and enhancing climate change awareness at the state department level	37
Success stories and implementation challenges of SAPCCs from states in India	38
UNFCCC COP 26 and strengthening action on climate resilience, adaptation and the role of sub-national actors	40
Summary of key messages	41
Webinar 6: Land Restoration at Scale: Towards meeting India's Commitments	42
Introduction	43
Barriers to land restoration in India	44
An agriculture perspective of India's land degradation	45
Zero-Budget Natural Farming in Andhra Pradesh	45
A forests perspective: financial considerations for scaling land restoration in India	46
Reviewing technology for land restoration	47
Action on ground: NTFP value-chain development in Maharashtra	48
Examples of successful land restoration business models	48
Summary of key messages	49
Webinar 7: Wetlands as Ecological Connections in the Central Asian Flyway	50
Introduction	51
The CMS COP13 and commitments to ecological connectivity	51
The Central Asian Flyway	52
Importance of India's wetlands to the Central Asian Flyway	52
India's leadership in action on wetland conservation and maintaining ecological connectivity	53
Ecological Connections – the requirement of systemic and systematic monitoring	54
Landscape approach to management of wetlands	55
Enhancing information access and sharing for transboundary cooperation	56
Capacity building for wetland management and achieving positive behavioral change	56
Summary of key messages	57
Webinar 8: Emerging Mechanisms to Mitigate Illegal Wildlife Trade	58
Introduction	59
UNDP's work in addressing wildlife trafficking	59
Capacity building for effective enforcement: Perspective from India's enforcement agencies	60
Information and Communication Technology for combatting IWT: the eCITES system	61
Challenges in the implementation of eCITES	62
Data collection and sharing mechanisms in combating wildlife crime in India	63
The role of forensics in the fight against IWT	64
Transboundary cooperation mechanisms for effective mitigation	65
Summary of key messages	66

Webinar 9: Promoting Forest Conservation through Public Funding	67
Introduction	68
Context: The evolution of Finance Commission Grants for maintaining forest cover	69
Reevaluating public funding options for forests in India	69
Strengthening inter-linkages between investment in forests and trees and other key priorities of Indian states: opportunities in the post-COVID period	71
Ensuring adequate compensation and incentivizing forest stewardship in the hill states of India	71
Strengthening the case for public investments in forests in the 'plains' of India	72
Expanding forest and tree cover through flagship rural livelihood and development programmes	73
The role of joint forest management in landscape level forest restoration	74
Triggering private sector action for forests	74
Summary of key messages	75
Webinar 10: Building synergies and linkages between biodiversity and infrastructure development	76
Introduction	77
Context: Linear infrastructure and biodiversity, ecosystem protection in India	78
India's mitigation measures to climate change in the road transport sector	78
Moving towards a landscape approach to linear infrastructure	79
Science-based best practices for mitigating biodiversity impacts of infrastructure development: a focus on solar and wind energy development	79
Trends in private sector commitments to biodiversity conservation	80
The evolving role of the judiciary in interpreting the infrastructure-biodiversity contradictions	81
Summary of key messages	81
Reports cited by webinar series speakers	83

Foreword



As the world grapples with the catastrophic loss of lives and livelihoods in the wake of the COVID-19 pandemic, it has become evident that this shock to our health and socio-economic system stems from our deteriorating relationship with nature. New research suggests that environmental degradation may make pandemics more likely and less manageable.

Given the emergence of the global health crisis in 2020 and the economic fallout thereafter, the UN Environment Programme (UNEP) and its partners, United Nations Development Programme (UNDP)-India, World Resources Institute-India, The Nature Conservancy-India, International Union for Conservation of Nature (IUCN), Wetlands International-South Asia (WI-SA), The Energy and Resources Institute (TERI), Development Alternatives (DA), Climate Policy Initiative (CPI), World Wildlife Fund-India (WWF) and the National Biodiversity Authority (NBA), discussed the need to initiate discourse on mainstreaming nature into the economic recovery process in India. We greatly value this partnership and I take this opportunity to thank them for making this webinar series a success.

These discussions led to the initiation of a webinar series under the overarching theme of rebuilding nature as a response to COVID-19. The series was titled 'Investing in Nature to Build Back Better' and it aimed to generate and foster discourse on how we can lay the groundwork for scaling up transformation as part of a 'green new normal'. The webinar series ran through the year, bringing critical aspects of ecological rebuilding and green recovery to the fore, highlighting areas of strength and those where significant work may still be needed. The series also explored what 'building back better' means in the Indian context and presented compelling advisory on the

pathways to a better future and the barriers we may face along our journey.

This Partners Synthesis Report brings together perspectives of global experts, practitioners, policy and decision makers on core issues surrounding nature rebuilding in India. The report presents a synthesis of the various perspectives brought forward during the course of the webinar series.

With the UN Decade on Ecosystem Restoration being launched on the World Environment Day this year, we felt that it was fitting to release the Partners Synthesis Report, providing valuable perspectives and insights on India's position for ecosystem restoration at the beginning of the UN Decade. This is also a critical period for the environment – there has never been a more urgent need to revive damaged ecosystems than now; action today will define how our future looks.

With the UN Decade on Ecosystem Restoration aiming to massively scale up restoration of degraded and destroyed ecosystems as a proven measure to fight the climate crisis and enhance food security, water supply and biodiversity, I hope that this report is useful for action at various levels. As a clarion call for the Decade we should adopt the motto, 'Prakriti Devo Bhava' and treat nature as God, respecting it and protecting its integrity.

A handwritten signature in black ink that reads "Atul Bagai". The signature is written in a cursive style with a large, sweeping flourish at the end.

Atul Bagai,
Head,
India Country Office,
UN Environment Programme

THE 'INVESTING IN NATURE TO BUILD BACK BETTER' WEBINAR SERIES

The benefits of biodiversity conservation and ecosystem restoration are well known: from its aesthetic and cultural value to a hedge against global climate change; from a medicinal repository to a natural defense against zoonotic diseases, from basic raw material to waste sinks, from the microscopic to the largest species, all interacting with their physical environment to form complex ecosystems on which human wellbeing and stability is dependent. Natural capital underpins human existence and economic systems; yet dependencies on ecosystem functionality are largely undervalued and far too often go unnoticed. The long-term sustainable use and management of natural resources is still far from being a serious consideration in financing and investment decisions. If there is one lesson from COVID-19, it is that the world needs to get serious about conserving biodiversity and ecosystems and investing in its conservation and restoration or prepare for more severe and frequent crises. As countries plan their economic recovery, it would be critical to increase public and private investments in nature to halt the deteriorating state of the environment.

In building back better, valuation of ecosystem services will be important to make nature's values visible and drive investment decisions of public and private sector. Significant work has happened in this direction. For instance, The Economics of Ecosystems and Biodiversity (TEEB), a global initiative led by the UN Environment Programme (UNEP), has helped decision makers to recognize, demonstrate and capture the wide range of benefits provided by ecosystems and biodiversity, across sectors such as agriculture. There is a need to strengthen mechanisms that incorporate the values of ecosystems into decision-making through incentives and price signals, such as payments for ecosystem services, reforming environmentally harmful subsidies or introducing tax breaks for conservation.

Policy and investment decisions taken for economic recovery from COVID-19 will also determine if future threats to humanity and economies are mitigated or amplified. It is imperative that in recovering from COVID-19 transition towards Green Economy is facilitated. The key aspects of 'Building Back Better' entail delivering new jobs and businesses through a clean, green transition; achieving green jobs and sustainable growth; de-risking through a shift from the grey to green economy; investing in the future; incorporation of climate risks and opportunities into the financial system as well as all aspects of public policy making and the international community coming together to forge co-operations.

Investing in nature presents an opportunity to strengthen climate action, align with Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDCs) towards climate change. Here, the role of sub-national actors is a critical link in enhancing resilience against climate change related crises, including COVID-19. They form a complementary part of national policy making and governance as region specific considerations are crucial elements of most initiatives and undertakings. The revision of the State Action Plans on Climate Change (SAPCCs) is an opportunity for states to prepare a strategy to enhance their climate resilience and strengthen the existing mechanisms for addressing climate change.

Furthermore, India has set an ambitious goal to restore 26 million hectares, a notable decision in meeting targets of the Bonn Challenge and the fulfilment of multiple Sustainable Development Goals (SDGs). India also currently holds the Conference of Parties (CoP) Presidency of the United Nations Convention to Combating Desertification (UNCCD). Addressing the complex issue of land degradation and promoting restoration on a large scale will require an inter-disciplinary approach and thinking outside the box. Achieving India's target of bringing 33% of its geographical cover will form a key component. In India, where most forests are under state control and management, public funding plays a key role in its conservation, management, and restoration; given the challenges that have arisen in the post-COVID context, reevaluating public and private financing options to increase forest cover will need to find importance in decision-making. Identifying 'levers' that could deliver restoration at scale in

a cost-efficient manner within a reasonable timeframe and help the country meet its national goals and international commitments becomes imperative.

India is also one of the mega biodiverse countries of the world, with four biodiversity hotspots and a wide range of ecosystems. In alignment with its efforts to conserve biodiversity, in February 2020, India hosted the 13th meeting of the CoP of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and currently holds the CMS CoP presidency. As prioritized at the CMS CoP13, Feb 2020, India will look to pursue and promote the role of ecological connectivity and will undertake research, assessments, capacity development, and conservation initiatives for migratory species. Meanwhile, the COVID-19 crisis has also underlined the adverse impacts that illegal wildlife trade (IWT) have on health and economy. The likelihood of increasing incidences of wildlife crime will need to be checked to reduce threats of biodiversity loss and the spread of zoonotic diseases. Furthermore, while there is a certain need for developing resilient infrastructure in recovering from the devastating impact on the economy, mitigation measures will need to be mainstreamed in reconciling infrastructure development and biodiversity conservation.

Building back better means taking a pathway that proactively strengthens investment into nature; in hindsight, it is likely that substantial costs associated with the COVID-19 pandemic could have been avoided if done so. In this context, UNEP-India and its partners, United Nations Development Programme (UNDP)-India, World Resources Institute-India, The Nature Conservancy-India, International Union for Conservation of Nature (IUCN), Wetlands International-South Asia (WI-SA), The Energy and Resources Institute (TERI), Development Alternatives (DA), Climate Policy Initiative (CPI), World Wildlife Fund-India (WWF) and the National Biodiversity Authority (NBA) organized a series of webinars, starting on World Environment Day 2020, to engage decision-makers, experts and practitioners to discuss the significance of biodiversity conservation and ecosystem restoration, and find ways to mobilize investments into nature as we build back better. The webinar series concluded in March 2021, bringing valuable insights on nature rebuilding to the fore. Collectively, these webinars help identify ways to recognize, demonstrate and capture reflections on the benefits of investing into India's unique biodiversity and natural resources. It provides a power message that building back better is needed now more than ever.

WEBINAR 1: INVESTING IN NATURE TO BUILD BACK BETTER

Synthesis of Discussions

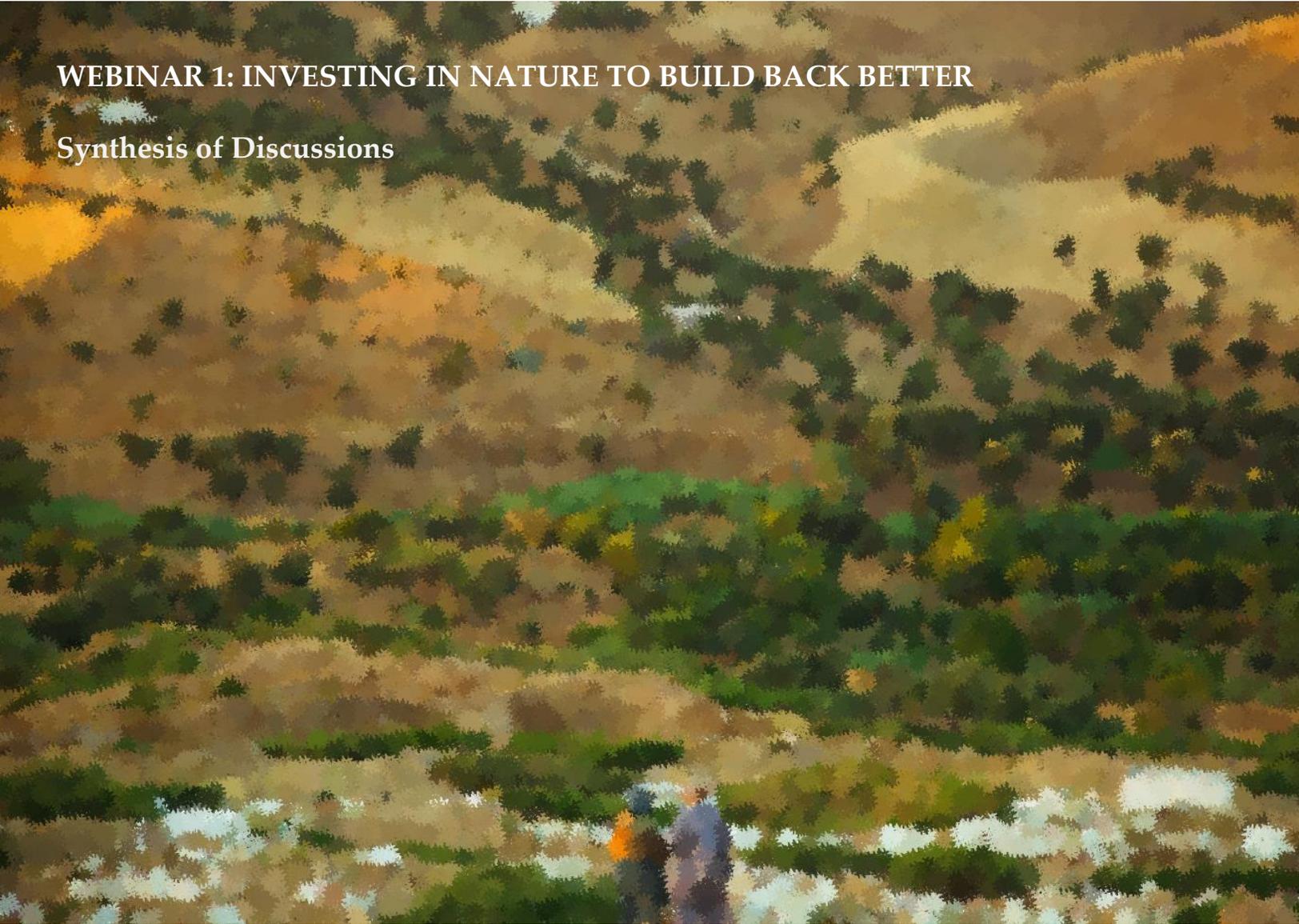


Photo: Pexels | Ryutaro Tsukata

5th June 2020

Panelists:

- *Dia Mirza*, UNEP Goodwill Ambassador and UN SDG Advocate
- *Ravi Singh*, Secretary General and CEO, WWF India
- *O.P. Agarwal*, CEO, World Resources Institute, India
- *Keshav Verma*, Advisor to the Government of Uttar Pradesh & Chairman, Sabarmati Riverfront Development Corporation
- *Pushpam Kumar*, Chief Environmental Economist, UNEP
- *Mahua Acharya*, Asia Director, Climate Policy Initiative (moderator)

Investing in Nature to Build Back Better

5th June 2020

Introduction

Biodiversity loss is occurring at an unprecedented rate and scale, much of it subject to humankind's ability to manipulate the ecosystems that we have inherited and replace them with ones that favor human growth, many times overlooking the fragile ecological balance. Driven by unsustainable consumptive behavior, the burning of fossil fuels, deforestation, habitat loss, commercial hunting, persistent poverty, among others, conditions for the survival of a massive number of species have changed and are indicating a sixth mass extinction. According to landmark *Global Assessment Report of Biodiversity and Ecosystem Services* released in May 2019 by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), around 1 million species are faced with extinction, many within the next few decades and one out of every four species is threatened. Wildlife population has declined on average by over 60 per cent in last fifty years.

Year 2020 brings to end the United Nations Decade on Biodiversity and further ushers in the United Nations Decade for Ecosystem Restoration (2021-2030), where efforts will be made towards the primary goal to prevent, halt and reverse the degradation of ecosystems. Being at the fulcrum of the United Nations Decade on Biodiversity and the Decade for Ecosystem Restoration, year 2020 has been called the "super year" for the environment with the World Environment Day (WED) 2020 taking on the theme of biodiversity. As such, in light of the aftermath of the COVID-19 pandemic and the need to invest in nature, UNEP-India along with its partners organized the introductory webinar of the webinar series, "Investing in Nature to Build Back Better" to discuss wide ranging aspects of nature rebuilding.

Within the broad contours of the theme on investing in nature to build back better, the panelists set the agenda for the following series of webinars. Dia Mirza provided her views on mobilizing public action, Ravi Singh reflected on creating knowledge as an investment into biodiversity, O.P. Agarwal provided insights into the post-COVID agriculture scenario, Keshav Verma on illegal wildlife trade (IWT), and Pushpam Kumar explained the importance of recognizing the value of natural capital. The following sections provide a summary of their statements.

Mobilizing public action towards biodiversity conservation and the environment

Mobilizing public action is a critical element in moving towards biodiversity conservation and nature rebuilding. Given the context of India, the second most populous country, behavioral change towards biodiversity conservation and the environment holds immense value in achieving the goals of nature rebuilding. Here, a key role for people prominent in public discourse is to bring about change through advocacy for environmental consciousness; however, for advocacy to be effective, transformation needs to begin at the individual level. Further, in the context of the world today, the role of technology is instrumental in environmental advocacy, providing a powerful tool for building awareness at large and leading to action on ground.

Investing in knowledge for biodiversity conservation

Knowledge creates awareness and action, whether it is individual or corporate action. For any structured institution to invest in nature and biodiversity, investment in knowledge is important. In terms of biodiversity conservation, financial institutions need to identify areas that can be changed with minimal effort and conversely also examine aspects those that require sustained efforts to bring change. For instance, a shift in company policies on resource efficiency and sustainability in procurement can have significant impacts on reducing environmental footprint and

its associated impacts on biodiversity. Furthermore, there is also a need for companies to adopt a social and environmental assessment framework, through which sustainability can be incorporated into the financial screening system. On the demand side, society will influence future demand; knowledge plays importantly in the type of demands created and the subsequent investments that are made. As such, creating awareness and enhancing understanding of the value of ecosystems, of people, of instruments for rebuilding nature is vital in moving towards investing in nature.

Addressing agriculture sector concerns in India in the wake of the COVID-19 pandemic

The COVID-19 pandemic triggered a lockdown in India beginning at the end of March 2020, severely disrupting the agriculture and food supply chain. With the shutdown of thousands of businesses, a large demand gap has highlighted the high burden of risk placed on the farmer, underlining the need to reevaluate how supply chains function from the farm to the fork. Strengthening supply chain facilitators and intermediaries, including how transport links are established and the role of warehouses and cold chains need to be examined in reducing the risk to farmers and also the loss of produce. Furthermore, such investments will also enhance resilience to the impacts of climate change on agriculture. This is because unlike developed countries, where food waste is likely to occur downstream, in developing countries like India, investing in infrastructure to manage upstream food waste can help distribute risk more evenly. Additionally, the return of both skilled and unskilled migrant workers to rural India also presents an opportunity to strengthen decentralized food processing closer to the farms.

Addressing concerns on illegal wildlife trade and the spread of zoonotic diseases

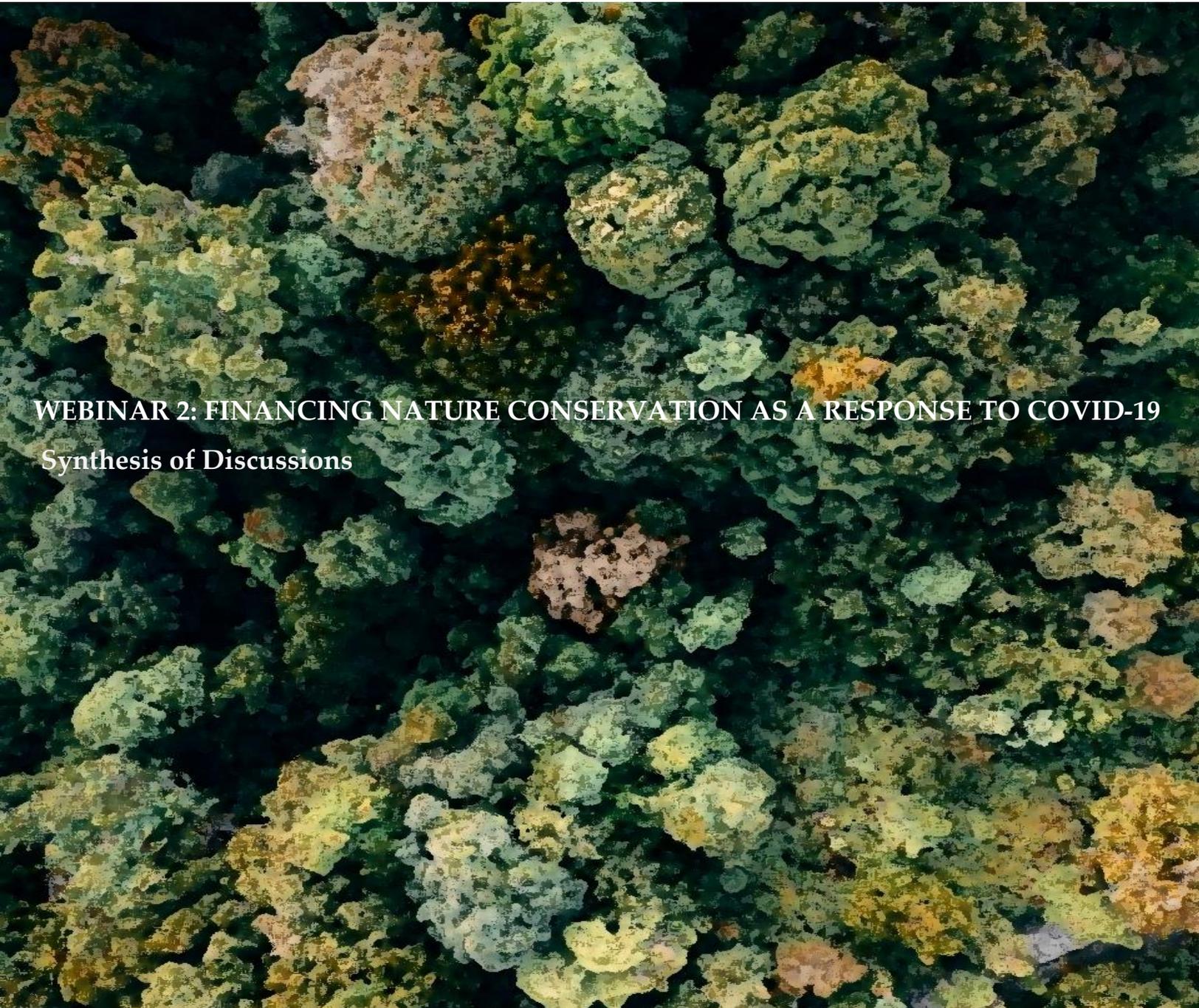
The issue of dealing with illegal wildlife trade (IWT) is an extremely complex issue as it involves a large number of persons who are dependent on the trade for livelihoods. However, COVID-19 while being a calamity also presents an opportunity both in creating an alliance at the highest level and catalyzing action, because of the public awareness that the pandemic has generated. A crucial and important aspect of reducing IWT is reducing the high demand for illegal wildlife products that is supported by a well-equipped and efficient supply chain. As such, the situation presents an opportunity to bring global leaders together and apply pressure on consumption countries. There is also a need to reevaluate policies and both the international and national levels and harmonize laws between countries to reduce poaching activity. Change is also needed in recognizing that conservation is not the exclusive responsibility of the ministry and state departments of environment alone but a joint responsibility of all ministries, the private sector and the public at large.

Bringing economic value of biodiversity into policy making and investment thinking

International scientific assessments have brought to light that different constituents of human well-being including health, income and social fulfillment is dependent on nature. Further, approximately half of the world's GDP depends on nature and biodiversity. Since the 1950s, the world has witnessed an increase in per capita output by approximately 5 times, however this has been at the cost of nature. Biodiversity loss is testimony to the loss of natural capital. In this light, there is a need for a paradigm shift in the way the global economy is looked at – while GDP has been used as a measure of production and growth, the need of the hour however may be the use of a new indicator, based on a wealth-centered economy that values human and natural capital as much as produced capital. There is also a need for focused subsidies and examination of investment design where nature is linked with the goods, capital and labour markets. Furthermore, as economic relief packages are rolled out, identifying opportunities to implement a range of activities under Nature-based Solutions (NbS) can be promising for the economic recovery process.

Summary of key messages:

- In building back better, a key role for people prominent in public discourse is to bring about change through advocacy for environmental consciousness
- To rebuild nature there is a need to invest into knowledge; knowledge of the value of ecosystems, of people, of instruments that can be used to build nature.
- Strengthening supply chain facilitators and intermediaries, including how transport links are established, the role of warehouses and cold chains need to be examined in reducing the high burden of risk on farmers
- Return of both skilled and unskilled migrant workers to rural India presents an opportunity to strengthen decentralized food processing closer to the farms
- COVID-19 while being a calamity also presents an opportunity in creating an alliance at the highest level to catalyze action on illegal wildlife trade
- Measuring growth may need a new indicator, based on a wealth-centered economy that values human and natural capital as much as produced capital.
- Identifying opportunities to implement a range of activities under Nature-based Solutions (NbS) can be promising for the economic recovery process.



WEBINAR 2: FINANCING NATURE CONSERVATION AS A RESPONSE TO COVID-19

Synthesis of Discussions

Photo: Pexels | Pok Rie

11th June 2020

Panelists:

- *Pushpam Kumar*, Chief Environmental Economist and Senior Economic Advisor, United Nations Environment Programme, Nairobi, Kenya
- *Vinod Bihari Mathur*, Chairman, National Biodiversity Authority, Chennai, India
- *Helen Mountford*, Vice President for Climate and Economics at World Resources Institute, Washington DC, USA
- *Ajay Narayan Jha*, Member, 15th Finance Commission of India, Former Expenditure Secretary, Secretary, MoEFCC & Finance Secretary, Govt of India, New Delhi, India
- *Juha Siikamäki*, Chief Economist, International Union for Conservation of Nature, Washington, DC, USA
- *Madhu Verma*, Chief Economist, WRI India, New Delhi, India (moderator)

Financing Nature Conservation as a Response to COVID-19

11th June 2020

Introduction

The origin of COVID-19 has been strongly linked to the disturbance of nature, the crisis, a symptom of the dysfunction between humans and nature. Steep costs being incurred on addressing impacts of the pandemic serve as a proxy measure for deteriorating health and resilience of the world's ecosystems, resulting from an unprecedented human impact on biodiversity loss and increasing vulnerability of communities to contagious diseases. Anthropogenic drivers such as agricultural expansion, encroachment of forests, fragmentation of natural habitats, illegal hunting and wildlife trade are not only driving biodiversity loss but are central to the outbreak of zoonotic diseases. The *UNEP Frontiers 2016 Report* flagged concerns of outbreaks of epidemic zoonoses as an emerging environmental concern, indicating that 60% of all infectious diseases are zoonotic in nature, as are 75% of all emerging infectious diseases.

While several such outbreaks in the recent past, such as the bird flu, SARS, MERS and Ebola have been successfully contained, the COVID-19 outbreak has gone on to cripple economies worldwide. In many ways it has shown that the linkages between nature and economy are even more critical than we have come to appreciate over the last several decades. Shrinking wilderness areas and blurring lines between man and wildlife are evident; *The Dasgupta - Independent Review on the Economics of Biodiversity (Interim Report)*¹ released in April 2020 indicates that during the period 1992-2014, while globally produced capital per head doubled and human capital increased by 13%, the value of the stock of natural capital per head has declined by nearly 40%. A powerful lesson that emerges from the crisis is that the wild should be kept in the wild and left for the wild.

Given that the root cause for the current pandemic is a result of a subversion of our relationship with nature, the remedy for the problem therefore cannot be devoid of it. It lies in nature rebuilding and investing in natural capital. The present pandemic only goes to strengthen the case that investing in nature is needed now more than before. Investing here does not only pertain to the arrangement of funds, but also extends to exploring various options for finance, finding creative solutions and blended approaches, enhancing participation of multiple sectors and stakeholders and above all, the prioritization of the investment for financing nature conservation.

Considering the context above, the panelists explored ideas for bringing nature into the economic recovery process. Pushpam Kumar reflected on the path that has led humanity to the point of crisis and reflected on benefits of mainstreaming nature in the planning process, Juha Siikamäki explained the benefits and potential of Nature-based Solutions (NbS) for inclusive green growth, and Helen Mountford recognized the opportunity for a convergence of solutions. Further, Ajay Narayan Jha reflected on challenges in addressing the reality of a post-COVID recovery, Andrew Harper provided viewpoints on taking responsibility for 'climate migrants' and V.B Mathur presented considerations of enhancing private sector engagement. The following sections provide a synthesis of the perspectives brought forward and the ensuing discussions.

Greening the economic relief package: evidence of its benefits from around the globe

World over massive challenges have been presented by the shutdown of economic activities. Given the daunting task of an economic recovery from the pandemic, a huge responsibility is to look at how resource allocations should be made in the coming years. Conventional strategies in crisis-recovery often deprioritize nature conservation, which

¹ <https://www.gov.uk/government/publications/interim-report-the-dasgupta-review-independent-review-on-the-economics-of-biodiversity>

is generally looked on as complementary to the goal. However this line of thought functions as a false dichotomy. Nature conservation and restoration is not an opposing goal but rather as a long-term vision for society and for economies; a move towards a sustainable and inclusive economy only benefits in strengthening economic resilience.

In recovering from the crisis, investing in nature presents an opportunity to strengthen climate action, aligning with Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDCs) towards climate change. In the recent decade, while the impacts of climate change, being witnessed in increasing episodes of natural disasters such as droughts, floods, forest fires, cyclones, have come tragically at a great cost to human lives and economies, it has also catalyzed action towards green growth. Today, we are witnessing a real shift with governments now committed to net zero emission targets, many setting targets by 2050 to limit the worst effects of climate change. Considering all countries and companies that have committed to net zero emissions by 2050, approximately 50% of the global economy is now committed, a major shift from where the world was last year and certainly a decade ago. The COVID-19 crisis serves as another call to strengthen the resolve towards greening the economic recovery.

Globally, experiences in recovering from past economic recessions also present a strong case that investment into a green economy considerably strengthens the resilience of economies. There is compelling evidence from South Korea, the European Union, and China of the benefits of investment in green technologies. For instance, South Korea, after the 2008-2009 economic recession allocated approximately USD 21.5 billion (24 trillion South Korean Won) to green industries including strengthening of conservation efforts, approximately 69% of its 2008-2009 stimulus package. Benefits of the investment is being witnessed in the current crisis; South Korea has been amongst the countries to have bounced back quickest from COVID-19 with the lowest level of unemployment in the current crisis.

Multiple examples from across the globe also show that investment in a green economy holds key advantages for a post-COVID economic recovery. Examples especially relating to investment in clean energy infrastructure and energy efficiency shows a tendency to double the amount of jobs as the same investment in fossil fuels. Further, an assessment of US states shows that those states that invested more of their 2008-2009 stimulus package in public transport generated approximately 70% more jobs as compared to states that invested in highways.

There are also examples that a shift towards investing in a green economy is central to economic recovery plans for various countries. Emphasis has been placed by the European Union on accelerating the implementation of various interventions under the European Green Deal in creating jobs and bringing back the economy, while also allocating considerable amounts for green purchases. For instance, Denmark has allocated EUR 300 million towards the purchase of green vehicles, while Germany has incentivized green investment especially in the construction sector. Chile's announcement to increase their climate ambition in the middle of the pandemic and thereby connect climate action with economic recovery in addressing inequalities also shows the bold steps being taken by governments in prioritizing a green recovery.

Opportunities for India to invest in rebuilding nature

India has been one of the worst hit amongst the emerging markets – it has been hard hit with the loss of millions of jobs from both the formal and informal sectors, reverse migration of workers resulting from sudden job loss, shrunken revenue streams, stability and growth issues, and steeply rising inflation rates. The sheer number of people being pushed back into poverty is a serious concern for the country. India's response to the crisis has been the infusion of a USD 280 billion (INR 20.90 trillion) package, approximately 10% of India's GDP. The package, besides providing immediate relief assistance largely attends to increasing gross domestic output and generating employment, largely through a mix of liquidity infusion and credit enhancement. As announced, the focus of the

package is to empower local economies through local enterprises, particularly MSMEs and agriculture. The challenge now is being able to see connections between the systems and solutions through which the issue of economic recovery can be resolved together with investing and rebuilding nature.

While a sector-wise deep dive is required in expanding on the potential of nature-based solutions and green technologies to support a green recovery, from India's standpoint, promoting green solutions holds immense potential in creating a narrative for a resilient new economy. Among several options, the promotion of sustainable agriculture, social forestry, wetland restoration, ecotourism through flagship schemes and programmes in rural employment, watershed management etc., such as the MGNREGS, have a great potential to create green jobs and build green local enterprises, albeit with the reorientation of schemes towards the enhancement of nature rebuilding. Additionally, green solutions, while creating millions of jobs also presents an opportunity for India to ambitiously scale up action towards meeting several international commitments including targets to increase forest cover and restore degraded lands.

Potential of nature-based solutions (NbS) to meet challenges and support green and inclusive economic growth post the pandemic

The World Economic Forum recently stated that with every dollar spent on nature restoration, almost \$9 worth of economic benefit can be expected in return. Defined by the IUCN as "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits", nature based solutions (NbS) can play a significant role in helping economies move towards a green recovery. With many ecosystems around the world having a sizeable human imprint on them, the restoration of these ecosystems are very much the target of NbS. By focusing on ecosystem restoration, they benefit environment and society at the same time.

In recent years climate focused NbS has received the most attention with global commitments in limiting greenhouse gas emissions. However, besides reducing GHG emissions, NbS spans a wide breadth and range that can be used to address a number of societal challenges at once. These include challenges such as water availability and quality, management and mitigation of disaster risks, coastal protection, protection from landslides, flood control, regulation of air quality and temperature, energy, and enhancing food security in making food systems more sustainable and productive. It is also clearly a method in advancing biodiversity conservation, a critical global challenge that has not received the same sort of attention as climate change over the years. Additionally, critical for public health, NbS can contribute to improved health and wellbeing, while also effectively managing health risks that we have become so familiar with now.

From India's standpoint, with high unemployment rates, reverse migration of workers, and given India's considerable geographical land area under degradation, in building back, NbS presents itself as a fitting solution in meeting in part the objectives of increasing economic output, creating jobs while restoring degraded lands. Land degradation is a major problem globally and in India; a study by TERI indicates that India suffers a loss of 2.5% of its economic output annually as a result of land degradation. India's commitment to restore 26 million hectares of degraded land can also be met successfully through the implementation of NbS at scale.

Furthermore, in light of the current crisis, a clear advantage of NbS is that they are shovel-ready projects that offer a wide range of solutions in addressing multiple societal challenges. This range is not available for conventional investments in economic stimulus and as such, it can play a key role in economic recovery. Additionally, in many cases, NbS offer ways of addressing societal challenges at costs that are competitive or even more cost-effective than conventionally used solutions. Further, there is flexibility in its implementation, where hybrid solutions, in part nature-based and in part conventional, can be adopted to various scenarios that may pose a challenge. Besides

being effective in creating jobs, investments in natural capital through NbS have the potential to provide long term returns in improving sustainability and productivity at local and global scales.

The key to the success of NbS is that it needs to function at scale. As an important part of the 2008-2009 economic stimulus in many countries, there is evidence that NbS makes economic sense, both through a societal and private sector perspective. However, learnings from the past also indicate that there is a need to go beyond pilot projects in capturing the various benefits that it offers. In the post-COVID context, an opportunity to scale NbS lies in the need for readily available, holistic solutions for accelerating the economic recovery process. With the *Global Standard for Nature-based Solutions*² to be released by the IUCN this year, specifically designed with the idea of implementing projects at scale, there is a clear opportunity to make NbS an integral part of economic recovery process.

Convergence of solutions and learning from past experiences with climate change

COVID-19 has reemphasized the interconnectedness of the world's systems – while there is the health crisis, closely interlinked to the health crisis is the economic, unemployment and income crises. This in turn is also closely connected to the ongoing crises of climate change, biodiversity loss, air pollution, and inequality. The world is seeing a convergence of crises in the pandemic and as a result, there is also a convergence of solutions that can be applied in recovery. Key lessons emerge in learning from the previous economic recession and addressing climate change:

- 1) **Listen to the scientists** – While COVID-19 has come as a shock for the world economy, the risks associated with climate change including disasters, flooding, droughts, heatwaves and the spread of diseases has regularly been flagged by scientists over many years, often without matching action on ground. In building back better, there is a need to work at reducing risks from future pandemics and natural disasters by taking concrete action on scientific findings.
- 2) **Green is better for growth and jobs** – It is now also very clear from a strong evidence base that green solutions provide cost-effective solutions with multiple benefits, whether they are nature-based solutions or green technologies and infrastructure such as renewable energy, battery storage and public transport. Gains in natural capital such as improved air and water quality, increased capacity for carbon absorption that have often not been valued in the past, provide added benefits in the implementation of green solutions. With the infrastructure sector being a powerful tool in stimulating economy, possessing the ability to rapidly create jobs that involves far-reaching value chains, an increase in infrastructure investments to boost employment and income is expected over the coming years. Here, opportunities lie in looking at green infrastructure as an alternative to conventional infrastructure development.
- 3) **Policy reforms** – Lessons from the 2008-2009 economic stimulus indicates that while sizeable investments into green infrastructure were made, many of them were not necessarily accompanied with the policies to ensure long term benefits. In building back better from the current crisis, there is a need to consider how sustainability and inclusive growth can be built in using implements such as fiscal instruments, carbon taxes and subsidy reforms. A need to review inefficient subsidies and put a value on natural resources in raising revenue for government expenditures is a clear lesson that emerges from past experiences. India has a commendable record of applying economic instruments such as in reforming fossil fuel subsidies that have benefited low income households and has kept them protected. Further, there are also good examples from

² <https://www.iucn.org/theme/nature-based-solutions/resources/iucn-global-standard-nbs>

the state of Gujarat in reforming water subsidies that have benefited farmers and land productivity. There is a clear need to consider applying such reforms at scale.

Taking responsibility for “climate refugees” and COVID migrants by investing in nature

The world is becoming increasingly challenged with populations being displaced by climate change, both as a result of severe natural disasters that bring sudden shocks or slow-onset events such as rising sea levels. A major fallout of the pandemic have been COVID-19 migrants, displaced both across borders but predominantly within the country. India has been very much at the forefront of those impacts during the year, where in addition to the large reverse migration of workers, India has also suffered from the impact of two major cyclones.

Although the term “climate refugee” is not based on international law, the image it appropriately conveys is one of people who have been forced to migrate as a result of the adverse consequences of climate change. However, here it is to be noted that people rarely move solely for climate-related reasons and is largely based on a whole host of reasons. These may include a lack of livelihoods, as experienced subsequent to the spread of COVID-19, and compounded by various reasons such as the lack of hope, issues of corruption of governments and the engagement of extremist groups. Many times at the last point – it results in violence, conflict, fragility and further displacement.

The vast majority of people who have been displaced by climate-related events find safety within their own community. Most are displaced from their homes but are generally internally displaced, as is the case with COVID related migration. As such, the role of the governments would be to support communities in providing for their own population, focusing on the most vulnerable sections of the population. It is to be noted that often the most vulnerable sections of the population do not migrate as they lack resources or the linkages to do so. Further, populations displaced across borders are largely hosted in locations that are often areas of vulnerability themselves, thereby increasing the vulnerability of displaced populations.

With climate change being a threat multiplier and its linkages to COVID-19 further complicating the situation at hand, there is a certain need to strengthen resolve in investing in nature. As has been well established, investment into nature-based solutions, green technologies and infrastructure have the ability to spur growth, create a large number of jobs while having a significant bearing on reducing further climate-related migration. Additionally, given that COVID-19 has resulted in the return of a large pool of skill into rural India, along with the stress placed by the Government of India on self-sufficiency through its economic stimulus, an opportunity has also been presented in the development and scaling up of green MSMEs throughout the country.

The 15th Finance Commission: addressing the new reality post COVID-19

The Finance Commission is mandated under the Constitution of India to be the body responsible for determining intergovernmental transfers of taxes between the central government and the state governments, and also considers the needs for grants to be given to the states for specific purposes. Its main task is to recommend a scheme of transfers that would serve the objectives of both equity and efficiency and result in transfers that are predictable and stable over a medium term. In its task, the commission takes cognizance of the prevailing macro and fiscal situation, particularly the need to sustain growth momentum while bringing about and sustaining fiscal consolidation.

The stability and predictability of resources is critical in the functioning of the Finance Commission. However with an unprecedented pandemic, where no sector of the economy, either fiscal, monetary, financial or real has escaped the adverse fallout, the tax receipts of the Centre and the states, debt and fiscal deficits and projections for the future trajectory of the economy have become both uncertain and unpredictable. From the 15th Finance Commission’s standpoint, a balanced approach that considers revenue raising possibilities in today’s environment,

the expanded expenditure commitments, particularly on health interventions and infrastructure, income generation and employment creation opportunities is critical in forward planning. Challenges however lie in the uncertainty and unpredictability in forecasting, where both over-projection and underestimation have adverse consequences for the fiscal health of the country, especially at a time when the combined finances of both the Centre and the states have been stressed.

Given the context above, while nature-based solutions are not directly considered in determining transfers in the Finance Commission, balancing concerns of nature and economic growth together has not only continued to figure, but has gained importance in the determination of transfers to states over the past two decades. An intervention that came in the 12th and 13th Finance Commission was the provision of specific purpose grants for forests. Further, the 14th Finance Commission provided a significant increase to natural resource financing through the incorporation of the extent of forest cover in the devolution formula. Over a 5 year period almost USD 6 billion (INR 50,000 Crores) flowed to the states as a result of the consideration. The 15th Finance Commission has not only continued with the formula but has increased the share of the total divisible pool of taxes from 7.5% to 10% for the year 2021, albeit as untied grants. Further, the 15th Finance Commission has also provided for pollution prevention in major cities of the country, especially with regard to air pollution.

Assessments however indicate that despite taking forest cover into the devolution formula, the incentive built for forest conservation and afforestation at the state-level has not materialized. In the post-COVID context and in learning from prior transfers, there is a need for states to recognize that investment in nature should be prioritized from the available funds to reap benefits for future transfers while balancing both economy and the environment.

Relooking at public and private finance available for mainstreaming biodiversity conservation: challenges and opportunities

India is one of the 70 megadiverse countries in the world, where the conservation of biodiversity is not only crucial for providing ecosystem goods and services but also directly linked with livelihoods and socio-economic wellbeing for millions in the country. In the post-COVID context, it has become important to relook at public and private finance options in mainstreaming biodiversity conservation in building back better. A closer assessment reveals that there is much to be done in closing the gap for financing biodiversity conservation.

The Biodiversity Expenditure Review (BER) carried out under the UNDP-led Biodiversity Finance Initiative (BIOFIN) mapped 116 public finance schemes of the 24 federal ministries and 29 departments of the Government of India (excluding the Ministry of Environment, Forests and Climate Change) that have a bearing on biodiversity conservation. Alongside, the BER estimated an annual biodiversity public finance expenditure from central and state governments to be approximately USD 10 billion dollars. In light of India's National Biodiversity Action Plan, a Financial Needs Assistance (FNA) carried out under BIOFIN also indicated a fund requirement of USD 16.5 billion annually in implementing the 12 national biodiversity targets, thereby reflecting a funding gap of USD 6.5 billion annually.

The Biodiversity Finance Plan (BFP), that seeks to facilitate the achievement of India's biodiversity vision, also developed under BIOFIN, identified five major schemes of the federal government that have the most bearing on biodiversity conservation – these schemes include the Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS), National Rural Drinking Water Mission, Swachh Bharat Mission, Integrated Watershed Management Programme and the Atal Mission of Rejuvenation and Urban Transformation. Besides the ongoing schemes of the MoEFCC, focusing on nature-based solutions under the identified schemes has the potential to provide substantial funding for nature conservation and restoration.

In prioritizing nature conservation for post-COVID recovery, MGNREGS provides the most promising option for mainstreaming biodiversity conservation, albeit with the prioritization of three specific subcomponents of the scheme that relate to soil and water conservation, groundwater recharge and plantations. With USD 5.3 billion (INR 40,000 Crores) being allocated to MGNREGS over and above the budgetary allocation of USD 8.2 billion (INR 61,500 Crores) in the wake of the COVID-19 crisis, components of afforestation and soil and water conservation can provide a major thrust not only for economic recovery but also for biodiversity conservation.

In addition to government budgetary allocations, the Compensatory Afforestation Fund (CAF) created through an order of the Supreme Court of India in 2002 also forms a major funding source for the purpose of nature conservation and restoration. With the CAF Act, 2016 and Rules coming into effect, in 2019, over USD 6.2 billion (INR 47000 Crores) of the fund was disbursed to the states to take up afforestation and conservation activities as per the provisions of the CAF Act and Rules. The use of funds under the NPV and interest component of CAMPA, which is almost two-thirds of the corpus is flexible to build in broader nature conservation activities. As a part of the economic stimulus, an additional INR 6000 Crores has been earmarked for disbursement from CAF in carrying out afforestation programmes.

Besides public funding, private sector investment into biodiversity conservation has been a trickle, coming largely by way of Corporate Social Responsibility (CSR) funds that amount to roughly USD 170 million (INR 1300 Crores) per year – barely constituting 4-5% of the total CSR funds available. The Environment Protection Act, 1986 also provides for Corporate Environmental Responsibility (CER), where amounts ranging between 2-10% of the total cost of projects is earmarked for environmental mitigation. Getting corporations involved in conservation has been a major challenge with reasons for the lack of investment attributed to high opportunity costs, lack of awareness of the dependencies, and a perception of environmental goods and services as externalities. It can also be attributed in part to the difficulties in interpretation of terminologies under the CSR Act. In closing the funding gap, more so now than before, there is a need to address challenges for underinvestment into biodiversity conservation, provide appropriate incentives for private sector engagement, and develop innovative solutions for biodiversity financing.

Summary of key messages:

- Nature conservation and restoration is not an opposing goal but rather a long-term vision for society and for economies
- Investing in nature presents an opportunity to strengthen climate action, aligning with Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDCs) towards climate change.
- Examples from across the globe show that investment in a green economy holds key advantages for a post-COVID economic recovery and has a tendency to increase the amount of jobs.
- A sector-wise deep dive is required in expanding the potential of Nature-based Solutions (Nbs) and green technologies to support a green recovery
- For India, NbS presents itself as a fitting solution in meeting in part the objectives of increasing economic output, creating jobs while restoring degraded lands.
- The key to the success of NbS is that it needs to function at scale; there is a need to go beyond pilot projects in capturing the various benefits that it offers.
- In the post-COVID context, an opportunity to scale NbS lies in the need for readily available, holistic solutions for accelerating the economic recovery process.
- The risks associated with climate change including the spread of diseases has regularly been flagged by scientists, often without matching action on ground; reducing risks from future pandemics and natural disasters needs to be met by taking concrete action on scientific findings.

- In building back better from the current crisis, there is a need to consider how sustainability and inclusive growth can be built in using implements such as fiscal instruments, carbon taxes and subsidy reforms.
- The vast majority of people who have been displaced by climate-related events find safety within their own community; the role of the governments would be to support communities in providing for their own population, focusing on the most vulnerable sections of the population.
- There is a need for states to recognize that investment in nature should be prioritized from the available funds to reap benefits for future transfers while balancing both economy and the environment.
- Major schemes of the Government of India such as MGNREGS and the Compensatory Afforestation Fund form major funding sources for the purpose of nature conservation and restoration; besides public funding, private sector investment into biodiversity conservation needs to substantially increase.

WEBINAR 3: VALUING NATURE FOR SUSTAINABILITY IN THE AGRICULTURE AND FOOD SECTOR

Synthesis of Discussions



17th June 2020

Panelists:

- *Anil Markandya*, TEEB Expert, Distinguished Ikerbasque Professor & Former Scientific Director, BC3
- *Alka Bhargava*, Additional Secretary, Ministry of Agriculture and Farmers Welfare
- *Vinod Bihari Mathur*, Chairman, National Biodiversity Authority
- *P. Bhanumati*, Deputy Director General, Ministry of Statistics and Programme Implementation
- *Madhu Verma*, Chief Economist, WRI India, New Delhi, India
- *Isabelle Hoffmann*, Coordination Officer, The Capitals Coalition
- *Salman Hussain*, Coordinator, The Economics of Ecosystems and Biodiversity (TEEB) – moderator

Valuing nature for sustainability in the agriculture and food sector

19th June 2020

Introduction

Valuation of ecosystem services plays importantly in making nature's values visible and driving investment decisions. It helps decision makers to recognize, demonstrate and capture the wide range of benefits provided by ecosystems and biodiversity, across sectors such as agriculture. Capturing value involves the introduction of mechanisms that capture ecosystem values into decision-making through incentives and price signals, such as payments for ecosystem services, reforming environmentally harmful subsidies or introducing tax breaks for conservation. Moving ahead, it is necessary that the embedded economic value of biodiversity and ecosystem health are recognized in mainstream economic policy and markets. This will incentivize sustainable practices and investments in conservation, livelihood diversification and development of critical safety nets for the vulnerable. As the Indian economy reboots in the aftermath of the pandemic, it will be critical to bring nature at the centre of the economic recovery. Fiscal and monetary stimulus measures can support the transitioning to a healthier economy, founded on sustainable consumption and production patterns in the agriculture and food sector.

The webinar was organized with an objective to generate awareness about the need for valuation of ecosystem services by showcasing the impacts created through a range of successful projects both in India and globally. The webinar also intended to inform stakeholders engaged in the area of economics of biodiversity and ecosystem services about the scope, progress and next steps for implementation of an EU funded project, The Economics of Ecosystems and Biodiversity (TEEB): Promoting a Sustainable Agriculture and Food Sector. The TEEBAgriFood programme aims to assess the true costs of agriculture, make visible the impacts and dependencies of the agri-food value chain on nature, and mainstream the values of biodiversity and ecosystem services into public sector and private sector decision-making. It informs decision-making through the disclosure of impacts of decisions on natural, social, human and produced capital.

In this context the panelists discussed various aspects of valuation in the agriculture sector. Anil Markandya and Salman Hussain provided the platform for the discussion, bringing forward the current state of the agriculture sector and the environment, and highlighting the TEEB Initiative. Alka Bhargawa and V.B. Mathur discussed the policy priorities for improving sustainability and mainstreaming biodiversity conservation in the agriculture sector, P. Bhanumati provided perspectives of public sector engagement in valuation of ecosystem services in the agriculture sector, and Madhu Verma further built upon its importance, highlighting the use of the TEEB framework in technical studies at the sub-national level. Further, Isabelle Hoffmann detailed the opportunities for private sector engagement with respect to the TEEBAgriFood Initiative. The following is a synthesis of the perspectives brought forward and the discussions that followed.

Context: Agriculture, food and the natural environment – the prospect of containing, coping, restarting and building back better

Agriculture forms a major driver of biodiversity loss globally. Diseases such as COVID-19 and Ebola, which are transmitted from animals to humans, are exacerbated by deforestation and forest degradation. Feeding a growing human population in ways that maintain habitats and minimize harm to biodiversity is thus imperative to prevent other future outbreaks. Food systems also contribute up to nearly a third of all greenhouse gas emissions and have contributed substantially to biodiversity loss. There is an urgent need to rethink of how we produce, process, market, consume our food and dispose of waste. A prime concern is also the growing threat of land degradation that has major implications agriculture and food production systems.

In recovering from the crisis, countries must ensure that relief and stimulus packages reach the most vulnerable including meeting the liquidity needs of small-scale food producers. In this regard, India's relief package providing INR 300 billion for small and marginal farmers to meet post-harvest Rabi and Kharif requirement is a welcome step. An important part of the recovery needs to ensure the restoration of degraded forests and lands that support agriculture. There is also a need to make a shift from tightly controlled value chains to more flexible business models. Here, India's allocation of INR 60 billion for employment under forest management, soil and moisture conservation works also is promising. Furthermore, given the inherent uncertainty about how food systems evolve, it is also critical that developments in this area are closely monitored. Food systems that better address the needs of food producers and workers, increased inclusive access to healthy and nutritious food to eradicate hunger and rebalancing the relationship between food systems with the natural environment is required in building back better.

The Economics of Ecosystems and Biodiversity (TEEB) Initiative

The TEEB Initiative is an effort to make an economic case for biodiversity and ecosystem services. This outlook is related to the 2006 Stern Review of Climate Change, which made the economic case for climate change. In 2012 in an important TEEB study¹ that assessed sectors which have the maximum impact on ecosystems and biodiversity and linked that to their dependencies. The outcome provided a ranking of the 20 most impactful sectors, where the agriculture sector vis-à-vis the impacts and dependencies emerged as the most impactful. This provided the reasoning for the need for a structured and rigorous assessment of the agriculture sector, leading to the TEEBAgriFood initiative.

TEEBAgriFood initiative is an attempt to fix our current food metrics. Globally as that in India, large resources and time have been spent focusing on yield per hectare, looking at the need to increase access to nutritious food. There is a tendency to focus on irrigation methods, breeding, machinery, and biotechnology, which are all important, however have a singular focus on to increase yield per hectare. As such, it means that we do not look at all the inputs from biodiversity and ecosystems that contribute and are necessary in terms of our natural capital. Equally, there is focus on the visible outcomes like employment, food and nutrition, however there is a neglect of important aspects like health, cultural heritage, and access to recreation. By using a single metric of yield per hectare, there is an avoidance of both positive and negative impacts and externalities that apply across the agri-food value system.

The TEEBAgriFood perspective includes a full value chain analysis and also looks at other aspects that include not only natural capital, but also social capital, produced capital and human capital. TEEB studies involves looking at different alternate scenarios that include the positive and negative externalities across the value chain. In many cases support to intensive crop production systems do not account for the externalities those systems pose on society that have real impacts and harm people. It allows for a deeper insight into where things are going wrong, where support to alternatives as that to intensive crop production systems should be given.

In January 2019, UNEP with funding of the European Union (EU), launched a four-year project to stimulate biodiversity conservation and ecosystem provisioning for agricultural landscapes, finalizing seven partner countries of the EU, namely Brazil, China, India, Indonesia, Malaysia, Mexico and Thailand for implementation. The basis of selection of these countries was the size of the areas of natural ecosystems, cumulative pressures, and the local and global dependence on the ecosystem services provided.

The project aims to protect biodiversity in target countries and contribute to a more sustainable agriculture and food sector with well-functioning ecosystems. It will complement the Indian Government's ongoing initiatives for agriculture sustainability and biodiversity conservation and contribute to integrating biodiversity values into

¹ <http://teebweb.org/publications/teeb-for/business-and-enterprise/>

national accounting and reporting systems. Furthermore, it also seeks to encourage sectors that depend or have an impact on biodiversity to adopt integrated approaches for its conservation and sustainable use.

Capitals Coalition is implementing the private sector engagement of the TEEBAgriFood project focusing on the business engagement across partner countries. The Capitals Coalition is a global collaboration of over 370+ organizations from across different stakeholder groups with an ultimate aim is to create a new normal where all systems consider the value of nature, of people and society in decision making. A five step strategy was adopted for the implementation of TEEBAgriFood for business that includes the development of guidelines for business, country-by-country collaboration, roundtables, training sessions and application. The guidelines² developed provide clear step by step processes to help businesses in the food system implement a 'capitals thinking' in their decision making and is based on existing guidance under the TEEBAgriFood framework, and the natural, social and human capital protocols.

Adopting the TEEB Framework in Practice: Expanding Agricultural Income Calculus beyond Food and Employment

With more than a quarter of the Indian population in rural areas living below the poverty line, India has set an ambitious target of 'Doubling Farmer's Income' (DFI) by the year 2022. Seven sources for income growth that have been identified include improvement in crop productivity, resource use efficiency, increase in crop intensity, diversification towards higher value crops, improvement in real prices received by farmers and a shift from farm to non-farm occupations. Furthermore, farm sector reforms to overcome economic and livelihood issues and improve the wellbeing of farmers has been an important part of the recovery strategy post COVID-19. In order to achieve the target of DFI, it is important to measure the contributions made by multipronged, agro-ecological (agriscap) approaches, involving the dimension of society, ecology, culture and economy and internalize them in the accounting system for sustainable management of agro-ecological systems.

The World Resources Institute (WRI), India has also commissioned a study on the potential of agro-ecological approaches to Double Farmer's Income that will utilize valuation approaches under the TEEB framework and develop incentive-based mechanisms for those engaged in a shift towards sustainable agriculture. The research includes a meta-analysis of studies to synthesize recommendation for DFI, identification of landscape of agro-ecological systems for enhancement of ecosystem services, regional land use planning, crop diversification, water conservation and climate resilient agriculture.

Priorities for a shift towards sustainable agriculture

Sustainability in agriculture has become a priority for the Indian government with several initiatives being led by the Ministry of Agriculture and Farmers Welfare (MoAFW) including the strengthening of inter-ministerial consultations and cooperation. The National Mission on Sustainable Agriculture (NMSA), launched in 2010, one of the national missions under the National Action Plan for Climate Change (NAPCC) provides a multiple programme intervention in shifting to sustainable agricultural practices. The NMSA was revised in 2018 with a roadmap till 2030. At the core of the revision, there is a shift in policy from a production centric approach towards an income centric one; while production still remains an important aspect of the roadmap, over the recent years, a greater focus placed on post-harvest management. NMSA envisages work on 10 key deliverables that are reported by the MoAFW to the Ministry of Environment, Forests and Climate Change (MoEFCC).

- A key deliverable is the expansion of organic farming including the use of bio-fertilizers and precision irrigation, largely based on micro-irrigation.

² <https://capitalscoalition.org/teebagrifood-operational-guidelines-for-business-launch/>

- With rice production being a major contributor to GHG emissions, the Indian government has also increased interventions through the encouragement of System of Rice Intensification (SRI) and Direct Seeding (DSR) methods.
- Crop diversification forms another important activity for MoAFW with a concerted programme for crop growing patterns as per the agro-climatic zones. For instance, states such as Haryana have increased the incentivizing of a shift from paddy to maize.
- Identification of genotypes of crops with enhanced CO₂ fixation potential and lesser water consumption and nutrients have been ongoing at the Indian Council for Agricultural Research (ICAR).
- Coverage of milch animals and diversification of bypass protein feed milking units are also interventions being made to move towards sustainable agriculture systems.
- Promotion of typical models of agroforestry and integrated farming systems have been an important step that seeks to also address issues of decreased land holding, risk management and climate resilience alongside.
- Soil Health Card programmes in conjunction with integrated nutrient management (INM) are also being employed to monitor and reduce dependencies on chemical fertilizer based agriculture.
- Advisories for farmers on the types of crops required, harvesting, inputs and maintaining quality along with expansion of Farmer Producer Organizations have supported the sustainable agriculture efforts in the country.

A major thrust that has also been put by the Government is increasing inter-ministerial cooperation on sustainable agriculture. For instance, with the Ministry of Water Resources anchoring the Prime Minister's Krishi Sinchai Yojana programme, the MoAFW has been handling the Per Drop More Crop programme in encouraging micro-irrigation practices and agronomic practices for water efficiency. Over the years, there is greater synergy among all stakeholders with market-led decisions forming an important part of the transformative process.

Biodiversity mainstreaming in the agriculture sector

While the injection of more than \$11 trillion in the form of relief packages in the global economy, and India's own massive relief package of INR 20 trillion is a welcome step, fiscal and monetary stimulus measures may have their own cascading effects on biodiversity loss. In building back better, there is a need to mainstream values of biodiversity conservation into the initiatives for economic recovery, even within the agriculture and food production sectors. Recently under a UNDP biodiversity finance initiative (BIOFIN), more than 35 countries in the world, including India conducted the Biodiversity Expenditure Review (BER) and prepared a Biodiversity Finance Plan. The analysis revealed that in India, the annual biodiversity finance requirement is approximately \$16.5 billion, against an availability of \$10 billion from all sources for its conservation. With a significant finance gap already existing before the pandemic, there would need to be a serious considerations made in mainstreaming biodiversity into the planning process.

The major concerns for agrobiodiversity is the increasing replacement of locally adopted and traditionally grown cultivars by high yielding varieties. There are also other concerns of excessive tillage, lack of crop rotation, land degradation, fragmentation, water scarcity, increase of invasive species, and the overarching climate impacts. A certain need is to focus on mainstreaming biodiversity that can enhance fund flows to halt further degradation and biodiversity loss can be stopped or minimized.

While there is no single way in which biodiversity mainstreaming into agriculture can occur, a large number of schemes of the Government of India, flagged out under the BIOFIN project, such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) can be used to generate resources for sustainable agricultural production and the protection of biodiversity simultaneously. Furthermore, an important aspect for consideration are the rights of farmers and plant breeders. Currently, in the context of biological resources, there is the Biological Diversity Act (BDA) and the National Biodiversity Authority which forms the legal and regulatory framework for biological resources in the country. However, alongside the BDA is the closely related Protection of Plant Varieties and Farmer's Rights Act. Enacted in India in 2001 to honor and respect both the farmers and communities for their contribution of traditional crop varieties, the Act can be used alongside the BDA to strengthen biodiversity mainstreaming into agriculture.

The use of geographical indicators for agriculture also provides a good avenue for converging agriculture and biodiversity targets in the country. Viewed as a development tool, geographical indicators can be intertwined with programmes like rural development, environment protection, and agrobiodiversity conservation in meeting such objectives. Policy support is required for the practice in establishment and maintenance of seed banks and is critical as an ex-situ conservation technique of biodiversity.

Other related Environment Accounting Initiatives

The Ministry of Statistics, Planning and Implementation (MoSPI) under the European Union funded project, namely the Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES) has been developing a range of ecosystem accounts, both in physical and monetary terms; the accounts will be applied in scenario analysis on national policy priorities. Under NCAVES, ecosystem accounts have been developed following the System of Environmental Economic Accounting (SEEA), prescribed by the UN Statistics Division. The project's aim inter alia is to frame ecosystem accounts for cropland, including extent and condition accounts and the valuation of ecosystem services. Due to a high level of convergence and synergy between the NCAVES and TEEBAgriFood project, the information being developed will also provide critical baseline information for the TEEB evaluation.

Current work on developing extent and condition accounts under NCAVES revealed the lack of a formal composite index at the national level, such as the Gini's Index for evaluating land concentration. Under the project, using databases including that of the Census of India, National Bureau of Soil Survey and Land-use Planning and the Soil Health Card scheme of the MoAFW, MoSPI has worked on compiling a set of pressure indicators on croplands. A set of indicators that are under development include those on irrigation requirements of croplands, land capability in terms of lands suited for cultivation, and soil macro and micro nutrient indices across the country. The development of the accounts will provide critical information inter alia on the extent and condition of agricultural lands dependent on rainfed and groundwater based facilities, soil health and land capability. Furthermore, as a broader goal, MoSPI is also evaluating the effective number of plant species that are being cultivated in different regions of the country.

Apart from the development of extent and condition accounts, the NCAVES project is also carrying out the valuation of the flows of ecosystem services. The process of valuation of flows of ecosystem services is dependent on evaluating the complete process of crop production including the valuation of supporting services such as nutrient

and water recycling, holding capacity and soil organic carbon; however, with large data gaps, the SEEA prescribed resource-rent method has been employed for the valuation of the flows. The data has primarily been derived from the Cost of Cultivation Surveys, a scheme implemented through 16 agricultural and central universities and implemented through 20 states of India, along with APY data of major crops from each district. Spatial distribution analysis of rent per unit quantity of crop production derived from the data indicates that there is a significant overlap between land degradation and resource rent.

Suggestions from the webinar for scaling up the TEEB analysis

There are several successful cases and areas of work in India that can benefit decision-making and scaling of sustainable holistic agriscapes approaches using the TEEB framework and SEEA. The state of Sikkim, declared as the first fully organic state of India, achieved through strong political will and policy coherence along with well-defined implementation targets and plans provides a potential study. The large success achieved with Zero Budget Natural Farming (ZBNF) in the state of Andhra Pradesh, with a target to cover six million farmers by 2024 can also benefit from a TEEB analysis. Furthermore, studies that reveal the true value of ancient grains such as millets and its potential as a climate-resilient crop in contributing to food security, traditional knowledge and practices such as the 'water tank' system for moisture conservation utilized in Tamil Nadu, shifting to better crop management practices in Haryana and Punjab, and community managed food forests in West Bengal also provide good options for such an analysis. Current interventions made by the Indian government under the National Mission for Clean Ganga that seeks to increase plantations across the entire catchment area will also make a major difference in terms improving both soil and water quality.

Summary of key messages:

- Feeding a growing human population in ways that maintain habitats and minimize harm to biodiversity is imperative to prevent future outbreaks.
- Recovery needs to ensure the restoration of degraded forests and lands that support agriculture; there is also a need to make a shift from tightly controlled value chains to more flexible business models.
- Valuation helps decision-makers recognize, demonstrate and capture the wide range of benefits provided by ecosystems and biodiversity, across sectors such as agriculture.
- TEEBAgriFood Initiative is an attempt to fix our current food metrics; it includes a full value chain analysis that looks not only at produced capital, but also natural, social and human capital.
- TEEB studies involve looking at alternate scenarios that include the positive and negative externalities across a value chain; it allows for a deeper insight into where things are going wrong, where support to alternatives as that to intensive crop production systems should be given.
- Capitals Coalition has developed guidelines for the implementation of TEEBAgriFood for business
- The National Mission on Sustainable Agriculture (NMSA) provides a multiple programme intervention in shifting to sustainable agricultural practices; in recent years there is a shift in policy from a production centric approach towards an income centric one.
- The World Resources Institute (WRI), India has commissioned a study on the potential of agro-ecological approaches to Double Farmer's Income that will utilize valuation approaches under the TEEB framework and develop incentive-based mechanisms.
- A large number of schemes of the Government of India, flagged out under the BIOFIN project, such as the MGNREGS can be used to generate resources for sustainable agricultural production and the protection of biodiversity simultaneously.
- The Biological Diversity Act and the Protection of Plant Varieties and Farmer's Rights Act, 2001 are legal instruments that can help in the protection of agrobiodiversity in the country

- Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES), developed following the System of Environmental Economic Accounting (SEEA) is developing a range of ecosystem accounts, both in physical and monetary terms in India; the accounts will be applied in scenario analysis on national policy priorities.
- There are several areas of work in India such as ZBNF, climate-resilient cropping techniques etc. that can benefit decision-making and provide evidence for scaling of sustainable holistic agriscapes using the TEEB framework and SEEA.



WEBINAR 4: TOWARDS A GREEN RECOVERY OF THE INDIAN ECONOMY

Synthesis of Discussions

6th July 2020

Panelists:

- *Atul Bagai*, Head, UNEP India Country Office
- *Ajay Mathur*, Director General, The Energy and Resources Institute
- *Ashok Khosla*, Founder, Development Alternatives Group
- *C.K Mishra*, Secretary (Retd.), MoEFCC, Government of India
- *Mahua Acharya*, Asia Director, Climate Policy Initiative
- *Rene Van Berkel*, UNIDO Representative, Regional Office in India
- *Nadia Rasheed*, Deputy Resident Representative, UNDP India
- *Kelvin Sergeant*, Enterprise Specialist, ILO
- *Naina Lal Kidwai*, Chairperson, Advent Pvt. Equity
- *Rita Pandey*, Senior Fellow, National Institute of Public Finance and Policy
- *G. Suribabu*, General Manager, NABARD
- *Manish Chourasia*, Managing Director, Tata Cleantech Capital Ltd.
- *Sunita Sanghi*, Senior Advisor, MoSDE, Government of India
- *Malini Chakravarty*, Additional Coordinator, Centre for Budget Governance and Accountability

Greening India's Recovery Package – Ideas for Consideration

6th July 2020

Introduction

The ongoing COVID-19 pandemic and the imposed restrictions to contain it have had a disruptive impact on the Indian economy, severely debilitating vital sectors and exacerbating unemployment. Experts across the board have forecast contraction in India's economy in FY2021, due to the drastic fall in household consumption and private investment. For the economy to recover from this downturn, Government of India has announced an economic recovery package; ~ INR 20.90 lakh crore (~ \$ 0.29 trillion) - a combination of expansionary fiscal measures (~13lakh crore) and monetary stimulus (~8 lakh crore). In this context, an active discussion has started across countries on using national stimulus packages to steer economies on a greener track with the underlying idea of a "green stimulus." Climate Policy Initiative co-hosted a webinar titled, "Building Back Better: Green Recovery of the Indian Economy" with the Partnership for Action on Green Economy (PAGE - a 5 UN Agencies' collaboration of UNDP, UNEP, UNIDO, UNITAR, and ILO), and Development Alternatives Group. The webinar deliberated on directing economic stimulus packages towards greening India's economy. This summary presents considerations out of this discussion.

Economic Stimulus Package

The economic stimulus package, announced as around 10% of GDP, is a blend of fiscal and monetary measures, and several structural economic reforms. Although the stimulus works out to be approximately 10% of India's GDP, the fiscal cost is only 1.2% of the GDP (approx.). Within the stimulus package, INR 0.9 trillion (0.4 percent of the GDP) is drawdown from existing funds available with state governments (INR 0.67 trillion) and existing budget provisions (INR 0.23 trillion). Thus, the effective fiscal stimulus in terms of extra spending is INR 1.76 trillion, which is 0.8 percent of the GDP. While the structural economic reforms will help the economy in the medium to long term, the fiscal and monetary stimulus aims to expeditiously revitalize the economy. A significant 36% of fiscal stimulus is directed at relief measures such as providing free food grains, increasing cash transfers to the poor, and boosting social sector investment. A large proportion (30%) of budgetary support is allocated for the benefits of the MSME sector – worst affected by the slump in the economy. The rest is for agriculture and agriculture-based industries, power, and other sectors. The RBI's monetary policies are directed at infusing liquidity, decreasing interest costs, and augmenting credit-flow.

The monetary stimulus measures include the reduction of Cash Reserve Ratio (CRR), Targeted Long-Term Repo Operations (TLTROs), an increase of the banks' limit for borrowing overnight, setting up special refinance facilities and the opening of a special liquidity facility (SLF). With this approach, the RBI is attempting to increase investment and demand by reducing the cost of lending, liquidity, and credit stress in the financial system. The RBI's monetary stimulus package is based on the expectation that an increase in cash circulation will revive lending to corporates and households.

The two major regulatory reforms are in the agriculture sector: 1) Amendment of the Essential Commodities Act, 1955; 2) Agriculture Marketing Reforms. The Amendment of the Essential Commodities Act includes deregulation of some agriculture food items (e.g., cereals, edible oils, oilseeds, pulses, onions, and potato), removal of stock limits of agriculture products except in exceptional circumstances, and removal of stock limits for food processors or value chain participants. The Agriculture Marketing Reforms permit farmers to sell their produce to not only the state monopoly Agricultural Produce Market Committee (APMC) and allow for a barrier-free inter-state movement of agriculture produce. The industrial policy reforms comprise the introduction of commercial mining and

infrastructure upgrading in the coal sector, increasing the FDI limit in defense manufacturing, opening of commercial coal mining, space and atomic energy sectors for the private sector, opening up more airspace, and the privatization of six more airports. Sectors badly affected by the pandemic are MSMEs, retail, tourism and hospitality, aviation, automobile, and real estate. The restriction on the free passage of goods and services, muted demand, and limited cash balance has hurt the MSME sector. As per a survey conducted by All India Manufacturers Organisation (AIMO) with 46,000 SMEs, one out of 3 SMEs have termed their businesses 'beyond recovery'. This translates into approximately 20 million SMEs facing severe business disruptions. The cancellation of passenger flights and unwillingness to travel (after opening the domestic air travel) has hurt the aviation sector. The lockdown and fear of the spread of the virus has severely hit the tourism and hospitality sector. The bleak future income prospects of households have collapsed demand in the real estate and automobile sector.

Apart from the immediate relief measures and incremental cash handouts to the poor, the package concentrates on supply-side measures to increase aggregate output and generate employment. These measures include liquidity infusion by the RBI, credit enhancement through credit guarantees, emergency working capital line, subordinated debt, and liquidity infusions in DISCOMs. Additionally, the economic package includes a concessional credit boost, particularly to farming, housing, fisheries and animal husbandry, farmgate infrastructure, and street vendors. Some of the stimulus package measures were well planned before COVID-19, such as the revision in the definition of MSMEs, and liquidity support to DISCOMs.

Will the economic stimulus measure enough to revive the economy?

Compared to 2019, India's economy contracted 23.9% in the April-June 2020 quarter (Y-o-Y). The economy is most likely to contract further in the July-September 2020 quarter as compared to the last year, due to muted household demand and reduced private investment. Although green shoots are visible in a few sectors, most business activities are on a negative trajectory. Hence, an increase in Government expenditure amounting to only 1.2% of GDP is unlikely to uplift an economy that is expected to contract at least 9.5% in FY 2021. In the short term, general risk aversion among households will persist due to health risks, rising unemployment, and bleak income prospects - the primary channels of reduction in aggregate demand. The private investment side is unlikely to accelerate due to the current situation of banks (saddled with NPAs and capital inadequacy), limited NBFC funding, and the general risk aversion environment by financially healthy corporates due to market uncertainties.

The economic package is primarily directed at fixing supply-side issues

While it is commendable to fix the supply side of the economy, it is also imperative to address insufficient demand as one of the root causes of the economic downturn. There are very few demand-side measures in the economic package, such as additional allocation for flagship employment guarantee scheme MGNREGA and an increase in cash aid to the poor, and they offer only immediate relief to the poor.

Households are suspending their discretionary consumption and hoarding cash due to salary cuts, job losses, reverse migration and uncertain income prospects in the near and medium-term. The recent RBI's consumer confidence surveys indicate that households' future perception of income and discretionary consumption has collapsed in recent times. There is an increase in cash deposits in banks and an increase in cash circulation, which reflects the fact that consumers are not confident about their future income prospects. The prevailing sentiments explain depressed consumer demand. As the fiscal stimulus is mostly targeting the supply side, there is limited demand stimulus to uplift the economy. It is imperative to calibrate the interventions which can be used to boost demand and put the economy on a robust recovery path.

The easy monetary policies, supply of credit facilities, and better conditions of credit may not immediately result in an increased supply of goods and services, since the overall demand in the economy is low. Since corporates are

not confident about the economy, there is little scope for debt capital to add new capacities. The easy liquidity is most likely to be used in refinancing existing loans, not in adding new capacities when overall demand in the economy is low. Additionally, banks are reluctant to provide easy credit due to a weak credit environment that is reflected from negative credit growth in recent times. Stimulus measures are not going to immediately add to the economy as a significant portion of the stimulus package is directed at providing credit facilities and building new infrastructure, which will occur in the medium to long-term.

There is still room to increase fiscal expenditure, directed more towards creating demand in the economy. It is noteworthy here that COVID-19 is a global shock where limited debt monetization would be acceptable to investors. There is ample liquidity in the financial system, though not enough appetite for private investment. Hence, an increase in the Government's market borrowing is neither crowding out private investment nor increasing borrowing costs for the Government itself.

Unpaid receivables must be cleared on priority

The Government is offering a massive amount of credit and liquidity facilities in the economic system, particularly to the MSME sector. However, a substantial unpaid amount due to corporates and MSMEs is outstanding at-both the state and central Government. There are reports which suggest that the total outstanding due to private corporates, including MSMEs, is more than INR 5,000 billion. Only DISCOMs owed power producers INR 905 billion, as of the end of March 2020, out of which INR 68.4 billion was due to renewable energy power producers (Mercom India, 2020). Massive unpaid receivables not only increase the working capital requirements of the companies, but also increase the riskiness of business and lower new investment flows. An immediate release of the private sector dues can unlock capital flows to the private sector. Moreover, this will restore faith in the 'Government's efficiency at business transactions and will uplift sentiments.

Is it possible to green the package?

Ever since countries began to feel the economic impact of COVID-19, an active discussion has started, mostly led by Europe, on using national stimulus packages as a means to put economies on a greener track. The economic package is sector-neutral and silent on the country's aspiration to decarbonize the economy. According to our estimate, only ~1.5% of the economic stimulus package can directly help green projects. The rest would be utilized in areas that are either colourless or brown. It is imperative to rejuvenate the economy, damaged by the COV19, to protect the lives and livelihoods of people who don't have safety nets. However, there is a high possibility that the policy actions directed towards a quick recovery of the economy, without a thought on environmental sustainability, could lead to either environmentally harmful or 'non-beneficial' consequences.

For example, the Government's commendable policy push along with a drastic drop in technology prices has surged renewable energy investments over the past few years. However, the Government's plan to impose tariffs on solar modules, solar cells, and inverters could weaken renewable energy's competitiveness vis-à-vis the carbon-intensive energy sector. This would derail India's transition to a clean energy path. Additionally, the opening of new coal mines and lowering of entry barriers therein send the wrong signals on India's sustainable development plans.

Carbon emissions have decreased significantly due to the lockdown of the economy. However, the economic costs under current production and consumption patterns are too high. The Government has prioritized economic revival and environmental concerns have become somewhat secondary. A similar pattern was witnessed after the 2008 global financial crisis, when all Government stimulus measures were targeted at boosting the economy without paying any attention to the impact of these measures on climate change. Governments across the globe gave impetus to the economy, through vigorous fiscal and monetary actions, but deprioritized climate change mitigation plans. These short-sighted economic stimulus measures helped the economies to recover quickly in 2010, while

the increase in carbon emissions continued unabated. History could repeat itself. The business-as-usual economic stimulus would derail global efforts, to limit global warming to 1.5°C to 2°C, that need similar or more vigorous attention than the COVID 19 response.

Currently, the Government of India is paying all attention to quickly turning around the economy. However, it can ill-afford to ignore the looming threat of climate change and bio-diversity risk. Any deviation from India’s green development plan, including the target of reducing the carbon intensity of its economy by 33 to 35% by 2030, could unnecessarily expose the country to the further risks of climate change. The Government of India has recognized and assessed this threat, laying down a series of measures to mitigate the risk. The fossil-fuel industry stocks recently collapsed recently, due to a drastic drop in oil prices and rapid divestment from the sector by global institutional investors. Moreover, the valuation of coal companies was recently eroded in India, owing to the rapidly falling cost of renewable energy and climate transition risk (policy, legal, and market risks). Hence, it is the right time for India to attract large scale capital from investors who are looking for investment opportunities in climate-friendly sectors.

Although the economic stimulus has a singular goal - reviving the economy quickly, there are specific ways the package can be deployed to help in quick economic recovery while offering long-term environmental benefits. It is possible to make the twin goals complementary instead of competing, even though the economic stimulus package is focused on short- and medium-term gains and the realization of environmental benefits is long term. Hence, it is essential to explore green stimulus economic activities and mechanisms which support green projects but offer immediate impetus to the economy. The short-term benefits can be gauged by examining the three primary stimulus objectives: employment generation, the time required to stimulate the economy, and the actionability of the measure.

Directing Existing Economic Packages to be Green	
Economic Stimulus Component	Possible Green Economic Activities
Financial Support	
Risk Mitigation	<p>The easy availability of credit measures can ease the CAPEX and working capital needs of the MSME. A portion of a Partial credit guarantee for MSME can help the MSME sector transition to distributed solar energy, install energy efficiency equipment, and make energy efficiency retrofits. The MSME sector is struggling to transition to clean distributed solar power and energy efficient equipment due to lack of access to debt, as they are low rated/ unrated and lack collateral securities. A credit guarantee mechanism, a smart way of using public capital, can resolve the barrier. The adoption of distributed energy and energy-efficient equipment can also reduce MSME’s energy tariff cost and improve their bottom lines.</p> <p>Stimulus Goal: These economic activities generate employment quickly, and the ecosystem is ready to carry them out.</p>
Liquidity support for DISCOMs	<p>The Government can direct DISCOMs to give preference to RE generating companies in clearing dues to non-renewable power generating companies.</p> <p>Delay in payment by DISCOMs to RE companies is the most significant risk the RE sector currently faces. This risk also weakens the credit profile of the</p>

	<p>RE player, and consequently the riskiness of the sector. Also, it exhausts the working capital of developers and makes the loan book NPA as per the new rule of the RBI. The DISCOMs receiving liquidity support can also be directed to procure more energy from RE generating companies. The preference for the RE sector sends a positive signal on India’s commitment to accelerate clean energy.</p> <p>Stimulus Goal: The RE sector generates a higher number of jobs per unit of capital and create new capacity vis-à-vis the coal sector in a short timeframe.</p>
Equity fund	<p>A portion of equity capital allocated for MSME funding can be allocated for low-carbon businesses in the MSME sector. For example, the number of small and medium-sized rooftop solar companies has been constrained by the ability to raise debt due to a lack of equity capital availability. These companies that are past the start-up and technology development stage require further support in the form of growth capital. Equity support will help these companies raise more debt capital and scale-up quickly.</p> <p>Stimulus Goal: The availability of equity capital can enable these small-size companies to scale-up quickly, augment their capacities, and ensure their green transition.</p>
Agriculture and animal husbandry infrastructure fund	<p>The fund is designed for agriculture and animal husbandry infrastructure like cold chains, post-harvest, and milk plants. These projects are energy-intensive, hence Instead of using grid power (mix of coal and RE), these facilities can use clean distributed solar power as an energy source. The Government can make it mandatory to use clean energy (distributed solar, for example) as a source of energy for these facilities and plants.</p> <p>Stimulus Goal: RE energy quickly generates a higher number of employments, and the ecosystem is equipped to carry them out.</p>
Agriculture (Additional emergency working capital and Kissan Credit Card)	<p>Incentivize farmers to adopt sustainable agriculture practices, for example, solar water pumps, water conservation, agroecology and agroforestry, crop rotation, soil cover, etc. Sustainable agriculture practices are crucial in India's fight against climate change. Also, these practices will make farmers, the most vulnerable group to climate change, resilient against climate change risk.</p> <p>Stimulus Goal: Sustainable agriculture practices can start in a short time frame and absorb a large number of unskilled workers, primarily in the states witnessing an influx of migrant workers.</p>
Fiscal Support	
MNREGA Scheme	Create labor-intensive green assets such as increasing forestry coverage (a small amount allocated to forestry, but can be

	<p>increased further), mass-scale plantation, soil and water conservation, development of efficient irrigation systems, etc. Enhancing carbon sinks through an increase in forestry and tree cover, water efficiency, and sustainable agriculture practices is a critical part of India’s plan to decarbonize its economy.</p> <p>Stimulus Goal: All these are labor-intensive projects, which can start quickly and absorb many unskilled workers in a short time frame. Moreover, these projects create sustainable assets.</p>
Affordable housing	<p>Align with green building standards: Green building can reduce water consumption over 20-30%, generate 50% less waste, and reduce carbon emission by 35%. Affordable housing would also reduce the Government’s future subsidy burden in the later years, since the state subsidizes most of the ‘households’ electricity bills.</p> <p>Stimulus Goal: Housing construction projects generate employment in a short time.</p>

All is not lost; there are some possible downstream activities to support a green economy

Greening the electricity grid by closing down low PLF coal power plants by bidding out RE projects in the same - Retiring a significant number of selected coal power plants would save DISCOMs USD1.6 billion per annum, add ~60,000 MW of new RE into the system, and save India 113 MMT of GHG emissions annually (CPI, 2020)

Summary of key messages:

Developing a green finance taxonomy:

- Green tagging – Tracking climate-related expenditures in national budget systems
- Designing appropriate and regulatory interventions by assessing India’s progress on NDC goals
- Enabling the financial sector and corporates to act upon climate change risk and opportunities
- Better reporting and disclosure of climate change risks and opportunities
- Attract foreign capital for green sectors
- Encourage companies to adopt international best practices on climate change disclosure, ESG guidelines, sustainable business practices, lending, and investments
- Create financial instruments such as green equities, green bonds, and ESG funds for foreign investors who want to invest only in green assets
- Make a separate helpdesk in ‘Invest India,’ National Investment Promotion and Facilitation Agency, to facilitate green investment in India
- Use public capital for environmental compliances (for example, set-up of wastewater and sludge treatment common facilities) of MSME clusters, since they will not be in a position to deploy additional capital to meet the regulatory compliance in the scenario of shrinking order books and a cash crunch.
- Large scale grants and equity funding for carbon mitigating technologies such as electric mobility and batteries increase in green demand generating interventions: Increase in subsidies for electric cars, tax benefits for green buildings, and energy-efficient consumer goods.
- Promote public transportation through better city planning, subsidies, and incentives

WEBINAR 5: STRENGTHENING SUB-NATIONAL ACTIONS THROUGH ROBUST SAPCCs

Synthesis of Discussions



Photo: Pexels | Lisa Baker

24th July 2020

Panelists:

- *Atul Bagai*, Head, UNEP India Country Office
- *R. R. Rashmi*, Distinguished Fellow, TERI
- *Dipak Kumar Singh*, Principal Secretary, Department of Environment, Forest and Climate Change, Government of Bihar
- *K. Kalamegam*, Nodal Officer Climate Change Cell, DSTE, Government of Puducherry
- *Ashish Chaturvedi*, Director - Climate Change, GIZ
- *Aishwarya Raj*, Research Associate, TERI
- *M. H. Khan*, Additional Chief Secretary, Department of Forest, Environment and Rural Development, Govt. of Manipur
- *Naman Gupta*, Department of Environment, Government of Maharashtra
- *Jatinder Arora*, Executive Director of the Punjab State Council of Science and Technology, Government of Punjab
- *Abdul Raheem*, Department of Environment and Forest, Government of Lakshadweep
- *Daniel Bradley*, Head of Low Carbon Growth, British High Commission, India

Strengthening sub-national actions through robust SAPCCs

24th July 2020

Introduction

Subnational actors have an important role to play on the climate agenda if the level of adaptation, resilience and emissions reduction required to meet climate goals is to be achieved. The COVID-19 crisis has further highlighted the importance of sub national actors, emerging as a critical link in handling crisis situations and enhancing resilience. They also hold a complementary role in national policy making and governance, with region specific considerations being crucial elements of many initiatives and undertakings.

The UN Environment Programme's *Emissions Gap Report* of 2019 estimated that there is a need of a 7.6% annual reduction in GHG emissions globally between 2020 and 2030 for a 1.5°C goal. This is roughly the reduction that is expected in the year 2020 with worldwide lockdowns to fight the coronavirus. While this is not the manner in which climate goals need to be attained, it provides insight into the kind of transformative action required. Sub national governments will have a critical role to play in this direction, a role recognized in the Paris agreement and one that has gained tremendous momentum globally post 2015.

The importance of the involvement of sub-national actors stems from a need to adopt a bottom up approach; contemporary research suggests that the vulnerabilities, risks and capacities to adapt to and mitigate climate change are better identified and assessed at the sub national level. The Paris agreement envisages that the sub national and non-state actors including cities, states, regions, businesses, etc. play a role, subject to the domestic legislation as applicable, in enhancing actions within the UNFCCC framework, with the contribution of such sub national actors measured, supported, and mobilized.

Considering the advances made in the international climate scenario and accounting for the evolving nature of climate science and developments that have taken in the national policy, the government of India advised, in 2019, all states to revise their SAPCCs. The revision of the SAPCCs presents an opportunity to prepare an enhanced strategy for strengthening existing mechanisms for addressing vulnerabilities and enhancing climate resilience. The learnings from the experience of previous SAPCCs can feed into the new plans and help states to improve the current policy, regulatory and institutional frameworks ensuring more effective and robust response to climate change.

In this context, TERI and UNEP, India co-hosted the webinar to relook at some of the major lessons from the first phase of SAPCCs and explore various aspects of strengthening institutional mechanisms, enhancing access to investments, and evolving robust state action plans in revising SAPCCs, especially in the wake of the COVID crisis. Atul Bagai and R.R. Rashmi set the context for the discussions highlighting the importance of science and scenario building for enhancing resilience. Dipak Kumar Singh and K. Kalamegam discussed the current policy and regulatory framework for SAPCCs, while Ashish Chaturvedi and Aishwarya Raj provided perspectives on how institutions can be strengthened to address challenges. M.H. Khan, Naman Gupta and Jatinder Arora provided details on state-level experience in the development and implementation of SAPCCs. In concluding, Daniel Bradley highlighted perspectives on SAPCCs with respect to the UNFCCC COP26 and its priorities. The following report is a synthesis of the discussions that transpired during the webinar.

Lessons from SAPCCs 1.0

India being a large country with varied geography and climatic zones needs customised climate change actions at the local level. All states vary in terms of their topography and access to natural and human resources. They have different levels of vulnerability to climatic risks and disasters as well as capacities in addressing them. Following the launch of the National Action Plan on Climate Change (NAPCC) in 2008, the state governments in India were called upon to devise state specific action plans on climate change, consistent with the NAPCC. This was the first time that there was a very keen recognition of the role that states, and local governments played in incorporating climate considerations into their day to day governance. However, with a lack of understanding in downscaling models to the local context compounded with a lack of resources, state action plans on climate change (SAPCCs) did not achieve the level of integration into developmental plans as expected.

With the SAPCC processes initiated in 2009, SAPCC from states and UTs were prepared and submitted during the period 2012-2014. It was an important milestone in developing decentralized climate policies in India and had large overlaps with the development discourse, especially with the departments of agriculture, water, disaster management, health, forests, biodiversity and urban habitats. Furthermore it provided insights into how states in India could look at both mitigation and adaptation in policies, programmes and regulations. The first set of SAPCCs had a representation of five crucial elements including climate profile, assessments of vulnerability, GHG emission and energy needs, climate change strategy and climate change action plans.

However in developing the first set of SAPCCs, a few lessons that have been learnt, can be used to considerably strengthen the development and implementation of SAPCCs in the second phase. The key challenges that emerged through the implementation of the first phase of SAPCC's include the lack of a robust institutional mechanism for its implementation, issues of outcome-based financing, the lack of private-sector participation, the further need for integration into sectoral planning processes and strengthening monitoring and evaluation processes. The lack of technical know-how to conduct climate vulnerability assessments also impacted the level of engagement of the states; almost all plans submitted were not implementable or investment ready. Access to investment was an area of concern, both for strengthening technical expertise in preparation of action plans and also in taking forward the implementation of the actions.

Robust guidelines have been provided by the Ministry of Environment, Forest and Climate Change (MoEFCC) for the second phase of the SAPCC preparation. There is greater focus of adaptation and resilience and the incorporation of sectoral plans and investment plans along with linkages to NDCs. At present, states and UTs are at different stages of revision, largely as a result of the considerable variation in the level of understanding of the matter and the political priorities at the state level. Although significant capacities have emerged at the sub national level in dealing with dialogue on climate policies since the preparation of the first SAPCC, time and resources still continue to remain a challenge. In strengthening the action plans, there is a need to relook and address several key areas of concern. Furthermore, with the pandemic highlighting several concerns on the complex interlinkages of climate, biodiversity and human wellbeing, there is a further need to consider the lessons learnt from the pandemic into the revision.

Climate change: a multi-sectoral concern

A major lesson that emerges is that SAPCCs have to not only be driven by the highest political management but also needs to take on a multi-disciplinary approach. Climate change has to be reflected in respective sectoral developmental plans and cannot be left as a standalone activity. In its current setup, the preparation and implementation of SAPCCs has largely been left as a responsibility of the Department of Environment (DoE) or a state nodal agency, however its implementation requires collective action from line departments, including

agriculture, energy, transport, urban and rural development, without which action plans will not represent the correct position at the state level.

A key issue is that the climate crisis is also largely understood in a scientific context and less so as that having sectoral implications. This in turn does not allow climate change to figure as a developmental priority at the departmental level. Unless sectoral developmental agencies do not take ownership of action plans and does not form a part of the decision-making process, action plans prepared are less likely to succeed. Climate policy therefore needs to form an umbrella framework under which climate action for each sector can be evolved. The challenge for the Government of India along with the support of international and national expert institutions is to present the need for climate change action plans at the state departmental level and one which is perceived as an integral part of the developmental planning process rather than as an additional work to be shouldered by the department.

Furthermore, increasing cross-sectoral dialogue for identifying departmental overlaps and adjusting action plans accordingly also holds importance in achieving desired outputs. Creating platforms at the sub national level which bring expertise together becomes integral to the development of SAPCCs. While a state's Department of Environment plays integrally to coordination, it becomes crucial for departments that possess greater financial resources and political influence to strengthen the capacities of the state and bring key actors on board for climate action. The creation and structuring of multi-stakeholder platforms that bring the climate and SDG agenda together at the state level can bring further impetus to the process while providing a diversified approach in developing SAPCCs.

Strengthening the institutional mechanism for resource allocation

State action plans are a vehicle for involving the states in implementing the climate policy, however in its current set up, policy making at the national level has focused largely on providing resources and mechanisms to central government agencies. While state governments have been tasked with evolving action plans as far back as 2010, an effective mechanism in providing resources for enhancing capacities at the state level and for the implementation of such plans has largely been missing. In going forward, it becomes important to review the current mechanism and explore ways to improve the rollout framework and improve capacities at the sub national level.

State governments are also increasingly realizing that while access to resources has been a major issue, equally important is the issue of internalizing the risks arising out of climate change. Through the experiences gained, alongside increasing episodes of climate related disasters, climate change risks are largely perceived as genuine risks for each of the sectoral developmental activities within states. However this consciousness needs to seep further into policies that are made. State governments need to adopt an outlook where climate risks are internalized and anchored in sectoral developmental plans for any action plan to be successful. Developmental schemes aimed at improving water resources, constructing roads, improving road connectivity, addressing livelihood and rural developmental concerns need to make provisions for resources within respective sectoral plans.

An institutional mechanism for the coordination and delivery of action plans needs to be inbuilt into the revised SAPCCs. While common practice often puts one or two departments in charge of implementing the climate action plans, with such an arrangement, state level actors either do not have the access to sectoral data, inputs or resources, impacting the effective implementation of such plans. The development and strengthening of an institutional mechanism needs to be embedded in the decision-making process. State action plans also need to be created and drafted through a bottom-up process capturing the needs of the most vulnerable sections of society and further coordinated at the state level through a properly constituted institutional mechanism. Resource allocation can happen through the sectoral development plans but an institutional process of coordinating allocations or the utilization of those resources should form a key activity.

Need for a financial roadmap in implementing action plans

Action plans need to also have a clear financing roadmap – in the first version, the total financial requirement was estimated from sectoral strategies planned, however in its revision, there is a need to convert sectoral strategies into specific projects and activities which can be financed either from the developmental budget of the state governments or through extra-budgetary means. This calls for the need to enhance action oriented projects and activities in the SAPCCs, an aspect which was found lacking during the preparation of the first version of the SAPCCs.

A challenge in the revision of the SAPCCs as per the guidelines of the MoEFCC is the requirement for a planning for a period of 10 years from 2020-2030. As such, there is requirement of considerable forethought from the various sectoral agencies in revising the SAPCCs. Here, expert organizations play a critical role in the process of constructing a roadmap on accessing the required finance and for the prioritization of identified areas under the SAPCCs.

Internalizing climate change finance into sectoral developmental plans

Most of the interventions planned by states and UTs during the preparation of the first SAPCCs assumed the provision of additional funds from the central government in its implementation. However, climate change finance has not been forthcoming, either for enhancing capacities to develop state level action plans or for the implementation of such actions plans. For instance, the Government of Pudducherry included 171 action points with a budget of INR 1400 Crores in the course of preparing the first set of SAPCCs; INR 200 Crores was earmarked for provision from the state government while it was expected that INR 1200 Crores would be sourced from the Central Government or other institutions. While some funds were received by Puducherry from the National Adaptation Fund, a large number of action points were not implemented due to the lack of finance. As such, in revising the SAPCCs, there needs to be a policy shift where plans need to be made in synergy with the existing developmental priorities and sectoral activities. Climate action cannot be perceived as an extra-budgetary commitment, but rather the inclusion of action plans in each departmental activity needs to utilise existing resources to achieve the deliverables.

Strengthening the monitoring and evaluation framework

An assessment of the initial SAPCC reports indicates that the entire monitoring and evaluation (M&E) process of state action plans were based on the financial deliverables; expenditure against climate action points largely formed an indicator of the level to which objectives set forth in the action plans were met. However, in its revision, there is a need to build clear indicators for the M&E process into the SAPCCs.

The M&E framework of state governments is also critical in identifying extra-budgetary resources and financing support for climate action at the sub national level. For instance, the framework lends itself as an important climate risk screening tool for financial lending institutions both at the national and sub national levels. NABARD as well as other developmental banks require a robust climate risk screening tool for project approvals, including the type of crops that are given credit and the type of infrastructure given approval for developmental financing.

Linkages to SDG goals

Considering the advances made in the international climate scenario and developments that have taken place in the national policy, interlinkages to SDG goals were by and large missing in the first phase of preparation of SAPCCs. Given that SDGs are an overriding priority for the global community and for national governments, there is a need to strengthen linkages between the SDGs, their delivery mechanisms and the state action plans. Since SAPCCs address climate vulnerabilities with focus on its sectoral implications, they by their very nature run parallel to the

SDGs. As such, it can be capitalized to meet climate change and SDG goals co-beneficially through the development of sound sectoral strategies.

Furthermore, in the absence of a clear linkage between the SDGs and state action plans, the state agencies entrusted with the responsibility of implementing the action plans can find it very difficult to access resources. The SDG India Index, developed by NITI Aayog tracks the progress of States and Union Territories on a set of 100 national indicators derived from the National Indicator Framework; a methodology will need to be put in place to ensure that as state governments implement action plans, there is a linkage made with meeting SDGs and further validate resource allocation for state action plans. Through cooperation of international development agencies along with the Government of India, work to develop a framework for linking information on SAPCCs to the SDGs at the national level is currently under progress. A web-based centralized climate change action plan management and monitoring system that highlights targets of various interventions and results achieved over time at the sub national level can add significant value and clarity in the implementation of SAPCCs.

Demystifying the SAPCC document and enhancing climate change awareness at the state department level

The revision of state action plans needs to bring further clarity at the science-policy-practice interface, especially keeping in mind that the action plans are implemented by field officials. A key concern has been that plans need to be made intelligible for persons working at the farm, block, and sub-divisional levels who can identify and appreciate the work being carried out. Here knowledge management plays an important role in creating understanding of action plans for departmental and ground-level implementation. SAPCCs however cannot be a standalone document – what is made intelligible to a block level state representative cannot be the same document as a policy document at the state level. As such, the SAPCC will need to have different versions tailored to the needs of different actors rolling out the action plan.

A change in mind-set also needs to percolate from the design of national level programmes to its implementation at the sub national level. Capacities of state departments to recognize and internalize climate concerns into developmental planning becomes vital in the implementation of climate action. For instance, while the National Green Highways Mission exists at the national level, experiences in the state of Bihar show that executing agencies at the state-level often pay little attention to the carbon sequestration trade-offs between clearing of existing trees and planting new saplings in drawing up engineering plans for such highways. Here, there is a need for sensitization of engineers on climate change mitigation strategies. Likewise, another example from Bihar shows that while programmes for river rejuvenation exist at the national level, there is a need for increasing awareness on integrated developmental solutions for flood control; currently the construction of embankments, heavily used by irrigation and flood control departments for training rivers makes little consideration of drying wetlands and riverine ecosystems that have thrived because of natural inundation.

Part 2: Success stories and implementation challenges of SAPCCs from states in India

Sub-national experience in the preparation and implementation of SAPCCs have been highly varied across states. Varied geography and agro-climatic zones have resulted in states prioritizing different activities under their SAPCCs, while institutional and human capacities and access to resources have also posed unique challenges in its implementation to each state. The following section revisits some of the approaches, successes and implementation challenges from the implementation of the first phase of SAPCCs from across India.

Manipur's climate action strategy through land and water conservation

Given the hill terrain and climate of the state, Manipur's action plan on climate change is predominantly anchored around land, water and forest conservation programmes. Using an integrated watershed management approach, several pilot projects have been undertaken by Manipur in reducing climate change vulnerabilities and enhancing resilience of communities in the state. For instance, Manipur has implemented the UNDP-GEF supported 'Model carbon positive eco-village' project adopted under NAPCC in the Phayeng village of Imphal (West) district. The project focuses on land and water conservation through springshed management and afforestation activity. This has further been integrated with mountain farming practices utilising a blended approach between traditional knowledge and modern farming practices. Similarly, with the support of KfW, Manipur has also worked on establishing women SHGs and watershed management committees for enhancing water conservation practices as a part of the state action plan.

In going forward, Manipur has identified the need for capacity building of government departments and enhancement of resources to the state's line departments to carry out planned interventions. Furthermore, a major challenge highlighted in the implementation of state action plans is the lack of private sector interest in the development of renewable energy resources in the northeast states. While Manipur has been working on removing barriers that serve as a disincentive for RE investment in the state and has initiated the process of energy audits of all government offices for the conservation of energy, there is further need to create enabling conditions to scale up climate action in the state and the northeast region likewise. The promotion of nature-based solutions can play an integral role in climate action plans not only for Manipur but all states and territories of India alike.

Lessons from Maharashtra's DoE in addressing implementation challenges of its SAPCC

Maharashtra's efforts in addressing implementation challenges of its SAPCC provides good lessons for tackling challenges that are a recurring theme amongst many states. As is common to several other states of India, Maharashtra's challenges inter alia have included the lack of incentive and awareness of line departments for climate action, challenges in demystifying technicalities related to climate change and difficulties of implementation given a lack of a monitoring and evaluation framework.

A key learning of the DoE, Maharashtra from the first phase of SAPCC implementation was the need for preparation of sectoral action plans and prioritization of certain actions, and its place in making climate change technicalities intelligible at the departmental level. Through several rounds of discussions, the DoE, Maharashtra was able to discuss technicalities around climate change with eight line departments and prioritize sectoral action points for climate change mitigation and adaptation. For instance, the DoE, Maharashtra worked with the departments of energy, transport, industries, agriculture and rural development in identifying a pathway for increasing adaptation and mitigation actions over a course of several years. The process of preparation of sectoral action plans and the role of nodal agencies therefore has played critically in demystifying climate change technicalities at the departmental level.

A common misconception during the first phase of preparation of SAPCCs was that the state anticipated additional budgetary allocation for the implementation of climate action plans. In identifying climate finance options, Maharashtra found that the majority of funds could be garnered through state budgetary allocations with slight modifications and alignment of developmental plans to climate action. As a step to enable action on climate, programmes with greater climate change relevance were given priority for the approval of finances from the state.

With Maharashtra being one of the leading industrial states of India, private sector plays an integral role in the states' SAPCC. An important exercise carried out for addressing financing challenges was the mapping of climate change priorities as per the state action plan along with private sector priorities. The DoE, Maharashtra held consultations with 100 leading private sector companies to discuss common priorities and identify projects that could be co-funded, which has led to an increase in private sector finance for climate projects in the state. Furthermore, for the agriculture sector, under the support of the Action on Climate Today (ACT) initiative of the World Bank, Maharashtra has also developed a FPC risk-rating tool wherein climate related parameters have been integrated. The risk assessment screening framework has been shared with NABARD and other banks who have been evaluating possibilities for its adoption.

Another major factor that affected effective implementation of climate change initiatives can be attributed to climate change action being viewed as a priority concern for the state's political leadership. Maharashtra has developed a state level M&E framework wherein SAPCC interventions have been linked to NDC and SDG indicators. This framework is in the process of being integrated with the Chief Minister's dashboard wherein climate change priorities and its alignment with the SDGs can be handled through the dashboard at the highest political level. Furthermore, in order to ensure that climate change policies across the state are not abruptly ended with the change in political leadership, Maharashtra has constituted a cross-party Legislative Committee on Climate Change headed by the Speaker of the Assembly.

Punjab's actions on climate change under SAPCC 1.0

Climate change concerns in Punjab are housed in a dedicated cell of the State Council for Science and Technology, the think tank and the technical arm of the Department of Science and Technology (DoST) in Punjab. The strategy has been employed to bring science, technology and environment of the state under one umbrella that can strengthen the role of research and development in the development of policies of the state. Being a state that sees substantial industrial and agricultural activity, climate action projects undertaken under the state have also largely focused on mitigation strategies from these sectors.

A noteworthy achievement of the Government of Punjab under the implementation of SAPCC 1.0 is the development and implementation of side-suction boot technology and alternate firing techniques for heavy induction furnaces, thereby improving its efficiency. The DoST, Punjab also worked with foundries and forging industries in the state to increase the overall efficiency of technologies and processes. Over the last three years, the adoption of 1300 MSMEs and an investment of INR 300 Crores into the deployment of cleaner technologies for the forging and foundry industries has resulted in a direct monetary benefit of INR 334 Crores. Furthermore, the adoption of new technology has also allowed for the reduction of an estimated 580,000 tons CO₂e per annum and particulate matter estimated at 52,000 tons per annum.

Punjab has also made significant inroads into the development of technology for paddy straw briquetting units as a mitigation measure, both as they relate to climate change and air pollution. Due to high silica content, life cycles of briquetting units are often adversely impacted by the briquetting of paddy straw. Under the NAPCC supported by the MoEFCC in collaboration with TERI, the Government of Punjab set up a unit to examine the techno-economic feasibility of improved units with a capacity of 24 tons per day; this has been scaled up to a 100 ton per day capacity

today. Given the success of the work, plans to scale the work through provisions under Corporate Environmental Responsibility (CER) are in the pipeline.

Furthermore, under the National Adaptation Fund on Climate Change (NAFCC), a multi-institutional project that seeks to cover 3000 farmers from 3 districts of Punjab in demonstrating climate resilient animal-sheds with capacities ranging from 500 to 1500 animals has also been undertaken by Punjab. To mitigate the land-based drivers of climate change, the Government of Punjab through funding under NAFCC has also taken up a project for the diversification from paddy to maize and other crops for an area of 10,000 hectares.

UNFCCC COP 26 and strengthening action on climate resilience, adaptation, and the role of sub-national actors

The United Nations Framework Convention on Climate Change (UNFCCC) COP 26 to be held in Glasgow in November 2021 is seen as an event where the world can reunite on setting a path for a clean and resilient recovery from the COVID-19 pandemic. In the run up to UNFCCC COP 26 and beyond, the United Kingdom (UK) as the COP President communicated clean energy, clean transport, adaptation and resilience, nature and biodiversity, and climate finance as five priority areas where member states need to drive forward action. Engagement of a broader set of actors including those at the sub-national level therefore becomes particularly vital to galvanize action as states form the ground for innovation and implementation.

Over the past the UK's collaboration with India on climate and clean energy themes such as e-mobility and smart grids have explored partnerships predominantly at the sub-national level, largely because of the need to evaluate on ground issues and share good practices. For instance these have involved technology transfer and sharing of world-class expertise with regard to off-shore wind power development in Tamil Nadu and collaboration on the original project design for the Pavagada solar power project in Karnataka.

Another important area of work between the UK with Indian states is the development of planning tools at a state level. Through collaboration with states such as Andhra Pradesh, Gujarat, Karnataka, Maharashtra, and Tamil Nadu, state level versions of India's national level energy security scenarios calculator have been developed. The state level calculators provide powerful open source scenario planning tools that can help state governments develop plans and strategies for meeting energy security and emission reduction objectives. Furthermore, owing to its flexibility, the tool can also be used to help plan responses to COVID-19 pressures and climate action pathways.

However, in the wake of the economic pressures of the COVID-19 pandemic, while collaboration on green growth offers multiple benefits for a clean, resilient and inclusive recovery, there is also a need to focus on tackling the many vulnerabilities that have become more of a pressing issue on a day to day basis. Mainstreaming climate change resilience into sectoral plans, policies and budgets becomes vital in reducing people's vulnerability and expense of losses due to extreme events. Climate change is already expensive, however failure to manage it will make it even more expensive in the future.

In going forward, state action plans need to incorporate actions to improve the resilience of systems, communities, and infrastructure which are already being impacted by climate related stress and shocks. The recent impact of cyclones in India and the ongoing pressures of drought and floods have highlighted the need to strengthen resilience action. An example of a successful work in strengthening climate resilience is the UK's Department for International Development (DFID) work under its Infrastructure for Climate Resilient Growth programme (ICRG) programme. In partnership with the Government of India, the programme has helped support plans for improving the resilience of infrastructure that are designed and built under the MGNREG scheme. The work has helped people build more resilient livelihoods through public works in areas such as groundwater recharge, micro-irrigation, and water conservation in the states of Bihar, Chattisgarh, Madhya Pradesh, Odisha and Uttar Pradesh.

Furthermore, while governments and supporting actors play an obvious and significant role with climate finance, there is no way to achieve climate goals without the engagement of the private sector. Private sector investment is crucial in generating the type of finances required, both at pace and scale. As such, climate finance is one of the five key priority areas for action that the COP Presidency has identified. Several mechanisms can be utilized to enhance climate finance including the mobilization of green bonds. The Government of the UK have been mobilizing green bonds using the London Stock Exchange and have found success in this regard. Large entities such as NTPC have raised climate bonds in millions on the London Stock Exchange and through other channels which can help inject finance. Furthermore the Green Growth Equity Fund provides a good example, where the Indian and the UK governments put in GBP 120 million of core capital and is available for the mobilization of investment into green infrastructure in India. The role of the fund is to mobilize private sector contributions, where recently a large contribution was received from British Petroleum. In going forward, working with the private sector through investments and technical collaborations will be a powerful driver of change, one that is vital if we are to achieve climate goals.

Summary of key messages:

- .The revision of the SAPCCs presents an opportunity to prepare an enhanced strategy for strengthening existing mechanisms and enhancing climate resilience.
- The preparation and implementation of SAPCCs must not only be driven by the highest political management but also needs to take on a multi-disciplinary approach
- Climate change must be reflected in respective sectoral developmental plans and cannot be left as a standalone activity of the departments of environment.
- Mainstreaming climate change resilience into sectoral plans, policies and budgets becomes vital in reducing people's vulnerability and expense of losses due to extreme events.
- Increasing cross-sectoral dialogue for identifying departmental overlaps and adjusting action plans accordingly holds immense importance in achieving desired outputs.
- State governments need to adopt an outlook where climate risks are internalized and anchored in sectoral developmental plans for any action plan to be successful.
- An institutional mechanism for the coordination and delivery of action plans needs to be inbuilt into the revised SAPCCs.
- There is a need to convert sectoral strategies into specific projects and activities which can be financed either from the developmental budget of the state governments or through extra-budgetary means.
- A monitoring and evaluation framework for state governments is critical in identifying extra-budgetary resources and financing support for climate action at the sub national level.
- Given that SDGs are an overriding priority for the global community and for national governments, there is a need to strengthen linkages between the SDGs, their delivery mechanisms and the state action plans.
- The SDG India Index, developed by NITI Aayog tracks the progress of States and Union Territories on a set of 100 national indicators; a methodology is needed to link state government action plans with the SDG India Index.
- Climate action plans need to be made intelligible for persons working at the farm, block, and sub-divisional levels who can identify and appreciate the work being carried out.
- UNFCCC COP 26 to be held in November 2021 is seen as an event where the world can reunite on setting a path for a clean and resilient recovery from the COVID-19 pandemic; the United Kingdom (UK) as the COP President for the UNFCCC COP26 has communicated clean energy, clean transport, adaptation and resilience, nature and biodiversity, and climate finance as five priority areas where member states need to drive forward action.

WEBINAR 6: LAND RESTORATION AT SCALE: TOWARDS MEETING INDIA'S COMMITMENTS

Synthesis of Discussions



Photo: Pexels | Helena Lopes

26th August 2020

Panelists:

- *Satya Tripathi*, Former UN Assistant Secretary-General and Head, UNEP, New York
- *Pradeep Monga*, Former Deputy Executive Secretary, UN Convention to Combat Desertification (UNCCD)
- *Priya Shyamsundar*, Lead Economist, The Nature Conservancy (moderator)
- *Archana Godbole*, Founder-Director, Applied Environmental Research Foundation (AERF)
- *Dr. Ajai*, Emeritus Scientist, Space Applications Centre, Indian Space Research Organization (ISRO)
- *Ashok Khosla*, Founder, Development Alternatives, Co-chair, UNEP-IRP and Member, World Future Council

Land Restoration at Scale: Towards meeting India's Commitments

26th August 2020

Introduction

The condition of land resources is vital in delivering essential goods and services that life and human societies are inextricably dependent on. Land use and management has shaped the world for millennia and continues to have significant bearing on ecological functions, climate regulation, and the provision of essential ecosystem services that delivers numerous socioeconomic benefits to human society. However, with rapid population growth, rising levels of consumption and growing competition for different land-use, there are tremendous pressures on land-based natural capital today. On the contrary, decreasing availability of productive land is already undermining food security and the ability of land resources to support local livelihoods and economic growth.

For India, addressing land degradation and promoting restoration at a national scale assumes importance because of its impact on the economy and the well-being of millions. With a population of over 1.3 billion people, India holds 18% of the world's population on 2.4% of the world's total land¹. It also holds 15% of the world's livestock population. In terms of the economic impact, a Government of India supported study² indicates that land degradation leads to a loss of roughly 2.5% of the country's economic output annually. Urbanization is also likely to form a predominant driver of land degradation in the next 20-30 years, not only because built-up area will spread onto fertile land, but also because of the materials that go into producing construction material. Given that 30% of India's geographic area, i.e. 96.4 million hectares stands degraded, addressing land degradation and desertification has enormous implications in addressing wide ranging issues and economic growth targets of the country.

India has demonstrated leadership in addressing land degradation, initially pledging to restore 13 million hectares of degraded and deforested land by 2020 and an additional 8 million hectares by 2030 at the United Nations Framework Convention on Climate Change (UNFCCC) COP 15. Since assuming the United Nations Convention to Combat Desertification (UNCCD) COP Presidency in 2019, the target was further revised to an ambitious goal to restore 26 million hectares of degraded lands by 2030. For India, in the post-COVID context, land restoration is not only about solving issues around food, water security or ecosystem services, but equally important for creating jobs and enhancing the income of farmers. By looking at the restoration of 26 million hectares, there is a potential to create 4-5 million jobs.

Given the context, UN Environment Programme, India co-hosted the webinar "Land Restoration at Scale: Towards meeting India's Commitments" with Development Alternatives and The Nature Conservancy, India to deliberate on achieving land restoration goals with speed and at scale. Satya Tripathi, in his keynote address set the context to land restoration in India, expounding upon the current challenges and later went on to highlight the success of Zero Budget Natural Farming in the state of Andhra Pradesh. Pradeep Monga provided insights on addressing the complex issues of land degradation, while Priya Shyamsundar reflected on potential opportunities for financing land restoration. Further, Dr. Ajai provided a review of the technologies available for assisting the process of land restoration at scale and Ashok Khosla concluded with observations on the discussion. The report synthesizes the views of panelists in evaluating key barriers and identifying pathways through which land restoration targets can be met.

¹ <https://www.unescap.org/sites/default/files/chapter%205.pdf>

² <https://www.teriin.org/project/study-economics-desertification-land-degradation-and-drought-dldd-india>

Barriers to land restoration in India

Lack of financing: At a global level, governments have agreed to restore 350 million hectares of land by 2030 under the Bonn Challenge. However given the size of the task of restoration, the challenge lies in that global financing for restoration is nowhere near the need of the hour. In the year 2010, countries of the Global North committed to a goal of mobilizing US\$100 billion per year by 2020³ through a wide variety of sources for assisting countries of the Global South in enhancing climate action. However, looking at the resources available today, it can be seen that GEF has garnered about US\$21 billion⁴ in resources since its founding, roughly 27 years ago; GCF has accumulated approximately US\$10 billion⁵. A recent analysis also indicates that Official Development Assistance (ODA) for forestry sector has reduced by 50% as compared to the previous decade, from roughly US\$3.5 billion to US\$1.7 billion. With financial resources not forthcoming, developing countries will need to lean in, both for inspiration and resources within their envelopes to address land degradation at scale.

Conservative estimates put the cost of land restoration in the range of US\$100-500 per hectare. In India, targeting the restoration of 26 million hectares of land by 2030 therefore requires funding roughly equal to US\$7-8 billion, an investment of approximately US\$1 billion per year. These challenges necessitate that in furthering land restoration, financing needs to be both large and creative. Financial sources cannot consist only of monies from regular channels but a rethink of financial options beyond the regular domain becomes essential.

Need for targeted financing: One of the biggest challenges to land degradation is that there is currently no targeted funding for land degradation in India. At the global level, the UNCCD has been instrumental in setting up of the LDN fund, an SDG impact transformative fund set up by governments and partners that at present has been capitalized for US\$300 million⁶. However, given the extent of the fund requirement, India needs a dedicated financing mechanism in achieving land restoration targets. Targeted financing along with policy support, knowledge management and capacity building can spur private sector investment. Here, CSOs and international NGOs hold an important role in capacity building and knowledge management.

Land fragmentation: The challenge with land restoration in India, as is globally is that land is a contested resource – there are overlapping systems of formal and informal rights, competing land claims and missing land managers. Furthermore, common properties with partially implemented laws and opportunity costs tied to alternate land uses create complex issues. The land agenda is also dealt in silos by multiple ministries at the central, state and district levels, numerous rules, regulations, and policies result in further increasing the complexity of finding solutions. Scaling sustainable land management practices is also impacted by gender issues where women, who in their traditional roles are responsible for many aspects of land use and management do not have ownership, tenure or control over land.

Land tenure concerns are increasingly being addressed by India, especially with the NITI Aayog, the Ministry of Agriculture and Farmer's Welfare, and the Ministry of Rural Development devising innovative programmes and consolidation solutions. However, there is a further need for an integrated view to permeate the national development planning process. Relooking at the possibilities for cooperative ownership forms an important aspect in enhancing investment for land restoration. A new social contract, an integrated national land restoration policy that caters to a wide range of issues including biodiversity, climate, livelihoods, and food security among others may be the need of the hour.

³ <https://unfccc.int/topics/climate-finance/the-big-picture/climate-finance-in-the-negotiations>

⁴ https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.C.54.Inf_09_GEF_TF_Financial_Report.pdf

⁵ <https://www.nature.com/articles/d41586-019-03330-9>

⁶ <https://www.unccd.int/news-events/ldn-fund-officially-launched>

An agriculture perspective of India's land degradation

In the context of the famines in India during the 1940s, the Green Revolution of India was vital for the country. Realized in the 1960s, through an approach that consisted of agricultural expansion, adoption of high-yielding varieties (HYVs) along with heavy agrochemical use, it prevented starvation and helped address food requirements and nutritional challenges. While the methods of promoting HYVs and providing input subsidies achieved high productivity, over the recent decades, the negative impacts of the trade-off between soil chemistry and soil ecology has become increasingly evident. Major concerns include the decline in yields, impact on soil fertility, low soil organic carbon (SOC), and poor water quality amongst a host of environmental and health issues.

Sixty years on, while India stands as a leading agricultural producer, it also relies significantly on imports to meet its food and nutrition requirements. Moreover, there has been a persistent struggle for farmers to make their ends meet. Given India's obligation to keep a burgeoning population fed and nourished, agricultural business models have continued to rely heavily on input subsidies. Fertilizer subsidies amount to roughly US\$13 billion (INR 95,000 Crores) per annum, while another US\$5 billion (INR 40,000 Crores) comes by way of crop development schemes and the subsidies built therein. Furthermore, subsidies on electricity provided by state governments for agriculture falls nothing short of US\$3.3 billion (INR 25,000 Crores) annually, while also have major implications on water availability. Over and above the subsidies provided, farm loan waivers across the spectrum, running into thousands of Crores, made necessary by the lack of investment into soil health and land fertility manifests itself in every political cycle.

Given an arrangement where enormous sums are spent on subsidies, which continue to diminish land productivity, a growing emphasis has been placed on alternatives to conventional farming practices. In the 2020 budget speech, the Finance Minister of India emphasized the scaling up of sustainable farming practices such as organic farming and Zero Budget Natural Farming (ZBNF)/ Community Managed Natural Farming. With land restoration assuming national importance, several successful global and national land restoration initiatives provide both avenues and inspiration in scaling out sustainable agricultural practices.

Zero-Budget Natural Farming in Andhra Pradesh

Developments in ZBNF in the state of Andhra Pradesh have been promising. Initiated as a grassroots women's movement with pilots, ZBNF backed by political leadership has been adopted by roughly one million farmers in the state today. The work continues as Andhra Pradesh looks to convince its six million farmers to switch-over. It is estimated that \$365 (INR 27,000) is spent on each farmer in capacity building and demonstrations on natural farming, which when extrapolated to six million farmers, amounts to roughly US\$3 billion (INR 20,000 Crores). Besides its benefits in the restoration of soil health, as compared to the sums spent on input subsidies and farm loan waivers, the switch-over to sustainable farming practices makes financial sense as well.

Key elements to scaling ZBNF in Andhra Pradesh: Few aspects from Andhra Pradesh's efforts on natural farming stand out as key ingredients for scaling natural farming methods in the state. Omission of these key elements could create significant barriers in the scaling of natural farming, even threatening the maintenance of such benefits and actions arising from past work.

- 1) Andhra Pradesh's greatest benefit are its women; 11.5 million women in the state are a part of self-help groups. Therefore, social mobilization has happened in a context where the architecture is available for promulgating natural farming. The strength of women driven SHGs are aiding the swift mobilization of farmers. With women having a significant say in matters of farming choice, this has also helped greatly in scaling natural farming.

- 2) Political championship and the state's bureaucratic leadership in supporting grassroots movement has been tremendous in Andhra Pradesh. Despite changes in political leadership, ZBNF work has carried through into several political terms, providing both financial resources and momentum to natural farming. Built on the base of the SHG movement in India through the 1990s, initiated through the Society for Elimination of Rural Poverty (SERP) in Andhra Pradesh, the implementation of ZBNF has been able to leverage the power of partnership in scaling natural farming methods as opposed to a top-down arrangement. The National Rural Livelihoods Mission (NRLM), the world's largest poverty alleviation programme eventually evolved from the SHG movement.
- 3) Andhra Pradesh's 'rollout architecture' has also lent support in creating an enabling environment for scaling ZBNF. Farmers switch-over to ZBNF practices steadily through the conversion of 15% of their farm area every crop cycle, allowing farmers to witness the benefits firsthand. Furthermore, champion ZBNF farmers hired at three times the farm wages are engaged in neighboring districts to train farmers for an entire crop cycle. This approach has been crucial in creating a social movement, where the change happening over an extended period allows communities to understand and discuss the benefits of the switch-over. Here, an important learning is that farmers learn best from each other, as opposed to conventional forms of training and extension. Ensuring widespread and active participation has helped bring in a profound shift in how a community perceives its role within society and as such created lasting positive benefits that can further the land restoration agenda.
- 4) The loss of objectivity in scientific assessments can form barriers to scaling natural farming practices. Scientific motivation strengthened over six decades in India has leaned towards chemical farming practices and often dispute the effectiveness of natural and organic farming methods. Research methods focusing on increasing productivity are often devoid of considerations of its long-term impacts on soil organic carbon and soil biology. A challenge for scientists is to consider new methods of assessing both the shock versus the long-term benefits and the risks versus the returns. Economic valuation and natural capital accounting approaches such as The Economics of Ecosystems and Biodiversity (TEEB) studies for land restoration importantly contribute in raising the profile of natural capital and the external impacts of various actions that are often forgotten. However, the need of the hour is to act on its findings and monetize the benefits recognized by such valuation studies.

A forests perspective: financial considerations for scaling land restoration in India

Strategies to enhance public financing for forest conservation and management largely encompasses the assessment of 1) ODA, 2) national taxes and revenues coming from them, and 3) alternate measures such as reforming perverse subsidies for its redistribution towards sustainable practices. India has relied on ODA significantly over its past. However, similar to global trends, 2019 data of forestry ODA in India indicates that there has been a decline of approximately 30% as compared to the beginning of the millennium. With forestry ODA declining, increasing internal public funding is critical in keeping with the forest and land restoration agenda of the country.

A noteworthy development in India is that with the 15th Finance Commission recommendation, based on its devolution formula, the share of tax revenues to states for maintaining forests has increased from 7.5% to 10%. Based on the criterion, approximately US\$11.5 billion (INR 85,000 Crores⁷) has been transferred to the states, albeit as untied grants. Another major source of funding for afforestation is the Compensatory Afforestation Fund (CAF).

⁷ <https://prsindia.org/policy/report-summaries/report-15th-finance-commission-2021-26>

In August 2019, with over US\$6.3 billion (INR 47,000 Crores⁸) of the CA funds released to 27 states, a sizeable amount of money stands parked for furthering the forest agenda. This is a significant leap from an aggregate amount of approximately US\$2.4 billion (INR 18,000 Crores) released in ten years prior to 2019. The need of the hour is to focus on states that are receiving money and examine state specific strategies and policy incentives in ensuring that finance flowing is channeled optimally for afforestation and land restoration purposes.

Public spending alone is not sufficient to scale out. Private sector financing becomes essential and can come through investments and markets that are purchasing resources contributing to land restoration. Globally, investments in forest assets have continued to see a rise – examples from the USA and Canada show that investments, particularly pension funds and trust funds have increased forest investments in their portfolios. Forests are seen as a hard asset that generate real investment-based returns while allowing for diversification and long-term profitability. However, such investments require land tenure security.

There has also been growth in impact investments by companies and funds which have the explicit goal of creating social and environmental impact besides a financial return. Currently, at a global level, at least 34 funds manage nearly US\$10 billion of forests and related assets, primarily targeting environmental impacts in areas including climate change mitigation, land restoration, water and biodiversity conservation. Furthermore, markets for carbon offsets that include forest and land-use offsets has also considerably increased private sector investment for land restoration. Though offsetting carbon forms a medium-term strategy for mitigating climate change, it importantly increases financing for forest restoration. In the 2016-2018 period, markets for forest and land-use offsets increased by about 264% relative to small growth in other types of offset.

Reviewing technology for land restoration

While technological advances in the past have contributed to the acceleration of land degradation processes, it also holds a crucial role in meeting land restoration targets. India is well established in remote sensing and geospatial technologies and has launched a series of earth observation satellites which are used operationally for the management of natural resources; this includes the mapping and monitoring of degraded lands in the entire country. The Indian Space Research Organization's (ISRO) work on mapping the extent and type of land degradation and desertification in the country provides vital information in assisting planning for land restoration.

An important issue that comes forward in dealing with land degradation is the identification of the precise locations and the areal extent of land degradation, especially in light of India's land restoration targets against the resources available. Further, alongside the identification of degraded areas, it also becomes critical that the severity status and the drivers of land degradation are well identified for prioritizing action areas and the type of intervention required. Treatments differ for different land degradation processes. For instance, the treatment to reclaim land impacted by water erosion differs significantly from those degraded by salinity or acidification. Remote sensing and geospatial technologies provide a critical tool in resolving issues of prioritization and forms an integral component for the development of land restoration action plans in the country.

Furthermore, geospatial technologies also provide an advantage in the integration of information including the topography of the area, soil information, availability of ground and surface water among others. The integrated information generated forms a composite land development unit – a homogenous parcel of land with comparable parameters on which action plans for reclamation and restoration can be prepared. With land highly fragmented in the country, superimposing revenue and cadastral maps along with land degradation information allows for precise farm-level action plans to be developed. Geospatial and remote sensing technologies also importantly provide

⁸ <https://pib.gov.in/PressReleaselframePage.aspx?PRID=1594384>

scope for change detection and therefore monitoring the effectiveness of action plans, especially over extended periods of time.

Besides the advantage that technology brings to planning and monitoring, technological advances in artificial intelligence and machine learning offers further scope for its utilization in assisting tree planting processes. Examples of drone assisted plantations from various parts of the world indicate its advantage in reaching inaccessible locations, collecting precise soil information and determining prime locations for planting. Drones are also being utilized for plantation which can significantly increase plantation areas and decreasing plantation time.

Action on ground: NTFP value-chain development in Maharashtra

Non-timber forest produce (NTFP) has received increasing international attention with a steady growth of green consumerism. As such, private sector investment for NTFP based value-chain development provides a potential avenue for scaling sustainable land management practices, especially in large expanses of land that lie outside the protected area network. As many forest-dwelling communities depend on wild plant harvesting for meeting many needs including food, medicine, fiber for clothing, building materials and income, restoration of these areas bring multiple benefits; crucially, such investments incentivize the conservation of land resources.

The work carried out by the Applied Environmental Research Foundation (AERF), a Maharashtra based CSO provides a certain example of its scope. AERF has supported hundreds of villages on NTFP-based value chain development in the northern extent of the Western Ghats, a region with a limited protected area network and prone to indiscriminate use of land resources. The organization initiated work almost 25 years ago with an extensive baseline study to understand natural resources that could benefit communities at large. Subsequently, the implementation of rotational agroforestry models and value-chain development, predominantly supported through CSR funding created opportunities to further enhance private sector investment. Over the recent decade, AERF has witnessed increasing private sector engagement with FairWild certification of NTFP produce providing access to new markets worldwide.

Furthermore, besides income benefits, the implementation of the FairWild certification process has also supported capacity building of local communities and contributed to the restoration of traditional cultural spaces such as sacred forests and privately owned unprotected forests. Value chains have been developed particularly for wild plant species including *Terminalia bellirica*, *Terminalia chebula*, *Acacia catechu*, *Pterocarpus marsupium* which are used as ingredients in herbal medicines. AERF has also been emphasizing the development of the bamboo value chain in recent years. Opportunities to further scale private sector engagement lies in identifying and replicating such successes in the country and enhancing microenterprises that provide steady cash flow to rural communities alongside social and environmental benefits.

Examples of successful land restoration business models

The Tropical Landscapes Finance Facility's natural rubber project around the Bukit Tigapuluh forest in Indonesia provides a good example of an innovative financing solution used for land restoration/ conservation. With the Government of Indonesia providing a land concession on 88,000 hectares of degraded land, 38,000 hectares is now run as the world's largest sustainable rubber plantation; the remaining land has been set aside for conservation. Finances purely raised from capital markets have funded the joint venture between the French tyre-company Michelin (49 per cent) and Indonesia's Barito Pacific (51 percent). Besides the restoration of degraded lands, the plantation employs 50,000 people, previously engaged as bonds in destroying forests and also forms a buffer zone around the forest today.

Land restoration and rehabilitation efforts in the Kubuqi Desert in China also shows how public-private partnerships can play a vital role. Private investment supported by smart government policies have been instrumental in the restoration of 6000 sq. km of the Kubuqi Desert. The business model combines agroforestry, value chain development of medicinal plants, ecological husbandry, ecotourism and solar energy production. The developments have created new market and employment opportunities and also improved standards of farmers and pastoralists.

Similarly, in India, enabling policies and incentives that promote the integrated development of wastelands have the ability to create employment and market opportunities while developing business and community institutions. For instance, given India's targets for solar energy generation, smart policies that foster public-private-people partnerships can cater to land restoration targets alongside solar power development. This can also be undertaken through public-sector undertakings in the country. The need for the restoration of 5 million hectares of India's abandoned mining lands presents an opportunity to initiate such work. Furthermore, programmes launched in India after UNCCD COP 14 such as the India Legacy Programme that targets the restoration of the Aravalli range through the states of Gujarat, Haryana, Rajasthan and Delhi can form flagship projects in scaling land restoration.

Summary of key messages:

- For India, in the post-COVID context, land restoration is not only about solving issues around food, water security or ecosystem services, but equally important for creating jobs and enhancing the income of farmers.
- Targeted financing along with policy support, knowledge management and capacity building can spur private sector investment for achieving land restoration at scale.
- An important aspect in enhancing investment for land restoration is to consider an integrated view to permeate the development planning process including relooking at the possibilities for cooperative ownership of land resources.
- An integrated national land restoration policy that caters to a wide range of issues including biodiversity, climate, livelihoods, and food security among others may be the need of the hour.
- Scaling up of sustainable farming practices such as organic farming and Zero Budget Natural Farming (ZBNF)/ Community Managed Natural Farming provide avenues and inspiration in scaling out sustainable agricultural practices.
- Social mobilization, political championship and object-oriented programme design are key elements in successfully scaling out land restoration.
- With forestry ODA declining, increasing internal public funding is critical in keeping with the forest and land restoration agenda of the country.
- Forests are seen as a hard asset that generate real investment-based returns while allowing for diversification and long-term profitability. However, such investments require land tenure security.
- Impact investments have the explicit goal of creating social and environmental impact besides a financial return and can increase financing for land restoration.
- Though offsetting carbon forms a medium-term strategy for mitigating climate change, it importantly increases financing for forest restoration.
- Technology can greatly enhance the ability to determine the severity status and the drivers of land degradation for prioritizing action areas and the type of intervention required.
- Technological advances in artificial intelligence and machine learning offers further scope for its utilization in assisting tree planting processes.
- FairWild certification of non-timber forest produce can increase private sector engagement and provide access to new markets worldwide.
- Enabling policies and incentives that promote the integrated development of wastelands have the ability to create employment and market opportunities while developing business and community institutions.



**WEBINAR 7: WETLANDS AS ECOLOGICAL CONNECTIONS IN
THE CENTRAL ASIAN FLYWAY**
Synthesis of Discussions

Photo: Pexels | Arti Agarwal

2nd September 2020

Panelists:

- *Amy Fraenkel*, Executive Secretary, Convention on Migratory Species of Wild Animals (CMS)
- *Soumitra Dasgupta*, Additional Director General of Forests (Wildlife), Ministry of Environment, Forest and Climate Change, Government of India
- *Manju Pandey*, Joint Secretary, Ministry of Environment, Forest and Climate Change, Government of India
- *Dhananjai Mohan*, Director, Wildlife Institute of India
- *Fernando Spina*, Former Chair, Scientific Council, Convention of Migratory Species
- *Taej Mundkur*, Wetlands International, The Netherlands
- *Deepak Apte*, Former Director, Bombay Natural History Society
- *Ritesh Kumar*, Director, Wetlands International South Asia (moderator)

Wetlands as Ecological Connections in the Central Asian Flyway

2nd September 2020

Introduction

Ecologically dependent on wetlands, migratory waterbirds connect continents, hemispheres, cultures and societies through their seasonal movements. The flyway concept is used to link sites and ecosystems into a single functional unit in order to enable waterbirds to complete their migration cycle. Migratory waterbirds play an essential role in wetlands they inhabit at different stages in their life cycle, by contributing to resource fluxes, biomass transfer, nutrient export, food-web structure, and even shaping cultural relationships. Therefore, population dynamics of waterbirds is often used as an indicator of wetlands ecosystem health. Conserving species movement as a process is an equally important goal as conserving migratory species.

India hosted the 13th meeting of the Conference of Parties (COP) of Convention on the Conservation of Migratory Species of Wild Animals (CMS) in Gandhinagar, Gujarat from 15th to 22nd February 2020, and holds the CMS COP presidency for next three years. The Hon'ble Prime Minister of India in his inaugural address to the CMS COP 13 underlined India's commitment towards development of an institutional mechanism for the Central Asian Flyway (CAF), and stressed on the need for undertaking research, studies, assessments, capacity development and conservation initiatives for migratory species by creating a common platform, with active cooperation of all the CAF Range Countries.

While protected areas have been cornerstones of securing wetland habitats of high ornithological value in several parts of world including India, several such wetlands are located outside protected area network, and within a high development setting. Governance solutions for conserving such wetlands need to have people as part of the solutions and put in place governance mechanisms that enable collaboration between a range of conservation and development sector actors. Equally pertinent is to nest conservation actions across several wetlands used as habitats by migratory birds.

In this context, UNEP, India co-hosted a webinar titled "Wetlands as Ecological Connections in the Central Asian Flyway" with Wetlands International – South-Asia to discuss pathways for conserving high ornithological value wetlands using an ecological network approach. Amy Fraenkel set the context for the webinar in her keynote address discussing CMS COP13 and the commitments to ecological connectivity. Soumitra Dasgupta and Manju Pandey further explained India's importance in the CAF and detailed India's priorities and commitments under the CMS COP Presidency. Fernando Spina and Taej Mundkur provided insights on enhancements required in monitoring and information access. Dhananjai Mohan and Deepak Apte reflected on mechanisms for capacity development and achieving behavioral change. This report presents the viewpoints put forward by the panelists in the webinar and the key recommendations from the discussions.

The CMS COP13 and commitments to ecological connectivity

The 13th meeting of the Conference of Parties (COP) to the Convention on Migratory Species (CMS) held at Gandhinagar, Gujarat in February 2020 came at a time of the emergence of COVID-19, importantly reminding the world of the pressing need to enhance conservation efforts, without which human wellbeing is severely compromised. Protection of natural habitats and conservation of biodiversity remain key components that form the base from which human development needs to be built. CMS COP13 placed emphasis on ecological connectivity, not only important for the survival of migratory species but also biodiversity more broadly.

As in other parts of the world, in India there are issues of conflict with animals and human settlements. Animals follow natural instincts, even as human populations build roads and cities, and ports on coasts and wind farms to provide energy for socio-economic growth. Migratory species need to be able to move freely from one place to another and wetlands form critical areas along migratory routes to support various stages of their lives. In doing so, the concept of ecological connectivity points to the need to find ways to coexist with wild species even when we strive for improved human development. It is possible – if we look at creative ways of accommodating species beyond protected areas.

Ecological connectivity is a notion beyond protected areas and embodies the natural pattern of wild species and their lifecycles. It brings to bear that the functionality of the migration process can be compromised by human development even outside the realm of protected area networks. As a key word for CMS, ecological connectivity provides a means by which multiple countries can agree on shared goals beyond national plans and priorities and provides a roadmap for action. The Gandhinagar Declaration, adopted by CMS COP13, sets out CMS priorities for the post-2020 global biodiversity framework including the maintenance and restoration of connectivity. It is defined as the unimpeded movement of species and the flow of natural processes that sustain life on Earth, a definition endorsed by the CMS COP13.

The Central Asian Flyway

The Central Asian Flyway (CAF) is one of the nine global waterbird flyways, comprising migratory routes from the northernmost breeding grounds in Siberia to southernmost non-breeding grounds in the West and South Asia, The Maldives and British Indian Ocean Territory. Covering at least 279 populations of 182 migratory waterbird species, the flyway spans 30 countries of North, Central and South Asia and Trans-Caucasus. The critically endangered Sociable Lapwing *Vanellus gregarius*, vulnerable Black-necked Crane *Grus nigricollis* and Indian Skimmer *Rynchops albicollis*, Bar-headed Goose *Anser indicus*, and Brown-headed Gull *Larus brunnicephalus* are restricted mainly to the CAF region.

International cooperation on the CAF is at the core and is at the basis of action at the CMS. COP13 adopted a targeted resolution and decision for action on the CAF, agreeing for strong legal and institutional framework for the CAF that will provide a means for cooperation among the CAF Range States, for the conservation for migratory birds and their habitats. This has been a key missing element thus far. In addition to the resolution, CMS adopted a decision at COP13 which gives specific direction to different actors and calls on all range states to work with the Government of India which has committed a leadership role in strengthening international cooperation, and with the CMS and AEWA Secretariats to develop an institutional framework. The aim of the institutional framework is to agree on inter alia conservation priorities and related actions, and measures to support Parties with the implementation of conservation action for migratory birds and their habitats in the region, including by promoting research, studies, assessments, capacity-building and conservation initiatives thereby further strengthening the implementation of CMS and its avian-related instruments. Furthermore, a decision was also taken to contribute to an inter-governmental meeting of the Range States of the CAF organized by the Government of India and the CMS Secretariat to agree on the modalities of the framework by COP 13, and to update the CMS Central Asian Flyway Action Plan.

Importance of India's wetlands to the Central Asian Flyway

India is located at the heart of CAF. Nearly 71% of the migratory waterbirds of the CAF use India as a stopover site. Sustaining the health of Indian wetlands is thus crucial for maintaining the waterbird populations within the Flyway.

Wetlands are highly productive ecosystems that provide a range of ecosystem services such as water storage, water purification, flood mitigation; they are also socially and culturally integrated with Indian society. Due to its

geographical location, India plays a very important role in the CAF; the numerous changes in topography allows it to harbor many important riverine, coastal and oceanic wetlands, attracting a large number of resident and migratory birds. Furthermore, the CAF zone has approximately 1600 Important Bird and Biodiversity Areas (IBAs) with India harboring more than 550 of these IBAs; it also holds 42 Ramsar sites.

Enhancing ecological connectivity requires a landscape approach to conservation. Currently, while a large number of the major wetlands are within the domain of the Protected Area Network of the country, many birding areas also lie outside its realm. The Forest Survey of India in its latest report indicates that 8.13% of the total wetlands in the country lie inside PA and Reserve Forest areas, whereas the rest are outside the protected area network. As economies develop, human population expands, greater demands are placed on the region's natural ecosystem. As such, the bird population and its habitat have also come under pressure for multifarious reasons. The large number of wetlands, within the country as well as in other Range States of the CAF, outside the protected area network requires protection against unsustainable development.

India's leadership in action on wetland conservation and maintaining ecological connectivity

The Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India has played a leading role in prioritizing national action for the conservation of wetlands and strengthening institutional mechanisms on the CAF. Given the developmental needs for a country like India it is imperative that human development happens alongside conservation. As such, India has explored a participatory mode of conservation, in recognizing that conservation cannot happen in isolation within the country. Based on Ramsar Convention's wise use approach – the MoEFCC has developed guidance for diagnostic and cross-sectoral approach to wetlands management planning. Particularly at the national level, several interventions have been made that show India's commitment to the management and conservation of wetland ecosystems around the country that can form an important basis in scaling up to the CAF level.

Regulatory Framework for Wetland Conservation: The Wetlands (Conservation and Management) Rules (2017) forms the core regulatory framework for conservation of wetlands in the country. One of the major interventions made was the creation of State Wetland Authorities (SWAs) – the delegation of power was given to the states to constitute such authorities with an aim to increase cross-sectoral coordination. SWAs constitute of members from the departments of irrigation, rural development, fisheries, forests, tourism, among others along with experts in ensuring that conservation of wetlands is integrated into developmental plans. The constitution of SWAs has been promising. For instance, some states have taken decisions through the SWAs to categorize wetlands as a separate land-use for the revenue records and in doing so ensuring that wetlands are not treated as wastelands that are often encroached upon. Furthermore, a National Wetland Committee has also been constituted as a subset of the Wetland Rules.

Central Asian Flyway National Action Plan: The MoEFCC has also brought together scientists and national experts in developing the Central Asian Flyway National Action Plan which was languishing for more over 15 years. With the National Action Plan prepared, India has committed to taking a leadership role in the creation of an institutional mechanism of CAF on a common platform for all the CAF Range countries under the umbrella of the CMS. This will enable the development of synergies on conservation of species and habitats, monitoring and crucially the sharing of data related to CAF issues. Furthermore, relevant ministries and departments have also come together under this tenet which has resulted in this country's linear infrastructure policy, another policy which ensures that conservation happens along with the developmental needs of the country.

Funding support to the state governments: The MoEFCC has also been providing funding support through the National Programme on the Conservation of Aquatic Ecosystems, a programme that has been operational since

1986, formerly known as the National Wetlands Programme. The Ministry has provided funding assistance to state governments for the conservation and management of 170 wetlands in the country. To support management, the Ministry also conducts regularly capacity development programmes for wetlands managers and stakeholders.

Ramsar Sites: With India being a party to the Ramsar Convention, the designation of Ramsar sites within the country has also added in bringing wetlands under conservation following the Ramsar principles. Prior to the World Wetland Day 2020, India had 27 designated Ramsar sites; 10 were added on World Wetlands Day 2020 with another 5 added as Ramsar sites at the end of the year 2020. With 42 designated wetlands, India has the second largest Ramsar Site network in Asia.

Wetland Rejuvenation Project: In 2019, the MoEFCC undertook the Wetland Rejuvenation project, a transformative pilot project which identified 130 wetlands for restoration and rejuvenation. The project followed a four step strategy. As a first step, nodal officers were brought together for capacity building and training on the preparation of an e-document to provide baseline data of the 130 wetlands. Further, the preparation of Wetland Health Cards, built on the baseline data was developed for the first time in the country, rated on the basis of several parameters including biodiversity. The project also employed a concept of 'Wetland Mitras' (Friends of the wetlands) in an effort to formalize roles of local wetland managers in strengthening local capacity for conservation of wetlands. Targeted management plans based on the baseline studies carried out and wetland health cards were shared with states alerting them both on the state of the wetlands and providing a plan for its rejuvenation.

With the success of the pilot project, the MoEFCC has taken up the restoration and rejuvenation of a thousand wetlands in the second phase. This forms the groundwork for an anticipated National Wetlands Mission in the country. Furthermore, with the support of knowledge partners, collation of wetland information and a website for public access to wetland information is expected by end of the year 2020.

Cross-sectoral action on wetlands: Besides efforts of the MoEFCC, the Ministry of Jal Shakti, through their programmes and projects have enhanced efforts for the restoration of rivers and water bodies. Funds through the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) can be utilized for such restoration works. Given the success of the pilot Wetland Rejuvenation Project by the MoEFCC, the Namami Gange Mission has adopted the four-step strategy for the restoration of 29 wetlands along the river Ganga.

Ecological Connections – the requirement of systemic and systematic monitoring

Migratory systems are complex environmental systems which involve the entire life cycle of an animal, particularly migratory birds and further waterbirds. In dealing with migratory birds, there is a tendency to concentrate on breeding grounds or wintering grounds of birds for monitoring. However, each component of the flyway and hence their annual migratory system are of key and equal importance and therefore needs to be monitored as a systemic whole. This is particularly important as it provides key insights on the role of the different wetlands which are often scattered over large distances. If any of these wetlands may not be used for breeding, or for wintering, they still form key wetlands for the birds to accomplish their whole life cycle.

Furthermore, while the knowledge base on migratory species has grown, it is still limited in addressing issues at a flyway scale. There is a need to understand how they migrate, stop, rest, breed, and interact with people as migratory birds are in contact with people for much of the flyway. Capturing interactions between people and the migratory birds becomes important for conservation, especially with wetlands being areas of high productivity that bring human and migratory bird populations closer to each other. Therefore, ensuring good mechanisms of bilateral and multi-lateral cooperation across the flyway becomes crucial in strengthening collaborative governance and conservation efforts for migratory species.

In looking at connectivity through an India perspective, it is quite clear that it is impossible for all habitats of waterbirds to come under protection, however this means that there is a further challenge of ensuring that birds are able to utilize habitats, specifically wetlands. Even when these habitats are not protected, this calls for strengthening management strategies and capacities of wetlands. Furthermore, there is also the need to look at connectivity through an even scattering of wetland distribution, an iconic example for connectivity; habitats which are scattered across space but which are connected through waterbirds that move from one to the other. In developing strategies, it therefore becomes vital to ensure that migratory waterbirds have a system with functional size and areas and wetlands which they can use during the whole of their annual cycle.

The task of maintaining connectivity cannot be accomplished without data. In addition to the numbers over the long-term and at a large scale, there is also the need to collect and analyze information on behavioral observations and the roles that different wetlands along the flyway. Here, banding data plays importantly in obtaining variables of sex, age and physical conditions – proxies that allow crucial understanding of the role of wetlands in migration. Furthermore, the collection of information needs to be done at a flyway scale; therefore, it is important to steer cooperation across CAF Range States working together to optimize efforts. The medium- and long-term need would be to develop conservation strategies at a flyway level. Data is also vital for other applied and political aspects of connectivity. For instance, there is a need to determine countries that share the same populations and species in order to take responsibility for the individual animals across Range countries.

Systematic waterbirds and wetlands monitoring are crucial for effective conservation planning and management decision-making. The data on waterbird population and distribution within India and at flyway scale remains patchy. The fifth edition of Waterbirds Population Estimates contains CAF level population trend information for 73 species, a majority of which (68%) do not have known trend estimates. There is no idea about trend quality for 71% of species, and another 25% do not have quality assessments. Poor data quality has consequences for the implementation of waterbird related criteria for the designation of new Ramsar Sites. There is a pressing need to increase the waterbird population and distribution monitoring efforts. Reliable population estimates will ensure that Ramsar site designation is based on robust data, and the site network is representative and relevant for the needs of waterbird conservation. Wherever possible, waterbird monitoring may be institutionalized within the wetlands monitoring programmes, so that information on long term trends is generated as a part of the assessment of changes in wetland ecological character.

Landscape approach to management of wetlands

Management is a key activity for the conservation of wetland habitats, especially in areas with a concentration of important human activities. Therefore, finding the right balance between human activities and conservation becomes imperative. Relooking at the definition of wetlands adopted by the Ramsar Convention indicates that wetlands cover a large range of ecosystems including freshwater, brackish, coastal, and marine ecosystems, and natural as well as manmade. As such, it brings to fore that the management of wetlands requires the adoption of unique strategies and sharing of good practice to ensure that in the short term, the right solutions for wetland types and locations are available. In this context, a need to focus further on the role of manmade wetlands, including agricultural ponds, salt works, and flood plains also becomes important in enhancing conservation strategies.

Additionally, besides wetlands there is also the need to recognize that many of the waterbirds, during their non-breeding period use non-wetland area for activities such as roosting, nesting which could include urban parks, drylands and agricultural areas. Therefore, conservation cannot adopt an isolated area approach. Strengthening an ecological network needs a landscape approach to management, finding management strategies for conserving larger landscapes with human use. Moreover, in the CAF many species are declining rapidly because of natural factors as well as human factors including legal and illegal hunting, poisoning and loss of many birds to growing

linear infrastructure including windmills and power lines. The impact of infrastructure development near wetland sites also needs to be carefully considered in meeting conservation and development goals.

Enhancing information access and sharing for transboundary cooperation

Information access and sharing are vital to transboundary conservation efforts that results in strong connections, an ability to advance sound national and regional conservation strategies and improve upon the efficacy of conservation efforts. CMS in 2007 established an international site network called the West and Central Asian Site Network for the Siberian Crane and other waterbirds, a site network which was set up and focused on the Siberian Crane. While the Siberian Crane has unfortunately been lost in the CAF over the last few years, the site network it is an extremely important mechanism for increasing cooperation between States. It provides an excellent opportunity to expand the Central Asian Flyway site network; finding ways in establishing the site network at the earliest opportunity provides a mechanism for national governments to enhance focus for developing good conservation and management.

Transboundary cooperation can also be strengthened by learning from developments in other flyways globally. While India is front and center in the CAF, the eastern part of the country also overlaps with the East-Asian-Australasian Flyway; within this flyway, a partnership exists covering 140 sites from Russia and Alaska, to East and South-east Asia through to New Zealand which can strengthen learning and sharing of good practices, especially in dealing with conservation and management in human dominated areas. Additionally looking over to the west, the CAF also overlaps the African-Eurasian Flyways which are protected and managed under the CMS initiative, the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), an agreement which has worked carefully with governments and partners to develop a network of over 3500 critically important sites and forms the basis for conservation action.

Access to databases also plays crucially in strengthening collaborative action. In an innovative project implemented by Wetlands International, closely with Birdlife International, UNEP, Ramsar, CMS and AEWA, a Critical Site Network Tool has been developed that provides basic information on important wetland sites. The tool has benefitted from information on monitoring undertaken by the networks within government, within NGOs over many years under the framework of the International Waterbird Census; in India, BNHS and WI-SA are working together in coordinating the Waterbird Census in India. Furthermore, there are other tools such as World Heritage Sites that can be used for conservation. Creative approaches in expanding the tool and providing decision support requirements of governments and stakeholders in the Central Asian Flyway is the need of the hour. Similarly, the recent publication on the State of India's Birds, launched at CMS COP13 and based on e-bird data provides a good data set on trends and status.

Capacity building for wetland management and achieving positive behavioral change

An important step in the conservation of wetlands has been the revision of the Wetland Rules in 2017, bringing structure to the management of wetlands in India. Initiated with the mapping of wetlands by the Space Applications Centre, the enhancement of the Wetland Rules (2017) has brought more wetlands under structured management and regulation, even to wetlands outside the protected area network. An important aspect of the amendments is that it allows for greater public participation and those who are considered as wetland managers.

Besides forest department personnel, there is a need for capacity building to enhance cross-sectoral and multi-level coordination; irrigation departments and hydropower development agencies become important stakeholders for the conservation of wetlands. For instance, in Uttarakhand, sensitization and capacity building of the irrigation department on conservation of wetlands achieved conservation status of the Assan Barrage, with the irrigation department an equal partner in the conservation. It is also important to note that small wetlands dot the entire

agricultural and rural landscape, almost at a frequency of a couple of kilometres, and therefore panchayats and farmers become important stakeholders in conservation of wetlands, particularly those that are critical and outside the protected area network.

Migration and the interlinkages to human communities is an important concept that connects to the idea of conservation; however it is not one which has not been capitalized for enhancing conservation globally. With a human dominated landscape, flyway conservation needs to be looked at in a different dimension; while conservation plans can be made, addressing complex socio-economic balances and engaging the ordinary man remains at the heart of conservation. This however requires a transformative approach where inclusiveness of stakeholders is vital to its success. With flyways providing an excellent opportunity to reframe the conservation agenda, a water-conservation centric approach may provide a common thread, where the likelihood to bring a diverse group of stakeholders to the table is greater. In doing so flyways and birds become beneficiaries. Bringing local communities is vital in achieving conservation targets at a landscape level – migratory birds will never have a safe refuge if we don't.

Summary of key messages:

- CMS COP13 placed emphasis on ecological connectivity, not only important for the survival of migratory species but biodiversity more broadly.
- Ecological connectivity is a notion beyond protected areas and embodies the natural pattern of wild species and their lifecycles.
- International cooperation on the Central Asian Flyway (CAF) is at the core and the basis of action at the CMS.
- Strong legal and institutional framework for the CAF will provide a means for cooperation among the CAF Range States, for the conservation for migratory birds and their habitats.
- India is located at the heart of CAF; nearly 71% of the migratory waterbirds of the CAF use India as a stopover site. Sustaining the health of Indian wetlands is thus crucial for maintaining the waterbird populations within the Flyway.
- The Wetlands (Conservation and Management) Rules (2017) forms the core regulatory framework for conservation of wetlands in the country. One of the major interventions made was the creation of State Wetland Authorities (SWAs).
- India has committed to taking a leadership role in the creation of an institutional mechanism of CAF on a common platform for all the CAF Range countries under the umbrella of the CMS.
- Each component of the flyway is crucial for migratory species and hence their annual migratory system is of key and equal importance and needs to be monitored as a systemic whole.
- The task of maintaining connectivity cannot be accomplished without data. In addition to the numbers over the long-term and at a large scale, there is also the need to collect and analyze information on behavioral observations and the roles that different wetlands along the flyway.
- Access to databases plays crucially in strengthening collaborative action.
- Besides forest department personnel, there is a need for capacity building to enhance cross-sectoral and multi-level coordination; irrigation departments and hydropower development agencies become important stakeholders for the conservation of wetlands.
- Flyway conservation needs to be looked at through the lens of addressing complex socio-economic balances and engaging the ordinary man.
- Flyways provide an excellent opportunity to reframe the conservation agenda; a water-conservation centric approach may provide a common thread, where the likelihood to bring a diverse group of stakeholders to the table is greater.



WEBINAR 8: EMERGING MECHANISMS TO MITIGATE ILLEGAL WILDLIFE TRADE

Synthesis of Discussions



Photo: Pexels | Jan Kopriv

17th September 2020

Panelists:

- *Tilotama Verma*, Additional Director, Wildlife Crime Control Bureau
- *Haruko Okusu*, Chief, Knowledge Management and Outreach Services, CITES Secretariat
- *Dhananjai Mohan*, Director, Wildlife Institute of India
- *Shekhar Kumar Niraj*, Director and Additional PCCF, Advanced Institute for Wildlife Conservation, Chennai
- *Sukesh Nayak*, Chief Creative Officer, Ogilvy India
- *Pradeep Bhattarai*, Senior Environment Officer, South Asia Wildlife Enforcement Network (SAWEN)
- *Ruchi Pant*, Head, Natural Resource Management and Biodiversity, UNDP

Emerging Mechanisms to Mitigate Illegal Wildlife Trade

17th September 2020

Introduction

The COVID-19 crisis has highlighted the adverse impacts that illegal wildlife trade (IWT) can have on our health and economy. It is a multi-faceted global threat that undermines biodiversity conservation efforts, erodes ecosystem integrity leading to numerous counts of poaching and criminalizing of local communities for small returns. It is the leading direct threat to iconic species and poses the overall second-biggest direct threat to species survival, alongside climate change and habitat destruction. Its strong linkage to the pandemic has also underscored how swiftly it can cripple economic infrastructure and development processes.

In recent years, IWT activity has escalated dramatically and poses a global challenge that needs to be addressed urgently. Even with lockdown measures and restrictions in travel post the spread of COVID-19, surging incidences of wildlife crime indicates the seriousness of the threat that IWT plays in species survival. Moreover, the world's increasingly interconnected and complex systems of finance, communication, and transport have brought isolated source regions in remote areas closer to large demand markets for wildlife and their derivatives. Internet-based platforms have also provided an avenue for conducting trade and transactions, while expansion of air transport networks is allowing for faster movement of contraband. It is estimated that the global value of IWT exceeds \$20 billion annually and ranks third after trafficking in drugs and arms in terms of profits.

Tackling the issue of IWT requires focusing on all three aspects of the trade, viz. supply, transit and demand. A 2018 study commissioned under the Global Wildlife Programme presented the need for future recommendations including the need for strategic and technical tools to support law enforcement efforts to combat IWT¹. Core policing functions supported by databases, utilization of secure communication platforms and provision of basic equipment were important strategies outlined in the report. In tackling IWT, there is a need to strengthen monitoring systems to reduce poaching and capture of wild animals. Further cooperation between countries and enforcement organizations plays a key role in increasing seizures along transit routes and changing the perception of IWT as a low-risk, high-reward crime. Consumer awareness regarding the detrimental effects of IWT is required to reduce demand.

UNDP and UNEP conducted the webinar 'Emerging Mechanisms to Mitigate Illegal Wildlife Trade' to highlight the urgent need of mitigating illegal trade in wildlife, which is not only accelerating loss of biodiversity but had adverse direct impacts upon human health. Ruchi Pant set the context for the webinar and discussed UNDP's work on IWT while Tilotama Verma in her keynote address, provided the perspective of India's enforcement agencies. Haruko Okusu provided details on the eCITES system and Sukesh Nayak highlighted the importance of awareness campaigns to reduce demand. Further, Dhananjai Mohan explained the importance of data collection and Shekhar Kumar Niraj drew attention to the role of forensics in contributing to the fight against IWT. In concluding, Pradeep Bhattarai spoke about the need for enhancing transboundary cooperation mechanisms for effective mitigation. The report synthesizes the viewpoints of the panelists and the ensuing discussions of the webinar.

UNDP's work in addressing wildlife trafficking

UNDP has adopted an integrated approach in addressing the multidimensional facets of wildlife trafficking. At the international level, UNDP facilitates the South-South and Triangular Cooperation between source, transit and

¹ <https://www.thegef.org/sites/default/files/publications/GWPBrochureMay2018WEB.pdf>

consumer countries, and along with UNEP is also a part of the UN Inter-agency Task Force on Illicit Trade in Wildlife and Forest Products. Furthermore, as part of the GEF supported Global Wildlife Programme being implemented in 32 countries, UNDP is implementing a project to reduce maritime trafficking of wildlife between Africa and Asia by strengthening the capacities of law enforcement agencies, coordinating with the private sector to prevent illegal trade, and to detect, prevent and intercept the wildlife being trafficked through the ports, and strengthening coordination and knowledge sharing with national projects in the Global Wildlife Programme. UNDP also hosts the secretariat for the Lions' Share Fund, an innovative funding mechanism harnessing the power of advertising and businesses to conserve wildlife and habitats worldwide.

In India, under the SECURE Himalaya project, a part of the Global Wildlife Programme, UNDP is working with the Wildlife Division and the Wildlife Crime Control Bureau (WCCB) in the MoEF&CC and state governments of Sikkim, Uttarakhand, Himachal Pradesh, and the Union Territory (UT) of Ladakh to support enhanced enforcement, monitoring and cooperation to reduce wildlife crime. Key intervention areas include strengthening the capacities of enforcement agencies for combating wildlife crime, identification of hotspots and pathways of trade, technology-driven interventions including digitized management information systems, and establishing community-based surveillance systems. The project also aims to leave behind a cadre of community volunteers to serve as 'Himal Rakshaks', (loosely: protectors of the Himalayas), to assist in monitoring and surveillance work.

Capacity building for effective enforcement: Perspective from India's enforcement agencies

While globalization has provided many benefits such as increased capital flows, enhanced free trade and reduced barriers for communication and transport, unfortunately it has also opened new markets for illicit wildlife trade. With the supply and demand chain significantly changed by globalization, increase in both domestic consumption and cross-border trade of wild species pose major concerns in addressing the problem, further exposing considerable gaps in capacity in dealing with increased IWT activity.

Convergence of multiple crimes: IWT cases typically exhibit a convergence of multiple crimes, especially its linkages to narcotics and the arms trade. It is also a type of crime that encompasses a host of financial crimes including fraud, corruption, tax evasion, custom breaches, money laundering and the like. As such, given the wide and complex nature of such crimes, it becomes imperative that a multi-agency approach, involving sensitizing, stimulating and engaging the entire enforcement system is adopted in preventing IWT.

For instance, from information available through seizures and investigation reports, it becomes apparent that a large demand for the horn of the Indian Rhinoceros originates from South-East Asian countries and China. Numerous actors are involved along the supply chain, such as sharpshooters who operate at inter-state levels, village informants, specialists in the removal of the rhino horn, and handlers and transporters who operate across the porous borders of Bangladesh, Bhutan, India and Nepal. In many cases, poor people who live on the fringes of forest areas turn into informants, providing shelter to poachers and human carriers for meagre amounts. Given the multiple dimensions of the crime, there is a need to strengthen collaboration and cooperation amongst a large number of agencies including the police, forest personnel, customs officers, Directorate of Revenue Intelligence (DRI) officials, intelligence operatives, and concerned paramilitary forces in monitoring and detection of the crime. Furthermore, a combined review of the databases of the Wildlife Crime Control Bureau, the Narcotics Crime Control Bureau, and weapons databases from police stations, as opposed to a standalone review, can enhance detection of wildlife crimes.

Data access and sharing: The speed with which information is obtained and shared among concerned parties is also a major factor that enhances IWT or detracts from the likelihood of its detection. Strengthening mechanisms for swift data access and sharing among countries is a need of the hour. Currently, while transboundary cooperation

through Interpol and SAWEN has provided a framework through which cooperation on monitoring and detection of such crimes can be carried out, the lack of appropriate laws on such issues undermines the ability for investigative agencies to increase the likelihood of detection.

Knock-on effect of infrastructure projects: Expansion of infrastructure projects throughout the country is often linked to habitat fragmentation and its direct impact on biodiversity loss, however an issue that has often received less attention is its knock-on effect in fueling IWT. For instance, in the past, the trafficking of illegal wildlife products was often channeled through major airports in the country, however with the expansion of the transportation sector into 2nd and 3rd tier cities of India, smaller airports have become vulnerable to IWT today. With a lack of trained personnel in the detection and identification, wildlife derived products regularly pass through security measures in place. There is also a general lack of knowledge and forensic capacity in place for the identification of wildlife and its derivatives among investigative agencies in smaller cities.

A growing domestic market: The domestic market for illegal wildlife products is also a growing threat in the country; with increasing purchasing power in the country, the domestic demand for wildlife, parts and derivatives are likely to increase in the country. Seizures over the recent years indicate that the trade is going unchecked and needs immediate redressal. For instance, earlier seizures of pangolins largely consisted of seizure of pangolin scales, however in the recent past a growing number of cases of trade in live pangolins indicate that the trade of the animal has remained largely unchecked. Even during the COVID-19 lockdown, poaching and illegal trade continues unabated, even showing a surge in certain parts of India.

Expanding training of enforcement agencies: Furthermore, investigation of several IWT cases within the country indicates the need for awareness generation and sensitization among institutions beyond the training imparted to conventional enforcement agencies. In 2017, a case involving mongoose hair being traded to produce brushes in Uttar Pradesh, revealed the various networks used for the illegal activity including the railways, postal service and truck operators' network. As such, there is a need to expand training of personnel to the Indian Railways, the postal and courier services, and transportation operators and companies. Particularly, with mailing wildlife items becoming a common smuggling technique, post office personnel would need to act as supplementary wildlife enforcement officers in increasing IWT detection rates. Furthermore, there is also a need to update records of private farms and zoos that can be important links for transnational elements of IWT.

Online wildlife crime activity: Online wildlife crime cases using both e-commerce and social media platforms have also become common today. Common wildlife items that are smuggled online include reptile skins, bristles, and hair, shahtoosh shawls, feathers, ivory and musk pods. In tackling cases of online IWT activity, WCCB organizes and coordinates an enforcement operation, namely Operation Wildnet to bring attention to enforcement agencies on IWT occurring over internet platforms. Illegal offers and clandestine activities over the internet are detected by officials through the Wildnet operations. Online IWT activity has been detected on trade platforms such as OLX India, QUIKR, Amazon, Snapdeal and social media platforms such as Facebook, Twitter, Whatsapp, WeChat etc. in the past. However, with internet based IWT becoming a growing menace, there is a pressing need for the international community to strengthen collaboration in monitoring and documentation of actors operating online.

Information and Communication Technology for combatting IWT: the eCITES system

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates wildlife trade through issuance, exchange and control of CITES permits ensuring legality, sustainability and traceability in wildlife trade. The Convention was opened for signature in 1973 and came into force in 1975; India has been a signatory to the Convention since 1976 and is among the 183 parties to the convention.

CITES is considered a mesh between a trade agreement and an environmental agreement as it controls trade in over 36,000 species, including live, parts and derivatives of animals and plants. Trade is regulated through the issuance of the CITES permit, its key instrument used for meeting conservation and sustainable use objectives. The CITES trade database consists of over 20 million trade transactions that have been collected from member states annually. Valued in billions of US dollars, the database largely consists of highly processed products including furniture, cosmetics, pharmaceuticals, food, fashion, collections and ornamental items.

While information and communication technology (ICT) has provided resources for criminals to operate, it has also provided tools to combat IWT. ICT can streamline processes like permit issuance, provide fast and secure mechanisms for information exchange, and improve the regulation of legal trade, allowing law enforcement agencies to focus on illegal trade. ICT can also be used to help improve species identification through improved databases that use photographic information for identification. The CITES electronic permit system (eCITES), initiated in 2004, is aimed at improving the implementation of the Convention through simplified and automated processes in the CITES Management Authorities. It involves national and cross-border electronic information exchange, and collaboration between government agencies for improved processes and controls. The eCITES system's end goal is to improve end-to-end transparency and control and involves a four-step process including:

- 1) ePermit – request and issuance of the CITES permit for legal trade in wild species of animals and plants
- 2) eControl – permit information is exchanged amongst enforcement agencies/ customs risk management within the member state to ensure that the consignment is of legal origin
- 3) eReporting – automated exchange of national permit data to CITES Secretariat for a sustainability assessment and to generate the CITES reporting
- 4) eExchange – exchange of permit data shared with other government agencies allowing for cross-border traceability

Challenges in the implementation of eCITES

While the implementation of eCITES provides several advantages, the number of countries that have implemented the system is low, partly due to high costs and issues of implementation capacity and integration with existing systems. A survey carried out in 2017 among CITES member states revealed that over eighty percent of the parties felt the eCITES system would greatly reduce corruption and IWT and is important for implementation of the Convention. However, challenges in implementation often cited are the complex environmental requirements of different member states, each with a unique set of products. The involvement of different ministries and multiple agencies involved with the control of different produce, mechanisms in place for the electronic payment of fees, export quota management, availability of new technologies, transparency and audit, and the widely varying national laws on the trade of wild species have also created multiple challenges of the implementation of the eCITES system. Moreover, as compared to major commodities and agricultural produce wildlife products involve lower permit volumes and developing country-specific eCITES solutions involve high development costs and extended time for cost recovery. Concerns have also been expressed on the integration of the eCITES system with current cross-border information exchange systems and the need to be compatible with databases used by customs offices for information exchange. As such, support from donor agencies, especially for implementation of eCITES in developing countries, is crucial to its wider acceptance and success.

In an effort to holistically resolve the challenges of implementing eCITES, the CITES Secretariat is working with different agencies, particularly UN agencies, to explore cost-effective solutions suitable for countries looking for off-the-shelf base solutions. An example is the ASYCUDA eCITES BaseSolution developed by CITES with the UN Conference on Trade and Development (UNCTAD) and has different options of adaptability for interested parties.

Direct and technical advisory support is also provided by the CITES Secretariat in this regard. Most recently, CITES supported the implementation of the ASYCUDA BaseSolution in Sri Lanka, who now have a fully automated online system available for the issuance of permits online, including its access on handheld devices and a QR code for authentication of consignments. Furthermore, in an effort to standardize implementation approaches, the CITES Secretariat has also been exchanging experiences and know-how with other sectors and standard setting bodies. For instance, CITES has been working with the International Plant Protection Convention (IPPC) on building synergies; the IPPC ePhyto solution, a phytosanitary certificate is highly compatible with the ASYCUDA system.

Furthermore, it is also critical to change, decode and rewrite narratives of wildlife trade to alter public opinion and perception in reducing demand of illegal wildlife products. Awareness campaigns play an important role in mass sensitization and changing perceptions of existing and potential customers, dispelling myths surrounding the use of wildlife parts for medicinal purposes, and engaging communities in monitoring and surveillance. Current technology and internet accessibility make visual communication an effective tool for creating awareness on the harmful impacts of IWT.

Data collection and sharing mechanisms in combating wildlife crime in India

Forest and Wildlife Departments in India have maintained comprehensive records of wildlife crimes, however, as practiced traditionally, the recording of preliminary offence reports, charge sheets, enquiries and documentation of wildlife crimes by and large continues to be kept in paper document formats today. A considerable effort is required in the digitization of wildlife crime databases that would drastically improve data collection processes and significantly reduce time in sharing of information for combating IWT. Additionally, as wildlife crime is not limited to divisional boundaries but even transgresses state and national boundaries, digitization of wildlife crime records needs to occur at all levels. Currently, there is limited scope within the country of integrating granular data into larger datasets.

Digitization of wildlife crime databases have, however, moved forward on some fronts in India. For instance, the Wildlife Institute of India (WII), in an effort to conduct the All India Tiger Estimation developed the android-based M-STrIPES (Monitoring System for Tigers – Intensive Protection and Ecological Status) monitoring system, through which considerable data on tiger sightings, wildlife crime observations and spatial coverage of patrols have been captured in the remotest areas of the country. Given that the use of the system has resulted in checking anti-forest and wildlife activities, similar digitized offence reporting can become effective tools for combating IWT. Furthermore, the Tiger Photographic Database has profiled 90% of the tigers in the country providing details of morphological features and can help in the detection of tiger products, particularly skins and zeroing down to the area of crime. Additionally, the RhODIS Project is underway that facilitates identification of rhinos using genetic markers and also aids in identification of crime hotspots.

Experiences at a sub-national level in digitizing wildlife related databases have indicated various gaps that exist in carrying out the task. For instance, early efforts in the state of Uttarakhand in digitizing human-wildlife conflict databases were not able to capture the fields of information required for abating the issue and also ran into issues with regard to the maintenance of secrecy of information. Under the UNDP SECURE Himalayas project, a component supporting the enhancement of capacities of law enforcement led to the development of the Wildlife Information State Database Centre in Uttarakhand. Capacity building activities of field functionaries in digitizing offense cases have been undertaken through the programme. The database is already lending support to decision-making through the profiling of wildlife criminals, allowing wildlife managers in Uttarakhand to be in a better position in dealing with IWT.

However, creating a framework for wildlife crime databases importantly needs to consider its integration with national and international level databases. In this regard, it becomes important to strengthen state level capacities in digitizing wildlife crime data as the bulk of the management of the database will have to be handled by the state, where offense cases are booked. Moreover, there is a need for active dialogue for standardization of state level databases such that it can be integrated seamlessly with the national database being set up by the WCCB.

The role of forensics in the fight against IWT

India has a strong legal and policy framework for the protection and conservation of wildlife including the Wildlife Protection Act (WPA) 1972, the Prevention of Cruelty to Animals Act 1960, the Indian Forest Act 1927, and the Indian Penal Code 1860 through which IWT cases can be prosecuted. However, in spite of the strong legislation, conviction rates for wildlife crimes is currently less than 2.5% in the country. The abysmally low rate of conviction of wildlife crimes can in part be attributed to its perception as a low priority area for investigative agencies, leniency in sentencing for wildlife crimes, and under-resourced forensics capacity, leading to the failure to prove IWT cases beyond reasonable doubt.

Institutions dealing with wildlife forensics including WII, the Advanced Institute of Wildlife Conservation (AIWC) in Chennai, and the Centre for Molecular Biology (CMB) in Hyderabad are highly overburdened with the number of cases that need forensic evidence. This crucially impacts the volume of cases that are solved and the speed at which forensic reports are produced. As such, there is a need for diversification through a network of labs that can corroborate information. Similarly, under-resourcing at the ground level also impacts the time taken for the transfer of samples to labs and thereby the filing of affidavits. Moreover, with forensics being of a highly scientific nature, there is a need for training public prosecutors in increasing wildlife crime conviction rates.

Innovative forensic methods can be used for identifying samples for use as evidence in courts to improve conviction rates for wildlife crimes in India. Traditional identification methods that rely on morphological characteristics of samples (bones, skins, feather) have been prone to fabrication. Enhancing existing databases can however strengthen proof against IWT cases in the court of law. While parts of certain species are identified easily, such as the elephant tusk through dentin Schreger lines, for many other species, there is a need for increasing the number of statistically significant studies in strengthening the role of scientific evidence for use in the court of law. A particular challenge in forensics has been the identification of species through hair morphometry. AIWC has been working on creating indexes based on hair morphometry through cuticular, medullary and cross-sectional observations. The observed data is importantly contributing to the creation of standardized reference books, especially for species that have not been referenced earlier, such as the Sambar Deer, Tibetan Antelope, Blue Sheep, Tibetan Wolf, Dhole and the Asiatic Lion.

Biological evidence such as blood, tissue, skin, hair and feather samples, cooked or burnt meat, bone, soil or stone with blood stains, and scat are also extremely important as proof of poaching and IWT activity. Genomic approaches used include DNA barcoding, metabolomics, Next-Generation Sequencing (NGS) technologies/microarrays and genetic markers. DNA segments extracted are compared against national and global databases to match the sample against references. However, the lack of national standards for the use of markers by different labs is a concern for use of studies in combating wildlife crime. Apart from crime control, enhancement of resources for applying genomic approaches can also significantly contribute to phylogenetic, disease and conservation studies.

Currently, wildlife crime investigation in India is also looked at through a narrow lens, largely resorting to the use of DNA analysis and morphometry in the generation of forensic reports. However, forensics can be significantly improved through the adoption of a diversified approach to investigation at all levels. Strengthening evidence of IWT activity needs to adopt an integrated approach whereby wildlife forensics is supported by human, financial and

digital forensics. Furthermore, at the laboratory level, forensics needs to go beyond DNA and morphometric studies and can employ a variety of methods including serological, histopathological, stereoscopic and microscopic analyses that bring a holistic view to the investigation. Moreover, the lack of national standards currently undermines the effective use of forensics in the court of law; the establishment of national standards for communication and documentation, sample collection, laboratory, PCR, and pathology is a need of the hour. The use of AI technologies for systematic sample collection also can be used to improve forensic sampling.

Transboundary cooperation mechanisms for effective mitigation

Given that IWT is a highly complex transboundary phenomenon, regional cooperation and joint action is critical in combating IWT. The establishment of Wildlife Enforcement Networks (WENs) globally is to strengthen wildlife law enforcement through enhancing cooperation, coordination, and communication between parties in the WEN. In the context of the South Asian region, the South Asian Wildlife Enforcement Network (SAWEN), launched in 2011 forms the inter-governmental body for the coordination of regional cooperation in curbing IWT; member countries include Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The objectives of SAWEN are to achieve harmonization and standardization of laws and policies of member countries, document trends in poaching and IWT across the member countries, strengthen institutional response by promoting partnerships, information sharing and research, and support countries in the preparation and implementation on National Action Plans for combating IWT.

South Asia, being a biodiversity rich area of the world has been vulnerable to IWT and predominantly forms a source and transit region for IWT. Limited cooperation between member states and weak enforcement has often caused IWT to remain unchecked in the region. A major challenge for the SAWEN has been that combating IWT has been largely under-resourced in the region, exhibiting itself in the inability of enforcement staff in the identification of wild species and their derivatives. Further, the constant transformation of wildlife products into more complex forms complicates the identification of wildlife derived goods. For instance, while enforcement staff may be able to identify red sandalwood in timber form, products such as essential oils and soaps derived from red sandalwood often go undetected across borders. The lack of modern equipment for enhancing detection and monitoring of IWT, especially in frontier territory is also a major concern. The nature of IWT has also evolved with the advancement of technology and complexity of enabling systems. As such, there is an equal need in strengthening the capacity of and enhancing cooperation between professional enforcement agencies across borders in preventing illegal wildlife trade.

The sophisticated nature of IWT linkages in the region also indicates the challenge in detection of illegal wildlife products through transit countries; several items remain undetected in transit countries because of the non-occurrence of certain species within its territory. For instance, capacities to detect parts and products derived from terrestrial species in the Maldives is likely to be less than those countries possessing them within its jurisdiction, whereas the capacities to detect marine species in Bhutan and Nepal would likely be less than in the Maldives. As such, the dynamic and complex nature of the trade additionally calls for comprehensive training of law enforcers to identify a wide range of wildlife products. Joint action for the development of a central database for South Asian countries can significantly enhance capabilities of member countries.

Collaboration between member countries also is crucial in breaking the supply chain, especially in the identification of criminals whose removal will cause the largest disruption in the supply chain. Extended cooperation with other WENs and similar organizations such as the Lusaka Agreement Task Force (LATF), Association of Southeast Asian Nations-WEN (ASEAN-WEN), Central Asian Wildlife Enforcement Network (CAWEN), South Asian Wildlife Enforcement Network (SAWEN) and the Snow Leopard and Wildlife Enforcement Network (SLAWEN) can enhance

detection and monitoring of IWT. Furthermore, with the growing threat of cyber-enabled IWT, joint action on monitoring e-commerce and social media platforms also becomes important within the enforcement network.

Summary of key messages:

- IWT activity has escalated dramatically and poses a global challenge that needs to be addressed urgently.
- Increasingly interconnected and complex systems of finance, communication, and transport have brought isolated source regions in remote areas closer to large demand markets for wildlife and their derivatives.
- Internet-based platforms have provided an avenue for conducting trade and transactions, while expansion of air transport networks is allowing for faster movement of contraband.
- As IWT cases typically exhibit a convergence of multiple crimes, a multi-agency approach, involving sensitizing, stimulating and engaging the entire enforcement system is required in preventing IWT.
- Strengthening mechanisms for swift data access and sharing among countries is a need for enhancing detection of IWT cases.
- There is a need to expand training of personnel to the Indian Railways, the postal and courier services, and transportation operators and companies in addition to enforcement agencies.
- The international community needs to strengthen collaboration in monitoring and documentation of actors operating online.
- Information and communication technology can streamline processes like permit issuance, provide fast and secure mechanisms for information exchange, and improve the regulation of legal trade, allowing law enforcement agencies to focus on illegal trade.
- eCITES can greatly reduce corruption and IWT, however challenges remain with high costs and issues of implementation capacity within member states.
- It is critical to change, decode and rewrite narratives of wildlife trade to alter public opinion and perception in reducing demand of illegal wildlife products.
- A considerable effort is required in India for the digitization of wildlife crime databases; doing so would drastically improve data collection processes and significantly reduce time in sharing of information for combating IWT.
- Creating a framework for wildlife crime databases needs to consider its integration with national and international level databases.
- Despite the strong legislation, conviction rates for wildlife crimes is currently less than 2.5% in the country. The abysmally low rate of conviction of wildlife crimes can in part be attributed to its perception as a low priority area for investigative agencies, leniency in sentencing for wildlife crimes, and under-resourced forensics capacity.
- Forensics can be significantly improved through the adoption of a diversified approach to investigation at all levels; besides DNA analysis, a variety of methods including serological, histopathological, stereoscopic, and microscopic analyses can bring a holistic view to the investigation.
- The lack of national standards currently undermines the effective use of forensics in the court of law.
- Joint action for the development of a central database for South Asian countries can significantly enhance capabilities of member countries.
- Extended cooperation with Wildlife Enforcement Networks can enhance detection and monitoring of IWT.



WEBINAR 9: PROMOTING FORESTS
THROUGH PUBLIC FUNDING
Synthesis of Discussions

Photo: Pexels | Mali Maeder

30th September 2020

Panelists:

- *Hemendra Kothari*, Chairman, The Nature Conservancy-India, Founder-Chairman, Wildlife Conservation Trust & Chairman, DSP Investment Managers Pvt. Ltd.
- *Indira Rajaraman*, Former Member of XIII National Finance Commission & Former RBI Chair Professor, NIPFP
- *Jai Raj*, Principal Chief Conservator of Forests and Head of Forest Force, Uttarakhand
- *P.D. Rai*, Former Member of Parliament, Sikkim and President, Integrated Mountain Initiative
- *C. Suvarna*, Chief Executive Officer, National Fisheries Development Board
- *Leena Johri*, Joint Secretary (Skills), Ministry of Rural Development
- *Sandeep Tambe*, Professor, Indian Institute of Forest Management
- *Damandeep Singh*, Director, CDP India
- *Madhu Verma*, Chief Economist, World Resources Institute - India, New Delhi, India
- *Sushil Saigal*, Program Lead – Lands, The Nature Conservancy India
- *Divya Datt*, Programme Management Officer, UN Environment Programme, India (moderator)

Promoting Forest Conservation through Public Funding

30th September 2020

Introduction

According to the Food and Agriculture Organization's (FAO's) *The State of the World's Forests 2020* report¹, forests cover approximately 31% of the global land area. A quarter of these forests remain as primary forests, where human impact is still minimal. They hold an immense value for life on the planet, holding about 80% of the terrestrial biodiversity, absorbing about 2 billion tonnes of carbon dioxide equivalent (CO₂e) every year, and are a major source of food, fuel, and medicine for over a billion people in the world. However, despite the heavy dependence on forests, deforestation continues to occur at an alarming rate – 4.7 million hectares per year².

With a total geographical area of 71.22 million hectares³ under forest cover, India is the 10th most forested country in the world – roughly 22% and 3% is under forest and tree cover respectively. Based on data published in Forest Survey of India's *India State of Forest Report* of 2009 and 2019, India's area under forest cover increased 3.2% between 2004 and 2017-18, whereas the area under tree cover grew by 2.4% between 2006 and 2017-18. While an addition has been made during the period, a point of concern has been the loss of natural forests, occurring especially in the northeast region of India, a region critical to India's primary forests.

Given the importance of forests to the socio-economic wellbeing of the country and in meeting its international commitments, India's National Forest Policy target to bring 33% of the total geographical area under forest cover is laudable. However, while such a target exists on one hand, funds expended for forests annually amount to a diminutive 1-2% of the total expenditure budget of the country. Funds that have flowed from the Reserve Bank of India for forests over the last two decades approximately amount to USD 53 billion (INR 4 Lakh Crores), an investment of roughly USD 38/hectare/year (INR 2820/ha/year)⁴. This translates to 1.6% of the state's aggregate development expenditure, indicative of the lack of importance placed on forests in general.

Finance Commission grants based on the forest cover and the Compensatory Afforestation Fund (CAF) form the bulk of public funding for the forestry sector in the country, however debates continue to be held on its efficacy and use given the current framework. Furthermore, with ongoing forestry programmes falling short, a need to also explore cross-sectoral linkages and avenues for public investment into forestry has become important. Besides public funding, achieving targets set for expanding forest cover cannot be devoid of private sector engagement.

Given the context, TNC-India co-hosted the webinar "Promoting Forest Conservation through Public Funding" with UNEP, India office and WRI-India to expound upon key challenges around public funding for forests and opportunities that exist in mainstreaming forests into the larger development agenda. Madhu Verma and Sushil Saigal set the context for the webinar providing insights on the state of forest resources and evolution of public financing for forests. Jai Raj shared viewpoints on strengthening linkages between forests and priorities for the Indian government, P.D. Raj presented the importance of hill states in maintaining forest cover, and C. Suvarna explained how forest stewardship can be incentivized in the 'plains of India'. Further, Leena Johri detailed the role of rural livelihood programmes in increasing forest cover, Sandeep Tambe, the role of joint forest management, while Damandeep Singh reflected on opportunities for private sector engagement. In concluding, Indira Rajaraman

¹ <http://www.fao.org/state-of-forests/en/>

² *ibid*

³ <https://fsi.nic.in/isfr19/vol1/chapter2.pdf>

⁴ TNC assessment

reflected on the panel discussion and reevaluated India's position for adding to forest cover in the post-COVID scenario. The report synthesizes the perspectives put forward by panelists and the discussions that followed.

Context: The evolution of Finance Commission Grants for maintaining forest cover

Over the years, in consideration of the immense value of forests to the country and the development disabilities created in its maintenance, forests have been given increasing importance in intergovernmental fiscal transfers in India. As early as the year 1999, exercises carried out in valuation of forests of Himachal Pradesh, led to the setting up of the net present value (NPV) system for compensating the diversion of forest area. Simultaneously, consideration of forest policy directives to maintain two-thirds of the area under forest and tree cover in hill states, spurred various states in building a case to the Finance Commission to provide compensation for the disabilities created. As such, in the 12th Finance Commission, a grant of USD 135 million (INR 1000 Crores) spread out over the award period 2005-2010 for forests was provided.

Subsequent studies conducted and international experiences tabled have demonstrated the conservation value of forests, resulting in discussions around the inclusion of forest cover as a factor in tax devolution. Though the 13th Finance Commission did not incorporate the extent of forests into the devolution formula, the grant was increased to USD 675 Million (INR 5000 Crores). A major step was taken in the 14th Finance Commission to include a 7.5% weightage to the extent of dense forest cover in the horizontal devolution formula for the divisible pool of taxes, albeit as untied grants. To further incentivize forest conservation, in the 15th Finance Commission's Report for the FY 2020-21⁵, the weightage has not only been continued but increased to 10% of the total pool of divisible taxes. Based on the weightage given to forest cover, for the FY 2020-21, this translates to the transfer of an amount of USD 11.5 billion (INR 85,518 Crores), amongst the largest ecological fiscal transfer globally.

Debates continue to be held around what comprises of forest cover; the devolution criterion privileges states with a natural endowment of dense forests, however there is the issue of considering how naturally open forests, grasslands, wetlands, arid forests, and other unique ecosystems can also figure in the equation. Moreover, with India being a mega-biodiverse country, subject matters such as diversity of forest species, rate of regeneration, fragmentation, corridors, and size of conservation areas have also been very much a part of the discourse. Further, while the incorporation of forest cover in the devolution formula incentivizes forest conservation, concerns around transparency and ensuring adequacy in allotment of transferred grants for forestry purposes, especially to compensate communities directly engaged in conservation also have also come to the fore.

Reevaluating public funding options for forests in India

In India, most forests are under state control and management, where public funding plays a key role in its conservation, management, and restoration. Public funding for forestry can come from central programmes, state schemes, Finance Commission grants, externally funded programmes and as compensation for diverted forest lands. However, given both the need of pace and adding to forest cover, and challenges that have arisen in the post-COVID context, relooking at public funding for forests holds importance in the development agenda today.

- **Finance Commission grants:** In the 14th and 15th Finance Commissions, with the inclusion of dense forest cover as a parameter in determining the overall share of tax devolution, forested states have benefited in receiving a larger share of the total devolution. The increase in weightage for forest-related criterion in the 15th Finance Commission has further added to the incentive. However, despite the weightage given to the 'forests and ecology' criterion, it has been observed that the considerations have not produced desired results. Currently there is no assurance that states will respond in a manner by serving forestry, the sectoral

⁵ <https://prsindia.org/policy/report-summaries/report-15th-finance-commission-2021-26>

area that has provided forested states the larger share of the devolved funds. A study carried out by Busch, Kumar and Mukherjee from the Centre for Global Development shows that during the period 2008-2018, the share of expenditure on forests in aggregate across all states went down by 16%. Further, in the 14th Finance Commission, while the overall state budgets substantially increased, on an average by 72% annually, the increase in forest budgets have been only 17%. As such, there is a need to explore whether aspects such as conditionality and a monitoring mechanism is needed along with the 'forest and ecology' criterion in the years to come.

Furthermore, with dense forest cover being a parameter in the determination of tax devolution, states also share both the downside risk and upside buoyancy of tax collection at the center. In the current COVID context, with falling revenues, a stark reality is the reduced financial flow to state exchequers. As such, it brings forward the need to reevaluate the benefits and trade-offs of specific grants for forest preservation as opposed to its inclusion in the overall devolution formula. Additionally, forests have also not formed a priority area for state governments; with shrunken revenue streams, funds that come into a state are likely to be utilized in addressing priority areas as deemed fit by the state's leadership. COVID-19 provides a perfect excuse to do so.

- **Compensatory Afforestation Fund:** The CAF has emerged as a key instrument for forest restoration in the recent years. With the release of USD 6.4 billion (INR 47,000 Crores) of the CAF in August 2019, a considerable amount of money stands parked with state governments for furthering the forest agenda, especially during a fiscally constrained time. However, as it takes centre-stage in forest funding, there are several concerns that have emerged. Growing concerns about the curtailment of regular budgetary allocations for forests, and its efficacy in moving the forest agenda forward are issues that have come to bear.

The reasons for the establishment of the CAF was to offset the loss of forests, however from the perspective of increasing the overall forest and tree cover, it does little. CAF cannot create additionality – public funding over and above the fund is required to achieve the same. Furthermore, a larger inherent issue with CAF remains that it is based on compensating the diversion of forest area. In its current setup, funds accrue with states that have diverted more forest area, creating a disincentive for forest conservation, especially in states with smaller fiscal capacities.

Furthermore, states receiving compensatory money from CAMPA under contract are both honor-bound and legally bound to compensatory afforestation. The state's obligation in the transaction is ensuring both compensatory afforestation (CA) and the availability of land to do so. In a 2013 Comptroller and Auditor General of India (CAG) report⁶ on CAF, it was found that in years prior to 2012, CA funds released to states were highly underutilized – to an extent in aggregate of 39% across all states. Further, the degree of utilization was lower in the most richly forested states such as Arunachal Pradesh and Meghalaya. The slow pace of utilization of CAF raises serious concerns that the land which has been diverted for non-forest purposes is not being compensated. A crucial need in keeping with the forest agenda in the country is the careful monitoring of compensatory afforestation.

- **Political commitment for long term profitability:** Investments in forests reap long term benefits. However, in contrast, with decision-makers holding office for a five-year term, both at the Centre and states,

⁶ <http://iced.cag.gov.in/wp-content/uploads/2013/02/1.%20CAG%20Report%20on%20Compensatory%20Afforestation%20in%20India.pdf>

policies are often viewed with a 3–5-year perspective, a period not long enough to see a discernable change with interventions made during the term. As such, getting the attention of decision makers to make such investments becomes difficult, even if they are important.

- **Private sector investment:** Although a tremendous scope for investment in the forestry sector exists, private sector investment has not been forthcoming. High opportunity costs, long gestation periods, lack of regular cash flow and liquidity problems often pose considerable difficulties in attracting private sector investment. The use of both policy and fiscal instruments to attract such investments, alongside studies that form a strong evidence base for promoting the benefits of forestry, is essential in enhancing private sector engagement.

Strengthening inter-linkages between investment in forests and trees and other key priorities of Indian states: opportunities in the post-COVID period

With the ongoing national and state forestry programmes slow in providing desired results in India, over the recent years, several considerations at both the Centre and the states have considered policy changes required to strengthen linkages of forests with other sectoral goals. Increasingly, considerations for intensifying private sector engagement, including industry, local communities, and individuals, and bringing convergence of resources is seen as a growing need. Contemporary forest policies and programmes and inter-ministerial efforts have also placed emphasis on empowering forest-dependent communities in expanding social safety nets and strengthening partnerships to promote the sustainable use of forests.

State governments are increasingly exploring opportunities that exist for private sector engagement in the forestry sector. The management and development of NTFP resources is seen as an ecologically and economically sustainable option if extraction rates are not exceeding maximum sustainable yields. Opportunities for private sector investment in forests also lie in expanding off-farm rural employment opportunities, especially small-scale forest-based enterprises based on NTFPs. Several states have enhanced efforts in promoting forest-based enterprises including the development of medicinal and aromatic products, bamboo, and biofuels such as *Jatropha*. With herbal medicines and aromatic compounds becoming increasingly popular among modern consumers, supported with e-commerce distribution channels, India has witnessed a steady growth in its demand over the recent years. In the post-COVID period, widespread promotion of traditional medicines is further contributing to a rising demand for medicinal and aromatic products.

Besides the development of NTFP resources above, fruit-tree based afforestation programmes provide a potential space for investment, which while creating livelihoods and enhancing food security also address issues such as human-wildlife conflict mitigation, water and soil conservation and disaster risk reduction. Unique models for forest-based ecotourism also offer an avenue for state governments to enhance investment in forests. For instance, experiential ecotourism focused on nature, besides those centered on charismatic species are ecotourism models being developed by the state of Uttarakhand. Public-private partnerships in ecotourism can act as an important means to creating jobs and income while simultaneously creating environmental benefits, particularly in context of a post-COVID economic recovery. Further, with thorough planning, joint forest management systems such as the Van Panchayats of Uttarakhand, provide a robust structure and human resource base that can be leveraged in promoting a forest-based economy.

Ensuring adequate compensation and incentivizing forest stewardship in the hill states of India

The hill states of India, particularly the northeast region (NER) is naturally endowed with rich forest resources and are crucial in accounting for forest cover in the country. To highlight its importance, the NER, a region that is

approximately 8% of the country's total geographic area, accounts for a quarter of India's forest cover. The National Forest Policy (1988) aims at having one-third of the geographical area in the country under forest and tree cover and enjoins the maintenance of two-thirds of area in hill states under forest cover.

Given the disabilities created by policy directives, compensating for the development disabilities has formed a major part of the discussion in the devolution of taxes to mountain states of India. For instance, these include the degree of dependency on mountain communities to natural resources, the major loss in economic opportunities due to the lack of cross-border trade and the physical location of mountain states. With a small fiscal headroom for mountain states, funds that arrive in state exchequers are utilized primarily for addressing priority needs in the development agenda. In consideration of such development disabilities, though the recommendation was not adopted, the B.K. Chaturvedi task force in 2013 recommended a 2% blanket transfer to all mountain states.

In compensating for the development disabilities created, hill states receive a substantial portion of their overall funds from the Finance Commission based on the 'forest and ecology' criterion. However, despite an increase in fiscal transfers based on the forest-related criterion, the NER has seen a net loss in forest cover over the past two decades. As a result, questions emerge around the efficacy and adequacy of transfers, transparency, and whether communities directly involved in forest conservation are being equitably compensated. Table 1 outlines the top states with percentage of total budget allocated. As can be seen from the table, 9 out of the 10 top ten states are hill states.

Table 1: Top states - % budget from 'forest and ecology' criterion⁷

State	Percentage of total budget (%)
Arunachal Pradesh	75.8
Uttarakhand	41.8
Meghalaya	33.2
Himachal Pradesh	31.7
Mizoram	30.6
Chhattisgarh	29.7
Manipur	26.7
Nagaland	26.4
Tripura	21.5
Sikkim	17.7

Strengthening the case for public investments in forests in the 'plains' of India

Although states that form the 'plains' of India may not necessarily be naturally endowed with dense forests, ecosystems such as naturally open forests, grasslands, wetlands, arid and semi-arid forests that extend through the subcontinent play an equally important part in maintaining ecological integrity and environmental stability. Consequently, building a case for public investments in forests for states in the 'plains' plays significantly in increasing the forest and tree cover in the country. Apart from creating cross-sectoral linkages to accelerate forestry activities, addressing practical issues of forest administration, and strengthening its knowledge base can go a long way in revitalizing ongoing forest programmes within the states of India.

⁷ TNC assessment

Provided that a state's own resources form the lion's share of public funding flowing to the forestry sector, efficiency and vitality of a state's forest administration holds an important role in attracting the interest of key decision makers towards forests. Forests can lose on account of the lack of transparency and accountability in its administration, coupled with the inability of forest officials to strengthen the case for forests before decision-makers. Moreover, while state budgetary allocations for forests may be adequate, large unspent balances and a lack of vigor in pursuing funding releases become potential reasons for the reduction in budgets for successive years. Opportunities also exist in appealing to public representatives to adopt forest blocks under Members of Parliament Local Area Development (MPLAD) and Member of Legislative Assembly Local Area Development (MLALAD) schemes. Capacity building and knowledge enhancement of forest officials, especially on cross-sectoral linkages with forests such as disaster risk reduction, water and soil conservation and livelihood-creation are therefore important in the successful implementation of programmes and meeting sub-national targets.

Expanding forest and tree cover through flagship rural livelihood and development programmes

The effective leveraging of rural development and livelihood schemes can significantly contribute to an increase of forest wealth of the country. Additionally, in the post-COVID context, rural livelihood programmes have an added importance in achieving multiple targets of reviving economic output, creating jobs and provides an opportunity to enhance forest cover in the recovery process. In considering the promotion of the forest agenda, rural development and livelihood programmes have to be designed around the central ethos of sustainability – improving human wellbeing, social equity and reducing environmental risks.

There is adequate recognition that natural resources are intrinsically linked to rural livelihoods, reflected in flagship schemes like the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and the National Rural Livelihood Mission (NRLM). The potential to increase forest and tree cover through MGNREGS lies in its plantation subcomponent, through which provisions for livelihoods in afforestation, tree plantation and horticulture works has been made. Such activities can be carried out on common and forest lands, and along infrastructure including roads, canals, tank foreshores and coastal belts. Further, plantation of fruit-bearing orchards under MGNREGS also provides rural poor an avenue for income, over and above wages for employment.

Similarly, schemes under NRLM, bifurcated into farm and non-farm livelihoods, focus on interventions to enhance natural capital and present opportunities to increase tree cover. It also importantly highlights the central role of forests in meeting multiple SDGs. Farm-focused livelihood programmes under NRLM are based on a household-centric approach, focusing on small and marginal women producers that *inter alia* makes agro-ecological practices and NTFP value chain development priority areas for intervention. A focal area under the scheme is the promotion of fruit-tree-based backyard gardens, which besides generating livelihood and income, serves multiple benefits in providing food and nutritional security, addressing issues of gender equity, soil and water conservation issues, and strengthens climate resilience of communities.

Further, forest-based livelihoods under NRLM provide for plantations such as host trees for *Tasar* (*kosa* silk), Lac (resin), medicinal plants, tamarind, and *amla* among other NTFPs. For instance, the plantation of 1623 hectares of *Tasar* in Jharkhand, involving 40,000 households is indicative of its potential in expanding tree cover, besides importantly contributing to livelihood and income generation for tribal and forest dwelling populations. Moreover, the ability of such programmes in strengthening of community institutions and partnerships through the development of producer collectives, Self Help Groups (SHGs) and the mobilization of community resource persons are also exemplary aspects of such programmes.

The role of joint forest management in landscape level forest restoration

In considering the forested landscapes in the country, it is well established that the health of forest systems share a strong inter-relationship with the stewardship that indigenous and local communities provide. While the true value of contribution that indigenous communities make towards sustainable forest management remains uncertain, benefits forgone by such communities needs to be ensured. Inter-governmental transfers have benefited state governments with 'forest and ecology' as an inbuilt incentive, however without such incentives reaching communities directly making the difference on the ground, a continued loss of forest cover is witnessed. Therefore, both a deeper evaluation of trade-offs being made by local communities alongside the strengthening of monitoring mechanisms will be critical in ensuring better access and benefit sharing for indigenous and local communities, and in doing so protecting forest landscapes.

Over the last few decades, joint forest management and participatory afforestation programmes have been important features of forest policies that have not only sought to address forest restoration, but also enhanced livelihood opportunities and strengthened local institutions concomitantly. However, with CAMPA taking prominence and having strong elements of a technical programme, issues around the governance framework and the role of joint forest management have also emerged. In its current arrangement, CAMPA has the potential to undermine resource rights and food security of vulnerable forest-dwelling communities. With forests playing a central role to socio-economic development, positioning CAMPA as a livelihood and poverty alleviation initiative, rather than a technical programme would allow for the generation of both social and natural capital in its implementation. In doing so, poverty hotspots, particularly in regions with sizeable forest-dwelling populations, such as that in central and eastern India can be benefitted. An immense opportunity to garner political attention towards forest restoration is also presented in doing so.

Triggering private sector action for forests

Though the rates of deforestation have slowed over the past two decades, global deforestation has continued to remain a major issue. Demand for agriculture commodities including palm oil, soya, timber, rubber, and pastoral products along with mining form the primary drivers of deforestation – it accounts for approximately 80% of the world's global tropical deforestation. A two-pronged approach that involves engagement of private sector in afforestation/reforestation efforts along with arresting deforestation through the role of financial institutions in screening is crucial to the furtherance of the forest agenda.

Globally, nearly 450 major companies and over 50 governments pledged to implement net-zero deforestation and environmentally friendly sourcing commitments by 2020. However, a quarter of the companies have yet to take significant actions on these commitments. In transforming commitments into action, an important role of financial institutions is creating negative pressures by curtailing funding to companies whose activities lead to deforestation. Moreover, such pressures can also be created through the development of a rigorous methodology for climate-based and nature-based estimation and disclosure. An assuring indication of transforming commitments into action has been that in 2020, 515 investors representing assets under management of USD 160 trillion were signatories to CDP's (formerly: Carbon Disclosure Project) forestry project to understand the corporate management risks associated with deforestation⁸. With the availability and implementation of standards for estimation and disclosure, in attracting investment, added pressures can be built on companies to close the current execution gap. Science-based Targets, a joint initiative of CDP, the UN Global Compact (UNGC), WRI, and World Wildlife Fund (WWF) is also enabling corporate action on climate by providing defined pathway to reduce emissions in line with the Paris Agreement goals. With increasing public pressure on companies for both climate-related and nature-related

⁸ <https://www.cdp.net/en/forests>

financial disclosure, and in meeting net-zero emissions targets, opportunities lie in attracting private investment towards reforestation programmes.

Further, given the national context, with public funding to forests and conservation being inadequate to meet challenges, Corporate Social Responsibility (CSR) funds can also provide additional resources in the improvement of forest and tree cover. However, at present, the approach to the utilization of CSR funds in forestry programmes appears unplanned and piecemeal with little visible change on ground. Pooling of CSR funds for funding larger projects through an extended duration, such as the conceptualized 'Greening the Himalayas' project may work more effectively in demonstrating a measurable impact on the ground.

Summary of key messages:

- Given both the need of pace and scale needed to meet the target of 33% forest cover, in addition to the challenges that have arisen in the post-COVID context, relooking at public funding for forests is a need of the hour.
- Despite the weightage given to the 'forests and ecology' criterion in 15th Finance Commission grants, currently there is no assurance that states will respond in a manner by serving forestry, the sectoral area that has provided forested states the larger share of the devolved funds.
- Given the post-COVID realities, there is a need to explore whether aspects such as conditionality and a monitoring mechanism is needed along with the 'forest and ecology' criterion in the years to come.
- Compensatory Afforestation Fund (CAF) cannot be used as a reason for the curtailment of regular budgetary allocations for forests; CAF does not create additionality – public funding over and above the CA fund is required to create additionality.
- The use of both policy and fiscal instruments to attract such investments, alongside studies that form a strong evidence base for promoting the benefits of forestry is essential in enhancing private sector engagement.
- Ecosystems such as naturally open forests, grasslands, wetlands, arid and semi-arid forests that extend through the subcontinent play an equally important part in maintaining ecological integrity and environmental stability and needs consideration in EFTs.
- Apart from creating cross-sectoral linkages to accelerate forestry activities, addressing practical issues of forest administration, and strengthening its knowledge base can go a long way in revitalizing ongoing forest programmes within the states of India.
- In the post-COVID context, rural livelihood programmes such as MGNREGS and NRLM have an added importance in achieving multiple targets of reviving economic output, creating jobs and provides an opportunity to enhance forest cover in the recovery process.
- Deeper evaluation of trade-offs being made by local communities alongside the strengthening of monitoring mechanisms will be critical in ensuring better access and benefit sharing for indigenous and local communities, and in doing so protecting forest landscapes.
- In transforming commitments into action, an important role of financial institutions is creating negative pressures by curtailing funding to companies whose activities lead to deforestation.
- Pooling of CSR funds for funding larger projects through an extended duration may work more effectively in demonstrating a measurable impact on the ground.

An aerial photograph showing a dark asphalt road that winds through a dense, green forest. The road has white lane markings and a few cars are visible. The forest is lush and appears to be a mix of deciduous and coniferous trees.

WEBINAR 10: BUILDING SYNERGIES AND LINKAGES BETWEEN BIODIVERSITY AND INFRASTRUCTURE DEVELOPMENT

Synthesis of Discussions

Photo: Pexels | Deva Darshan

10th March 2021

Panelists:

- *B. V. Umadevi*, Additional Secretary, Ministry of Environment, Forest and Climate Change, Government of India
- *Vivek Saxena*, Country Representative, International Union for Conservation of Nature – India
- *Amit Varadan*, Joint Secretary, Ministry of Road Transport & Highways, Government of India
- *Guilia Carbone*, Deputy Director, Business and Biodiversity, International Union for Conservation of Nature
- *Raman Sukumar*, Professor, Centre for Ecological Sciences, Indian Institute of Science
- *Sandeep Srivastava*, Senior Vice President (Environment & Sustainability), Aditya Birla Group
- *Sanjay Upadhyay*, Founder and Managing Partner, Enviro Legal Defence Firm
- *Divya Datt*, Programme Management Officer, UNEP, India (moderator)

Building synergies and linkages between biodiversity and infrastructure development

10th March 2021

Introduction

Reliable and resilient infrastructure is vital in connecting supply chains and facilitating activities that increase overall productivity and efficiency of an economy. Through the movement of goods and people, improved access to markets, employment, education and health, infrastructure benefits social development and plays a key role in alleviating poverty and supporting economic growth. Moreover, in the wake of the COVID-19 pandemic, there is a certain need for resilient infrastructure, especially in recovering from its devastating economic impact. For developing countries such as India, infrastructure plays importantly into the development agenda of the country.

However, on the contrary, biodiversity is being increasingly threatened by rapid infrastructure expansion. 50 percent of the planet's landscapes are now human dominated, having consequential implications on biodiversity. UNEP's report, *Making Peace with Nature*¹ released in February 2021, synthesizes the finding of key assessments on nature and the message is stark; it reiterates the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) findings that a million species are threatened with extinction and ecosystem services essential for human life are eroding at a rate faster than ever witnessed in history. The pandemic is one of the many consequences of this erosion.

Linear infrastructure, such as roads, railway, power lines, and canals dissect natural habitats and are a major contributor to the decline of biodiversity. With habitat fragmentation and a loss of connectivity, wildlife movement is restricted, contributing to crowding and increased competition, and further increase the risk of emergence of infectious diseases. Furthermore, linear infrastructure act as barriers, alter natural processes, and cumulatively can have even greater impacts on biodiversity health and natural resources. Recognizing the important role of many of species and their contribution to ecosystem services and human development is a vital message to humanity. As such, gathering momentum in strengthening the policy-science-practice interface, finding solutions to promote green infrastructure that facilitates economic growth and balancing it with the protection of biodiversity and ecosystem functions is a crucial need at this hour.

In this context, IUCN-India and UNEP-India co-hosted a webinar on 'Building synergies and interlinkages between infrastructure and biodiversity' examining the current state of reconciling linear infrastructure development and conservation in India. Vivek Saxena set the context for the webinar, and in her keynote address, B.V. Umadevi outlined India's action on mitigating the impacts of infrastructure on biodiversity. Further, Amit Varadan detailed India's mitigation strategies to climate change in the road transport sector, while Raman Sukumar reflected on the need to move to a landscape approach to infrastructure planning. Guilia Carbone unraveled best practices for mitigating impacts of solar and wind projects on biodiversity, Sandeep Srivastava highlighted efforts of the Aditya Birla Group in mitigating impacts on biodiversity, while in concluding, Sanjay Upadhyay reflected on the evolving role of the judiciary in reconciling infrastructure-biodiversity conflicts. The following sections provide a synthesis of statements and ensuing discussions in the webinar.

¹ <https://www.unep.org/resources/making-peace-nature>

Context: Linear infrastructure and biodiversity, ecosystem protection in India

India is one of the mega biodiverse countries of the world, with four biodiversity hotspots and a range of ecosystems given the country's diverse physical and climatic conditions. It accounts for nearly 8% of the recorded species of the world with approximately 47,000 plant species and 100,000 animal species. However, the pressure on biodiversity in the country is immense, as India, within 2.4% of the world's land area, supports 18% of the global population and accounts for over 30% of the world's cattle inventory. Protected areas make up approximately 4.8 per cent of the geographical area of the country, however as per several assessments, only 0.9% per cent remain as intact forests. For India, conservation of its biodiversity is crucial not only because it provides several goods and services but also because the maintenance of biodiversity and ecosystems is directly linked to the livelihoods of millions, contributing to poverty alleviation.

The Ministry of Environment, Forest, and Climate Change (MoEFCC), Government of India has issued guidelines on how ecosystems and biodiversity need to be conserved alongside infrastructure development. The guidelines encourage the use of structural measures such as underpasses, land ridges and canopy bridges for movement of animals and non-structural measures such as devices to reduce noise pollution, speed, volume of traffic, and signage as some of the solutions. However, despite the introduction of such guidelines, improperly planned linear infrastructure projects continue to invite problems of the fragmentation of habitats, exposing wild animals to road and rail accidents, disturbing foraging and migratory patterns of birds and exposing communities to a greater risk of contracting zoonotic diseases. There is a need for the guidelines to be viewed as an overriding factor for infrastructure developments taking place in India. This requires the mainstreaming of biodiversity conservation in policies, plans and programmes and due diligence in monitoring and auditing mitigation plans under Environmental Impact Assessments.

India already has an existing road length of 5.9 million kilometers with the highest areal density of highways globally. Further, a length of over 90,000 ckm of transmission lines already pass through forested areas. As plans for the rapid development and upgradation of linear infrastructure is expected over the next decade, with rail and road traffic expected to grow at 12% and 8% per annum respectively, infrastructure planning cannot assume a piecemeal approach. There is a need to shift to a landscape approach to infrastructure development, wherein values for biodiversity conservation within impact assessments of infrastructure need to be strongly incorporated alongside capacity building of project developers.

India's mitigation measures to climate change in the road transport sector

Over the years India has witnessed remarkable economic growth, from \$468 billion in 2000 to \$2.9 trillion in 2020. Concomitantly, the annual growth rate of emissions has also been rapid, seeing an annual growth rate of more than 5 per cent. The transport sector in India has seen a growth of vehicles by 2500 times during the period 1981-2011 and contributes to 13% of the total CO₂e emissions; the road transport sector contributing to more than 80% of the total emissions of the transport sector².

Having ratified the Paris Agreement 2015, reduction of emissions intensity has been the primary focus of the Ministry of Road Transport and Highways (MoRTH), Government of India through various strategies including tightening of emission norms, scaling up of e-mobility and notification of alternate fuels. Furthermore, MoRTH also launched the Green Highways (Plantation, Transplantation, Beautification and Maintenance) Policy 2015, where 1% of the total project cost is kept aside for highway plantations. The aim is to promote the development of environmentally friendly national highway corridors that also encourage livelihood generation for participating local communities.

² Mr. Amit Varadan, Ministry of Road Transport & Highways

However, while climate change mitigation is one side of the coin, adaptation measures, including strategies for ensuring the unrestricted movement of species becomes vital for species in adapting to a warming planet. Along with climate change mitigation, emphasis needs to be placed on strategies to avoid the fragmentation of biological landscapes and consequentially on the threat of species extinction. If not implemented correctly, linear infrastructure can destroy natural landscapes, both physically and functionally, and further put brakes on climate change adaptation. Therefore, a move towards a landscape approach in preventing future habitat fragmentation becomes imperative.

Moving towards a landscape approach to linear infrastructure

While India is a growing economy and in recent years has also felt the need to address dimensions of infrastructure related to national security, an integrated long-term approach to linear infrastructure is needed in preserving natural landscapes. This means that there is a need to identify major infrastructure requirements for the next 20 to 30 years and simultaneously identify corridors that enable animal movement. Linear infrastructure development in the country has often been carried out in a highly piecemeal manner. For instance, in the Western Ghats region, disconnected demands for roads and railway lines have had impacts on the fragmentation of vital biodiversity areas. Given the current state, there is a need to identify areas which have the least potential for causing disruption and demarcating go and no-go areas. Moreover, the demand for non-essential infrastructure needs to be looked through the lens of a larger landscape level approach to infrastructure planning. Emphasis should be placed on strengthening existing corridors and reducing the demands of new non-essential infrastructure.

The commitments to the implementation of mitigation measures made by agencies must also be adequately monitored; while both structural and non-structural measures are planned for in EIA reports, it is often observed that there is little monitoring of the implementation of such measures. Currently, as per an affidavit of the MoEFCC to the National Green Tribunal (NGT), monitoring of the implementation of mitigation measures is likely to happen at an average of every 4.5 years by the MoEFCC. Without a strong monitoring framework, fragmentation of natural landscapes will continue to occur and have the potential to create serious disaster risks. For instance, cutting of slopes in both the Western and Eastern Himalayas, in ecologically fragile landscapes, have resulted in devastating consequences both to environment and human society. Additionally, without adequate monitoring, instances of unscientific cutting also increase the likelihood of loss of a larger forest area than that for which clearance has been obtained.

Science-based best practices for mitigating biodiversity impacts of infrastructure development: a focus on solar and wind energy development

Every infrastructure, because of design and need has a different context; however, preparedness plays importantly in the success or the failure of a project in integrating biodiversity mitigation measures. The IUCN '*Mitigating biodiversity impacts associated with solar and wind energy development*' report³ released in February 2021 draws upon expertise of developers and conservation agencies in understanding the links between renewable energy and its impacts on biodiversity. With only 11% of the global primary energy being derived from renewables, while there is a certain need for significantly increasing renewable energy (RE) contribution to the global energy mix, incorporating biodiversity conservation values and strategies into the early risk screening process plays importantly in mitigating its impacts.

Key Biodiversity Areas (KBAs) are defined as 'sites contributing significantly to the global persistence of biodiversity, in terrestrial, freshwater and marine ecosystem'. The IUCN report indicates that globally ~17.4% of large-scale (>10

³ <https://portals.iucn.org/library/sites/library/files/documents/2021-004-En.pdf>

MW) wind, solar (PV) and hydropower energy facilities operate within the boundaries of important conservation areas, including KBAs. Furthermore, the report also indicates an estimate of the possible impact to over 3.1 million ha of KBAs and 1,574 threatened and endangered species through solar and wind power development. In India, an assessment carried out by The Nature Conservancy (TNC) indicates that with the RE installation of 175 GW targeted by 2022, the expansion could threaten 10,000 sq. km. of forest lands and 2,500 sq. km. of Important Bird Areas (IBAs). A key species under threat is the Great Indian Bustard with numerous instances of collision into transmission lines. The findings highlight the need to consider options for avoidance in the mitigation hierarchy and encourage early planning and decision-making for all sectors alike. Once developed, there is little opportunity for restoration and for offsetting the impacts as infrastructure exists for long periods of time.

The concept of no-go areas is derived from the need for preparedness, where certain areas are barred from exploration early in the screening process. However, alongside the demarcation of no-go areas, identifying go areas is imperative, those that could potentially benefit from infrastructure development. These could include highly degraded lands, barren lands, existing roof-top real-estate, and sealed spaces. Examples from across the world also show that solar projects in degraded lands can help enhance soil quality and improve biodiversity. Early planning also allows for end-of-life waste management during the decommissioning phase of RE projects.

To realize the benefits of biodiversity conservation alongside infrastructure development, strengthening the science-policy-practice interface is essential. Here, the incorporation of local knowledge in the decision-making process needs special consideration as distributional patterns of organisms vary considerably through the landscape. The IUCN *Global Standard for Nature-based Solutions*⁴ (NbS) adopted in 2020, provides a systematic framework to implement nature-based solutions at the local level and can assist in the integration of biodiversity conservation and ecosystem restoration into development projects. Furthermore, it is critical that investments are made into activities that will not destroy ecosystems and biodiversity, but rather create opportunities for conservation.

Trends in private sector commitments to biodiversity conservation

Growing pressures on biodiversity and increased fragmentation of habitats necessitates the engagement of the private sector in biodiversity conservation. While there is growing public pressure that companies must also be held accountable for biodiversity loss, companies need to also recognize biodiversity conservation as beneficial for its long-term resource strategy. Sensitizing and supporting corporations in India to formulate group-level biodiversity policies and Biodiversity Management Plans (BMPs), such as that being carried out by IUCN under its Business and Biodiversity programme is a continuous need.

As an example of a shift towards integration of biodiversity values was provided by the Aditya Birla Group's (ABG) representative. Making mention of the structured approach taken to biodiversity conservation by the company, it was emphasized that the biodiversity policy of the company is a commitment to move beyond compliance and towards 'no net loss' (NNL). Aspects such as circularity, resource efficiency, decarbonization and NbS have been engrained into the ABG business strategy. The company has been utilizing the Integrated Biodiversity Assessment Tool (IBAT) to conduct detailed site-wise biodiversity assessments in developing Biodiversity Management Plans (BMPs.) Additionally, mitigation strategies under the BMPs have also looked to prioritize the avoidance of risks and encouraged community participation in conservation and restoration efforts. For instance, several intensive plantations, water-related interventions, development of eco-parks and mine restoration efforts have been carried out by the Aditya Birla Group.

⁴ <https://www.iucn.org/theme/nature-based-solutions/resources/iucn-global-standard-nbs>

The evolving role of the judiciary in interpreting the infrastructure-biodiversity contradictions

A fundamental question in reconciling infrastructure-biodiversity disputes is reconciling the question of right of way versus the right to biodiversity. From the project developer's perspective, linear infrastructure and the right of way are fundamental and therefore large linear infrastructure projects are often considered as essential infrastructure. This understanding also is found in the current Environmental Impact Assessment (EIA) framework of the country which does not limit several categories of linear infrastructure projects. For instance, large linear infrastructure projects including railway, inland waterways and transmission line projects do not come under the purview of EIAs.

Furthermore, while other linear infrastructure such as irrigation projects or slurry pipelines do fall under its purview, with a sleight of hand such projects can be qualified as essential infrastructure. For instance, irrigation projects have been turned into integrated water pipeline projects that include drinking water, thereby qualifying it as essential infrastructure. New highways do require EIAs, however the current trend is the uptake of projects on expansion of highways within a limit of 100 km which do not fall under the purview of EIAs; this is however currently under judicial scrutiny. Another reality of the debate is, 'which came first?'; the question is often asked as a substantial number of protected areas (PAs) and reserved forests (RFs) have not reached final settlement. Several Proposed Reserved Forests (PRFs) notified in the 1960s have still not completed the process of settlement.

While several linear infrastructure projects are currently outside the purview of the EIA framework, from a standpoint of biodiversity conservation, the Biological Diversity Act (BDA) of 2002 is critical. This is because as per BDA 2002, Biodiversity Impact Assessments (BIAs) are applicable to all linear infrastructure projects, wherever the Central Government considers it as necessary. Implementing provisions for notifying critical wildlife habitats (CWH) under the Forest Rights Act (FRA), 2006 and Biodiversity Heritage Sites (BHS) under the provisions of the BDA 2002 can also be utilized for the demarcation of no-go areas; currently 17 BHS with an aggregate area of 1006 sq. km⁵ and no CWH have been notified in the country. There is also a need to understand the administrative steps taken by the MoEFCC on linear infrastructure; approximately 120 memos on issues ranging from investigations, simplifying procedures, tree-felling, linear plantations, regularization of encroachment, repair and maintenance of roads etc. have been issued by the MoEFCC on linear projects.

Summary of key messages:

- Pressure on biodiversity in the country is immense, as India, within 2.4% of the world's land area, supports 18% of the global population and accounts for over 30% of the world's cattle inventory.
- Despite the introduction of biodiversity-infrastructure guidelines, improperly planned linear infrastructure projects continue to invite problems of the fragmentation of habitats.
- Infrastructure planning cannot assume a piecemeal approach; there is a need to shift to a landscape approach to infrastructure development, wherein values for biodiversity conservation within impact assessments of infrastructure need to be strongly incorporated in project development.
- If not implemented correctly, linear infrastructure can destroy natural landscapes, both physically and functionally, and put brakes on climate change adaptation.
- Along with climate change mitigation, emphasis also needs to be placed on strategies to avoid the fragmentation of biological landscapes and consequentially of species extinction.
- Infrastructure planning needs to happen a landscape level approach; there is a need to identify major infrastructure requirements for the next 20 to 30 years and simultaneously identify corridors that enable animal movement.

⁵ http://www.wiienviis.nic.in/Database/bhs_8650.aspx

- The implementation of mitigation measures committed by agencies must be adequately monitored; while both structural and non-structural measures are planned for in EIA reports, it is often observed that there is little monitoring of the implementation of such measures.
- Preparedness plays importantly in the success or the failure of a project in integrating biodiversity mitigation measures; once developed, there is little opportunity for restoration and offsetting the impacts as infrastructure exists for long periods of time.
- Alongside the demarcation of no-go areas, there is also the need to identify the go areas, those that could potentially benefit from infrastructure development.
- Companies need to also recognize biodiversity conservation as beneficial for its long-term resource strategy; IUCN under its Business and Biodiversity programme is aiding companies develop a long-term strategy for biodiversity.
- A fundamental question in reconciling infrastructure-biodiversity disputes is reconciling the question of right of way versus the right to biodiversity.
- While several linear infrastructure projects are currently outside the purview of the EIA framework, from a standpoint of biodiversity conservation, the biodiversity law in the country, namely the Biological Diversity Act (BDA) of 2002 is a critical legal instrument.
- Implementing provisions for notifying critical wildlife habitats (CWH) under the Forest Rights Act (FRA), 2006 and Biodiversity Heritage Sites (BHS) under the provisions of the Biological Diversity Act, 2002 is essential for the demarcation of no-go areas.

Reports cited by webinar speakers

- Capitals Coalition (2020). *TEEB for Agriculture and Food: Operational Guidelines for Business – Putting Nature and People at the Centre of the Food System Transformation*. Netherlands. <https://capitalscoalition.org/wp-content/uploads/2020/08/DRAFT-TEEBAgriFood-Operational-Guidelines.pdf>
- Dasgupta, Partha & McKenzie, Emily. (2020). *The Dasgupta Review – Independent Review on the Economics of Biodiversity (Interim Report)*. United Kingdom. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/882222/The Economics of Biodiversity The Dasgupta Review Interim Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/882222/The_Economics_of_Biodiversity_The_Dasgupta_Review_Interim_Report.pdf)
- FAO and UNEP (2020). *The State of the World's Forests 2020. Forests, biodiversity and people*. Rome. <http://www.fao.org/3/ca8642en/CA8642EN.pdf>
- FSI (2019). *India State of Forest Report 2019*. Forest Survey of India, Ministry of Environment, Forest & Climate Change. Dehradun. <https://www.fsi.nic.in/forest-report-2019>
- IPBES (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. IPBES secretariat, Bonn. https://ipbes.net/sites/default/files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf
- IUCN (2021). *Mitigating biodiversity impacts associated with solar and wind energy development. Guidelines for project developers*. International Union for Conservation of Nature and Natural Resources. Gland, Switzerland. <https://portals.iucn.org/library/sites/library/files/documents/2021-004-En.pdf>
- IUCN (2020). *IUCN Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS*. International Union for Conservation of Nature and Natural Resources. Gland, Switzerland. <https://www.iucn.org/theme/nature-based-solutions/resources/iucn-global-standard-nbs>
- TERI (2018). *Economics of Desertification, Land Degradation and Drought in India, Vol I: Macroeconomic assessment of the costs of land degradation in India*. The Energy and Resources Institute, New Delhi. <https://www.teriin.org/project/study-economics-desertification-land-degradation-and-drought-dldd-india>
- UNEP (2021). *Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies*. United Nations Environment Programme, Nairobi. <https://www.unep.org/resources/making-peace-nature>
- UNEP (2019). *Emissions Gap Report 2019*. United Nations Environment Programme, Nairobi. <https://www.unep.org/resources/emissions-gap-report-2019>
- UNEP (2016). *UNEP Frontiers 2016 Report: Emerging Issues of Environmental Concern*. United Nations Environment Programme, Nairobi. <https://www.unep.org/resources/frontiers-2016-emerging-issues-environmental-concern>