Living on the Land: An India Overview

PRE-READ DOCUMENT

**Sustainable Land Use Perspectives Forum
January 2019**

Photo credit: CIFOR, Flickr

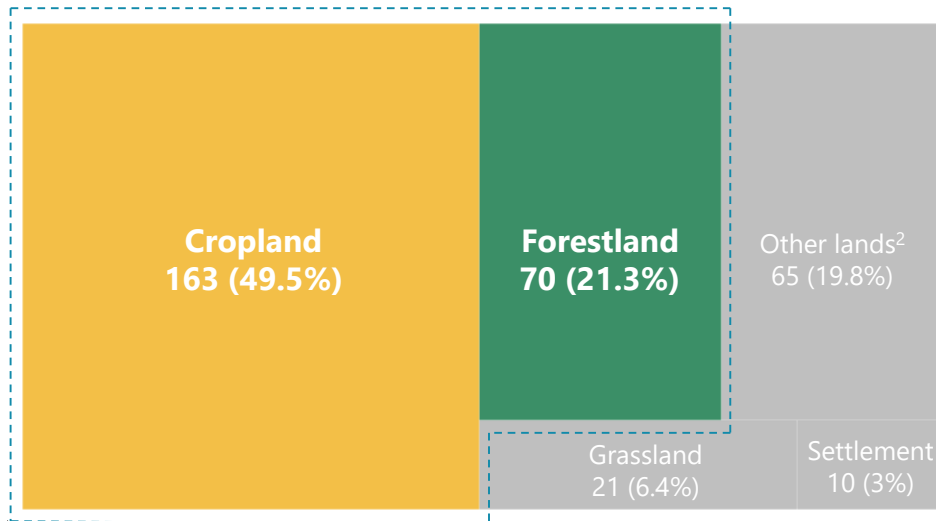# What do we mean by land use?

Our working definition of land use is the dynamic ways in which land is **owned, managed, and utilised** to generate diverse environmental, economic, and cultural services

Note: Land use in India includes both rural and urban uses, both of which are critically important to India's development and climate goals.
For the purposes of this workshop, we focus on rural land use only, as defined in the following slides.

This forum will focus on the agriculture and forestry aspects of land use due to their critical importance for India's land and population…

## Agricultural land and forests represent 70% of India's total land area

Area under different types of land use in India[1]
Million hectares, 2014

| Cropland 163 (49.5%) | Forestland 70 (21.3%) | Other lands[2] 65 (19.8%) |

Grassland 21 (6.4%) | Settlement 10 (3%)

*Nearly **30% (100 mn hectares)** of India's land is degraded and is not suitable for agricultural use[3]*

At least 700 mn people in India rely on agriculture and forests for their primary livelihood, and other forms of sustenance

Distribution of agricultural population by primary source of income[4]
Millions, 2013

Fisheries 16 | Forestry 32 | Livestock 170 | Farming 519 | Total 737
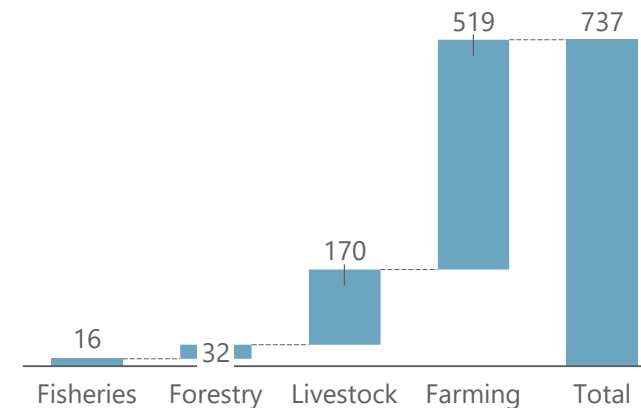
*The Government of India also estimates that **at least 350 mn people depend on forests for needs beyond primary income**, such as fuelwood, fodder, construction, labour opportunities and other forest products[5]*

## Agriculture and deforestation comprise 20% of India's emissions, providing an immense reduction opportunity

GHG[1] emissions from agriculture and deforestation[2]
Million tonnes of CO$_2$ equivalent, 2000-2014

Agriculture
Deforestation

20% of total emissions
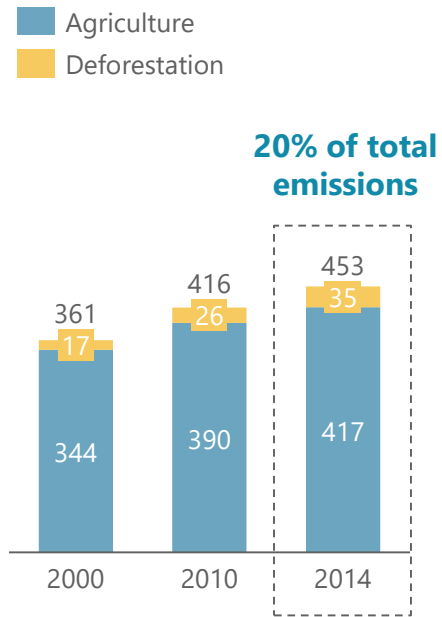
At a global level, existing farmlands and forestlands can contribute **37% of the total emissions reduction** needed to hold global warming below 2ºC by 2030[3] - equivalent to halting the burning of oil

Agriculture and forestry solutions are also highly cost effective for climate mitigation

Global GHG emissions mitigation potential versus mitigation cost
Annualized estimates, 2018-2030

SECTORS
- Agriculture
- Forestry
- Energy
- Transport

Climate mitigation potential[5] (Mt CO$_2$e per year)
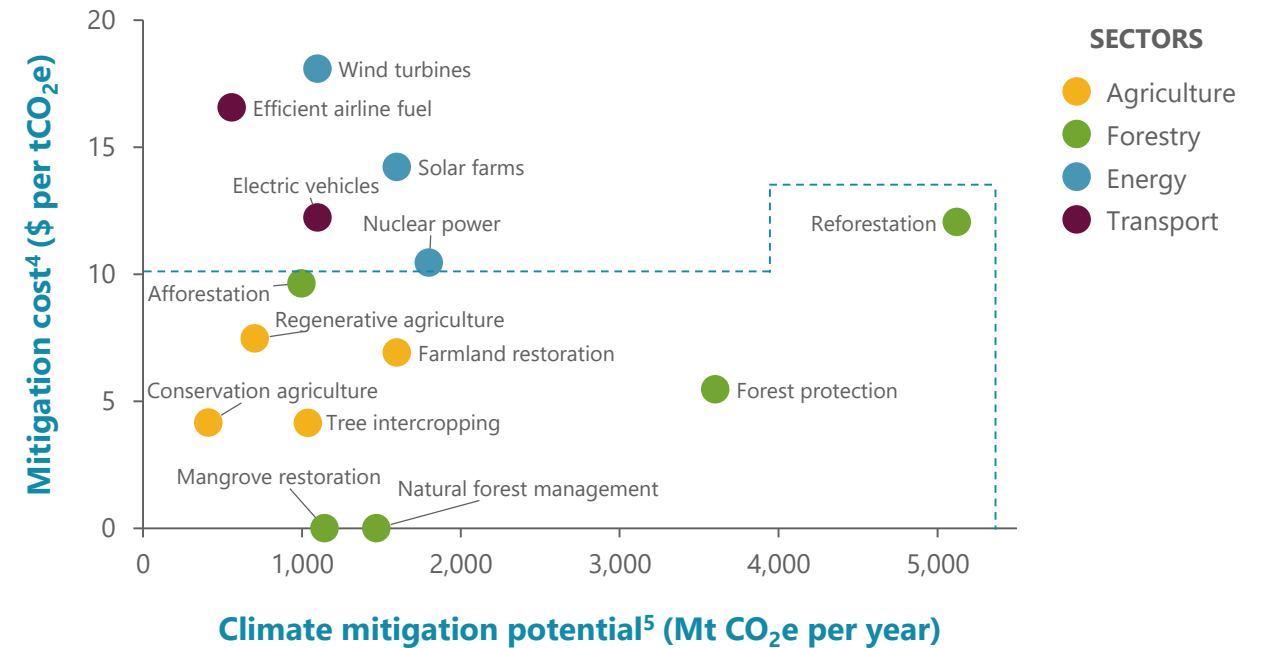
Notes and sources: (1) Greenhouse gases; (2) Beyond emissions, forests also provide a significant carbon sink opportunity, as described on slide 12. Second Biennial Update Report to the United Nations Framework Convention on Climate Change, Ministry of Environment, Forest and Climate Change, 2018; (3) Natural Climate Solutions, The Nature Conservancy, 2017; (4) Mitigation cost is defined as the cost of a low-carbon alternative solution. The cost includes annualized capital and operational expenditures until 2030; (5) Mitigation potential of a solution is defined as the yearly average GHG emissions reduction potential until 2030; Mitigation cost data unavailable for mangrove restoration and natural forest management; Popular solutions such as electric vehicles, efficient airline fuel, wind turbines have been included to draw relatable comparisons; Drawdown climate change solutions; Pathways to a low-carbon economy, McKinsey & Company, 2009; Second Biennial Update Report to the United Nations Framework Convention on Climate Change, Ministry of Environment, Forest and Climate Change, 2018; Dalberg analysis

Compared to its peers, India faces extreme land use pressure due low land productivity, and high population density and growth

Bubble size: ⬤ 1 mn annual population change

Bubble color: ⬤ Population increase ⬤ Population decrease

Country wise land use pressure[1]
People/hectare and USD/hectare, 2016

Population density (y-axis)

Value of agricultural production[2] (x-axis)

Countries plotted: Bangaldesh, Rwanda, India, Netherlands, Israel, Belgium, Japan, Philippines, Pakistan, Vietnam, UK, Germany, Nigeria, Italy, Switzerland, Ethiopia, China, Indonesia, Cambodia, South Africa, Egypt, Kenya, Argentina, Brazil, Russia, Australia, Norway, USA
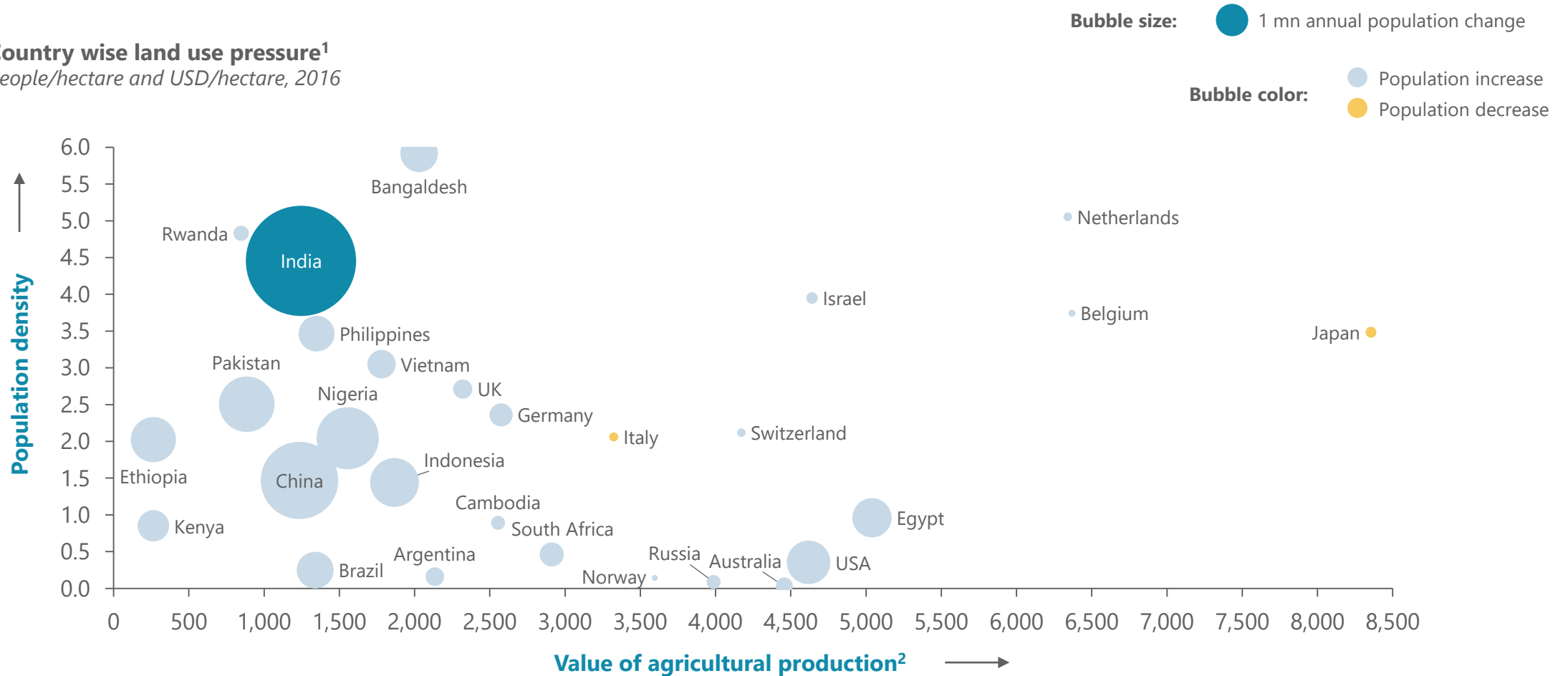
*India's overarching challenge is how to fulfill **growing demands** on its land despite **limited land availability***
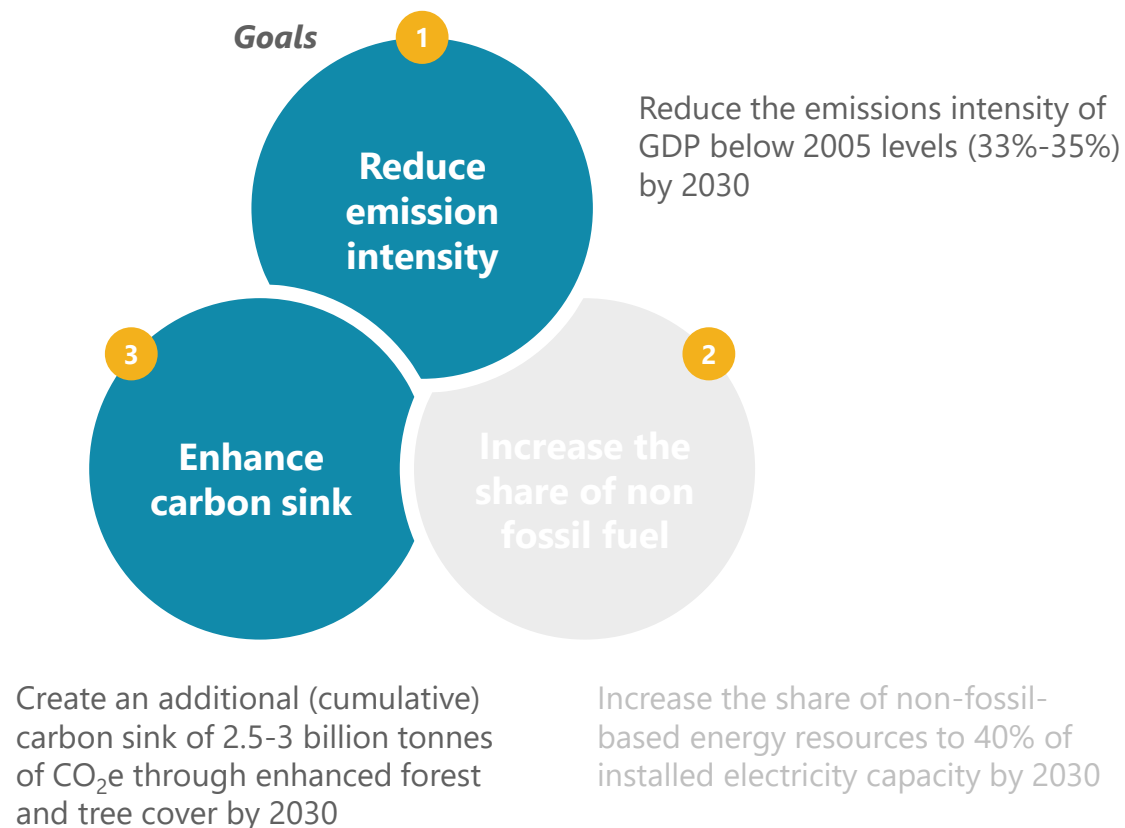
Notes and sources: (1) Food and agricultural data, FAOSTAT, FAO, United Nations; World Bank Open Data; Dalberg analysis; (2) Land may also be valued from other lenses than agricultural produce, such as sociocultural values. However for the purpose of this analysis, value is computed by multiplying gross production with farm output prices, per area of land used for agriculture

How we use our land is a crucial factor in achieving India's national priorities and international commitments

Land use underpins several SDGs and their sub-targets

1 NO POVERTY

Improve incomes and build resilience of vulnerable people

15 LIFE ON LAND

Ensure conservation of terrestrial ecosystems and biodiversity

2 ZERO HUNGER

Improve agricultural yields and food security

Land use

13 CLIMATE ACTION

Preserve and increase forestlands and drive low-emission farm practices

6 CLEAN WATER AND SANITATION

Enhance water table, and protect and restore water-related ecosystems

Promote equitable land rights and use of land resources

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

NDC goals 1 & 3 are directly linked to land use and change in land use patterns

Goals

1

Reduce emission intensity

Reduce the emissions intensity of GDP below 2005 levels (33%-35%) by 2030

3

Enhance carbon sink

2

Increase the share of non fossil fuel

Create an additional (cumulative) carbon sink of 2.5-3 billion tonnes of CO_2e through enhanced forest and tree cover by 2030

Increase the share of non-fossil-based energy resources to 40% of installed electricity capacity by 2030

Land use strategies should recognize their interlinked impacts on multiple co-benefit areas

Co-benefit areas

Land use strategies

Human development | Climate change | Ecology conservation
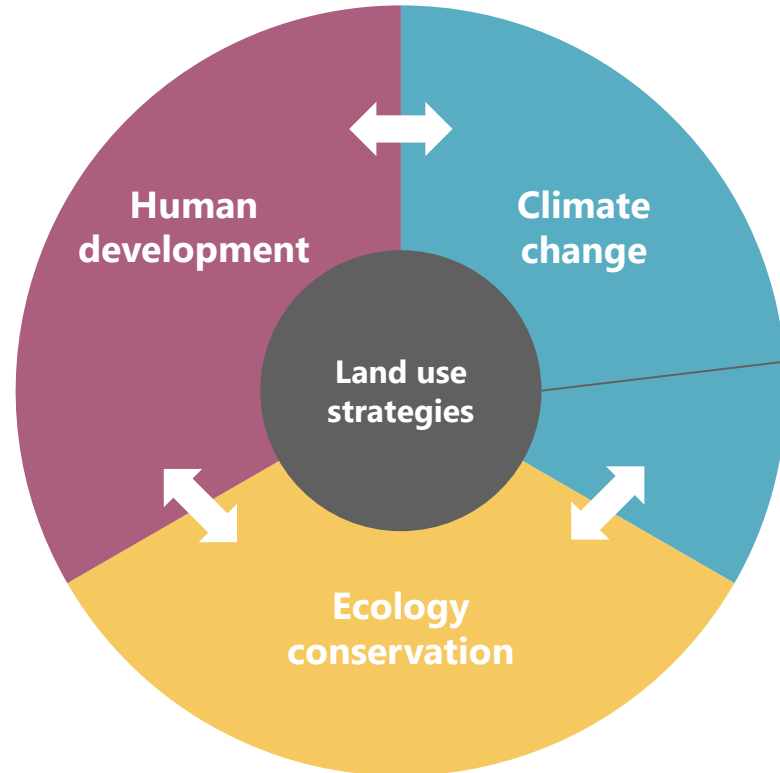
Sample strategies with potential impacts across co-benefit areas[1]

Forest protection and restoration[2]

- Incomes from timber, NTFPs, fuelwood usage, and tribal cultures
- Carbon sinks, and resilience against floods and landslides
- Habitats for wildlife, forest density and air quality
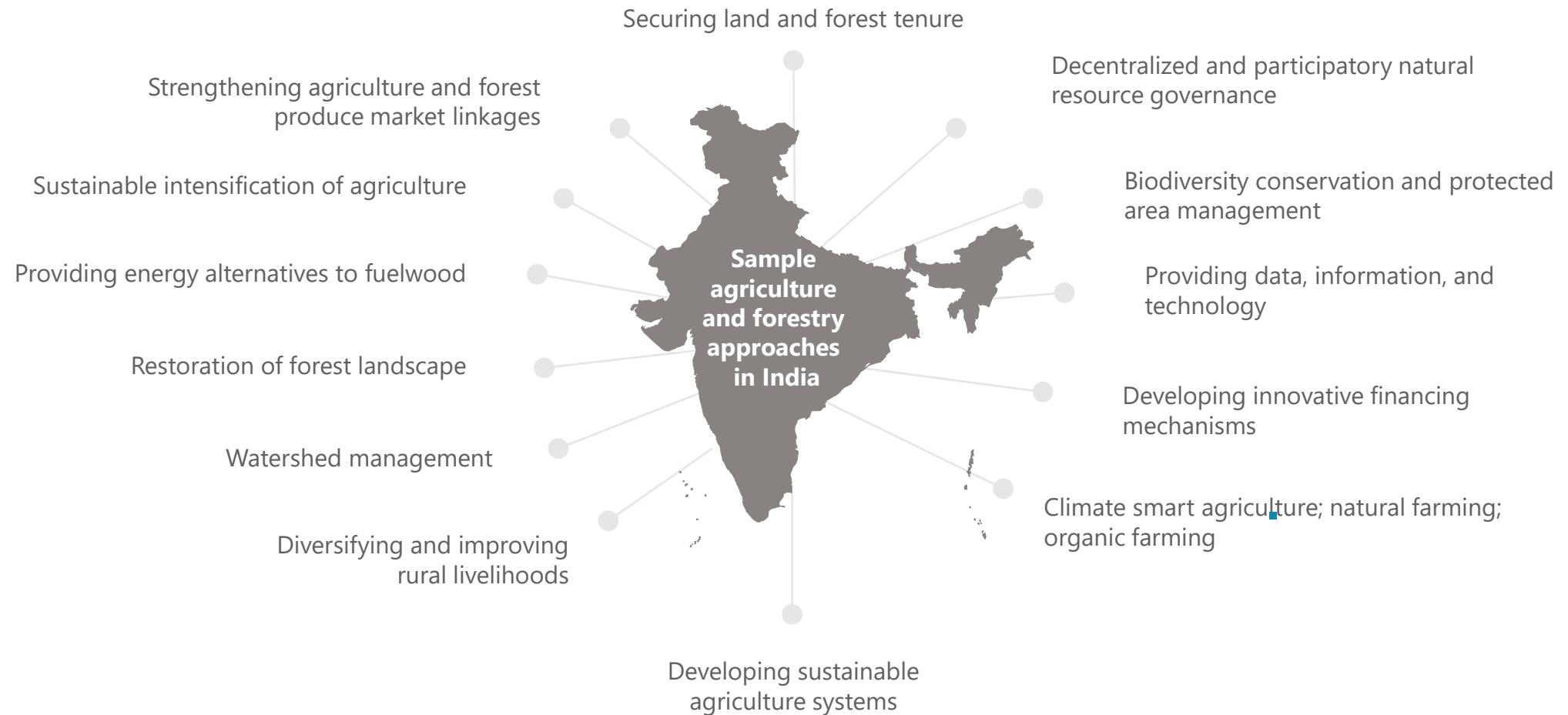
Farmland restoration[3]

- Farmer incomes, food security, and rural-urban distress migration
- Forest carbon sinks, forest conversion, farmland productivity
- Soil nutrient, microbiome health, soil erosion, and water eutrophication

Agroforestry[4]

- Farmer incomes and vulnerability to extreme shocks
- Water table, resistance to droughts, and carbon sinks
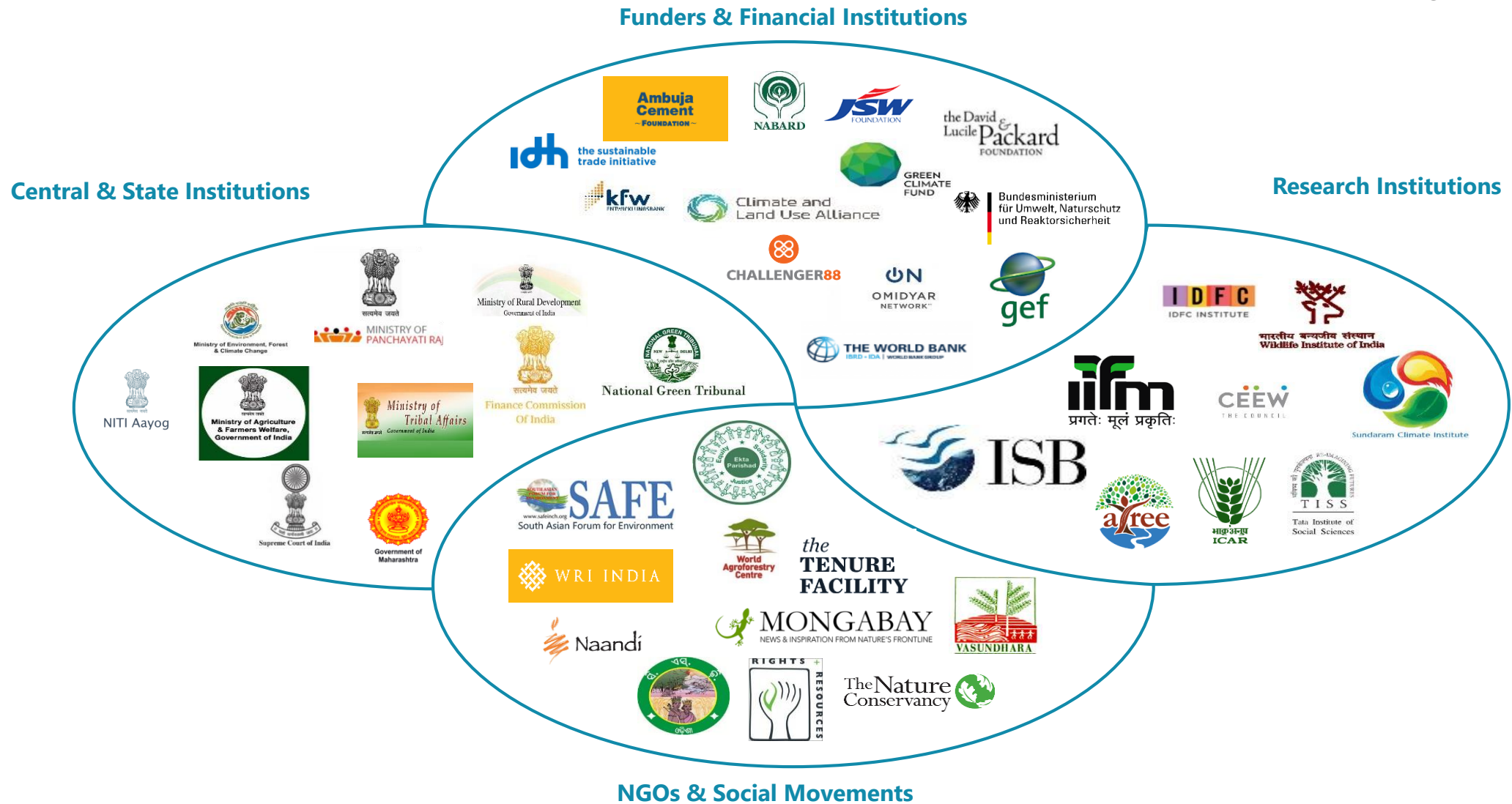- Biodiversity, cross pollination, and seed dispersion

Notes: (1) Impacts indicated may either be positive or negative; (2) Preventing deforestation practices and restoring forests by planting trees and native seedlings; (3) Restoring native vegetation on abandoned cropland through productive, carbon-friendly farming systems; (4) Blending layers of trees between crops to improve productivity of land

Securing land and forest tenure

Strengthening agriculture and forest produce market linkages

Decentralized and participatory natural resource governance

Sustainable intensification of agriculture

Biodiversity conservation and protected area management

Providing energy alternatives to fuelwood

Sample agriculture and forestry approaches in India

Providing data, information, and technology

Restoration of forest landscape

Developing innovative financing mechanisms

Watershed management

Climate smart agriculture; natural farming; organic farming

Diversifying and improving rural livelihoods

Developing sustainable agriculture systems

... by a diverse ecosystem of actors

Funders & Financial Institutions

Central & State Institutions

**Research Institutions**

NGOs & Social Movements

Note: Other ecosystem actors include stakeholders from the media covering land use, such as The Economist and DownToEarth

Despite this extensive work, the agriculture and forestry sectors in India remain under strain, with adverse trends that affect co-benefit areas

Adverse trends

- Large proportion of India's population suffers from **starvation and malnutrition**
- Majority of India's farmers are vulnerable to income shocks, which are linked to **suicides, shifts in occupation and migration**
- Loss of **livelihoods for indigenous communities** who rely on forest ecosystems

Human development

Climate change

Ecology conservation
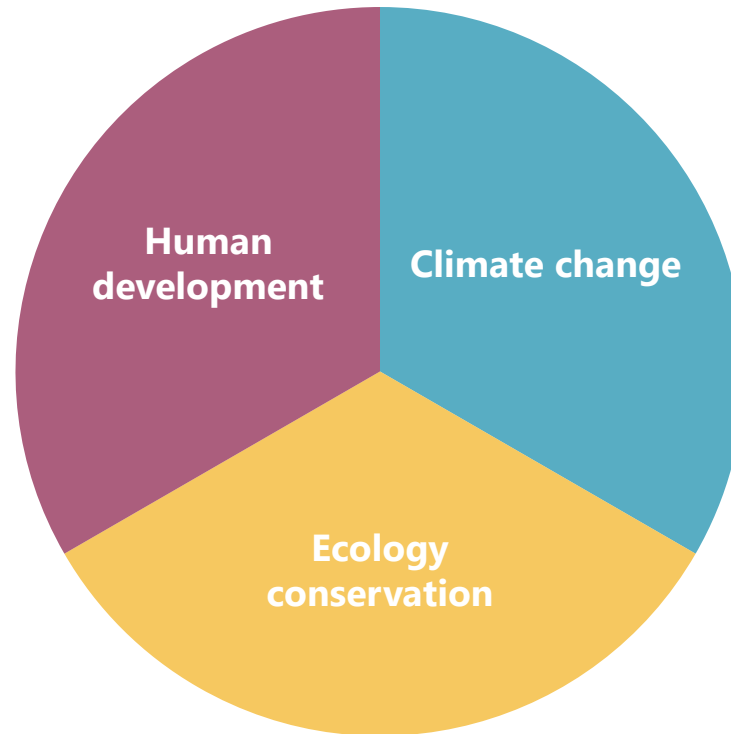
- Degradation of forests as a result of reduced **forest quality and density**
- Insufficient growth in **forests' carbon sink** capacity
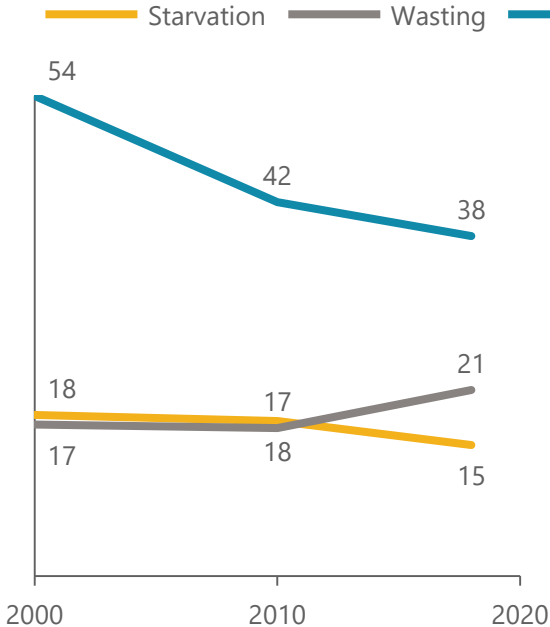- Reduced **resilience** among vulnerable communities

- Degradation of **vulnerable ecological hotspots** due to land use pressures
- Decrease in **wildlife habitats** and increase in number of threatened species
- Depletion of **ecosystem services** due to imbalances in natural environment

Poor food access and limited agricultural productivity contribute to starvation and malnutrition[1]

Starvation, stunting, and wasting in children[2]
% of total population, 2000-2018, India

Legend: Starvation — Wasting — Stunting

- Starvation: 18, 18, 15
- Wasting: 17, 17, 21
- Stunting: 54, 42, 38

(2000, 2010, 2020)

- India is the world's second largest food producer but has **195 mn undernourished people**[3] (25% of the global starving population)
- Despite reduced instances of stunting, India still has **47 mn stunted children**[4] (30% of the world's stunted children)
- India has a **poorer** Global Hunger Index (GHI)[5] score **compared to the world average, BRICS peers, and its neighbours**, including Bangladesh, Nepal, Sri Lanka, and Myanmar

Farmers are vulnerable to income shocks, linked to suicides, shifts in occupation, and migration

Farmer suicides[6]
Number of farmers, 2013 - 2015

- 2013: 11,772
- 2014: 12,360
- 2015: 12,602
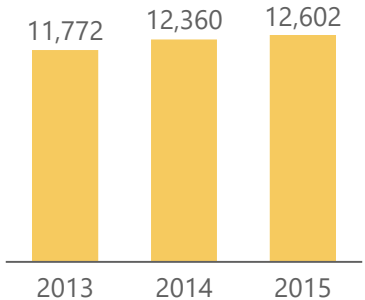
- **70%** (62.6 mn) of agricultural households **spend more than their average monthly income**, and only 15% (13.5 mn) are covered under insurance or have access to institutional credit[7]
- **Bankruptcy (20.6%) and crop failure (16.8%)** were the leading causes of farmer suicides during these years[8]

Mean income of a non-agriculture worker to an agriculture worker[9]
Ratio, 2000 - 2015

- 3.05, 3.35, 4.08, 4.42
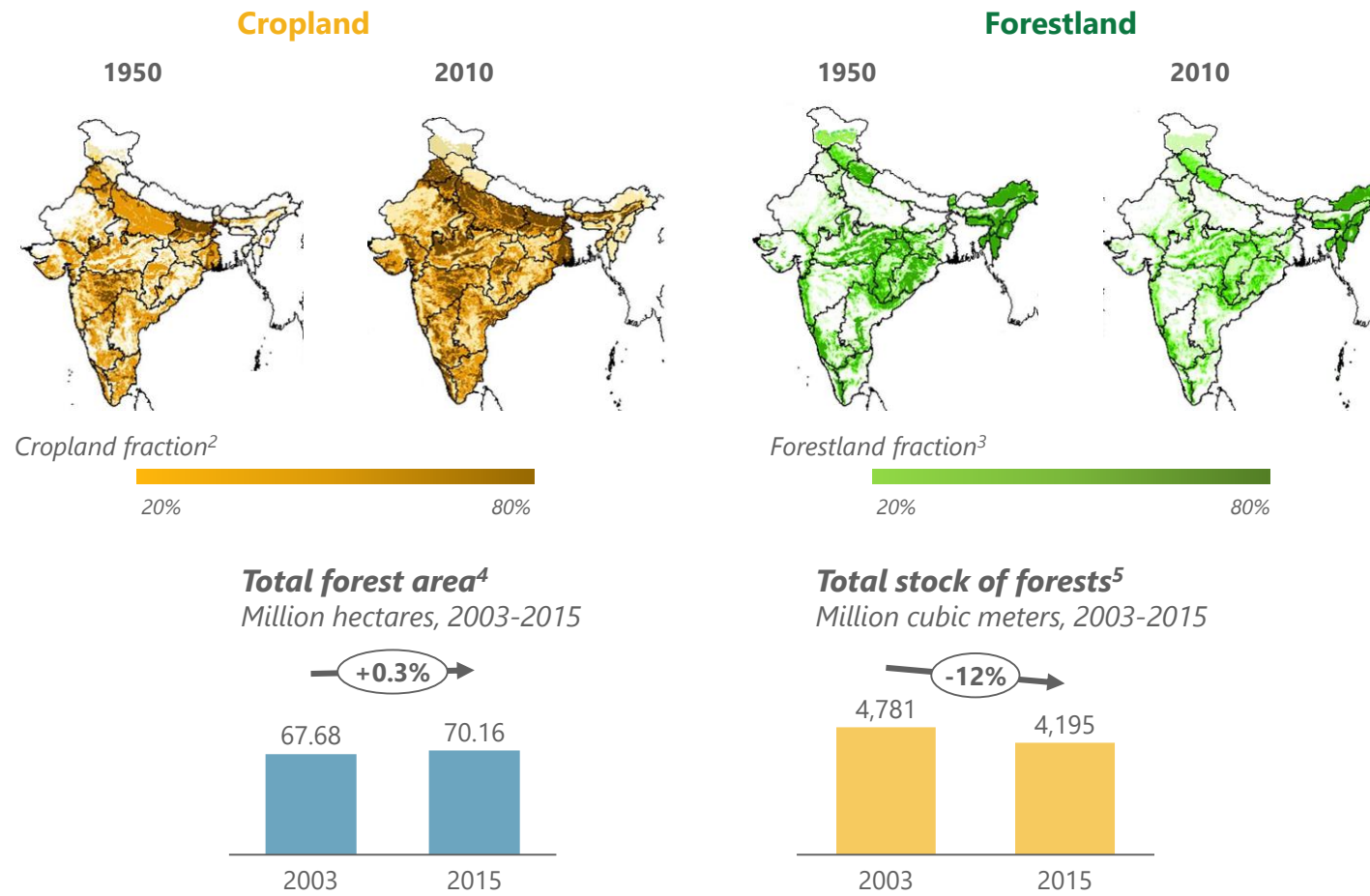- (2000, 2005, 2010, 2015)
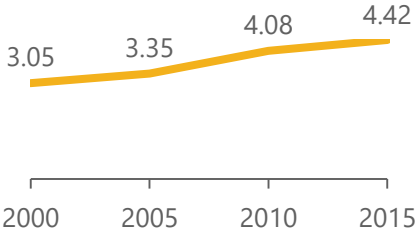
- India has **8.6 mn fewer farmers** today than in 2008
- The number of urban migrants **increased by 44%** from 2001-11, at an average of **14 mn migrants a year**[10]

India's climate change mitigation outlook reflects continuous forest degradation, and slow improvement in carbon sink capacity

Forest density and quality have reduced, despite marginal increases in forest area[1]

Cropland

1950

2010

Cropland fraction[2]

20%   80%

Forestland

1950

2010

Forestland fraction[3]

20%   80%

Total forest area[4]
Million hectares, 2003-2015

+0.3%

67.68   70.16

2003   2015

Total stock of forests[5]
Million cubic meters, 2003-2015

-12%

4,781   4,195

2003   2015

Slow carbon sink growth has hampered progress on NDC 3

Emissions removal due to forests[6]
Million tonnes of CO_2 equivalent, 2000-2014

-10%

303   229   272
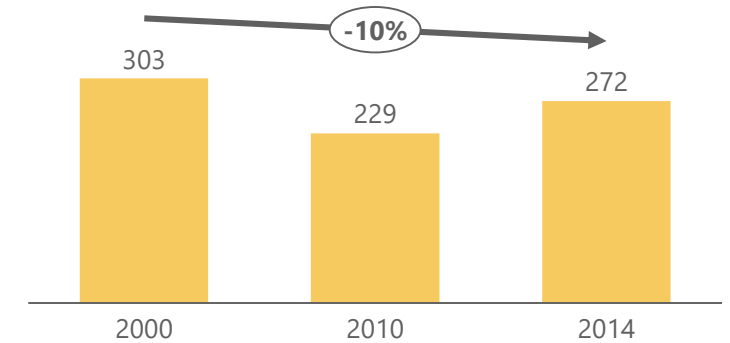
2000   2010   2014

- **Carbon sink capacity has improved** in recent years, but has not yet recovered the loss in capacity observed from 2000-2010

- Carbon sink growth is insufficient, and will result in a **shortfall of 1.1 bn tonnes** of carbon sink needed to meet India's 2030 NDC target[7]

India's ecological biodiversity is under threat due to depletion of natural habitats

Vulnerable ecological hotspots have degraded due to land use pressures

Himalayas

- The average annual erosion rate has doubled since 2005 to **80 tonnes per ha**[1]
- Traditional crop cultivation has **declined by 85%** since 1970[2]

Brahmaputra Basin

- **25% of forestlands** and **40% of wetlands have degraded** due to excessive erosion and sedimentation[3]

Sundarbans

- Increasing agricultural & industrial activity has **destroyed over 1000 ha of mangroves**
- **54 inhabited islands have no forests,** due to conversion of mangrove forest into paddy land[5]
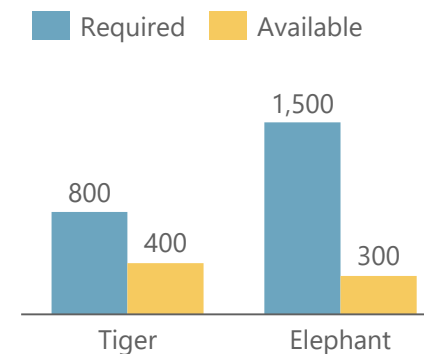
Western Ghats

- **2/3rd of the region** has lost its natural vegetation cover[4]
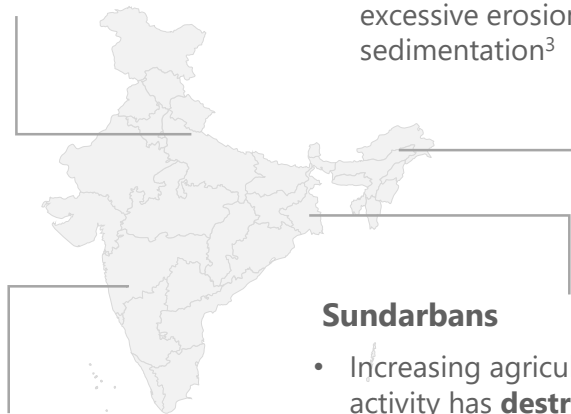
Wildlife habitats have reduced, while the number of threatened species has increased due agricultural practices

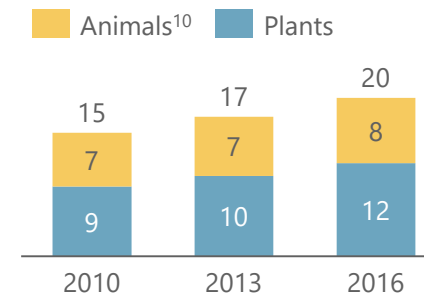### *Average habitat area required versus area available*[6]
Hectares, India, 2016

Legend: Required (blue), Available (yellow)

	Tiger	Elephant
Required	800	1,500
Available	400	300

- **30% of India's habitats** are fragmented into patches of **less than 100 ha** due to agricultural encroachment[7]
- Increased wildlife population and shrinking habitat has led to **29% of tigers, 40% of leopards, 67% of elephants** wandering to adjoining farmlands, resulting in **30% rise in man-animal conflicts** since 2013[8]

IUCN threatened flora and fauna species[9]
'000 species, India, 2000-2016

Legend: Animals[10] (yellow), Plants (blue)

	2010	2013	2016
Animals	7	7	8
Plants	9	10	12
Total	15	17	20

- **30%** of India's cropland depends on **honeybees for pollination.** Honeybee **populations have fallen by 30-90%** since 2006, endangering several bee species, due to increased monoculture and pesticide use[11]

Notes and sources: (1) Losing ground, DownToEarth, 2015; (2) Crop species disappearing in Garhwal, DownToEarth, 2015; (3) Projects impacts on the Brahmaputra basin, 2017, ICIMOD; (4) Western Ghats face threats, DownToEarth, 2016; (5) Rising tidal erosion eating up Sundarbans, DownToEarth, 2015; (6) Habitat is the type of natural environment in which a particular species of organism lives. Required area of habitat for territorial animals is the area needed for animals to live in an unhindered manner; India Environment Portal, 2016; (7) National assessment of forest fragmentation in India:, National Remote Sensing Centre, 2013; (8) The data presented does not include conflicts related to poaching. Man-animal conflict, DownToEarth, 2016; (9) International Union for Conservation of Nature; India Environment Portal, 2016; (10) For the purposes of this analysis, figures for animals includes vertebrate species only; (11) Honey, where are the bees?, DownToEarth, 2015;

Furthermore, limitations in India's enabling environment pose obstacles for stakeholders in India's land use space to pursue lasting impact

Key structural challenges

Fragmented work and conflicting institutional mandates constrain:

- Financial flows
- Program implementation
- Knowledge exchange
- Ability to adopt a holistic co-benefits lens

Insecure tenure and resource rights inhibit:

- Community engagement
- Impactful implementation
- Assured flow of land benefits to communities

Fragmentation and insufficient collaboration

Insecure land tenure

Limited and contested data

Insufficient data and data systems hamper:

- Decision making
- Evaluation of programs
- Adaptive learning

The Sustainable Land Use Perspectives Forum will highlight promising solutions to address these trends, as well as the potential of co-benefits and ecosystem-building

Identify innovative solutions and opportunities for collaboration and funding partnerships
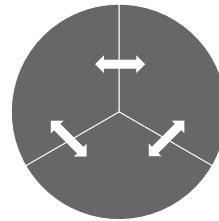
Highlight the importance of using a holistic lens, acknowledging co-benefits for climate, human development and ecology
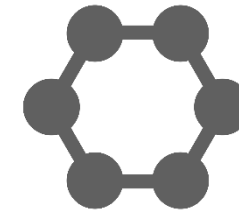
Support a networked ecosystem in India, including domestic and global philanthropies, experts, businesses, civil society and others

We look forward to welcoming you to the event

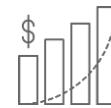| TENTATIVE AGENDA	
Time	*Session*
9:00 – 9:20 a.m.	**Registration**
9:20 – 9:30 a.m.	**Welcome Address:** *R. Venkataramanan, Managing Trustee, Tata Trusts*
9:30 – 10:30 a.m.	**Opening Plenary:** *Shri Jairam Ramesh, Member of Parliament and Former Minister of Environment and Forest, and Dr. Mihir Shah, 12th Planning Commission*
10:30 – 10:40 a.m.	**Participant Introductions**
10:40 – 11:00 a.m.	**Presentation: Living on the Land - An India Overview**
11:00 – 12:15 p.m.	**Lightning Talks: Approaches to Land Use in India**
12:15 – 12:30 p.m.	**Tea and coffee break**
12:30 – 1:30 p.m.	**Panel Discussion: Human Development, Ecology, and Climate – Trade-offs and Opportunities**
1:30 – 2:30 p.m.	**Lunch**
2:30 – 3:30 p.m.	**Exercise: Partnership for Land Use-Related SDGs**
3:30 – 4:00 p.m.	**Plenary: Co-creating Our Shared Future.** *Roopa Purushothaman, Chief Economist & Head, Policy Advocacy, Tata Sons Ltd, and Shloka Nath, Interim Director, India Climate Collaborative and Head of Sustainability & Special Projects, Tata Trusts*
4:00 – 4:30 p.m.	**Closing Plenary:** *Shri Dinesh Kumar Jain, Chief Secretary, Maharashtra Chief Minister's Office*

ANNEX 1: India Land Use Fact Sheet

Indicators[1]

Population[2]	1.21 Bn	Annual GDP growth rate in 2017-2018[6]	6.7%
Human development index (rank)[3]	136/186	Share of agriculture, forestry, and fishing in Gross Value Added[7]	14.8%
Income inequality *(GINI coefficient. 1 = unequal, 0 = equal)[4]*	0.83	Food grain production (2016-17, fourth advance estimate)[8]	276 Mn T
Poverty headcount ratio[5]	29.5%	Economic migrants (% of total Indian workforce)[9]	8.1%

Note: (1) MOEFC. India (2018): Second Biennial Update Report to the United Nations Framework Convention on Climate Change. Ministry of Environment, Forest and Climate Change, Government of India; (2) Population data is based on Census 2011; (3) HDI value of India is 0.64; 4) India's GINI coefficient illustrates increasing inequality; (5) Poverty Headcount Ratio is based on Census 2011; (6) GDP rate in 2017-2018 is measured at constant 2011-12 prices; (7) Share of agriculture, forestry & fishing is measured at constant 2011-12 prices, GVA is the measure of the value of goods and services produced in a particular sector of an economy; (8) 4th advance estimate is assessment of production of different crops for 2017-18 vis-à-vis estimates for 2003-04; (8) Economic migration in India tends to be circular in nature in both short and long term migration trends

Definitions of forest cover and area[1]

Forest Cover

All lands more than one hectare in area with a tree canopy of more than 10%, irrespective of land use, ownership, and legal status

Forest Area

Refers to all the geographical areas recorded as 'forest' in official government records

Types of forest cover of India[2]

'000 sq. km

Dense forest (98)   Scrubs (45)

Moderately dense forest (308)   Open forest (301)   Non forest area (25)

Sources: (1) State of Forest Report, 2017; (2) The forest cover of India is measured at area per thousand square kilometer; Forest cover classification in India, 2017

19

NON-EXHAUSTIVE

1 Policies

- **National Agroforestry Policy, 2014**
- **Compensatory Afforestation Fund Act, 2016**
- **National Forest Policy, 2018** *(draft)*
- **Land Acquisition Act, 2013**
- **National Land Utilization Policy, 2013** *(draft)*
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006
- Biological Diversity Act, 2002
- National Agriculture Policy,2000

2 Missions

- **National Mission for a Green India**
- **National Mission on Sustainable Agriculture**
- **National Mission on Sustaining Himalayan Eco-system**
- **National Mission on Sustainable Habitat**

3 Programs

- Mahatma Gandhi National Rural Employment Guarantee Act Scheme
- Public Distribution System
- **Compensatory Afforestation Fund Management and Planning Act**
- **Nagar Van Udyan Yojana** *(Urban forestry)*
- Pradhan Mantri Adarsh Gram Yojana *(Integrated development of identified villages)*
- Deendayal Antyodaya Yojana-National Rural Livelihood Mission
- National Afforestation Programme, *(ninth fiver-year plan)*

Note: India's federalist structure is important in the agriculture and forestry sectors as states have jurisdiction over agriculture and own the lands. As such, land use interventions must take a multi-level governance lens to take into account shared jurisdiction. Sources: Ministry of Environment, Forest and Climate Change, Government of India; National Action Plan on Climate Change, Government of India

Central Government

- **Ministry of Environment, Forest & Climate Change[1]**
- Ministry of Agriculture & Farmers' Welfare
- Ministry of Rural Development
- Ministry of Tribal Affairs
- Ministry of Panchayati Raj

State Government

- State Agriculture Departments
- Tribal Welfare Department
- State Rural Development Departments
- State Forest Departments

Local Governance

- Panchayati Raj Institutions
- Gram Sabha
- Autonomous District Councils/Regional Councils
- Traditional Forest Management
- Joint Forest Management
- Village Forest Management & Planning Committee

National Action Plan for Climate Change[2]
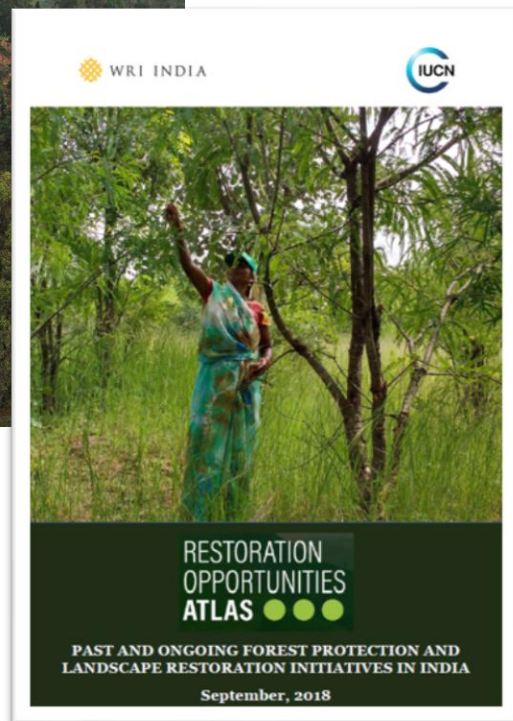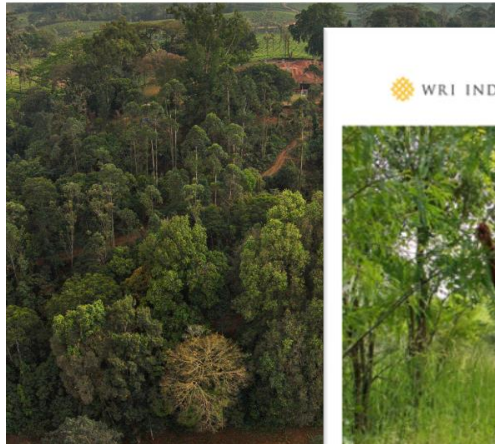
Note: (1) The Ministry of Environment, Forest & Climate Change is a nodal agency in the administrative structure of the Central Government for planning, promotion, co-ordination, and overseeing the implementation of environmental and forestry policies and programs; (2) The National Action Plan for Climate Change pulls together a number of existing plans into a set of eight missions.

IUCN and WRI have collated meta analyses of 200+ land-use initiatives in India to date

Bonn Challenge and India:
Progress on Restoration Efforts across States and Landscapes

WRI INDIA · IUCN

RESTORATION OPPORTUNITIES ATLAS ●●●

PAST AND ONGOING FOREST PROTECTION AND LANDSCAPE RESTORATION INITIATIVES IN INDIA

September, 2018

These analyses highlight several trends

- Most land use interventions **focus on both environmental and developmental outcomes**
- **Government-led projects dominate the land use space,** but many are implemented in partnership with civil society organisations
- **Local communities have played pivotal roles** project implementation including knowledge sharing, contributions of free labour, and development of supportive local institutional frameworks

Government finance

- Estimates suggest the **Government of India** allocated more than **USD 13 bn to improving forest and tree cover** in India between 2011-2016.[1] It is unclear how much of this was utilized and with what outcomes.

- When forest land is diverted for development projects (e.g. mining, infrastructure), project proponents or users are required by law[2] to pay **compensation for the loss of environmental services**. These funds have accumulated over two decades and today account for more than INR 66,000 crore. Per the **Compensatory Afforestation Fund Act 2016,** the money is to be allocated to states in proportion to their deposits.[3]

- **The 14th Finance Commission** recommended 7.5% weightage to forest cover in it's 'devolution formula,' which determines how states' share in tax revenue should be distributed. This is intended to **incentivize states to protect their forests rather than diverting** them for economic development, and is expected to result in an estimated **USD 7-12 bn** flowing to Indian states between 2015-2020.[4]

- **The Green India Mission** highlighted the need for Rs. 46,000 crore to increase tree cover on 5 mn ha and improve forest cover quality on another 5 mn ha. It had released 126 crore as of early 2017.[5]

Bilateral and multilateral finance

- **The UN Reducing Emissions from Deforestation and Forest Degradation (REDD+)** mechanism remains nascent in India, but may provide an important opportunity to raise finance for forests.[5]

- **Bilateral and multi lateral funding played a pivotal role in past land use programs,** including for strengthening livelihoods, decentralized natural resource governance, biodiversity conservation, watershed development, and forestry. Since 2003, however, much of this **funding has dwindled due to the Government of India's policy stance** against bilateral aid.[6]
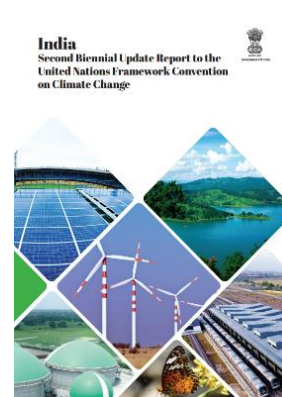
Ecologies of the Colonial Present
Environment & Planning E, 2019
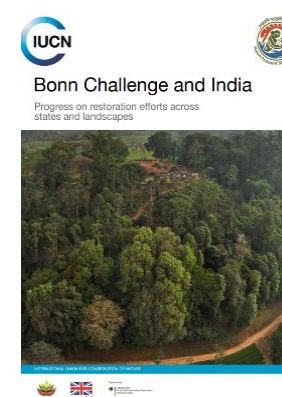

Creating a Sustainable Food Future
WRI, 2018

ZBNF for the SDGs
CEEW & SIFF, 2018

Second Biennial Update Report to the UNFCCC
Government of India, 2018

Restoration Atlas Technical Note
WRI, 2018

Bonn Challenge and India
IUCN & MOEFCC, 2018

People's Forest
Centre for Science and Environment, 2018
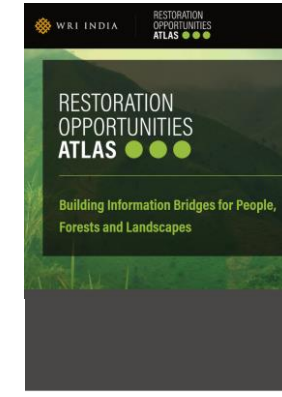
The Restoration Atlas
WRI, 2018
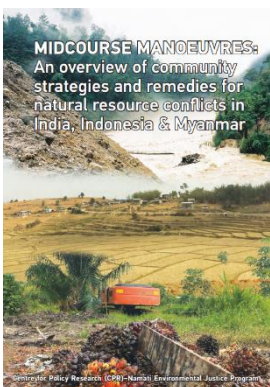
Midcourse Manoeuvres
Centre for Policy Research, 2018
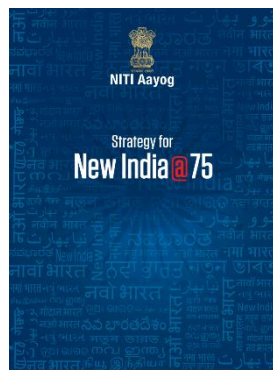
Strategy for New India @75
Niti Aayog, 2018

India State of Forest
Forest Survey of India, 2017
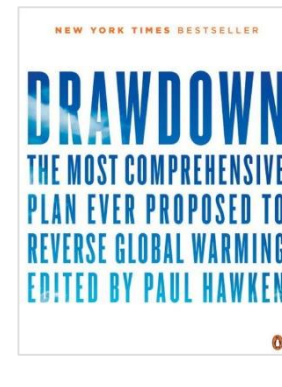
Drawdown
Penguin Books, 2017

Climate Benefits, Tenure Costs
WRI, 2016

India's Forest Federalism
Taylor & Francis Group, 2016
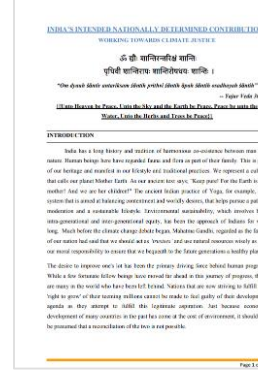
India's NDCs
MOEFCC, 2015
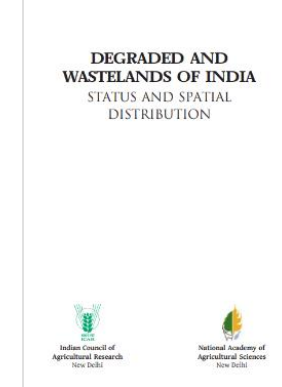
Degraded & Wastelands of India
ICAR, 2010

ANNEX 2: Speaker Biographies

Speaker biographies (1/9)

Dr. Rohini Chaturvedi, Senior Advisor, Tata Trusts; Senior Fellow of the Global EverGreening Alliance

Dr. Rohini Chaturvedi is a development professional with a keen interest in designing innovative, evidence-based land use strategies for achieving climate and development goals. She is an independent consultant focused on landscape restoration, tenure and resource rights, and conservation.

- For 15+ years, she has worked in natural resource management, conservation, and restoration, focusing on the politics of decision-making, strengthening institutions, and translating evidence to policy and practice
- She established and led a program on Sustainable Landscapes and Restoration for the World Resources Institute (WRI), in India. Her role here included strategy development, building partnerships and fundraising. At WRI, Chaturvedi led the development of a first of its kind Restoration Atlas for India as well as the MapTenure Platform for addressing tenurial insecurity in Central India
- A Gates Scholar, Chaturvedi holds a MPhil and PhD from the University of Cambridge, UK in the political ecology stream at the Department of Geography. Her doctoral dissertation focused on Forest Federalism in India. She is also a gold medalist from the Indian Institute of Forest Management, India

Vikram Gandhi, Founder, Asha Impact

Vikram Gandhi is the Founder of Asha Impact, an impact investing platform focused on critical development challenges facing India and other emerging economies. He is also a senior lecturer at Harvard Business School.

- He is the Founder and CEO of VSG Capital Advisors, which focuses on strategic, financial, and investment advisory services both in the private and social sectors
- He is the Board Chair of the Asian Regional Committee of Grameen Foundation, a Board Member of Jana Small Finance Bank, Social Finance India, and a member of the Investment Committee at Gawa Capital
- He was a Member of the Standing Council of Experts under the Ministry of Finance, Government of India. The Council helped in assessing the Indian financial sector and made recommendations for enhancing its international competitiveness. He is also a member of the Bretton Woods Committee, Washington DC, which promotes economic growth, reducing poverty and maintaining global financial stability
- Gandhi holds an MBA from the Harvard Business School where he was a Baker Scholar, and a B. Com with high distinction from the University of Mumbai. He is also a qualified Chartered Accountant

Anirban Ghosh, Chief Sustainability Officer, Mahindra Group

Anirban Ghosh is the Chief Sustainability Officer at the Mahindra Group.

- Under his leadership, Mahindra Group developed an award-winning Sustainability framework, become a founding member of the Carbon Pricing Leadership Coalition and the first to commit to doubling energy productivity

- He has, in partnership with the World Bank, facilitated the creation of the Sustainable Housing Leadership Consortium to accelerate the spread of green buildings in India

- Ghosh has been an invited speaker at COP21, The Climate Week, World Circular Economy Forum, GRI Global, EE Global, and was featured in The Climate Reality Project and acknowledged as a Distinguished Sustainability Officer

- He has a degree in marketing from IIM-Ahmedabad, and a Bachelors in Electrical Engineering from Jadavpur University

Gaurav Gupta, Asia Director & Partner, Dalberg

Gaurav Gupta is a Partner in Dalberg's Mumbai office and co-leads Dalberg's Energy and Environment practice. He works extensively on clean energy solutions at the base of the economic pyramid (BoP). He is an industry expert with 10+ years of experience in the energy and environment space, having led Dalberg's efforts in clean lighting, rural electrification, clean cooking and development of decentralized utilities.

- In India, Gupta sits on the Steering Committee of several clean energy investment funds including Acumen's Rural Energy portfolio. Gupta co-founded one of India's leading NGOs on climate change advocacy, The Climate Project India, with the help of Al Gore and Dr R.K Pachauri

- His deep on-the-ground perspective is combined with a strong commercial background, including entrepreneurial work establishing a string of successful social and environmental businesses, including in eco-tourism

- Gupta holds a BA in Philosophy, Politics and Economics from Oxford and an MA in Development Economics from Yale University. He attended the United World College of Hong Kong

Speaker biographies (3/9)

Dr. H. Harish Hande, Director, SELCO Solar

Harish Hande is a renewable energy entrepreneur with over 23 years of grassroots experience. He is the co-founder of SELCO Solar Light Pvt Ltd and is presently the CEO of SELCO Foundation.

- Under Hande's leadership, SELCO's interventions have impacted more than 500,000 poor households across six Indian states, focusing on innovation and ecosystem building. For this work, he was awarded the Magsaysay Award, 2011
- He has led a large number of health, education and water related projects, overseeing the installation of over 1500 irrigation and drinking water systems, and over 500 small rural and urban health clinics
- He IA the Chairman of board and is a senior advisor of S3IDF
- His work with SELCO has earned multiple national and international awards including the Zayed Future Energy Prize, 2018, Ashden Awards for Sustainable Energy, 2005-2007 and the Skoll Award for Social Entrepreneurship, 2018
- Hande is a graduate from the Indian Institute of Technology, Kharagpur. He earned his Masters and Ph.D. from University of Massachusetts

Shri Dinesh Kumar Jain, Chief Secretary, Chief Minister's Office, Government of Maharashtra

Shri D K Jain is Chief Secretary in the Maharashtra Chief Minister's office. His main focus as the Chief Secretary is to work towards the development of agriculture in Maharashtra.

- Previously, he was the Additional Chief Secretary of the Finance Department and has been credited with streamlining the finance of the state and controlling the debt of the state
- He has served in key posts in various central departments including agriculture, IT, rural development, and employment guarantee scheme
- He served in the United Nations Industrial Development Organization, New Delhi, as national programme director
- He has an M Tech in Mechanical Engineering and MBA in Overseas Projects

Speaker biographies (4/9)

Stephanie Jones, Programme Manager, Energy Programme, Good Energies Foundation

Stephanie Jones is responsible for Good Energies' Energy Portfolio, which supports energy access efforts to mitigate climate change and promote development. Her work focuses on market-based support interventions in India and Sub-Saharan Africa.

- She previously worked for the Consortium for Energy Efficiency, developing strategies for efficiency programmes in North America
- Jones studied Ecology and Evolutionary Biology at Princeton University and holds a Master of Environmental Management from the Yale School of Forestry and Environmental Studies

Kanchi Kohli, Legal Researcher, Centre for Policy Research

Kanchi Kohli is a researcher working on environment, forest and biodiversity governance in India. Her work explores the links between law, industrialization and environment justice. In addition to her independent work, Kanchi is senior legal advisor to the Centre for Policy Research (CPR)-Namati Environment Justice Program.

- Since 2004, Kohli also co-coordinates an Information Dissemination Service for forest and wildlife cases in the Supreme Court of India
- She has in teams and individually authored several publications, including the book *Business Interest and the Environmental Crisis* published by SAGE and a three-country research study, *Midcourse Manoeuvers: Community Strategies and Remedies for Natural Resource Conflicts*
- She regularly teaches at university law schools in India on subjects related to biodiversity, environment, and community development
- Kohli holds a Bachelors in Sociology from Hindu College, Delhi University and an M.A. Social Work (postgraduate) from Tata Institute of Social Sciences, Mumbai. She was also awarded the Fulbright scholarship in 2012

Speaker biographies (5/9)

Manoj Kumar, Director, Naandi Foundation

As the Founding CEO of Naandi Foundation, Kumar created a sustainable model of outsourcing government programs and demonstrating successful large-scale implementation with efficiency and outcomes.

- Under Kumar's leadership, Naandi also established a large footprint in the area of Sustainable Agriculture and Small Farmer Livelihoods. Two decades of engagement in the hilly Araku region transformed lives of 100,000 Adivasi farmer . It has made the eco-fragile Araku region famous for world-class coffee as an organic agriculture hub spread across 1500 square kilometers, planting a functional forest of 20 million trees and 10 million coffee trees
- He is also the co-founder and director of Naandi Community Water Service Private Limited, the country's most impactful Safe Drinking Water Social business which is a joint venture with the Paris headquartered Danone
- A Robert S McNamara Fellow of the World Bank, Kumar has also worked in banking and microfinance. He is a John P McNulty Laureate, Moderator & Fellow of the Aspen Institute and CSR Advisor to the Mahindra Group
- Kumar holds a Masters in Economics from the Kariavattom affiliate of University of Kerala

Shloka Nath, Interim Director, India Climate Collaborative; Head, Sustainability & Special Projects, Tata Trusts

Shloka Nath is the Interim Director of the India Climate Collaborative and Head of Sustainability and Special Projects at the Tata Trusts. In this role, Shloka leads the Tata Trusts' climate, energy and environment work, implementing and funding sustainable and scalable solutions that help both people and nature thrive through India.

- Nath co-founded and was Managing Partner of the Sankhya Women Impact Funds, India's first women's investor fund, that focused on early stage enterprises impacting women. She is also an active angel investor in social enterprises and has mentored organisations across sectors
- She has spent over a decade in print and broadcast journalism with the BBC in London, New Delhi Television, and Forbes with a special emphasis on sustainability and financial inclusion. In 2010, Shloka was nominated for India's highest awards in journalism for her reportage on microfinance in India. She is also the author of a book on Wildlife in India
- She served as Campaign Manager for Meera Sanyal, the Aam Aadmi Party (AAP) candidate for Mumbai (South) in India's General Elections
- Nath has a Masters in Public Policy from Harvard's Kennedy School of Government and a BSc in Government from The London School of Economics and Political Science

Speaker biographies (6/9)

Roopa Purushothaman, Chief Economist & Head, Policy Advocacy, Tata Sons Limited

Roopa Purushothaman is the Chief Economist & Head, Policy Advocacy, Tata Sons Limited.

- Purushothaman has held leadership positions from Goldman Sachs to Everstone Capital Advisors, and is widely recognized for her path breaking research on BRIC countries
- She is also the founder of Avasara Leadership Institute, a non-profit educational institution focusing on accelerating academic and leadership outcomes for high potential adolescent girls in India
- Purushothaman is a graduate of Yale University and holds a post graduate degree from the London School of Economics

Shri Jairam Ramesh, Member of Parliament, Former Minister of Environment and Forest

Jairam Ramesh is a well-known economist, government official, and senior pioneer of the Indian National Congress. He is a Member of Parliament representing Andhra Pradesh state, a position he has held since June 2004.

- In 2011, Ramesh was elevated to the Union Council of Ministers of India and appointed Minister of Rural Development and Minister of the new Ministry of Drinking Water and Sanitation
- He has been a columnist for The Business Standard, Business Today, The Telegraph, The Times and India Today. He is also the author of the following books: 'Making Sense of Chindia: Reflections on China and India' (2005), foreword by Strobe Talbott, 'Mobilizing Technology for World Development' (Co-editor, 1979), 'To the Brink and Back: India's 1991 Story' (2015), Green Signals: Ecology, Growth, and Democracy in India (2015), 'Old History, New Geography' (2016), and Intertwined Lives: P.N. Haksar and Indira Gandhi (2018)
- He has received the Distinguished Alumnus Award from IIT-Bombay, and is an Honorary Fellow of the Institute of Chinese Studies, New Delhi since 2002
- He received a Master of Science in Public Policy and Public Management, Carnegie Mellon University. He is also the founding member of Indian School of Business, Hyderabad

Jagdeesh Rao, Chief Executive, Foundation for Ecological Security

Jagdeesh is the Chief Executive of the Foundation for Ecological Security (FES). FES works with culturally diverse communities in varied ecological settings across the country to conserve and better govern their natural surroundings, and commons in particular.

- Rao began his professional life in 1986 working with rural communities in the semi-arid tracts of Andhra Pradesh
- After handling critical functions to build a learning team of practitioners and strategic visioning of the organisation, Rao has been the Chief Executive of FES since 2001. FES has gained recognition not only as a sound practitioner organisation but also for its strengths in enhancing the capacities of village functionaries, other NGOs and government bodies and improving the rigour of field action through action research and use of GIS and IT tools
- He has been conferred the 'Skoll Award for Social Entrepreneurship' and is also a Henry Arnhold Conservation (Mulago) fellow
- A graduate in Agricultural Sciences, he completed his post-graduate degree in Rural Management from the Institute of Rural Management, Anand, India and a degree in Forestry for Rural Development from the International Institute for Aerospace Survey and Earth Sciences, Netherlands

## Dr. Walt Reid, Director, Conservation and Science Program, Packard Foundation

Dr. Walt Reid joined the Foundation in 2006 and is the director of the Conservation and Science Program. Prior to joining the Foundation, he was a consulting professor with the Institute for the Environment at Stanford University.

- He was responsible for the creation of the Millennium Ecosystem Assessment, which he directed from 1998 until its findings were released in 2005. From 1992-1998, he was vice president of the World Resources Institute
- Reid is a member (and past Chair) of the Board of the Climate and Land Use Alliance and a member of the Broad of Editors of Ecosystems. He previously was a member of: the Biodiversity and Ecosystem Services working group of the President's Council of Advisors on Science and Technology (PCAST); the Board of "The Economics of Ecosystems and Biodiversity" (TEEB) project; the governing committee of the Policy and Global Affairs Division of the National Research Council; the Board of the Society for Conservation Biology; and the Board of Editors of Ecological Applications and PLOS-Biology
- He earned his Ph.D. in zoology (ecology and evolutionary biology) from the University of Washington in 1987 and his B.A. in zoology from the University of California at Berkeley in 1978

P. Sainath, Journalist (Photo exhibition)
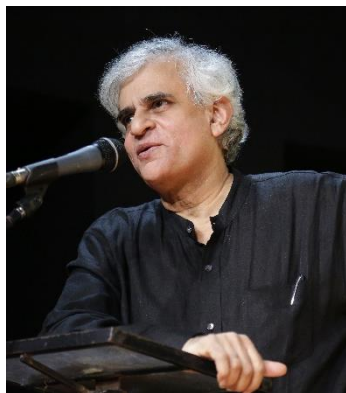
P. Sainath has been a full-time rural reporter since 1993 and spends, on average, 270 days a year in India's poorest regions writing for major Indian newspapers such as The Times of India and The Hindu, of which he was Rural Editor for a decade. He is best known for reporting on farmer suicides in India's ongoing agrarian crisis, which became the subject of the documentary "Nero's Guests."

- As India's mostly highly-awarded journalist, including over 50 national and international awards such as the Magsaysay Prize (often referred to as the 'Asian Nobel.'), Sainath is also known for the awards he has turned down, including the Padma Bhushan, which he declined saying "Journalists should never accept prizes and rewards from the governments they cover and critique"
- His book *Everybody Loves A Good Drought* was declared a Penguin Classic in 2013 and remains Penguin India's highest selling non-fiction volume on a subject like poverty and deprivation. All royalties of the book are awarded in prizes to rural reporters writing in Indian languages
- Sainath was McGraw Professor of Writing at Princeton University and has taught journalism for 30 years at the Sophia Polytechnic, Mumbai and at the Asian College of Journalism, Chennai, since it launched in year 2000
- In 2014, Sainath launched a independent multimedia digital platform, The People's Archive of Rural India (PARI), which is a free digital textbook publishing in 12 languages across many subjects for students in high schools, colleges and universities

Dr. Mihir Shah, Distinguished Visiting Professor, Shiv Nadar University

Dr. Mihir Shah was Member, Planning Commission, Government of India (2009-2014), holding the portfolios of Water Resources, Rural Development and Panchayati Raj. He was responsible for drafting the paradigm shift in the management of water resources enunciated in the 12th Five Year Plan. He also initiated a makeover of MGNREGA.

- In 2015, he chaired the Committee on Restructuring the Central Water Commission and Central Ground Water Board, as well as a Committee to draft the National Water Framework Law and the Model Groundwater Bill. He is a Founding Signatory of the Geneva Actions on Human Water Security, 2017
- He founded the Samaj Pragati Sahayog (SPS), one of the largest grass-roots initiatives for water and livelihood security, working with its partners on a million acres of land across 72 of India's most backward districts
- He designed a first-of-its-kind masters program on Water Science and Policy at Shiv Nadar University and is a Visiting Professor at Ashoka University.
- He studied Economics at St. Stephen's College (winner of KC Nag Economics Prize), and did his post-graduation from the Delhi School of Economics, completing his dissertation at the Centre for Development Studies, Kerala

Speaker biographies (9/9)

Shri. Krishna Kumar Singh, Former Member, Madhya Pradesh Legislative Assembly

Krishna Kumar Singh is a former legislator from Madhya Pradesh (MP), with a deep interest in forestry, tenure, conservation and ecotourism. As a legislator, he championed a first of its kind legislation called Madhya Pradesh Lok Vaniki Adhiniyam 2001 for sustainable management of private forests in the state.

- He continues to chair the MP Lok Vaniki Kisan Samiti organization of farmers who own private forests. He has worked to develop forest certification standards and facilitated FSC certification for 50 smallholder forest owners
- Singh served on the MP State Wildlife Board and was a member of the Bansal Committee set up by the Ministry of Environment and Forests, Government of India, to recommend policy and institutional changes on agroforestry
- He has been a vocal advocate for resolution of the Orange Areas land dispute in MP and Chhattisgarh, which affects over 1.5 million largely tribal households. A pioneer on eco-tourism in India, Singh set up the country's first privately owned wildlife camp in India in 1980. He has since been involved with policymaking on eco-tourism at state level, including as Chairman of the Tourism Council for Madhya Pradesh of the CII and Member of a Committee to address overcrowding of National Parks and Sanctuaries in Madhya Pradesh
- Singh holds a masters from the National College of Agricultural Engineering in Silsoe, UK

R. Venkataramanan, Managing Trustee, Tata Trusts

R Venkataramanan (Venkat) is the Managing Trustee of the Sir Dorabji Tata Trust and is responsible for management and oversight of all the Tata Trusts.

- He has over 20 years business and operations experience in the areas of finance, business support and strategy
- Venkat was previously Head of Business Support at the Qatar Foundation, a non-profit based in Doha. He had also worked in Videsh Sanchar Nigam Limited, Mumbai (VSNL), now known as Tata Communications and the Gujarat State Finance Corporation based in Ahmedabad
- Venkat is a science graduate and has done his MBA from the Sri Satya Sai University. He is also a law graduate from Mumbai University and has completed his Advance Management Program (AMP) from the Harvard Business School