

Policy

WATCH

Volume IX, Issue 4
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Environment, Natural Resources and Sustainability

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Editorial

The Rajiv Gandhi Institute for Contemporary Studies (RGICS) works on five themes:

1. Constitutional Values and Democratic Institutions
2. Growth with Employment
3. Governance and Development
4. Environment, Natural Resources and Sustainability
5. India's Place in the World.

Under the Environment, Natural Resources and Sustainability theme, there are three sub-themes:

- a) Water, Forests and Land (Jal, Jangal, Jameen)
- b) Climate change and India's response
- c) Environment and Pollution

In each theme/sub-themes, work is done under three modalities:

- Policy Observatory - A continuous watch of events, policy pronouncements and developments on each topic, with highlights published under Policy Watch.
- Policy Repertory - Working Papers as well as Research Reports by RGICS Fellows and Occasional Papers, by invited outside experts
- Policy Laboratory - action research projects, to the extent possible.

Our last Policy Watch issue in March 2020 observed the contemporary issue of impact on growth and employment of the Covid-19 pandemic. The first article was triggered by a discussion between Dr Chris Beyrer, Professor of epidemiology at the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland, in the United States, and RGICS Director, Mr Vijay Mahajan. Later, Ms Sahibpreet Kaur, Research Associate, RGICS, analyzed the available literature on relationship between zoonosis and biodiversity. The article attempts to focus on how loss of biodiversity resulted into transmission of various viruses from a wildlife reservoir including Covid-19.

The second article continues with the theme of what caused the COVID Pandemic. Apart from a brief videos on the topic What caused COVID - Environmental Destruction by us Humans ! (https://youtu.be/kFA4m3_ZICA) we carry a report of a presentation by David Albert and David Willis, two Gandhian Environmentalists, on 'Climate Change and Water Crisis' organized by RGICS and Khudai Khidmatgar in February 2020, by Sahibpreet and Jeet Singh. A detailed video of the full presentation is also available at <https://youtu.be/hZQJsbaeENG>

The third article is by Steve Lockett of the Mahseer Trust from United Kingdom (<https://www.mahseertrust.org/>) whose motto is "Because rivers need fish and people need rivers. The article focuses on challenges to biodiversity due to invasive fishes in India. The article also highlighted few policy gaps in India responsible for introduction of invasive fishes.

The fourth article by Arnab Bose and Jeet Singh assesses the implementation of Forest Rights Act, 2006 in Chhattisgarh. This article focuses on success, limitation and hindrances at national and state level to implement the Forest Rights Act.

The final article by Mr Vijay Mahajan, Director, RGICS and Jeet Singh, Fellow, RGICS deals with the jobs and income crisis for a large number of workers in rural areas, already underemployed and those who have migrated back to their villages due to Covid-19 pandemic. The article provides suggestions on how to utilize that workforce and situation by employing them on MGNREGA works aimed at regeneration of natural resources – jal, jangal, jameen (water, forests and land) and also to combat adverse impact of climate change. Thus it is a single strategy for addressing both the goals.

We hope the readers find the articles interesting and Policy Makers use some of the lessons to design better policies and programs with people's participation.

**Vijay Mahajan, Director,
Rajiv Gandhi Institute for Contemporary Studies**





Biodiversity Loss and Emergence of Infectious Diseases

Sahibpreet Kaur, Research Associate, RGICS

Editor's Note: In an informal Zoom conversation in the first week of April 2020, the Editor learned from his fellow Rockefeller Bellagio Centre Resident, Dr Chris Breyer, Professor of Epidemiology at the Johns Hopkins University, USA, that there has been extensive literature in the public domain, some as far back as 20 years ago, warning of wild-life habitat destruction by humans leading to overcrowding of earlier distinct species, leading to viruses crossing over from one specie to another. For example there are 1400 species of bats and they earlier tended to hibernate in their own colonies, one specie at a time. But due to habitat destruction, different bat species started hibernating together and this led viruses to crossover from one bat specie to another. Once they survived that jump, they these viruses were able to jump to non-bat species like pangolins. After that it was a matter of time till some of these viruses crossed over to humans.

The titles of the first two references in the article below summarise it all. The first one's (Bell, et al. 2004), title is "Animal origins of SARS coronavirus: Possible links with the international trade in small carnivores." The second article's (Carrasco-Hernandez, 2017) title is even closer to COVID's cause: "Are RNA Viruses Candidate Agents for the Next Global Pandemic? A Review". The fact that this was well known to professionals in the public health field and indeed to higher authorities raises questions about how responsive is our public policy to a possible threat, with low probability but high impact. The article below by Sahibpreet Kaur goes into the details and also covers some recommendations of experts.

The emergence of the current global pandemic caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) or COVID-19 has brought the attention to the role of biodiversity in the spread of infectious diseases. The COVID-19 is a zoonotic disease, which is speculated to have crossed over to humans from bats in a wet market, where wild meat is traded in Wuhan, China in late 2019. The present COVID-19 is genetically similar to the Severe Acute Respiratory Coronavirus (SARS-CoV) epidemic of 2003 which spread to 26 countries and infected patients with similar symptoms. Both viruses are suspected to be bat-borne viruses which spread to humans via an intermediate animal reservoir, suspected to be pangolins in the case of COVID-19, although this is disputed.

The present pandemic is caused by a single strand RNA virus, originated from a wildlife reservoir, a characteristic which it shares with all recent epidemics in the past century such as the Human Immunodeficiency Virus (HIV), H1N1 influenza, the highly pathogenic H5N1 avian influenza

Nipah, Hendra, the Severe Acute Respiratory Syndrome Coronavirus and the recent Ebola virus (Feldmann 2014; Jones et al. 2008; Joseph et al. 2016). In fact, it has been estimated by the US Centre for Disease Control and Prevention that three quarters of the new and emerging infectious diseases in humans originated from 'non-human' animals. The increasing interaction with wildlife which was earlier isolated from humans due to deforestation, urban and agricultural expansion and land use change has brought upon a greater risk of transmission of unknown parasites.

Various studies have been conducted on the link between biodiversity loss and emergence of infectious diseases, establishing the importance of biodiversity in reducing the risk of infectious diseases from transmitting to humans. A study by Keesing and others (2006) states that biodiversity can buffer disease transmission by certain mechanisms- the population density of important natural reservoirs for pathogens can be reduced in high biodiversity; the population of arthropod vectors is reduced and, encounter rates between vectors and reservoirs or among reservoirs would be lesser in an region of higher biodiversity. This phenomenon of high diversity reducing disease risk is known as the dilution effect. A study by Ostfeld (2009) establishes the occurrence of dilution effect by taking the case studies of two zoonotic diseases- the Lyme disease and the West Nile virus (WNV).



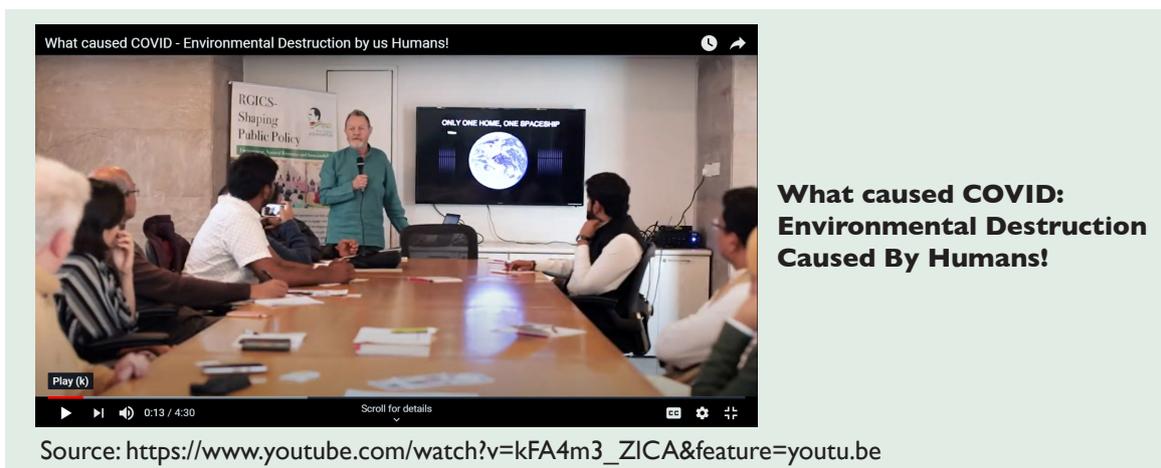
The samples from North Eastern USA on ticks occurring in high vertebrate diversity communities and low vertebrate diversity communities supported the hypothesis that high vertebrate diversity is linked to lesser incidence of Lyme disease outbreak in humans. In the case of WNV, predominant vectors are *Culex* mosquitoes and major reservoirs are passerine birds. The study hypothesized that mosquitoes found in areas of high avian diversity would be less likely to have blood meal on a competent reservoir of WNV whereas mosquitoes occurring in habitats of low avian diversity

would be more likely to get infected from a bloodmeal on a competent reservoir of the WNV. The data collected from all counties of continental USA where the WNV outbreak occurred, showed a strong negative correlation between WNV incidence in humans and bird diversity in those counties, upholding the dilution effect hypothesis.

Biotic homogenisation is also linked to increasing incidence of infectious diseases. Globalization has led to the transfer of exotic organisms from their native habitats to newer ones. These species can often be invasive and outcompete the local taxa causing a reduction in diversity of species leading to biotic homogenisation. Malaria, an infectious disease transmitted by the female anopheles mosquito, continues to infect millions in Africa and India every year. Studies have shown the impact of ecology on the mosquito. According to Yasuoka and Levins (2007), mosquito survival, density and distribution is greatly impacted by changes in plant diversity, especially through deforestation, fragmentation and habitat alteration and this may increase the risk of malaria transmission. Disease transmission is also impacted by land use change as according to a study by Walsh et al. (1993) the risk of malaria can increase with land use changes that can lead to the migration of people who are not immune to the disease, arrival of competent vectors and adaptation of vectors to newly created niches.

A study by Vittor and colleagues (2006) in Amazonian Peru showed the impact of deforestation on malarial incidence. Anopheles darlingi, the most efficient vector of malaria in the region was found in higher densities in deforested sites as compared to forested areas. The Hantavirus Pulmonary Syndrome (HPS), is caused by hantaviruses which are found in Europe, Asia and the Americas, is transmitted via rodents, with each virus species carried by a specific rodent host. A study by Ruedas and colleagues (2004) in South-eastern Panama showed that periods of unusually high rainfall and anthropogenic activities that lead to decline in biodiversity could increase the occurrence of HPS outbreaks. Other studies have also shown that in more diverse communities, with the presence of other rodent species, the hantavirus transmissions are lowered (Peixoto and Abramson, 2006; Suzan et al; 2009). In the case of WNV, a study in the Gulf Coast of Louisiana by Ezenwa et al. (2007) showed that as wetlands declined, the prevalence of WNV mosquitoes grew. As the wetlands declined, the bird composition of the area also changed, making way for more passerine birds that carry the virus. Thus, any changes in the biodiversity of an area can greatly impact the spread of viruses.

A macro study on the outbreaks of infectious diseases in Asia-Pacific by Morand et al (2014) suggested that while on one hand the region is a biodiversity hotspot from which more than a few infectious diseases emerged such as the Nipah virus, new cholera and dengue variants, on the other hand, the loss of biodiversity has further increased the number of outbreaks of infectious diseases. Thus, preserving biodiversity may moderate the spread of infectious diseases by containing pathogens and limiting interaction with humans.



Wildlife markets have emerged to be a major hotspot for spreading viruses as per the outbreak of SARS-CoV and the present COVID-19. It is suspected that the COVID-19 is a bat-borne virus. The genome of the COVID-19 virus has been found 96% identical to the virus RaTG13 which is carried by the intermediate horseshow bat as per a study published in Nature Medicine. However, it is not clear how the virus jumped to humans. Since wet markets host a number of different wild animals, in unsanitary conditions, which come in contact with each other and humans, the virus may have jumped hosts and crossed over to humans. It is suspected the same may have been carried over by pangolins who carry viruses with similar binding sequences to those in humans. Pangolins are one of the world's most trafficked mammals as their meat is consumed in many south-east Asian countries and their scales which are used in Chinese traditional medicines (Marshall 2020).

The international wildlife trade was also in part responsible for spreading SARS-CoV which emerged in China, to Vietnam and Laos (Bell et al. 2004; Grotzinger et al. 2016). While wild meat consumption has been in practice in many communities living close to forests, wild meat capture took momentum as international trade commenced. The demand of wild animals is not just for meat but also for traditional medicinal purposes. Grotzinger et al (2016) in their study in markets in Laos noted certain risk factors like wildlife-human contact, trade of animals carrying potential zoonotic diseases, poor biosafety and potential of diseases to spread from markets to wider population. Wildlife markets thus, could have the potential to be spaces of future epidemic outbreaks as well and need to be regulated to prevent over exploitation and limit contact between humans and disease-causing pathogens. COVID-19 is speculated to have started spreading from a wet market in Wuhan which was shut by the Chinese authorities as the virus spread rapidly in mainland China. However, as the situation came under control, the same market the virus seems to have spread from is open again.

Preventive Measures

The present pandemic has brought the world to a standstill and has had a huge impact on all major world economies. Unexpectedly, the marginalized and poor have been hit the hardest. The pandemic has made one and all introspect on the way the world functions. The SARS-CoV 2 has shown the negative impact of a globalized world, where an infectious disease starting from a market in Wuhan has spread to 126 countries within a few months, bringing almost all economic activity to a halt, with the most deleterious impact on so called developed nations. The present pandemic is not the first or last and many such infectious diseases are expected. However, the rate at which these diseases spread and affect human life have worsened as they travel faster and wider.

As stated, many of these infectious diseases emerge from our interactions with biodiversity. Anthropogenic activities such as deforestation, monoculture cultivation, migration, urban expansion and overfishing have brought pathogens closer to spaces where they can spread as infectious diseases. Pongsiri and colleagues (2009) note how global disease ecology is being driven by biodiversity loss and stress on the need for acknowledging the impact of biodiversity loss on human health while implementing policies. Below are some preventive measures in this regard-

Preservation of Biodiversity

With mounting evidence on the role of biodiversity and spread of zoonotic diseases, conservation policies need to be strengthened to avoid the risk of newer infections spilling over to humans. Global demand for resources such as minerals, wood, and clearing of forests for agriculture and cattle ranching

lead to ecological disruption and degradation of landscapes. Importance of preserving ecosystems in order to prevent the spread of zoonosis should be made a priority in national targets for the Convention of Biodiversity and part of the Sustainable Development Goals. Ecological restoration of degraded landscapes can also help in increasing biodiversity and prevention of certain diseases. Control of invasive species is also crucial in this aspect as their spread can lead to homogenization reducing diversity in the ecosystem.

Land Use Policy to Limit Interaction

Certain types of land use changes such as habitat alteration and human settlements can affect the distribution and abundance of important vector species differently. Understanding this pattern can help in recognizing landscape features and human activities such as resource extraction and outdoor recreation, that may predict risk of diseases (ibid). Land use policies should be designed to minimize interaction of important vectors and humans. For instance, in the case of Lyme disease, large forested areas could be protected in the vicinity of residential areas to reduce risk. Spatial aggregation to cluster settlements in non-forested areas and maintain contiguous forests could reduce risk of diseases that spread from small fragmented forests.

Regulation of Wet Markets and Wild Meat Consumption

Since wild meat forms an important part of people's diets and the wet markets in several countries like China, Laos, and several African countries cater to livelihood and food security of many, they need to be handled in a sensitive manner. Biosafety equipment should be made available in these markets to ensure a safe and sanitized environment. People involved in the hunt, trade and consumption of such meat such be made aware of the potential risk of zoonosis. Certain meats such as bats and rodents should be banned as research has shown they are huge reservoir hosts for various viruses as compared to other host species (Luis et al 2013; Shea et al. 2014). International trade should be discouraged as it can lead to spread of zoonosis and moreover reduces the abundance of those animals from the ecosystem, causing greater repercussions on the food web and diversity.



Behavioural Change

The prevention of infectious diseases originating from the wild also requires behavioural change of communities that reside close to buffer areas. Along with landscaping, efforts at a smaller scale such as building closed wells to prevent breeding of mosquitoes. Environmental based strategies such as applying bio controls may also help reduce risk in vector breeding sites. Biocontrols can be used specific to local ecology and can prove sustainable and cost-effective against some vectors. The dengue transmitting *Aedes aegypti* mosquito has been brought under control by using predatory fish as biological controls in Australian wells (Russell et al. 1996). In Nicaragua, China and Cameroon, incidence of malaria has been reduced with the application of the bacteria *Bacillus thuringiensis* and *Bacillus sphaericus* (Sutherst 2004).

People's use of natural areas and how their activities may expose them to disease carrying vectors should be understood to guide policies for behavioural change. Reducing access and dependence on such areas by providing substitute resources and alternate livelihoods may help in lowering risk of infections.

Economic and Political Policies for Epidemic Preparedness

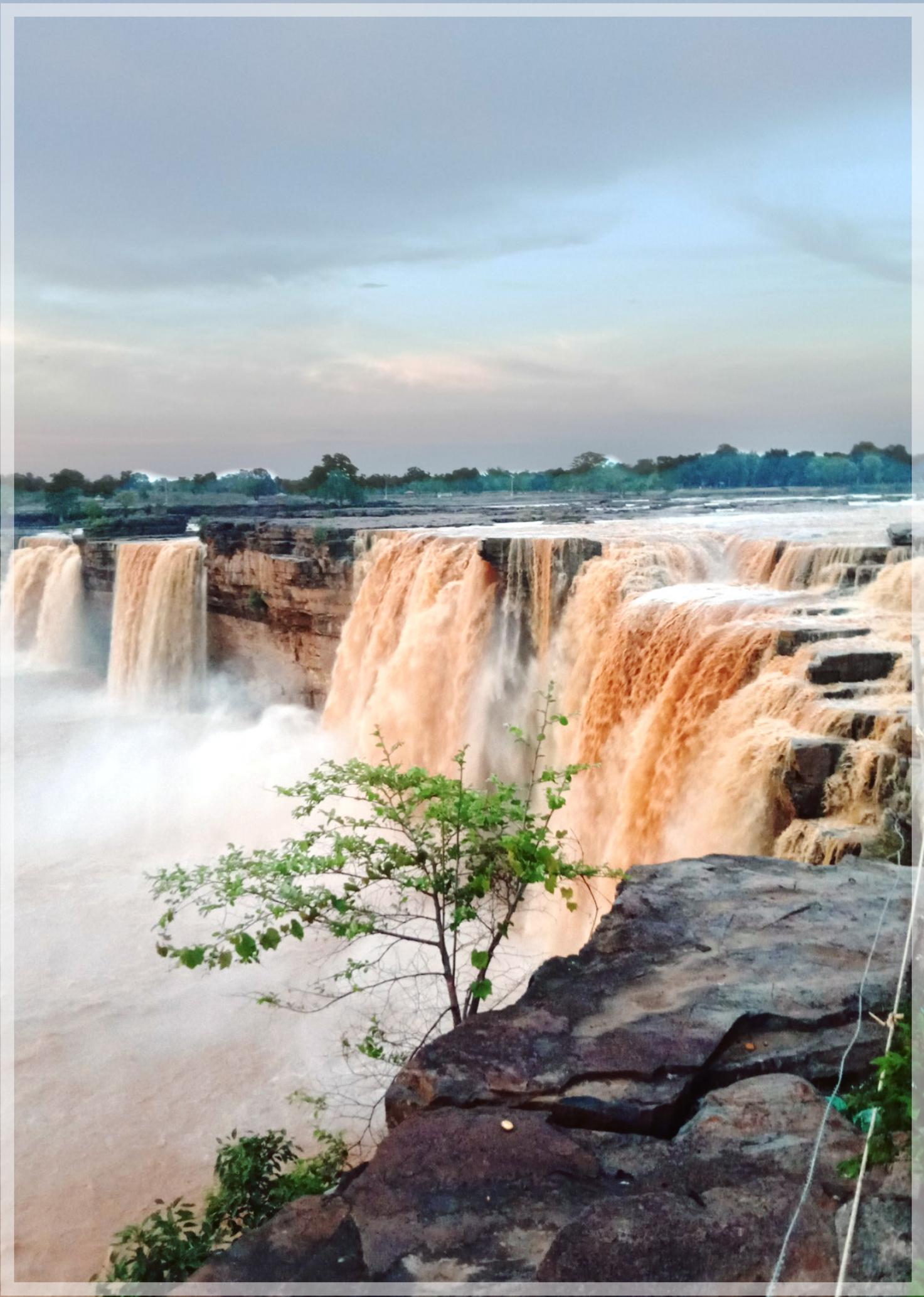
While there is ongoing scientific effort on prevention control of zoonotic diseases, there is a need of simultaneous economic and political action in the same regard. Hotez (2017) suggest setting up a global fund, such as the Coalition for Epidemic Preparedness Innovations, alongside national funds from wealthy countries (G20 nations), to ensure that there is adequate funding for timely action and pharmaceutical response.

Development policies must consider the impact of human activities on biodiversity. The increasingly complex ways in which humans, domestic animals and wildlife intermingle has led to the emergence of highly infectious diseases which have cost millions of lives and multitudes of resources. The pandemic caused by COVID-19 has spread in an unprecedented manner and impacted lives unlike before and has reiterated the importance of conserving biodiversity and practising preventive measures on spreading of zoonotic diseases.

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Climate Change and Water Crisis

Jeet Singh and Sahibpreet Kaur

Introduction

The protection of environment, revitalization of natural resources and sustainability related policy issues have been part of our work at Rajiv Gandhi Institute for Contemporary Studies (RGICS). The 'Environment, Natural Resources and Sustainability' theme of RGICS has been engaged on key national and state level policies related to environment and natural resources such as water, forest and land. In last two years, it has commissioned research studies, working paper, case studies and policy dialogues at various levels to explore advocate and pursue more ecologically sustainable solutions. Water resources has been one of the important subjects of policy work of RGICS in the last two years. Our work on water resources attempts to explore policy solutions to addresses brewing acute water crisis all across the country, changing climate leading to extreme weather events such as drought, heavy rain & floods, global warming and assimilation of modern science, innovation and traditional wisdom of communities. Our activities range from stakeholder consultations to policy analysis. We strongly believe that policy making should be inspired and informed by what is happening on the ground. Therefore, we organize consultations involving all kinds of stakeholders to enrich policy discussion, research and advocacy. The panel discussion on 'Climate Change and Water Crisis' organized in collaboration with 'Khudai Khidmatgar' is one such event.

The panel discussion organized on February 21, 2020 was steered by two USA based Gandhian scholar and practitioners. The first discussant was Prof. David Willis from Fielding Graduate University. He contextualized the global water crisis and touched upon broad global policy solutions. The second discussant was Mr. David H. Albert, Global Chairman of 'Friendly Water for the World'. He elaborated on grass root water solutions to address issues of malnutrition, mortality, morbidity and livelihood. He explained the above water and community deprivation nexus by illustrating his work in villages of India and various other African countries. The attempt of the discussion was to link grass root solutions with policy requirement. The discussion was moderated by Mr. Vijay Mahajan, Director of Rajiv Gandhi Institute for Contemporary Studies.

Climate Crisis, Water and Transformational Leadership

Prof David Willis from Fielding Graduate University initiated the discussion by speaking on global water crises due to rapidly changing climate. In his discussion, he also suggested way forward to resolve this huge crisis by promoting transformational leadership. Prof. Willis teaches anthropology and education at the Fielding Graduate University in USA. He has spent a considerable part of his life living in traditional cultural systems in Japan and India which researched and written on transformational

leadership and education, human development in transnational contexts, the Creolization of cultures, comparative education, citizenship, transcultural communities, transnational diaspora, transformative adult education, and Dalit/Gandhian liberation movements in South India. He is often identified as a Gandhian and is associated with the Friendly Water for the world and presented on Climate Crisis, Water and Transformational Leadership: Lessons from India. His deliberation has been summarized as follows:



Prof. David Willis presenting on Climate change, water crisis and transformational leadership

Impact of Climate Change

There is enough evidence to show that we are in the age of Anthropocene- the epoch when Earth's geological and ecosystems are immensely impacted by human action, or rather the age of Capitalocene- one dominated by capitalism. He states we only have one planet, the consciousness of whom we visualized for the first time in 1968. This is the only spaceship we have and he emphasizes on the urgency for constructive action.

Dramatic changes in temperature in the last 50 years has led to changes around the world- in Northern areas where glaciers are melting freshwater into oceans, sea levels are rising with an expected rise of 132 cm in 30 years compromising cities like Mumbai, Kolkata and large parts of Bangladesh in the Indian subcontinent. Climatic events like flooding, cyclones have gotten stronger. In Japan, there is a term for heavy rain in a short period of time causing heavy floods "guerilla rainstorm". Within the India, the super charging in the Indian Ocean has caused a variability in rainfall patterns leading to unseasonal showers as well as flash floods in many regions. Grass is growing around the Mount Everest, a place always seen as unlikely for primary succession.

Biodiversity has been greatly impacted with half of the birds and three quarters of the insects in Germany reported by scientists as gone in 1990. Countless mammals, insects and birds are in danger of extinction worldwide. According to the IUCN, 28,000 species worldwide are facing extinction.

As of 2015 in the US, number of bees and other pollinating insects has dropped to half of what the number of hives was in 1998.

The issues of global warming, he notes are systems issues, complex systems issues that cannot be understood or solved with a binary or linear view. These are intertwined deeply with other issues and require action at various levels.

He juxtaposes the example of flights in the world along with the endangered biodiversity to establish the complexity of the climate crisis. The number of commercial flights in India is 6300 and the same in the US is 42,000 per day. In the world 100,000 flights take off every day. Including the military and private flights, we a total of 50 million flights take off each year. Unsurprisingly contributing to a global crisis.

A second existential crisis that we have is of nuclear weapons and much is being to make a shift away from them. The doomsday clock is closer to midnight than it has ever been- it is 100 seconds away from midnight. In the 1990's the clock was 17 minutes away from midnight so what has happened in the past 20 years or so, that we are so much closer to the doomsday and what are we doing about it?

Transformational Leadership for addressing the looming crisis

This is where the role of transformational leaders comes into play. Prof Willis reminds us of one of the youngest climate activists, Greta Thunberg from Sweden and her resounding quote "we will be watching". American Indians believe that one must look seven generations back and seven generations forward when considering any decision or plan, reflecting a sustainable way of making decisions. The three-legged stool of sustainability is based on social welfare, economic stability and environmental health. How do we aim for all these three? One way to do so is by back casting. Imagine a positive, optimistic future, and back casting- coming back to today and what do we need to do today to attain that future tomorrow?

This would mean stopping the extraction of fossil fuels from the Earth. Reducing waste created by society, especially food waste- an extreme amount of effort and input goes into producing food, but in the US, Prof Willis informs, half of the food produced is wasted. Similarly, water, a fundamental need for our life, is threatened by climate change and our own non judicious use as well as pollution. The access to water especially in terms of quantity and quality is going to be a huge issue in the coming years and has already become one in some parts of the world as also witnessed in the summer of 2019 in Chennai.

In this regard, constructive work is being done by the organization Friendly Water of the World who are working towards the need of clean drinking water for healthy communities. The organization has been working in several states in India with a training facility in Gandhi Gram, Tamil Nadu. Younger leaders who work for the community with empathy and a sense of camaraderie are needed. And along with innovation, they must appreciate the wisdom of the past.

The organization is working in collaboration with Mrs Krishnamala Jagannathan, a Padmabhushan awardee who was also awarded the Right to Livelihood award in 2019.

Prof Willis also alludes to the various women led struggles in India as examples of transformational leadership.

In America- Dolores Huerta- American labor and civil rights activist and head of the United Farm Workers is a great example of such leadership. In the Strike against grapes she, along with Cesar Chavez, came up with the slogan “Si querda” which means yes, we can do. Barack Obama picked that phrase and used it in his campaign. And there is a need to instill the same feeling in ourselves to lead the fight against climate change.

Prof Willis concluded his presentation with a quote by Mahatma Gandhi- “I am praying for the light that will dispel the darkness, let those who have living in non-violence join me in this prayer”.

Global Water Crisis and India Today:

Mr. David H Albert is the Global Chairman of the international organisation ‘Friendly Water of the World’. He has travelled widely throughout the world and helped bring low cost clean water technologies to the most marginalized. Apart from that he has also worked with the Land for the Tillers Freedom and the renowned Gandhian activist Krishnammal Jagannathan, the African Great Lakes initiative in Burundi, the Israeli Palestinian Bereaved Families for Peace and the Rachel Corrie Youth and Cultural Centre amongst others. In his presentation, Mr. David highlighted some of work carried out by his organization in villages of India and African countries to address nexus of water crisis and community deprivation. His presentation has been summarized as follows:

The Friendly Water for the World

The Friendly Water for the World is an international organization works to expand global access to low cost technology and information about health and sanitation. They do knowledge sharing and training and don’t believe in giving anyone anything for free when with proper tools and training people can do it for themselves- which is also an important tenet of Gandhian philosophy around constructive work. The organization works with the most marginalized and disadvantaged people in the world- the poor, widows, HIV affected, former child soldiers in Congo, people with albinism, survivors of rape and sexual violence, orphans, survivors of genocide, unemployed youth, refugees, physically challenged people. They strive to help these people to realize the value they have and try to give them enough courage to understand the assets they have to try to build a community of self-sufficiency.

They practice the principle of altruism and believe that one can do a lot with very small amounts of money. The idea is one doesn’t need millions or billions, but just small inputs and initiative to make massive changes. This reflected in the work of the organization as illustrated through some case studies below.



Global warming crisis in India and Africa

Mr. Albert notes the many similarities between India and the US, noting the only major difference is the population. And despite the rich human resource in India, who are highly educated and skilled and have several esteemed institutions in the country one cannot breathe the air; in many areas one cannot drink water. A fact that perhaps reflects the shortcomings in the American and Indian education system.

Simple Solutions

Mr. Albert gives examples of how the bio sand filter, a mere \$50 instalment changed the lives of many in rural areas in Uganda, Kenya, Rwanda and several other African countries as well as India.

The bio-sand filter is a simple device- an adaptation of a slow sand filter. BioSand Filters stand 40 inches tall, and 12 inches wide on each side. The Filter container is made of concrete and filled with layers of specially selected and washed sand and gravel. BioSand Filters remove pathogens and suspended solids from contaminated water using biological and mechanical processes that take place on the surface of and in the sand column.¹

Along with bio sand filters, rainwater catchments, micro-flush toilets, non-fire soil stabilized bricks, rocket stoves and soaps are also technologies made and shared by the FWOV.

Africa

One compelling story is shared by David from Rwanda. The representative of Friendly water there Richard Shawnbody lived with his family of parents and two stepmothers and brothers and sisters. While his stepmothers are Christian and Animist, his mother is Muslim. Their village is in South west Uganda, where war was going through, and soldier were raping women giving them HIV and they also had a disease called Cryptococcosis. Richard at this time decided to open an orphanage, but had no resources- no organisation, no church, no rotary club. He got 50 children and wrote to David in late 2013m. He said that he was managing the orphanage but 1/5th of all children below the age of 5 were dying before their 5th birthday, it was because of Crypto. With \$100, to bio sand filters were installed in the orphanage. Within 18 days of installing it, the person informed it was a miracle that there was no single case of dysentery, diarrhoea, not even a stomach-ache. And from all the money saved from medical care on these diseases, they built a school catering 400 children.

Case Study- I: Gabila Milton Andrew from Eastern Uganda started an organisation in 2003 to stop child sacrifice. He ended up with a school of 50 kids with HIV, a school with 300 children with HIV, a rotational training institute with children with HIV and he was also supporting grandparents who were taking their grandchildren when their parents died of AIDS. He wrote in late 2014 to David that all his children were in hospital with water borne illnesses, if he paid the hospital bills, they would be left with no food for the children. David said pay the bills, that they would find some money for food and also promised that that situation would never happen again when so many kids got in hospital. 2 Bio-sand filters and 3 weeks later all kids were healthier. Gabila started making bio-sand filters to sell, and saved enough money for food.

¹ <https://friendlywater.net/HOW#BioSand>

Mr. Albert shared another instance from Tanzania and the role of mothers in developmental work. He said no real development can happen without focussing on mothers. The reason is they care for the culture of the community, the future, the children, husbands. So, it is crucial to start with mothers because no mother wants to have a sick child. They started a programme working on mothers in Tanzania. The community had many children dying of typhoid. They are now making bio sand filters and all are healthy.

Case Study-2: In the town of Minova in East of Congo, the effects of the biggest war of the world going on in Congo where 7 million people have died in the ongoing war was felt widely. Women were raped by soldiers, and many of them even got children, were abandoned by their families. These women were taught how to make bio-sand filters and they sold 700 filters and are now healthy and saved enough money to send children back to school and stop cholera in two refugee camps. The programme kept on expanding, every school got bio-sand filters, so the school children got healthier, and the local government, decreed that every restaurant and café has to have a bio-sand filter.

He also shared a story of women asking for training – of community themselves becoming aware and united. Despite the facility not having resources at the time, the women were adamant that they won't leave without training and walked 7kms back and forth everyday for 5 days for getting trained in making the filters. In the previous year, of these 26 women, 18 of them had children who died of cholera. Their leader, had a sister in Minova, who had learnt how to make bio sand filters, she was healthy, her kids healthy and going to school, when that sister visited her, she said she only drinks water from a bio-sand filter. So, in this village the sister gathered 25 other women for training and they told the men, that they were leaving and the men will take care of the children. Now they have built 110 filters.

India

India suffers from an acute water crisis where in along with less availability of water, access to clean water is even lesser. No recharge happens because of pavements, roads and houses. Rivers are extremely polluted. Water in wells have dangerous levels of fluoride especially in Northern Karnataka. Arsenic in irrigation water which is washed down from the Himalayas to Bihar and Bengal is present in water which is used to irrigate fields. Wells are running dry everywhere. Water facilities in every major Indian city is overwhelmed, sewage treatment has not kept pace with population growth. Water borne diseases that had not been seen for decades, are recurring- cholera in Karnataka, Punjab, Bengal, Rajasthan, UP.

Mr. Albert criticises the Reverse Osmosis water purifying systems. They waste 5 gallons of water for every one gallon gained- minerals and salts are removed and have caused an epidemic amongst the rich people of deficiencies. 21 cities of India are going to run out of water in 2021. Chennai is a harbinger of things to come. The city ran out of water and closed hotels, restaurants, and people started moving back to the countryside. Reverse movement is happening as opposed to the general trend of people moving to urban areas.

Case Study-3: Mr. Albert shared the story of Abdul Karim, who lives in a refugee camp in ___, who installed the filter in his house. Prior to the bio sand filter, children were constantly sick, he spent Rs. 1500 every month on hospital bills, which is now very rare expenditure. \$50 investment in bio sand filter was an investment that helped save \$250 every year. Now he makes these filters and sells them. Another family from the camp, spent Rs 6000 every month which has now come down to Rs 1000 every month ever since installing the bio- sand filter. They started making filters and provided them for 35 families.

Infant child mortality is 30 per 1000 births. A number not because of lack of food, rather because children can't digest their food. Children are missing school, girls are leaving schools early indicating parasitic stress- children are using all their energy to fight off parasites instead of building a stronger immunity and the result of this is permanent cognitive impairment. Children are going to school but they are not able to learn. In India it is estimated that more than 20% of youth under age 21 have permanent cognitive damage which means largest loss of human potential in the history of the world.

48% of children in India are malnourished. 1/3rd of them enough to eat and come from wealthy families but just because they cannot digest their food properly. There is an increased risk of diseases like diabetes, heart attacks and stroke.

Discussion and Summing up:

A short discussion followed the presentation by two main speakers of the event. Initiating the discussion, Mr. Major Pande from HIMCON shared his organization's experience in Himachal Pradesh and Uttarakhand. Remembering their work, he said that their organization also worked on bio-sand filter to provide clean water to mountain communities. He observed that while the technology is efficient and affordable, such intervention cannot be carried out without understanding and resolving community level power dynamics. While the filter worked well, there were clashes within the community, within the Dalits and upper castes. Even after having pure drinking water, people still had to walk 12 kms for water just because of caste issues within the community. He stressed that an informed and concerted social process is highly required for the success any technological intervention.

Taking this discussion further, Mr. Achintya Ghosh from Kabil Foundation touched upon importance of ensuring availability of water by conserving rainwater. He said that low cost water shed techniques if implemented effectively can solve the issue of water crisis. According to him, communities have to change their attitude towards water usage. While water is a right of people to survive, it is duty of every person to save water for its availability. Ms. Mika Obayashi, Mr. Inamul Hasan, Mr. Faisal Khan and N. Siva Kumar also contributed in the discussion. In his concluding remark Mr. Vijay Mahajan noted that the changes at policy level is also beginning to happen, as some states like Madhya Pradesh presented a separate budget for climate change mitigation and adaptation activities in 2019 as well as proposed initiative like Gram Sarovar authorities at village level. The need of the hour he noted is to conduct constructive work as well as bring about changes at the policy level with adequate financial resources in a collaborative system to bring about any change.

To see full video coverage of the discussion, click on:

https://www.youtube.com/watch?time_continue=6&v=hZQJsbaeENg&feature=emb_logo



Prepare for Invasion

Steve Lockett, Masheer Trust, United Kingdom

“Who will deny a poor man a tilapia to eat?”

I raised my hand, stood to reply. “Sir, why would you give that poor man an African fish to eat when he could eat Indian fish?”

Dr Ramakrishna, then Deputy Director of Karnataka State Fisheries Department looked at me, smiled, and acknowledged that I had a valid point. Not that the august body has done anything about my comments in the four years following. Retirement may have robbed them of a person who, quite clearly, understood the issues and was prepared to challenge the orthodoxy when he put a stop to wild release in the final months of his tenure.

In a recent magazine article¹, Gopakumar M., of Nityata River Otter Conservancy also raised the stocking of fish by Karnataka Fisheries Department, and questioned their “release of commercial species of fish - rohu, catla and tilapia... little realising that such releases were actively damaging endemic fish diversity.” And ignoring the effect upon locals who rely on the habitat and fish diversity.

Another active field worker, who asked to remain nameless, has told me that while cataloguing fish diversity in the upper Kabbini and connected tributaries of Kerala, where the Kattunayakan tribals like to fish, he found increasing numbers of species that had been introduced by Karnataka Fisheries Department downstream, across the state border. These included non-native catfish and tilapia.

It may seem unfair to be pointing the finger at Karnataka, but that is the state where I have most experience, and surprising actions just keep cropping up. Like the recent move to build small check dams in some of the beautiful streams of the Western Ghats, and then stock common carp and tilapia, two of the Twelve Worst Invasive Fish on Earth, (according to Karl Fabricius of Skribol Publishing) “as a recreation resource”!

Some have said that “the problem of invasive species makes all other environmental problems pale into insignificance”². Not only that, but MOEFCC have announced that, “according to the Convention for Biological Diversity, invasive alien species are the second largest cause of biodiversity loss in the world. In fact, introduced species are a greater threat to native biodiversity than pollution, harvest, and disease combined.”

Taking a look at the problems is the only way it will be possible to frame any answers and attempt to stop such a drastic threat becoming reality.

While studying the Vaitarna River, in rural Maharashtra with Unmesh Katwate of Bombay Natural History Society, I sat watching the locals of the tribal village where we were staying. It was a joy to see them fishing the river by hand, surely the most sustainable way to feed themselves. By hand, I

mean they dived under the water to pull out fish with only their hands, no gears or tackles of any kind, but they did have a secret weapon - drugs.

Ten minutes before taking the first dive, the lithe young men crushed and sprinkled leaves into the water. This had a mildly narcotic effect on those fish that did not swim away, those that like to hide beneath the black rocks at the bed of the river. Unmesh and I sat in the 45° heat, sheltering beneath an overhang in the unforgiving, volcanic landscape, and watched as the youths dived and then burst through the placid water's surface clutching their prizes, thick eels.

There is no doubt that people who live most closely with nature have preferred food items in what many of us would consider to be a meagre diet. Eels were top of the list in the villages of the Vaitarna plateau. In many parts of the Western Ghats, tiny fish are tops, as my friend Rajeev Raghavan has demonstrated³.



“Who would deny a poor man a tilapia to eat?” Why would you deliberately deny that poor man his food of choice? In many parts of the world, stocking of commercial, non-native fish would be viewed as state-imposed oppression upon the rights of indigenous people.

The so-called Blue Revolution has been used as a convenient banner to hide imposed fish stocking even in places where there is little need to boost food security. Mahseer fish from Maharashtra were stocked in Karnataka's River Cauvery at regular intervals between 1974 and the present day. At first, this was called a conservation programme, but as the evidence mounted of the impact that releasing a non-native species was having upon the endemic and critically endangered hump-backed mahseer, the Fisheries Department changed its tune. Now, the fish being stocked were part of the normal

remit - making fish available for eating. Which begs the question: why were they released into a strict no-take sanctuary? And why has so much time, effort and expense been spent on a fish with such low fecundity compared to most other Indian cyprinids?

Under the FAO's GIFT programme, genetically selected tilapia have been given to many countries in a bid to ensure better access to protein for the less affluent. While very worthy, and in some cases a much needed food resource, this gift, unless very carefully controlled, has the potential to devastate the accepted and preferred food of many in rural communities at the same time as chomping holes in local biodiversity.



Another regularly farmed fish, the African catfish, *Clarias gariepinus*, has found its way into many rivers across south India, much to the dismay of my friend Dr A.J.T Johnsingh. He believes it is one of the biggest threats facing endemic biodiversity saying; "the thoughtless introduction of a fish that even eats birds and mature fish is a great disaster for India's rivers, which are already being decimated by over fishing, pollution and droughts."

Invasives are very often also termed alien species, if they come from outside the biogeographic region into which they have been released. Without a doubt, tilapia and common carp are alien invaders into India. One question for those who wish to challenge the spread of invasive freshwater species is: can we separate river basins such that their difference is comparable to biogeographic regions? If so, then moving Indian fish species from one river basin to another can reasonably be given the highly emotive term - alien invasion.

Taking conservation messages and ideas between different parts of the country, and, indeed, between countries in the region, is something I feel is needed and brings me immense satisfaction. In Nagaland, the State Fisheries Department cannot carry out stocking without the active agreement of local villages. This may be an obvious route to follow across the whole country. However, in collaboration with the Directorate of Coldwater Fisheries Research, the Nagaland Fisheries Department has recently announced stocking and rearing of trout and mahseer to boost angling opportunities in the state. Local anglers, who lead the river conservation agenda, have agreed that this would be a fantastic chance for them to catch fish denied to them; alien fish. I'm not sure what lessons I can take from Karnataka the next time I visit Nagaland.

What constitutes an invasive fish is not even clearly outlined at present. Six of the top ten invasive fish species in the world, according to Mother Nature Network www.mnn.com are present in India. Yet none of brown and rainbow trout, common carp, walking catfish, mosquito fish or our old friend the tilapia appear on the new Global Register of Introduced and Invasive Species (www.griis.org) for the country.

“The threat of alien invasives taking over freshwater habitats is a reality and the ornamental fish trade is emerging as the most critical threat to aquatic habitats in peninsular India.” So says M. Eric Ramanujam, who studied the small rivers Vappady and Vaniyar, both tributaries of the fragile River Cauvery, in Yercaud, Tamil Nadu. He found, “in addition to native species, we also came upon catla, introduced by the Department of Fisheries. Most alarming was the presence of two alien invasive species: the guppy *Poecilia reticulata* and tilapia. The guppy outnumbered native species in catches almost 10:1.”⁴



For many, the threat of the aquarium trade comes from a sketchy, if not completely lacking, control over collection of wild fish to be sold around the world. There is another, not widely recognised aspect of the aquarium business that also poses great risk for the biodiversity of India’s rivers and lakes. It comes from two unconnected areas, but both, I can only presume, stem from an ignorance about wild habitats.

Saffron-clad monks are a common sight in the communities that sprung up after the Chinese invasion of Tibet in the 1960s. That India welcomed the persecuted Buddhist families, all of whom are essentially peaceful people, and respectful of nature, is an example of positive and unselfish neighbourliness.

One of the largest refugee communities is based at Bylakuppe, near Kushalnagar, Kodagu district of Karnataka. For more than 50 years, the monks have visited town to buy supplies and carry back the 10 km to their adopted home. In recent years, some of the produce has not made it all the way back.

Members of the local Coorg Wildlife Society began telling me, back in 2007, about the monks buying piranha and then ‘liberating’ them in the River Cauvery as they crossed it, on the outskirts of town. I can only guess that it has been by some miraculous fluke that the piranha have not thrived in the sacred waters, and become a menace to all the smaller fish that live there.

“Ecology of aquatic invasive alien species is rather poorly understood as most attention has been on invertebrates as that which spread through ballast water. Invasive alien species of fish that have taken advantage of the aquarium trade are emerging as the most important threats to fragile aquatic habitats. Regulations to this trade are rather weak and there is a general lack of data on the ecological impact of alien fish species despite the fact that a third of the world’s worst aquatic invasive species are aquarium or ornamental species.” J. D. Marcus Knight ⁵.

Many are the tales of fish grown too large for keeping in the tank at home. What to do with these ‘cuckoos in the nest’? While many a blockbuster movie has used the trope of a pet flushed into the sewer system growing into a mutant monster, it would probably be a safer way to dispose of them than throwing them into a nearby tank, well or lake. Definitely better than throwing them into a river.



As mentioned before, piranha released would create problems for indigenous stocks, but another, related fish has thrived across Asia when released, the pacu. This is a vegetarian piranha, so gives little concern, until you see that it can grow to 40kg and has a set of rabbit-like teeth and extremely powerful jaws that

would sever the fingers of an unwary dhobi wallah. Although many people understand the potential impacts of releasing predators, those fish that eat plants and algae, some of them very small, have been shown to have big impacts on food webs ⁶, being capable of causing devastating collapse across an ecosystem.

Alligator garfish are another common pet, bought without much thought to the fact that they can reach 3m long. It would take quite some home aquarium to house one of those for life. That must be why they have been spotted many times in Mumbai’s Powai Lake.

There exists a whole body of law designed to protect India’s precious biodiversity, much of it, though by no means all, referring to the value of agriculturally useful plants and animals. But most of this law is completely outdated, with the Livestock Importation Act, for instance coming onto statute in 1898.

The National Bureau of Fish Genetic Resources has drafted action plans, and the usual raft of conferences, like the recent Zoological Survey of India’s event in Kolkata (14/15th December 2017) inevitably follow with plenty of agreement, but little positive action. A recent, global, Invasive Species Week should have helped to raise awareness, but concrete action at government level is needed, and fast.

In other parts of the world, there are very strict laws, as well as easily available guidelines about keeping all kinds of pets, but especially fish or other freshwater wildlife. Disposing of them directly into a natural waterbody brings damaging fines, or even jail sentences. This applies whether it is fish that are released, or even the water they are kept in. Micro organisms hosted by the fish can wreak far more havoc, if allowed into the wild.

As Dr Biju Kumar so rightly says, “the presence of, as well as the damages caused by invasive fish are not always directly visible”.

Given that the best way to prevent wild release of alien species currently is the Environmental Protection Act (1986), for which painstaking documentation of the issues has always been the major stumbling block for prosecutors, it seems that whether inadvertent or deliberate, those who stock invasive alien fish species are unlikely to ever be found out, let alone pay the penalty for the damage they cause.



While this article is attempting to address issues of freshwater invasion within India, there remains an unsaid question: what happens if India, Pakistan, Nepal, Bhutan or Myanmar introduce an alien species into a river and the effect is felt most keenly across an international border? How would one sovereign country attempt to find redress following what may well be termed biological terrorism?

“What is required urgently is a national policy to deal with invasives” said Rauf Ali of the Foundation for Ecological Research, Advocacy and Learning, Puducherry.

Drafting a whole raft of new legislation, specifically to address the ease with which invasive species can and are allowed to threaten indigenous or endemic wildlife would take time and political will. Simple awareness campaigns, especially if targeted at particular special interest groups, like anglers or home aquarium fans, should be part of the battle, and may be more effective in the short term.

What to do about the invasive species already on the loose and causing environmental havoc needs to be the subject of a whole other article. One thing is for certain, though; the kind of knee-jerk

reactions that have allowed the release of unwanted species, if applied to the removal of the same, may cause just as much damage to native biodiversity. Any human intervention should only be carried out after a rigorous study of all of the pertinent facts, and with concerted follow-on monitoring. There should be no room in India's valuable and fragile ecosystems for any person or body to offer up the threats posed by wild release of invasive species.

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Status of Forest Rights Act in Chhattisgarh

Arnab Bose and Jeet Singh

Background

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, enacted in 2006 and came into force in 2008. It attempts to address the historic injustice done to forest dwelling communities by recognizing individual's right over dwelling and cultivation of forest land under their occupation and community right over community forest resources on common forest land. It is estimated that the rights of over 200 million people in over 170,000 villages should be recognized under FRA¹. Up to March 31, 2019, 4.2 million individual and community forest rights claim were filed, of which 1.9 million claims were accepted and land title were distributed².

The Chhattisgarh is one of the crucial states from the perspective of the Forest Rights Act, 2006. A large population including tribal and non-tribal of the state is directly dependent on forest and forest produces. More than 31% of the State's population is comprises of different tribal groups and they are highly dependent on forest for their live and livelihood.

The Chhattisgarh government received highest number of Individual Forest Right (IFR) claims, which accounts to more than 8.58 lakh. Out of which the state government accepted 4.01 lakh claims and rejected more than 4.61 lakh claims. While the state has received highest number of claims, it also rejected highest number of claims ever since this law came to force. According to the available data, it has rejected more than 52% of forest right claims filed by tribal and other traditional forest dwellers³.

While there are conflict and contradictions on the issue of recognizing rights of forest dwellers and changing land use in the middle of forest, the Supreme Court last year in one of its order asked state governments to evict all dwellers whose FRA claim has been rejected. However, after interventions from various state governments and central government, the Court stayed its own order later. Various state government and central government admitted that many claims were rejected wrongfully and before they can not evict anyone, they need to review the entire process⁴. Moreover, towards the end of year 2018, the Indian National Congress promised in its election manifesto for the state election of Chhattisgarh that if chosen to power, their government will ensure effective implementation of the forest rights Act. After the formation of new government in December 2018, the congress led state government had multi level challenges to deliver on its promise to implement the Forest Rights Act, 2006 in more effective way. These included challenges related to state level governance system, national level policy issues and cases pending against the Forest Rights Act, 2006 in the Supreme Court. This article is an attempt to highlight major challenges and initiative at national and the state level to make the Act more effective in the state of Chhattisgarh.

¹ A Citizens Report on Promise and Performance of The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, or FRA after ten years of Enactment. December 2016. CFR-LA, India , 2016

² <https://tribal.nic.in/FRA/data/MPRMar2019.pdf>

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⁴ <https://www.thehindu.com/news/national/supreme-court-continues-its-stay-on-eviction-of-lakhs-of-forest-dwellers/article29403695.ece>



National Level Key Issues

- **Under-Resourced Nodal Agencies:** MoTA is the central nodal agency for the implementation of FRA. It is severely under-staffed and under-resourced⁵. The state tribal welfare departments also lack human and financial resources. In many states, forest officials have been deputed to the tribal departments who often hinder implementation of FRA.
- **Misunderstandings about FRA:** A lack of in-depth understanding about the FRA amongst officials leading to misinterpretation⁶. Misunderstanding regarding the scope of the Act, particularly in relation to other forest laws. Misunderstanding about its CFR and CFRe provisions. Misinterpretation of FRA as a welfare legislation to distribute land to the landless and other user rights to the marginalized forest dwellers rather than recognition of existing rights. A misplaced fear that forests are being distributed to all the forest dwellers which would lead to ultimate decimation of forests. These misinterpretations lead to frequent violation of provisions.
- **Attempts to Dilute the Act:** Since 2014 there have been many attempts to dilute the provisions of the FRA through creation various rules (such as village forest rules) by side-stepping MoTA⁷. These rules allow the introduction of the forest department in the management of forests. Most of these changes have happened in states which are rich in minerals and as per activists with these rules the government wants the forest department to become an arbiter for forest resources. MoTA had initially opposed these rules but after pressure from the centre there has been a tacit approval.
- **Lack of Cooperation from Forest Officials:** Across the country forest departments have been hostile to FRA with forest officials dictating the agenda of implementation. Several cases of obstruction in the claim and recognition process by not cooperating in the verification proceedings, raising illegal objections to the claims, imposing Joint Forest Management on

⁵ Promise and Performance Report 2016

⁶ MoTA 2012. Regional Consultations on Implementation of the Forest Rights Act: Amendments in the Rules and the Way Forward. Ministry of Tribal Affairs, Gol.

⁷ <https://www.downtoearth.org.in/news/forests/rights-overruled-53977>

areas claimed as CFRs, re-refusing to sign titles approved by District Level Committees and carrying out evictions where claims have been filed but not yet processed.⁸

- **Focus on Individual Rights rather than CFR rights under Section 3(I):** Administrative machinery found to be concentrating more on claims for individual rights rather than community rights. Of the total recognised 19,05,155 claims made till January 31 2019, IFR constitutes 96 per cent⁹. Some issues concerning CFR as highlighted by the 2016 performance report:
 - Gram sabhas have filed large numbers of CFR claims which are pending at SDLCs and DLCs without any response
 - Customary boundaries delineated by the Gram Sabhas arbitrarily changed by forest department officials during field verification;
 - In some states CFR titles being issued to Joint Forest Management committees in violation of FRA.
 - Titles have been issued with illegal conditions, such as the Gram Sabhas having to follow forest department's working plans while exercising CFR rights.
 - No guidance and support systems for CFR management by the Gram Sabha.
- **High Rate of Rejection and Illegal Evictions:** A significant number of Forest rights claims have been rejected without following due process. According to a status report of the Ministry of Tribal Affairs, only around 50% claims approved as of April 2018. The data found in the Supreme Court Order of February 13, 2019 show a rejection rate as high as 75% in some states such as Uttar Pradesh. Additionally, widespread evictions in both protected and other areas continue¹⁰. Large scale evictions in violation of FRA reported from Himachal Pradesh, Telangana, Andhra Pradesh, Karnataka and Assam. Despite provisions of the Act willful destruction of legally mandated livelihoods also continues.
- **Non-recognition of Rights in Protected Areas:** In protected areas, the process of settling the claims is extremely slow. There are efforts to relocate beneficiaries from tiger reserves in violation of FRA. A study on violations of FRA in protected areas¹¹ revealed a large number and types of violations since 2007, including, curtailment of NTFP access, grazing bans, prohibition of fuel wood collection, harassment of villagers by the forest department and evictions.
- **State Control over NTFPs:** In most states policies not aligned to FRA provisions with respect to NTFPs. State control over high value NTFPs such as bamboo continues¹². Gram Sabhas continue to be denied transit permit by forest departments and transport of NTFP remains a challenge¹³. This is despite the amended FRA rules giving authority to issue transit permits to gram sabhas.
- **Little Progress on Habitat Rights of Particularly Vulnerable Tribal Groups:** The provision for habitat rights of PVTGs is not appropriately implemented¹⁴. There are instances of forest diversion for extractive industry like mining in habitats of PVTGs, evictions from protected areas as well as forcible plantations on their traditional cultivation lands under CAMPA, MGNREGA and other programmes.

⁸ Promise and Performance Report 2016

⁹ <https://www.downtoearth.org.in/blog/forests/10-interventions-government-must-make-to-protect-forest-rights-64863>

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¹⁴ Promise and Performance Report 2016

State Level Key Issues:

- **Review of FRA Claims:** To clear the air on large number of rejected claim of forest dwellers in Chhattisgarh, a comprehensive review was required. The government of Chhattisgarh issued a circular on January 22, 2019 directing all district administrations to review all rejected IFR claims¹⁵. Recently the department of tribal welfare of the state government has uploaded details of all IFR claims after review on their website for public access¹⁶. While the review reveals various problems related to the implementation of the FRA, this exercise will help to rectify systemic issues in more transparent and accountable manner.
- **Rehabilitation of IDPs:** According to an estimate around 16,000 tribals (5000 families) were uprooted from Bastar region of Chhattisgarh during 2004-05 when Naxal violence escalated in the region. Of these around 3000 families moved to neighboring states of Andhra Pradesh and Telangana. These uprooted families are living miserable life in the forest of Telangana and Andhra Pradesh. Likewise there are other states, from where tribals had to move in distress. The National Commission for Scheduled Tribe (NCST) in July 2019 asked all these states including Chhattisgarh to identify these families to pave way for their rehabilitation¹⁷. These people are called Internally Displaced Persons (IDPs). In December last year, the State government of Chhattisgarh has initiated survey to identify all IDPs in Telangana and Andhra Pradesh.
- **FRA in Maoist Affected Area:** The Abhuj Mar area of Narayanpur district in Chhattisgarh is considered by the government as only stronghold of Left Wing Extremism in the country. An area of 3,884 square kilometer has around 40 thousands Abhuj Maria tribes. Abhuj Maria is categorized as Particularly Vulnerable Tribal Groups (PVTGs). The state government has shown interest in building confidence among people living in Abhuj Mar to counter violent arm struggle of Maoist from this region. The government has initiated the process granting Habitat Right (Special rights to PVTGs under FRA) to Abhuj Marias of the region¹⁸.
- **Mining activities in PESA region:** Chhattisgarh is known for mining of coal, bauxite, iron and many other important minerals and fossils. Over last few years, villagers have complained that mining companies changed land use of the forest in control of local community by violating laws such as Forest Rights Act, PESA and Forest Conservation Act. Recent mining cases in Bailadila, Hasedo Arand and Pathrai village in northern part of the state are few to name such illegal mining in the state¹⁹. In such cases mining companies started mining without having consent of local Gram Sabhas under PESA law.

Recommendations

- Ensure adequate staff and separate funds for implementation of FRA for MoTA. Appointment of officials, dedicated full-time to FRA implementation at sub-divisional and district levels.
- Training sessions for FRC/SDLC/DLC members using simple, accurate material in multiple languages to ensure clear understanding of provisions
- MoEFCC and MoTA need to coordinate to ensure that all rules are aligned with FRA by undertaking systematic review. It needs to be acknowledged that the gram sabhas are the statutory institutions for CFR management instead of JFMCs.
- Government should send circular to forest officials giving clear directions to stop obstruction of FRA implementation

¹⁵ <https://www.downtoearth.org.in/news/india/chhattisgarh-govt-keeps-poll-promise-starts-review-of-rejected-fra-claims-62979>

¹⁶ <http://tribal.cg.gov.in/node/2229>

¹⁷ <https://www.outlookindia.com/newscroll/chhattisgarh-govt-begins-survey-of-internally-displaced-tribals/1697809>

¹⁸ <https://www.firstpost.com/india/chhattisgarh-to-grant-habitat-rights-under-fra-to-tribals-in-maoist-stronghold-abhujmad-forest-bhupesh-baghels-soft-approach-may-score-a-win-7241141.html>

¹⁹ <https://www.sabrangindia.in/article/chhattisgarh-hc-orders-psu-stop-all-mining-activity>

- Social audit similar to that of MGNREGA should be introduced. The report should include disaggregated information on CFRs, CRs, IFRs and, habitat rights.
- Governance of protected areas must be based on FRA. Gram sabha based plans for management of CFRs provides best opportunity for co-existence plans for all PAs.
- All procedural obstacles in the collection, sale and transportation of NTFPs by right holders and gram sabhas need to be removed. Minimum Support Price for NTFP needs to be provided.
- Rights of PVTGs need to be pro-actively recognized and declared suomoto by District Level Committees. Criteria which have been used for declaring them as PVTGs should also be applied as evidence of their forest rights.
- Rules of Panchayat (Extension to Scheduled Area) Act (PESA) needs to notified to protect community and individual forest rights of tribal groups.
- A committee of experts should be constituted to study reviewed IFR cases in Chhattisgarh and dispose them in time bound manner.
- Sensitization of members of DLC, SDLC, Panchayat and village level committees is required to entertain new claims from communities and process them as per the words and spirit of the forest rights Act.
- To protect forest and maintain them in their pristine form, a new system of tree based sustainable cultivation, harvesting, consumption and trade needs to be created especially for people who have been given land title under the forest rights Act.

To see full video coverage of the discussion, click on:

https://www.youtube.com/watch?v=s9gUIIBOjQ4&feature=emb_logo



A Single Strategy to Fight the Post-COVID Job Crisis and Environmental Degradation

Vijay Mahajan, Director, RGICS and Jeet Singh, Fellow, RGICS

Today when the entire world is struggling to get rid of COVID-19, we as a global community must also acknowledge its root causes and act to not invite future zoonotic pathogens. The solution lies in respecting nature, respecting wildlife, respecting bio-diversity and limiting encroachment by humans. This solution can help to address two big problems the world is facing today- climate change and transmission of zoonotic pathogens such as COVID-19. Yet, various international ongoing negotiations related to climate change have not yielded any tangible result to reduce destruction of the environment by humans. Similarly we have not learned anything from previous examples of interspecies transmission of pathogens resulting from destruction of biodiversity.

Various scientific studies have found that spread of zoonotic pathogens such as Ebola, SARS, Bird flu and now Corona is due to over exploitation of biodiversity. Like other previous zoonotic pathogens, Novel Corona (COVID-19) is also transmitted to humans through wet markets in China. A study conducted on transmission of various zoonotic pathogens in 2017 found that interspecies pandemic such as spread of HIV, H1N1 influenza, Nipah, Hendra, SARS and Ebola are strongly related to global land use changes. It further revealed that “the invasion of natural ecosystems and the growth of dense human settlements—as well as the growth of global trade and mobility—are driving increased rates of interspecies contacts and the interchange of parasites and pathogens that can develop into global pandemics¹.”

In India, the COVID-19 has affected millions of people. Migrant labourers are worst affected due to nationwide lockdown. They have lost their livelihood and most of them are starving in different parts of the country. A large number of them have managed to travel back to their villages. But even in villages, they don't have enough to earn livelihood. The ongoing slow-down of Indian economy and now lockdown has badly affected the economy. The revival of the economy will take some time, so finding jobs even after withdrawal of lockdown especially in urban areas is not that easy. Now in this difficult situation, the already underemployed rural economy will get additional labourers, who have migrated back to villages.

To address this challenge, the government needs to invest more in the rural economy through various schemes. It is also a good opportunity for the government to invest in programs related to its international commitments related to climate change. With this India can achieve three major goals.

¹ <https://academic.oup.com/ilarjournal/article/58/3/343/4107390>

- One, it will provide employment and income to millions of migrated labourers who have come back to their native villages,
- Two, it will help in achieving climate change goals and meet international commitments
- Three, it reduces the risk of local spread of zoonotic pathogens, by rejuvenating specie habitats

This article attempts to highlight the problem (jobless population), solution (employ them in regeneration of natural resources – land water, forests, leading to higher growth and sustainability) and the means to achieve it (financial resources and programs). This strategy was first advocated in 2018 in the context of overall jobless growth and rural distress. The weblink reference to that paper Jobful Growth is given below.²

Jobs Post COVID-19

Exodus of migrant labourers from various cities in India after the announcement of nation-wide lockdown on 25th March 2020³ was reported by various media houses. Various experts believe that this exodus will continue even after withdrawal of the lockdown. By then many people would have lost their job as the economy is badly affected, the high cost of living in cities makes it difficult for many to continue to be in cities and wait for a new job and finally in the time of chaos and uncertainty people would like to be in their native places with their family and relatives.

According to a rapid survey conducted by a NGO 'Jan Sahas' published by the 'Quartz India' reveal that over 80% of daily wage migrant workers fear it will run out of food before the end of lockdown announced on 25th March 2020. While the lockdown has been extended by the government of India for another 19 days, it is going to be a very difficult time for the majority of migrant daily wage people stranded all across the country.

According to the Economic Survey Report of 2017, the magnitude of inter-state migrant labourers in India was nearly 9 million. Moreover, as per the census-2011 the total number of internal migrants in India (both inter-state and intra-state) was 139 million⁴. Major sources of migrant labourers are states like Uttar Pradesh, Bihar, Uttarakhand, Madhya Pradesh, Rajasthan, Jharkhand and Punjab. Major destination states include Delhi, Maharashtra, Telangana, Andhra Pradesh and Kerala. Various reports suggest that labourers in large numbers from all across the country are willing to go back to their village.

Workers gathering in large numbers during lockdown in cities like Delhi, Lucknow, and Mumbai indicate that a large population of labourers will anyway go back to their home even after the withdrawal of lockdown. A daily wage carpenter Mr. Jai Prakash from a remote village in Allahabad district of Uttar Pradesh has lost all hopes from Mumbai city. He told me over phone that, he is desperately waiting for the withdrawal of the lockdown so that he can go back to his village.

“For quite some time, finding wages in Mumbai was difficult. But, now with this lockdown and Corona crisis, it will be even more difficult to find wages. It is going to be very difficult to survive here. Chances of finding jobs in my own village are also bleak, but I will go back to there any way. I am waiting for the withdrawal of the lockdown.”

Jai Prakash Vishwakarma

² <http://www.rgics.org/wp-content/uploads/Jobful-Growth%E2%80%93How-to-Achieve-It-in-2019-2024.pdf>

³ <https://qz.com/india/1833814/coronavirus-lockdown-hits-india-migrant-workers-pay-food-supply/>

⁴ <https://www.weforum.org/agenda/2017/10/india-has-139-million-internal-migrants-we-must-not-forget-them/>

The Reserve Bank of India recently in its biannual monetary policy report said that the Indian economy has been drastically altered by the Corona virus outbreak. The lockdown due to COVID-19 has badly affected the Indian economy which was struggling with the prolonged slow-down for many months. The report reads, "COVID-19 now hands over the future, like a spectre⁵". With all these signals it is clear that the rural economy will have to accommodate another huge influx of workers for next few months (or probably a year) after withdrawal of the nationwide lockdown.

Millions of Jobs in Regeneration of Natural Resources – Jal, Jangal, Jameen

India has been concerned about its rapidly degrading natural resources especially land, soil, water and forest. According to an estimate by TERI in 2018 land degradation through various processes in India cost around 2.5 per cent of the country's GDP in 2014-15⁶. The study of TERI in 2018 estimated total investment required for reclamation of land degraded by five major processes namely water erosion, wind erosion, forest degradation, water logging and salinity. The study found that India requires Rs. 2948 billion (2014-15 prices) to reclaim 94.53 million hectare degraded land as per latest survey by SAC, Ahmedabad. Assuming an increasing in costs since then, we can round this off to Rs 4000 billion in 2020-21. **Thus the nation needs to spend Rs 4 lakh crore, or about 2 percent of the 2019-20 GDP to address regeneration of degraded land, which is just one of the three key natural resources – Jal, Jangal, Jameen.**

India assured the world about its commitment in the latest conference of parties (COP-14) of United Nations Convention to Combat Desertification (UNCCD) held in New Delhi in 2019. The Prime Minister Mr. Narendra Modi announced its Land Degradation Neutrality (LDN) target at COP14 of restoring 26 mha of degraded land by 2030. India is also an important player in world climate policies in UN Framework Convention on Climate Change (UNFCCC). Along with many other commitments, India as part of its INDCs committed to create an additional carbon sink of 2.5 to 3 billion tons of CO₂ equivalent through additional forest and tree cover by 2030.

5 Percent Irrigation Model



Source:

https://www.youtube.com/watch?v=049noCfrK6o&feature=emb_logo

Water conservation for rainfed agriculture



Source:

https://www.youtube.com/watch?v=z3r-jWPcUk0&feature=emb_logo

⁵ <https://www.teriin.org/project/india-prepares-host-un-conference-curb-land-degradation>

⁶ [https://www.teriin.org/sites/default/files/2018-04/Vol per cent20of per cent20Macroeconomic per cent20assessment per cent20of per cent20the per cent20costs per cent20of per cent20land per cent20degradation per cent20in per cent20India_0.pdf](https://www.teriin.org/sites/default/files/2018-04/Vol%20per%20cent20of%20per%20cent20Macroeconomic%20assessment%20of%20per%20the%20costs%20of%20land%20degradation%20in%20India_0.pdf)

India has also emerged as a responsible country to protect its biodiversity. India is part of the UN Convention on Biological Diversity (UN-CBD). The convention covers protection of biodiversity at all levels – ecosystem, species and genetic resources. In accordance with the commitment of UN-CBD, India has prepared its National Biodiversity Targets (NBT) and is committed to achieve them. The 20 listed NBTs of India includes reducing rate of degradation, fragmentation and loss of natural habitat, appropriately addressing issues of invasive alien species, sustainable management of agriculture, forestry and fisheries and ensuring genetic diversity of cultivated plants. India is committed to achieve all above mentioned targets to contribute in global strategies to combat, adapt and mitigate adverse impact of climate change. However, not much has been invested in these sectors. Various schemes for regeneration of natural capital including the Green India Mission are under-funded. An enhanced investment to achieve all above targets and commitments will not only expedite our effort but also generate a huge opportunity of work especially in the rural area.

Using MGNREGA as the Flagship for Natural Resource Regeneration

Currently the MGNREGA is one of the biggest programs which provide opportunities to earn wages up to 100 days to labourers registered under this program. Official data shows that more than 266 million workers are registered under this program; however, only 116 million workers were active in the last financial year⁷. Data for previous few years suggests that the average days of employment is less than 50 days per family. As noted by Arnab Bose in a recent RGICS Paper on Status of MNREGA⁸:

“MGNREGS is a demand driven scheme where any worker that demands work needs to be provided with work within 15 days of the demand. However, the households provided employment as a percentage of households demanding employment has seen a steady decline from 2012-13 to 2018-19. As shown in figure 1, in 2012-13, 97% of households that demanded work received employment but this has declined to 84% over the last two years.”

Figure 1: Number of Households Provided Employment as a Percentage of Households that Demanded Employment



Source: MGNREGA MIS Reports from 2012-13 to 2018-19 PRS

It should be noted that while above chart talks of “households” the reality is that in a household, many times, more than one person needs and seeks work. The MGREGA website⁹ lists the number of job cards issues as 13.66 crore job cards were issued (which is issued one per household for every household where at least one adult member is seeking work).

The website says there were 26.61 crore workers, thus averaging 1.95 or almost two active workers per household or per job card. However, of all these, 11.69 crore active workers and 7.6 crore active

⁷ http://mnregaweb4.nic.in/netnrega/all_lvl_details_dashboard_new.aspx

⁸ <https://www.rgics.org/wp-content/uploads/Rights-Based-Legislations.pdf>

⁹ https://mnregaweb4.nic.in/netnrega/all_lvl_details_dashboard_new.aspx accessed on 23rd Apr 2020 at 5 pm

job cards In FY2018-19 and a total of 267.96 crore person-days, the highest ever, were generated in that year, making an average of 50.9 days of employment per household.

In FY2019-20 a total of 264.46 crore person-days were generated under MGNREGA. The number of persons who worked was 7.87 crore. This actually implies an average MGNREGA worker got only 33 person days of work, though the figure more commonly used is for number of days per household, which was 48.3 days on an average during the year.



The number of active workers seeking MGNREGA work this year may rise to as high as over 12.5 crore due to the fact that by the time the COVID lockdown is lifted on 3rd May, 2 to 3 crore migrant workers would return to their villages and almost all will be without work. If we want to revert to the logic of number of households (job cards) then we can safely assume at least 10 crore job card holders out of the 13.66 crore job cards issued will seek work for at least one member from the household. That means 10 crore persons, and if we want to meet at least half the promise of NREGA, that means 50 person-days or 500 crore person days in this distress year.

The government has allocated Rs. 61,500 crore for MGNREGA for the financial year 2020-21. This allocation is marginally less than the amount allocated for it in FY2019-20. The MGNREGA portal computes the average cost of generating wage employment per person-day at Rs 264.77 in 2019-20, which included the material cost (24.71%), the wages of semi-skilled and skilled workers and the administrative cost of 4.72%. As the Finance Minister has already announced on

27th Mar 2020, an increase in wage rate to Rs 200 per day. With a raise in wages by Rs 25 per day, this has number is already likely to be about Rs 300 per day per person-day of work generated.

Thus an allocation of Rs 61,500 crore will not be able to generate even the budgeted 280.76 crore person days of employment, even if we assume that State Governments are able to put up their matching 25% contribution of material and overhead costs. **If we aim at least 50 days of work in this distress year for 10 crore households with one person per household, that is 500 crore person days, or an outlay of Rs 150,000 crore at Rs 300 per day all in cost. Therefore, a substantial increase by nearly 2.5 times the existing allocation for MGNREGA is required.**

Where this will come from is a separate question and many fiscal experts are grappling with it. But it will have the double benefit of curbing rural poverty, hunger and unemployment, while regenerating the productive base – jal, jangal, jameen, (land, forest, water), of rural India which will yield a fillip to growth to the agricultural, allied and forestry sectors, and have a very positive effect on the environment. In addition, since a number of studies¹⁰ indicate a benefit-cost ratio of water conservation projects to be in the range of 2.0 at a discount rate of 7% pa, the investment is very beneficial for economic growth of rural areas.

Some other points to be noted are:

- ❖ The work related to Natural Resources Management requires very less material assistance. The main need is of water conservation for which we need to dig millions of farm ponds, small community ponds and percolation tanks, none of which require significant material component. Therefore, the material-labour cost ratio can be revised from 40% to 30% this year by mandatorily increasing the share of labour cost. This will discourage unnecessary construction of masonry and concrete small structures even when those are not needed. It will benefit more labourers.
- ❖ The share of NRM regeneration related work under MGNREGA should be increased substantially. In the guidelines issued by Gol on 15th April while announcing COVID lockdown relaxation for MGNREGA works, it has been specified that priority should be given in MGNREGA to irrigation and water conservation works. This should be interpreted in a hydrologically sensible way, thereby permitting treatment of land (both public and private) as also of degraded forest land in the catchment watersheds
- ❖ Only registered workers are entitled to apply for jobs under this program, many migrant workers do not have job cards to apply under this scheme. So, on the spot registration of such workers is required to accommodate them within the scheme.
- ❖ The ceiling of 100 days of work per family needs to be extended to ensure a long term guarantee of a job for this section of the distressed labour force.
- ❖ Few months ago the Union government released Rs. 47,436 crore rupees of CAMPA fund to 27 different states. This amount can also be used through the MGNREGA system to ensure equitable distribution of resources.
- ❖ Funds under other related schemes such as Green India Mission, Water Mission and the Building and Construction Workers' Welfare fund can also be utilized through the MGNREGA system to enhance its efficiency and impact.

¹⁰ See for example: Sahoo, SK (2006) Cost Benefit Analysis of Watershed Development Programme: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1315762



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