Rio’s stepchild: Must become the parent in our climate-risked world

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Rio 1992

On the agenda

• Climate change
• Biodiversity conservation
• Forest convention

African nations put desertification on agenda – linked the over-use of lands to declining commodity prices. Other developing countries supported them.

Convention on desertification was borne – but it was unwanted; stepchild of Rio
World 2019

- Climate change is happening – from increasing intensity of hurricanes in Pacific; tropical cyclones; extreme rains; extreme heat


Happening

- Realize management of land and water is at risk; our own mismanagement is being exacerbated by weird weather events
- Making millions more vulnerable. More marginalized
- Making the world more insecure

Desertification convention is today’s parent
Desertification happening

• Linked to our mismanagement

• We are over-extracting water resources; depleting groundwater; building on catchments of our rivers; ponds and tanks; polluting scarce water

• We are depleting soils; over-chemicalizing our lands and foods; producing and eating foods that over-use land and water and destroying forests

This is bad. **But it becomes worse as climate change kicks in**
Climate change happening

- **New Abnormal**
- Dust storms 2018: April-May
- Over 50 dust storms killed over 500 and destroyed homes and crops
- Why: global-local connections
**Dust bowl**

How changing global weather patterns triggered the dust storms in India in May 2018, considered to be the worst one in the last 40 years.

### Western Disturbances

While Western Disturbances (WDs) normally peak between December and February, a greater number of active WDs have been observed in spring and summer months. Instead of the normal 2-3 active WDs seen during the months of April and May, over the past month and a half, at least 10 separate active WDs have been observed. WDs carry high velocity winds that agitate the atmosphere and aggrade storm conditions.

### Trough

A trough is an extended area of low pressure developed along the East-West axis. The wind moisture-laden winds from the Bay of Bengal met hot and dry air from central and western India. These winds also took in contact with the cold front that develops due to active WDs. The confluence of these different winds culminated in intense and widespread storms across the Indus-Gangetic plains. Similarly, a North-South trough was formed from Bihar to northern Tamil Nadu, along which stormy weather was observed in Telangana, Andhra Pradesh and some parts of Karnataka.

### Easterly winds

Winds from the Bay of Bengal carry moisture and are associated with pre-monsoon thunder storms in the eastern coast. Moving towards the trough, these winds provided the moisture that further intensified the convective storms.

### Unusually hot conditions

Temperatures over 40°C observed in northwest, central, east and north peninsular India. Interaction of hot air near the surface with colder winds from the Western Disturbances gives rise to intense and widespread storms.

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**Between February and May in 2018, India experienced an unprecedented storm season—more than 14 in 16 states. This brings us to the linkages of geographically distant events related to climate. From a climatological perspective, these storms were anything but typical. Initial analyses have revealed several reasons for the stormy weather, including the activity of Western Disturbances (WDs), the low pressure in the Indus-Gangetic plains and the intense heating in the northern and northwest India’ said M Mohapatra of the Indian Meteorological Department (IMD), New Delhi.**

As the Arctic warms, the difference in temperature between the Arctic and the equator has reduced, particularly during recent winters which have seen highly anomalous heating around the North Pole. A warmer Arctic has been correlated to extended winter seasons punctuated with blasts of arctic weather in the northern hemisphere. The warming temperatures also impact the gradient in the jet stream, causing the jet streams to meander rather than take a straight course which, in turn, affects the stability and movement of the WDs. Additionally, steep increases in temperatures in the Western Himalayan region and the Tibetan Plateau—have linked to further destabilization of climatic patterns in the region. Western Himalayas and the Tibetan Plateau are considered to play a crucial role in maintaining the hydrological and weather cycles over the Indian subcontinent. Rapid warming, which has caused temperatures to increase by up to 3°C since 1951, have been linked with increased variability in the distribution and direction of WDs and associated precipitation.

There are clear indications of how the general trend of warming is exacerbating stormy weather during the pre-monsoon season. The general physics behind storms unequivocally points at a higher incidence and intensity. A review of the ‘EM-DAT’ Disaster Database that compiles information regarding disasters the world over reveals a worrying trend. One has to go back 40 years to see the last time convective storms during this season caused comparable losses of life. In 1978, storms in March and April across North and East India caused the deaths of over 600 people. But large-scale convective storms in the pre-monsoon season were few and far between. Between 1990 and 2005, just nine deadly convective storms were recorded in India in the March-May period. However, a steep increase has been observed in the last 15 years. Between 2005 and 2017, 22 such storms were observed over the Indian region accounting for nearly 700 fatalities compared to 640 fatalities in the preceding 22-year period. In 2018, 423 people have died owing to extreme weather systems.
• A. Western Disturbance changing – getting longer; link to weakened Arctic Jet Stream – warmer Arctic and difference reduced ocean
• B. Bay of Bengal getting warmer – more cyclones; more heavy rain. Colliding with WD, that are more frequent and late
• C. Intense heat spikes (Pakistan/north India) which is making ground dry
• D. Combined with groundwater overuse; lack of moisture; deforestation
• Deadly
Extreme Rain

A climate model simulating daily precipitation changes suggests that if the planet warms by 3 °C, most land areas would see substantially more heavy rains.

Nature, November 20, 2018 “Why extreme rains are gaining strength as the climate warms”
1000 extreme rain events in first 12 days of August

It does not rain
It pours

More rain
Fewer rainy days

https://www.downtoearth.org.in/dte-infographics/extreme_rainfall/index.html
India’s true finance minister turns extreme

- Extreme and heavy rain events in August 2019
- IMD has to rework definitions of ‘heavy’ rain
Flood-drought cycle becomes deadly

• Extreme rainfall means floods
• But worse, it means that water flows away; is not captured or harvested
• Leads to droughts
• Impacts on farmers - struggling for subsistence
• Impacts on water supply in cities
• Adds to conflict between cities and farmers on use of water
Drought at the time of flood
Extreme-rain floods

- Cannot hold water
- Destroys life when it floods
- Destroys life because of drought
Drought-flood not single day events

• Cripple people
• Destroy livelihoods
• Take away development dividend
• As events become more frequent, survival becomes more difficult
• No option but to move – migrate – to cities to new countries
• Add to growing insecurity in world

Not climate change alone. Our mismanagement. Climate change is exacerbating impacts. Let’s not let leaders blame change on the inevitable
2019: Desertification is global issue

• **Not only** because of impacts of climate change are impacting land and water and lives of people

• **But because** land and water management will provide us the way to cope with climate change and build livelihoods

• **Also because** land and water management will provide us ways to **mitigate emissions** -- combat climate change
Not about desertification
About fighting desertification

• This is the opportunity

• Soil is repository of carbon
• Forests sequester and hold carbon
• Grasslands hold carbon

• These are world’s natural sinks – if we grow them. We can mitigate and combat climate change

• But (or) And
But (or) And

• Cannot do this without securing rights of people to land and forests
• Our forests are habitats of people. Our forests are not wilderness
• People are best managers of forests; growers of trees
• This is the restoration agenda – growing livelihoods from trees

• Cannot do this without changing the way we do agriculture so that we do not over-chemicalize our soils
• Have to change diets so that we tread lightly on earth. Good for planet. Good for our health. Food is today biggest driver of bad health in the world. Malnutrition to over-nutrition
Real opportunity: local becomes global

• We can use the agenda to mitigate not just emissions but also eliminate poverty

• Build livelihoods of people from growing trees; cutting them and growing them again

• Build livelihoods of people from growing food that is local; biodiverse and nutritious
Global leadership?

- Worse time in the world for all this to happen
- No bandwidth to deal with climate change or development of the poorest

But can’t give up

- We must make the local-global connections
- We must show the possibility of change that is possible to people
- Capture their imagination; give them power to make a difference

Change is possible
If we had viewed Earth from space for thousands of years, we would describe humans as a desert-making species.

ELISABET SAHTOURIS
Evolutionary biologist
DESERrelanded

Over 75 per cent of the planet’s land area is already degraded.

India has lost productivity in about 30 per cent of its land area.

This is triggering crop loss, poverty, migration and even wars.