



Learning & Coping Climate Change



ICAR- CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

Indian Council of Agricultural Research

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ClimEd Series- II

This instructional material “Learning & Coping Climate Change” has been developed as a part of the Belmont funded project titled “Global Understanding and Learning for Local solutions: Reducing Vulnerability of marine dependent coastal communities” as a means to create awareness and impart climate change knowledge across the target populace.

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The logo represents Earth, with the bright green symbolizing life and the smoky black showing the deadly effects of climate change. Developed by Milton Glazer, towards the awareness campaign “It's not warming...Its dying” highlighting its urgency.



Disclaimer

Acknowledgements are due to the creative intellects of illustrations / photographs included in the ClimEd series. They are being sourced as an informative tool to its target audience on an "as-is, as-available" basis for educational purposes only.

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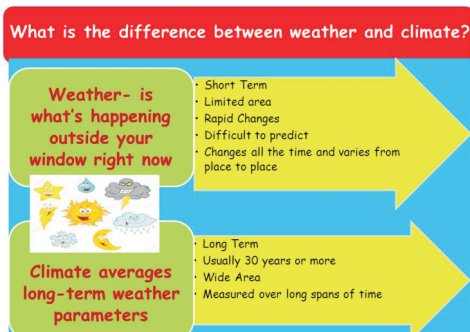
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Frequently Asked Questions

1. What is climate?

The long term pattern of weather conditions (temperature, air pressure, humidity, precipitation, sunshine, cloudiness, and winds) prevailing in an area.



2. What is climate change?

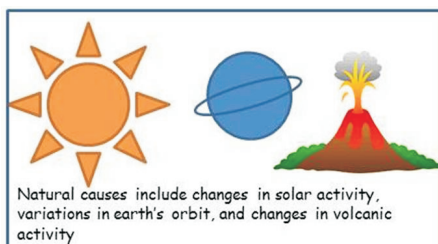
A change in climate that is gradual and persistent which may last for several decades or longer. The change may be due to natural or human-induced causes.

3. Is "Climate Change" and "Global Warming" the same ?

No, "Climate change" refers to any long-term change in Earth's climate, or in the climate of a region or location. This includes warming, cooling and changes besides temperature. "Global warming" refers to the long-term increase in Earth's average temperature.

4. What causes the climate change?

Natural factors - Changes in the sun's energy or slow changes in the earth's orbit around the sun; continental drift, volcanoes, ocean currents, the earth's tilt, and comets / meteorites.



Human activities - burning fossil fuels, livestock and paddy farming, land use and wetland changes, pipeline losses and covered/ vented landfill emissions, agricultural activities, including the use of fertilizers, cutting down forests, infrastructure developments, etc





5. What are the evidences / consequences of Climate Change?

a. Higher temperature - Greenhouse gases trap more heat in the Earth's atmosphere, causing average temperature rise across the world.

b. Sea level rise- As water gets warmer, it takes up more space. Melting glaciers and ice sheets adds more water to the oceans.

c. Warmer oceans - As the temperature of the atmosphere rises, oceans absorb heat and become warmer.

d. Habitat destruction – Considerable reduction in area under mangroves /seagrass /coral reefs resulted in depleting fish breeding grounds, and increase in coral bleaching events lead to loss of coral reefs and coral dwelling fishes.

e. Droughts-As temperatures rise, more moisture evaporates from land and water, leaving less water behind resulting in extended period of water scarcity across multiple uses .



f. Sinking islands and floods - Rising sea level will erode beaches, damage coastal wetlands, sweeps away certain islands threatening coastlines, buildings and the settlements located along them.



g. Extreme weather - As the top layer of the ocean gets warmer, cyclones and other tropical storms get their energy and grow stronger resulting in faster winds and heavier rain.



h. Species extinction - The changing weather and vegetation patterns across the globe, forces the species to migrate to new, cooler areas in order to survive which might ultimately lead to extinction.



i. Climate refugees - Climate refugees are people who must leave their homes and communities because of the effects of climate change and global warming.

6. How does climate change impact fisheries and fishers?

● Fisheries

Phenology and distribution: Changes in timing of ecological events (drastic shift in spawning season of major fishes, maturity attained at lower size than in the past), movement of fishes to deeper waters, higher latitudes etc.

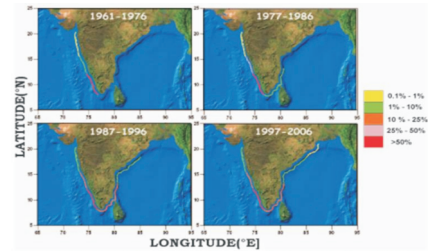
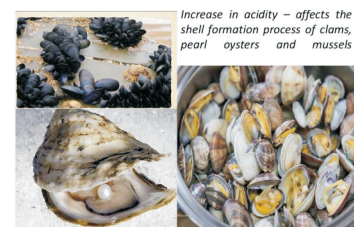


Fig. 3. Extension of distributional boundary of oil sardine along the Indian coast; the coloured lines indicate the percentage contribution of catch by each maritime state to the all India oil sardine catch during the corresponding time-period (from Vivekanandan et al., 2009c)

● **Species composition** : Fish stocks abundance and availability fluctuate seasonally leading to peak and lean fishing seasons

● **Catch**: The catch has decreased drastically over the years but the effort has increased fairly.



Fishers

- **Demography and Social standards:** Displacement of family members, disguised unemployment, labour migration, the young generation has a tendency to move out of fishing. Food security issues.
- **Infrastructure sensitivity:** Extreme weather events cause damage to the communities on shore through flooding, erosion, and storm damage and the fisher household are highly prone to disaster dwellings and the property loss.



- **Income Effect:** Loss in fishing days due to extreme weather events, Seasonality in employment, and minimal alternate livelihood options. Increased fuel cost / fishing efforts consequent to changing fishing ground affects the income levels of fishers .

7. What should be done to develop a resilient climate community ?

- **Awareness:-** sensitise, engage, mobilise and organise community towards climate change
- **Preparedness:-** involve community in identifying needs – livelihoods and training.
- **Adaptation:-** explore climate change indigenous knowledge, identify new alternative livelihood options, upgrading skills
- **Mitigation:-** increase government support levels- infrastructure, green technologies, insurance, fostering linkages across stakeholders

8. Who are the Climate change Agents?

The Climate change agents are players who will lead the climate change adaptation and mitigation activities across the regions



9. What are the differential roles you can play?



As an Individual:

- Get informed
 - Reduce your waste/ don't buy it unless you really need it/Buy in bulk [to reduce excess packaging]/ Opt for reusable bags instead of plastic bags/Choose products that have less packaging
 - Recycle and buy recycled products.
 - Reuse, repair or donate
 - Carry cloth bags when shopping
- Use a refillable travel mug or water bottle
 - Give your time instead of material gifts, or donate to a charity in the recipient's name
 - Be energy efficient/ efficient use of home appliances/ Choose renewable power/ Adopt energy-saving habits/ Pull chargers from the wall and turn off computers/ Switch off your electronic appliances at the plug point than on remote
 - Judicious usage of water / Make every drop count
 - Walk or ride your cycle instead of taking a car for a short distance/ If you must ride, carpool (if many people have to go to same destination, instead of using many vehicles use a common vehicle)
 - Change your attitude –think and act wisely
Reuse-Support and Donate
 - Go out for a couple of hours every day instead of watching T.V and Computer and be healthy
 - Plant trees
 - Switch off the street light, when there is a need of them/inform authorities
 - Use paper judiciously
 1. Use both sides of paper before recycling
 2. Request for e -statements
 3. Use and pass on textbooks – Juniors
 - Get involved/ plan and participate in eco-friendly activities



As a household:

- Make changes at home –
 1. Seal and insulate your home
 2. Make use of recycling programs, and compost food and yard waste;
 3. Judicious usage of water
 4. Use green power, such as solar panels
 5. Be energy efficient / Replace incandescent light bulbs with compact fluorescent bulbs / Buy appliances that have an energy star label.
 6. Practice moderate / usage of electricity, electrical equipment and vehicles
 7. Iron all your cloths at one time
 8. Reuse everything
- Encourage children's participation in environmental friendly activities
- Sharing – resources across different household members
- Keep your surroundings clean
- Educate future generation on climate change
- Organic Farming – grow your own vegetables



As a community

- Afforestation activities – carbon sink
- Sanitation programs
- Organic farming
- Proper waste management at source
- Reduce the usage of plastics
- Green fishing / responsible fisheries
- Conduct awareness programs
- Creation of climate community groups
- Provide leadership / partnership and support for a range of local actions



As a society

- Responsible fisheries
- Adequate and proper sanitation
- Integrated Waste Management programs
- Social forestry
- Creating social platform for a change
- Disseminating climate knowledge across stakeholders
- Provide incentives for green fishing / activities
- Get involved and educate others about the climate change scenario
- Partner with local governments to address climate change through local action
- Support and disseminate research, especially information about local mitigation and adaptation measures
- Intensify efforts to increase climate literacy among the stakeholders in fisheries sector



About CMFRI:

The Central Marine Fisheries Research Institute was established by Government of India on February 3rd 1947 under the Ministry of Agriculture and later it joined the ICAR family in 1967. Over the period of time the Institute has emerged as a leading tropical marine fisheries research institute in the world. Apart from fishery research the institute has been addressing climate change issues affecting coastal habitats and fishers.



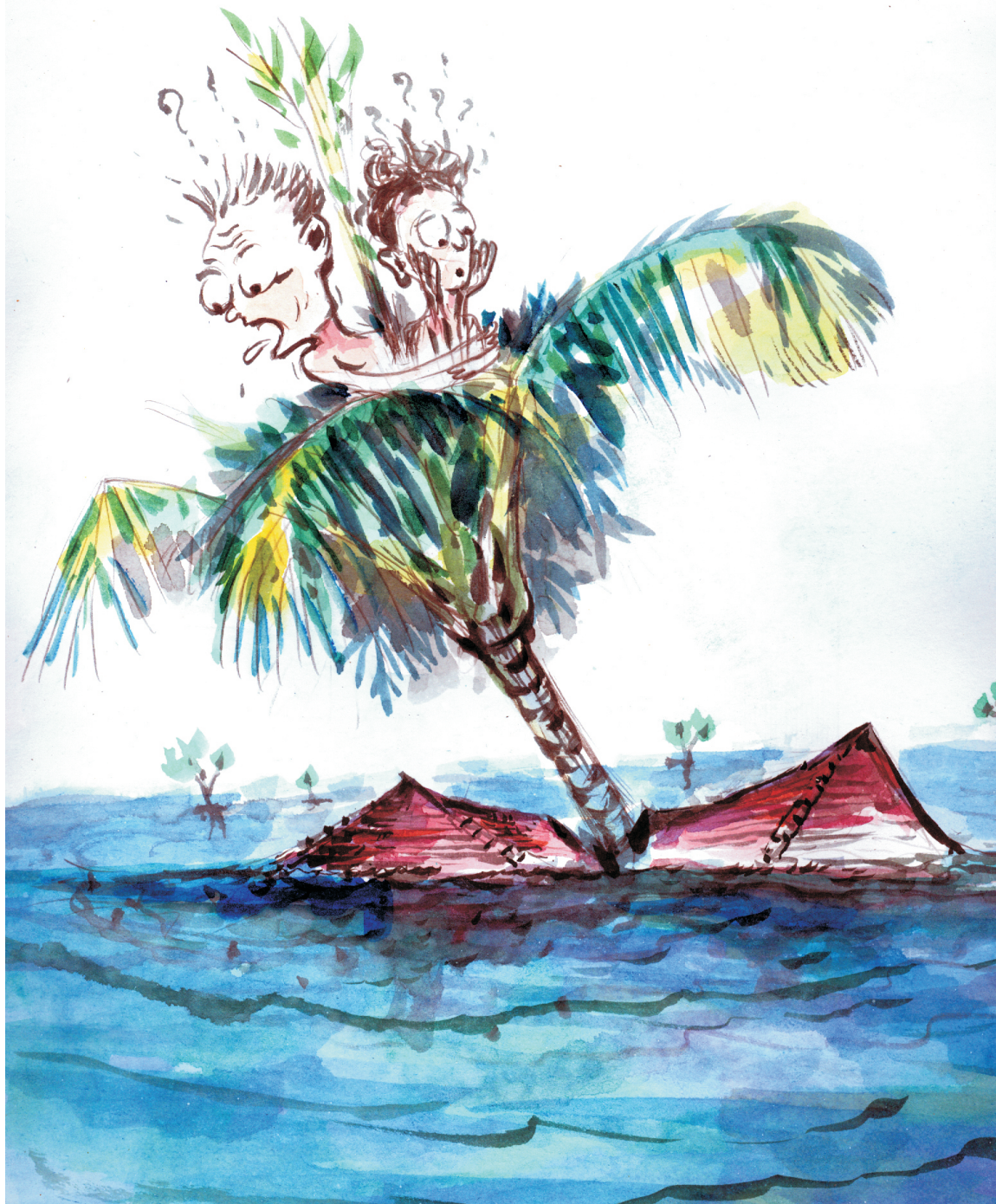
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About Belmont - GULLS:

The GULLS project funded by the Belmont Forum addresses coastal vulnerability issues,- specifically the challenges that arise in food security and sustaining coastal livelihoods as a result of global warming and increasing human coastal populations. It seeks to identify adaptation options and strategies for enhancing coastal resilience at the local level and in doing so will contribute to capacity building and local empowerment. The goal of the project is to provide insight to coastal communities to adapt to climate change through trans-disciplinary approach.

Gulls website: <http://www.marinehotspots.org/>



*Climate adaptation and mitigation mantra
Villages as climate change entities
Experienced fishers, committed women, proactive youth and
articulate children as climate change agents*