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Combatting floods and tackling climate change

Both water resources and agriculture are extremely important sectors in Odisha that will be severely impacted by climate change. Adverse impacts are already being observed. They are manifesting as more frequent floods and droughts, prolonged heat waves, depleted ground water levels, shifting monsoon patterns and an increase in extreme weather events.

Already, there are inherent issues in the agricultural sector, such as low productivity and low income leading to poverty, malnutrition and food insecurity. Because the sector is highly dependent on rain-fed agriculture, projected changes in the intensity and frequency of rainfall are likely to add to these problems. Weather, as a single factor, could be responsible for as much as 50% of the variation in yield from year to year.

Flood and drought are common in the State. Regular floods (on average one every three years) along the various river basins, particularly the Mahanadi, result in huge financial losses to the State's economy. At the same time the State is one of the most drought-affected in India where, on average, severe droughts occur about once every eight years.

With depleting ground water resources, a lower number of rainfall days (rainfall days have reduced from about 120 to 52 per year), but with higher amounts of rain, there is a huge amount of run-off water which goes unused. This is important as, given the change in the rainfall pattern, people have started shifting from rain-fed agriculture to irrigated, high-yielding agriculture. This compromises ground water sustainability.

Our approach

Action on Climate Today (ACT) works towards both technical outputs and those connected with the changing levels of understanding, capacity, political commitment and institutional mechanisms. Activities include knowledge management, awareness-raising, stakeholder engagement and

capacity building, as well as the more conventional expert technical advice.

In order to ensure water resources management and agriculture are resilient to climate change in Odisha, it is necessary to:

- Improve the way that floods, river basins and ground water resources are managed.
- Ensure that sufficient capacity is developed in the agricultural sector, both within the Government as well as within the farming community, to adapt to climate resilient practices and develop climate-sensitised value chains for diversified agrarian (crop and non-crop) products.

ACT's support is channelled through five focus areas and takes into account gender-specific issues so that the resilience needs of women are addressed (e.g. encouraging participation and providing training for entrepreneurs).

Forecasting floods

The Mahanadi River is a major water source for domestic, agricultural and industrial use in Chhattisgarh and Odisha. The Mahanadi River Basin is also historically notorious for its floods. There have been eight major floods in the period 1958 to 2011 and 2014 flooding affected over 1,500 villages and 1.8 million people. ACT's support will develop a flood forecasting model and build the capacity of the relevant departments to take decisions based on the model.

Prioritising water use

Over-exploitation of ground water and mis-utilisation of surface water resources, along with variable rainfall and monsoon due to climatic changes, have led to major gaps in irrigation potential created and utilised in the State. The State extracts surface water at the expense of sustainable use and augmentation of ground water resources. This has led to availability issues of ground water over the years. ACT is working on sustainable use and prioritisation of water use. This will involve a demonstrative planning that will account for sustainable and equitable use of water resource integrated with agriculture planning.

Institutional mechanism for knowledge management

At present, flood management and ground water management are overseen by different parts of the Government. ACT is providing the framework for implementing and making operational a sustainable institutional mechanism to carry out the different activities of water resources management under a single umbrella, such as a River Basin Organisation.

Adapting agricultural practices

ACT supports and strengthens the existing climate change cell in the Agriculture Department by developing capacity within the department and encourages the farming community to adopt climate resilient crop practices, diversified crops,

non-crop production and value chain development. This support assesses selected agro-climatic zones for developing value chains and climate resilient practices.

A heat island study

In Odisha, during the summer of 2015, nine cities recorded temperatures of more than 45°C resulting in more than 100 deaths. The heat island effect is worse in urban and industrial areas. The Ib-Jharsuguda region is a heavily industrialised area and experiences pronounced effects of this phenomenon resulting in higher heat stress of the population. This study is researching the significant factors causing the high ambient temperature and suggesting appropriate remedial measures to mitigate the heat island effect.

Partnership building

ACT's main partners are the Departments of Water Resources, Agriculture, Irrigation, and Health and Urban Planning, the State Pollution Control Board, the State Disaster Management Authority and the Special Relief Commission. District Agricultural Officers will be involved with the agricultural work stream.

The ultimate beneficiaries will be farmers in two agro-climatic zones of western Odisha and the coastal district. In the Mahanadi basin, up to three million people may benefit from improved flood forecasting. In districts where water allocations are improved a major beneficiary group will be women who have to carry water long distances.

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