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Summary Report of Workshop

Sustainable Agricultural Development in Jharkhand under Changing Climate

March 7, 2014

At ViSWA Training Centre, Near Joda Pul,
Kanke Road, Ranchi

Organized by :
Centers for International Projects Trust (CIPT)
New Delhi

OBJECTIVE

Centers for International Projects Trust (CIPT) organized a workshop on Sustainable Agricultural Development in Jharkhand under Changing Climate on March 07, 2014 at Ranchi. The objective of the workshop was to bring together important stakeholders including government officials, academicians, farmer organizations and extension agencies to share experiences on water sustainability and rural livelihood issues. It was also to facilitate a more focused discussion on conserving water, energy and enhancing farm incomes in times of increasing weather uncertainty. The workshop helped in identifying the conditions necessary to create a broader common framework on water-energy-food nexus under the changing climate. It outlined future areas of thrust and collaboration amongst the stakeholders for achieving faster and sustainable agricultural growth in Jharkhand.

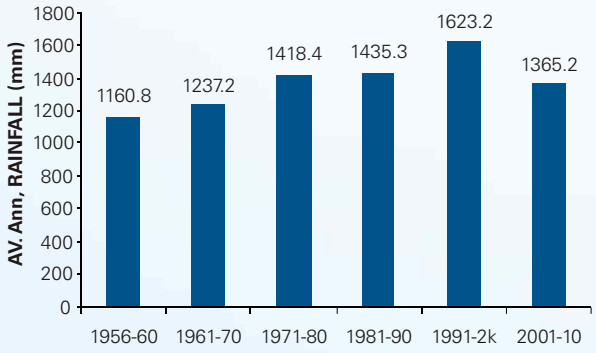
SUMMARY

Dr. Kamal Vatta, Director, CIPT outlined the purpose of the workshop which was mainly to identify key issues concerning water-energy-food nexus under changing climate in Jharkhand. The workshop will highlight past efforts, their successes and limitations and identify future viable strategies for developing possible partnerships, added Dr. Vatta.

Dr. M.P. Pandey, Vice Chancellor, Birsa Agricultural University (BAU) outlined in his inaugural address that Jharkhand was likely to see a decline in the yields of rice and wheat in the coming years. He further indicated that rice and wheat (irrigated) yields will decrease by 4 per cent and 6 per cent respectively by 2020.

He emphasized an increase in minimum temperature by 0.6 degree in Jharkhand and changes in rainfall pattern with increase in rainfall intensity. With unequal distribution of rainfall, the incidences of excessive rainfall causing floods are on the rise.

Figure 1: Changing rainfall patterns



Dignitaries at the Inaugural Session (From left to right) – Dr. A Wadood, Mr. JS Choudhary, Dr. MP Pandey (Vice Chancellor, BAU), Dr. Kamal Vatta, and Dr. DK Singh Dron

Dr. Pandey also stated that varieties and planting times were changing and emphasized the need for adaptation in response to the climate variability. With Jharkhand having just 12 per cent area under assured irrigation, an increase in irrigation facilities will increase cropping intensity and hence the food production in Jharkhand.

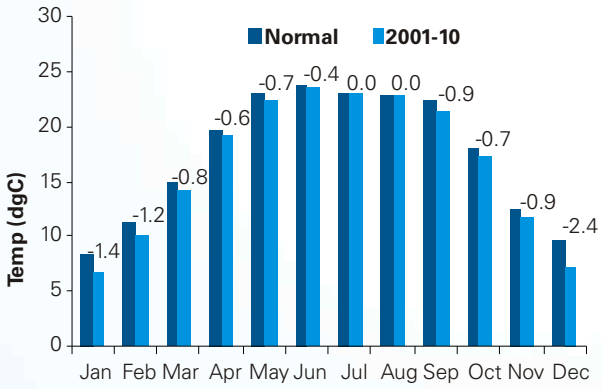
Dr. Pandey outlined various problems affecting Jharkhand agriculture such as poor soil texture, low water holding capability of soil, fragmented land holding, poor organic content of soil, and unequal distribution of rainfall. Coupled with this, the state faces periodic droughts.

Dr. Pandey urged the scientific community, civil society and government departments to join hands to develop a roadmap for sustainable agricultural production in Jharkhand. The roadmap should necessarily focus on involving the farming community, stressed the Vice Chancellor.

Dr. Kamal Vatta, Director, CIPT shared various initiatives undertaken as part of the Water-Agriculture-Livelihood Security in India program supported by USAID. He highlighted that CIPT's interventions address the fundamental issue of capacity building. There have been efforts to develop low cost technologies and decision support systems for the farmers and other stakeholders in terms of weather, markets and production practices. Dr. Vatta asserted that workshop will pave way for more focused approach towards conserving water and energy and enhancing farm incomes in times of increasing weather uncertainty.

Dr. A. Wadood, Chairman Department of Agricultural Physics and Meteorology indicated the changing trends in rainfall, temperature and humidity in the state across past few years and its impact on the state's agriculture.

Figure 2: Temperature patterns in the state



He said that Jharkhand is privileged by its geographical position and has diverse agro-climatic zones. Though annual rainfall in Jharkhand was high in recent years, it was poorly distributed which caused agricultural drought. In 2011, however, the rainfall was adequate and properly distributed. The scenario in subsequent years was not favourable for agriculture.

As the state was receiving reduced pre-monsoon rainfall, it was causing delay in land preparation, further delaying the sowing of Kharif crops. The ultimate impact of delayed sowing was the reduction in farm yields. Mid-season drought was pointed to be the major threat for agriculture in Jharkhand which was causing failure of the crops.

Dr. Wadood stressed the need for in-situ rainwater harvesting to conserve moisture and improve food production.

Dr. Wadood outlined the changes in temperature and its impacts. While high temperature in summer months was causing loss of yield, incidences of minimum temperature going down by 2-3 degrees was resulting into frost and adversely affecting the crop yields. It was emphasized that a balanced approach aimed at mitigation as well as adaptation was required to addressing the issues of climate change.

Mr. R.B Sinha, Chief Engineer, Drinking Water and Sanitation Department (DWSD), Government of Jharkhand called for sustainability of water sources to meet the drinking water requirements. He stressed on the need to prepare localized plans considering the needs of the local population and also highlighted the need for a detailed study of the local issues concerning water. The need for harvesting water in mine areas and making it available for differential use was also emphasized. Mr. Sinha mentioned that the planned Center for Research and Development for Water in Jharkhand has the potential to solve the above mentioned problems.

He cautioned that assuring water security and meeting competing demands for agriculture, industry and domestic sectors would pose a challenge. It would require identification of localized solutions for water harvesting, recharge and convergence of water programs across various departments.

Mr. Sinha called for amalgamation of plans relating to water use across sectors to ensure effective management and avoid duplication of efforts. He concluded by saying that CIPT's programmes on water were focused in that direction and there was a need to join hands and work in an integrated fashion.

Mr. S.L.S Jageshwar, Former Director, Groundwater Directorate highlighted groundwater fluctuations in the state. Both urban and rural areas are witnessing rapid decline in ground water levels, but problem is more pronounced in urban areas of Ranchi, Dhanbad and Jamshedpur (See Table 1).

He mentioned that rapid industrialization and urbanization were causing groundwater depletion. As Jharkhand was witnessing high-intensity low-duration rainfall owing to climate change, it did not facilitate groundwater recharge due to low time of concentration. Rainwater harvesting was emphasized as a viable solution for this problem and it could be done by harvesting water on the surface or by recharging groundwater aquifers through recharge pits, defunct hand pumps, recharge wells etc.

Table 1: Groundwater scenario in key urban/industrial areas of Jharkhand

Sl. No.	District	Block	Stage of groundwater development (2011)	Categorization	Category
1	Dhanbad	Jharia	112.48 per cent	Over Exploited	Semi-Urban
2	Dhanbad	Dhandbad	143.09 per cent	Over Exploited	Urban
3	East Singhbhum	Jamshedpur Sadar	107.52 per cent	Over Exploited	Urban
4	Godda	Godda	110.06 per cent	Over Exploited	Semi-Urban
5	Ramgarh	Ramgarh	105.26 per cent	Over Exploited	Urban
6	Ranchi	Kanke	122.44 per cent	Over Exploited	Semi-Urban
7	Ranchi	Ratu	70.30 per cent	Semi Critical	Semi-Urban
8	Ranchi	Ormanjhi	78.94 per cent	Semi Critical	Semi-Urban
9	Bokaro	Chas	78.37 per cent	Semi Critical	Urban
10	Saraiekela-Kharsawan	Gamharia	75.08 per cent	Semi Critical	Urban
11	Loahrdaga	Lohardaga	69.60 per cent	Semi Critical	Semi-Urban

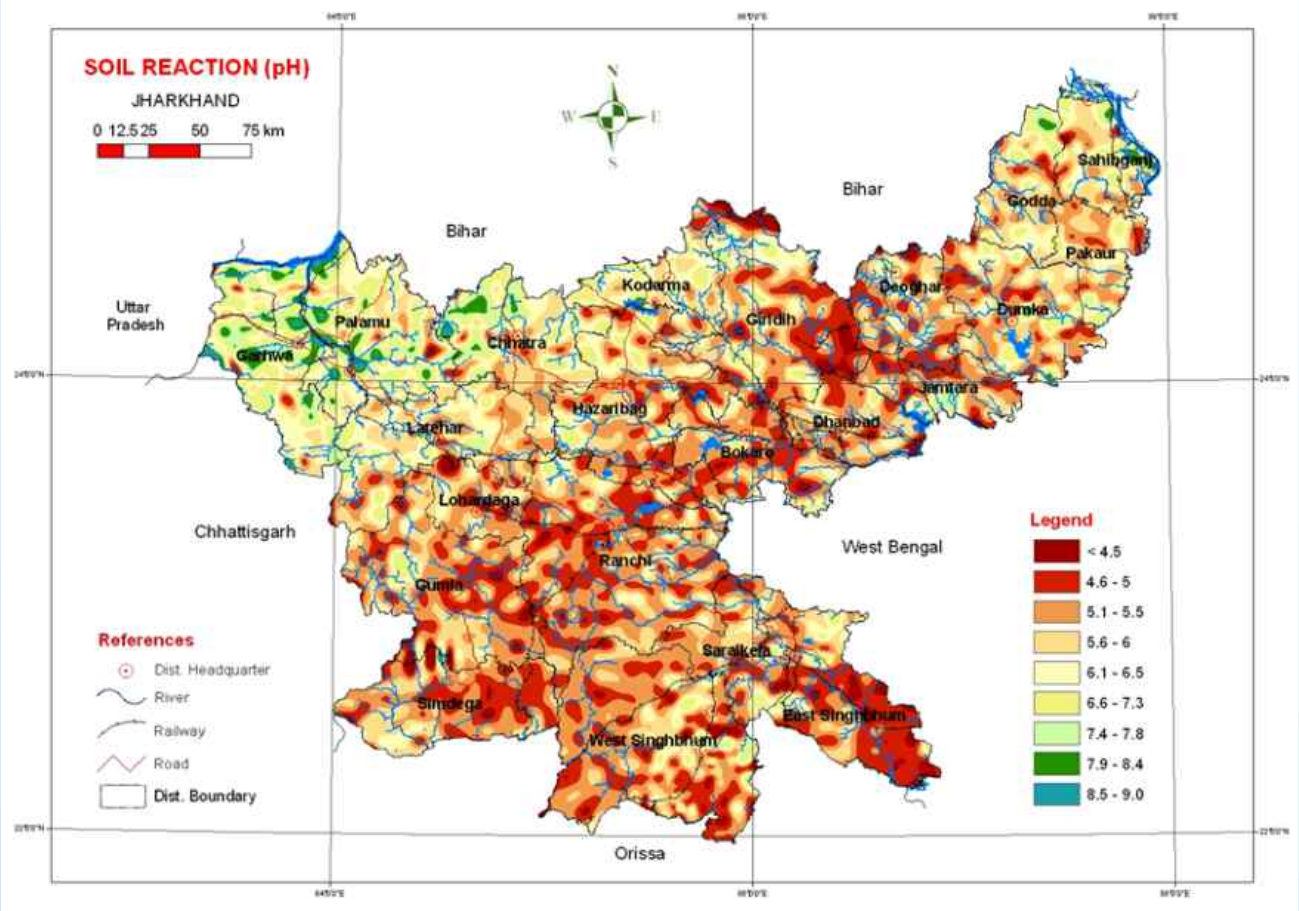
Rainwater harvesting through identification of locations based on hydro-geological studies is critical for augmenting water sources. Mr. Jageshwar called for massive sensitization program for addressing the challenges of growing water scarcity.

Dr. BK Aggarwal, Chief Scientist and Professor, Department of Soil Science and Agricultural Chemistry, BAU discussed major issues concerning acidic soils of Jharkhand. He informed that 49 per cent of the total geographic area (TGA) of the state had acidic soils, rendering them unsuitable for crop cultivation.

The organic carbon content of soils of about 47 per cent of the state area are low to medium (<0.5 per cent to 0.75 per cent). Majority of the soils in Jharkhand have medium nitrogen contents (280 to 560 kg/ha) and about 19.6 per cent area has low contents (<280 kg/ha). Soils of about 66 per cent area are low (<10 kg/ha) in available phosphorous content.

Most of the soils (about 51 per cent of TGA) have medium potassium content and about 18 per cent are low (below 108 kg/ha) in available potassium content. Soils of about 38 per cent area are low in available sulphur content. Thus soils in the state contain low organic carbon, phosphorus and sulphur and suffer from micro-nutrients deficiency.

Figure 3: Nature of soils in Jharkhand



To overcome soil acidity some methods could be adopted like liming acid soils to neutralize soil acidity and ensuring adequate supply of nutrients to crops. In rainfed areas, half the recommended dose of NPK fertilizers with lime can boost crop productivity in acid soil regions. Crops and varieties of crops tolerant to soil acidity problems must receive priority attention in acid soil regions. Soil test based use of secondary and micronutrient use is essential for improved crop productivity in acid soil regions.

Dr. Aggarwal called for designing of customized fertilizers based on requirement of the particular area for increasing the yield of production.

Dr. DK Singh Dron, Additional Director Research, BAU highlighted the opportunity to convert large area under non-agricultural use to agricultural use in Jharkhand. He emphasized that factors like erratic distribution of rainfall, poor water holding capacity, high infiltration rate, soil texture and soil acidity put a heavy stress on crop productivity and crop diversification in the state.

He said that green fodder cultivation was not a major practice in the state but was required for dairy and milk production. Jharkhand contributes 4.05 per cent of total fruit production in the eastern region. In vegetables and spices production, the contributions are 5.35 per cent of the total production in the eastern region. He pointed to the need for exploring dairy, horticulture and floriculture, which provide immense opportunities for Jharkhand.

Dr. Dron laid emphasis on the food quality as an important component. He proposed various research ideas for consideration such as integrated watershed development, development of integrated farming system models to achieve food and nutritional security at household level, integrated pest and disease management with the use of bio-pesticides, bio-agents, PGR and micro nutrients, weather based forecasting for disease and pest surveillance, increased mechanization in horticulture crop production and post-harvest handling.

He also discussed some potential opportunities for Jharkhand like food processing industries, large scale quality seed production, organic farming and allied activities such as apiculture to enhance farm incomes.

Availability of water, labour, power and inputs are critical for sustainable agriculture and require a mix of research and innovation, demonstration and awareness, he added. Dr. Singh called for developing right pricing signals for inputs and final produce to enhance economic well-being of the farmers.

Mr. J.S. Choudhary, Director SAMETI outlined the trends in agricultural production during the past few years. He highlighted important performance indicators for Jharkhand agriculture such as food grain production, paddy / rice, pulses and status of crop production, productivity and food procurement. Procurement of food grains was turning out to be a challenge and there were concrete efforts by the state government towards improving public procurement and storage.

Mr. Choudhary informed that the state was promoting the use of modern agricultural technologies, encouraging adoption of better inputs (hybrid seeds, fertilizers), enhancing own seed production, undertaking large scale capacity building programs in Jharkhand and was monitoring and supervising at Block/District/State Level for development of agriculture.

He also discussed about some of the ICT initiatives like inter-district and state communication solely through emails, publicity through web portals, monitoring of Kisan Call Center, activities of SAMETI with beneficiaries through SAMETI website, bringing videos and live programme to other people through social networking.

OUTCOMES

Based on the discussions the following were outlined as opportunities for engagement in Jharkhand –

- In-situ rainwater harvesting, judicious use of stored water
- Use of low cost technology like tensiometers
- Crop diversification in upland areas
- Promoting less water intensive crops
- Integrated nutrient management
- Post-harvest management and food processing amongst others.

PARTICIPANTS

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Water – Agriculture – Livelihood Security in India (WEALS Program)

Overview

Chronic water shortage and groundwater depletion have emerged as the leading challenge for food security in India. Agriculture consumes over 90% of water in India, and given the high climate variability, irrigation is the key to adequate crop yields, reliable production and farmer income. A variety of government subsidy and food procurement programs has led to the adoption of sub-optimal cropping patterns and has caused a dramatic increase in groundwater pumping. Increased pumping is fast depleting the groundwater resources. It also translates into increased power consumption, leading to unsustainable high levels of budgetary deficits as well as high carbon emissions.

Recognizing the diversity in climate, soils, agricultural practices and socio-economic factors across India, the USAID supported WEALS program seeks to address the water-agriculture-livelihood connect for states of Gujarat, Punjab and Jharkhand. The program includes, on-field engagement with farmers to test and scale up adoption of appropriate water saving technologies and practices while maintaining yield and income; providing them with access to reliable markets and technologies through corporate engagement in farming; and enabling on-farm best practices to manage chronic risk induced by ground water depletion and climate risk, through the use of ICT system that helps customize guidance to farmers.

Objectives

- Develop and implement a public-private partnership to provide modern extension services to farmers in Punjab, Gujarat and Jharkhand for climate informed crop choice and irrigation improvements to improve water productivity, income and climate risk management.
- Considering both chronic risk from groundwater depletion and weather extremes, develop and apply farmer targeted risk prediction and management tools, including pilots of policy initiatives.

Tasks

Task 1: Integrated assessment of the hydro-climatology, crops, water and energy systems.

Task 2: Economic analysis of short and long-term farmer and state level outcomes relative to climate, water and energy scenarios.

Task 3: Farm-level field implementation for assessing and promoting specific water and energy saving methods

Task 4: Climate and market informed agricultural supply chain development integrating farmers and corporate aggregators.

Task 5: Synthesis, results dissemination and policy change stimulation.

Task 6: Scale-up and future replication.

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