

## Summary Proceedings and Recommendations: National Workshop on Food Security and Climate Change Anand Agricultural University Anand, Gujarat

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**National Workshop**  
**on**  
**Food Security and Climate Change**

**Anand Agricultural University Anand, Gujarat**

**Summary Proceedings and Recommendations**

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The rising atmospheric temperature, widening variability in monsoons, and increasing frequency of floods and droughts in recent past are the major challenges today. The ensuing climate change has started showing its impact on agricultural productivity and is posing a threat to the food and nutritional security globally and more so for a developing economy like India. Over the years, the importance of understanding the impact of climate change on agriculture has been often underestimated. It is time to divert efforts to develop agricultural policies by factoring climate change.

Considering the importance of food security for the country, the National Council for Climate Change, Sustainable Development and Public Leadership (NCCSD) in collaboration with Anand Agricultural University, Anand, and the International Food Policy Research Institute (IFPRI), New Delhi, organized a one-day international workshop on **Food Security and**

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**Climate Change** on June 2, 2015 at Anand Agricultural University, Anand, Gujarat. The aim of the conference was to understand the impact of climate change on agriculture, enlist the efforts needed to combat this change and develop a road map to achieve food and nutritional security under the climate change scenario. The workshop started with the welcome words by Dr V V Sadamate, former advisor (agriculture), Planning Commission. He mentioned that household income security should be the major concern in our efforts towards achieving food security.

In his address, Dr NC Patel, Vice Chancellor of Anand Agricultural University, Anand, informed the participants that due to increase in atmospheric temperature, the production in agriculture is declining across the nation.

Dr PK Joshi, Director-South Asia, International Food Policy Research Institute (IFPRI), explained volatility in food prices through red, orange and green lights monitoring system as part of the India Food Security Portal. He also mentioned that return on investment (ROI) is low in agriculture compared to other sectors and climate change has enforced additional challenges in agricultural production. Dr Josh suggested that introduction of commodity-based insurance, and focus on MGNREGA and its interface with agriculture should be our primary goals to help the poor farmers in the country.

In his opening address, Dr Devi Prasad Juvvadi, Centre for Good Governance (CGG), explained the significance of climate change and soil

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conservation practices in agriculture. He advocated for development of a decentralized approach for managing climate change effect on agriculture.

Dr CJ Dangariya, Vice Chancellor of Navsari Agriculture University, explained the linkage of greenhouse gases with the agriculture sector. He emphasized that resilience in agriculture can be achieved through crop diversification. Dr B. Swaminathan, Vice Chancellor of Junagadh Agricultural University, presented the potential impact of climate change on both developing and developed countries and highlighted the importance of climate variability mapping in the agricultural system.

The second technical session started with the formal speech of Dr AR Pathak of Junagadh Agricultural University. The first speaker, Dr N Chattopadhyay, from Agriculture Metrological Division, emphasized on the importance of block level data adaptation and outlined the initiatives needed for better results. Prof. KV Raju, Director of Development Management Institute (DMI), highlighted the importance of programs like MGNREGA in ensuring food security. He suggested to follow focus-based approach for successful execution of the existing programs. He advocated for adoption of appropriate changes in the existing system of the financial institutions for giving agricultural credit. The next speaker, Dr M A Shankar, talked about smart village and smart agricultural practices for ensuring food security. He mentioned that bio-technology, natural resource management, nutrient management and zero tillage were the important tools for ensuring food security. Dr Kirit Shelat, Chairman of National Council for Climate Change, Sustainable Development and Public

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Leadership, highlighted the importance of post-harvest management. On the same lines, Miss Hetal, NCCSD, presented several details on post-harvest losses and suggested ways to address the existing problems in post-harvest management. Dr RASherasiya, Director ATMA–Gujarat, talked about the effect of climate change on wild life and forests and outlined the importance of extension services in information dissemination.

The third session started with the presentation by Dr Narayan Hegde, Bharatiya Agro Industries Foundation (BAIF), on the role of civil society in climate change management. He suggested several ways like livestock development, water and biodiversity conservation, climate resilience farming, role of marketing, and multiple cropping to combat the effects of climate change. Dr P Chandrashekara, National Institute of Agriculture Extension Management (NIAM), outlined the role of agricultural extension services, and contribution of ATMA therein for agricultural planning and climate change management.

Final session started with the presentation of Shri Malay Joshi from Vivekanand Research and Training Institute. He discussed a case study of Rukmavati River Basin and showed a dossier of suitable ways to manage natural resources for sustainable development. Shri Kanhaiya Choudhary from Sadguru Foundation, showed how rural development mitigates climate change in the drylands. He explained the benefits of knowledge sharing by presenting the Dahod case study. The session concluded with presentation by Dr Piyush Kumar Singh from Development Management Institute (DMI). He suggested the ways to secure household income from climate change impact. He highlighted the importance of weather index

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insurance and remote sensing based insurance for providing food stability to rural households. He stressed that through remote sensing based insurance, we can address various limitations of weather index insurance.

At the end of this knowledge-enriching workshop ,Dr V V Sadamate,Dr Kirit N Shelat, DrDevesh Roy and Dr N C Patel suggested some policy recommendations as effective outcomes of this event and also the way forward.

### **Dr V V Sadamate, Former Advisor – Agriculture, Planning Commission**

- Need for (i) promotion of climate smart agriculture, (ii) mapping of climate variability, (iii) block level recommendations and monitoring committee, and (iv) re-orientation of agricultural extension services.
- Required to promote agro-pilot and watershed management, need to focus on MGNREGA in relation to climate risk management.
- Need to develop suitable insurance product in the line of climate change impact; need to do convergence of agricultural extension services for effective information-sharing.
- Need to focus on research gap analysis.
- Need to document success stories which is lacking presently.

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**Dr Kirit N Shelat, Chairman, National Council for Climate Change, Sustainable Development and Public Leadership**

- Impact of climate change is visible in wheat production in the country, and wheat and groundnut production is down for the past two years in Gujarat.
- Incidences of farmers' discontent are on the rise. They are reflected in the agitation against Land Acquisition Bill, but in reality, the majority of farmers have nothing to worry about land acquisition. Similarly, incidents of farmers' suicides are rising and the rural youth is becoming restless.

Some of the important initiatives which are need of the time are:

- a. Identify vulnerable areas and poor farmers (whose number is more than 30 percent)
- b. Develop and expand early weather warning/forecast system backed by agro-advisory services. This should be implemented at the block level also. With the available expertise in IMD and SAUs, this is quite feasible.
- c. Develop a strong risk management system which should include insurance cover for crops, cattle, and fisheries; develop seed bank crop advisory based on soil health and moisture analysis of land and employment in community works (MGNREGA).
- d. Farmers need to be encouraged for developing multiple sources of income.

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- e. With climate risks in agriculture, diversification is the next step forward.
- f. Another crucial area is the minimization of post-harvest losses which range from 5 to 25 percent of produce. The value-added chain in agriculture which includes proper cleaning, sorting, packaging, transporting and marketing with back-up of cold storage facilities, needs to be developed. This has to be supported by the use of agro/cattle dung waste for production of compost and biogas — both save/reduce production cost in agriculture.
- g. The major challenges are:
  - Development of multiple stress-tolerant seeds and simulation of agro-advisory for erratic weather change.
  - Dissemination of knowledge/ technology at farmers' door-steps, particularly for small farmers and women farmers. Multiple sources of knowledge model and quality inputs are the other requirements.
  - Recycling of water is a big challenge. Encourage use of urban waste water after recycling, for the adjoining agricultural areas. Even recycled waste water of villages which have tap water supply as in the case of Gujarat, can be used for irrigation.
  - Energy saving is another key issue. This includes adoption of drip irrigation and solar power appliances.

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## **Dr Devesh Roy, Research Fellow, IFPRI**

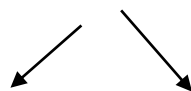
- Need for assessment of impact and economic viability of development programs.
- Need for cost-benefit analysis of different programs which were highlighted in the workshop.
- Pilots are fine but models that can be scaled-up, should be studied. How will a model be scaled up should be part of M&E. We will have to go beyond pure academic interests and the rigour needs to be respected.
- There is a strong need for compiling of case studies for multiplication.

On the way forward, it was suggested that research on impact analysis should be taken up by the JAU, AAU and NAU and the policy recommendations should be taken up by the NCCSD in consultations with the state and central governments. It was unanimously agreed that compilation of success stories on climate resilience be undertaken immediately.

The IFPRI may consider taking up pilots in two different ways with different organizations, as depicted below:

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## IFPRI Pilots



**Case studies**

**Success stories on  
climate resilience by  
NCCSD**

**Impact analysis of**

**development  
programs by  
AAU/JAU/NAU**

It is important that the government integrates different departments related to agriculture, like rural development, water resources, and energy. The Agriculture Department has to emerge as an effective nodal agency at district and taluka levels to address all agriculture-related issues. Food security is a challenge, but can be converted into an opportunity by integrated action. In this Workshop, several ideas emerged on how can we address the climate change impact and secure food for our present and next generations.

## **Recommendations of the Workshop**

### **(A) Recommendations for Policymakers**

#### **1. Promotion of Government's Policy for Climate Smart Agriculture**

Under the changing scenario of climate, special emphasis needs to be given by the central and state governments on the climate smart/ resilient agriculture by highlighting the issue with focus on dissemination of

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knowledge, and advanced technology for climate smart agriculture across farmers to augment their production and income levels

## **2. Climate Change Contingency Action Plan**

Different agro-climatic zones— there are eight in the Gujarat state —vary in terms of types of soils, cropping systems, irrigation and rainfed conditions, total precipitation, rainfall patterns, crop varieties and livestock breeds, which are highly responsive under specific locations. Therefore, it is necessary to make the contingent action plan at a more granular level to overcome the situation of climate change variability. There is an urgent need to prepare a micro level plan for each district, block and village in the state.

## **3. Provision of Special Funds/ Grants for Climate Smart Agriculture, Disaster Management and Restoration and Rehabilitation**

For sustainable livelihood of farmers, there is a need for provision of social funds/ grants by the state government to the agriculture sector including horticulture, agro-forestry, animal husbandry, poultry and fisheries, for climate smart agriculture, disaster management and restoration and rehabilitation of farmers.

## **4. District-wise Mapping of Climate Change Situation**

With the help of ISRO data, scientists in the state can devise action plan quickly for efficient management of climate change situations and use of government machinery to help farmers cope with climate variability.

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## **(B) Recommendations for Agricultural Scientists**

Research should be undertaken on the development of new stress-resistant crop varieties and breeds of animals, which can tolerate high and low temperatures, and high and low rainfall conditions, as well as are resistant to pests and diseases.

## **(c) Recommendations for Extension Functionaries and Farmers**

1. Dissemination of advanced technology and intervention among the farmers about climate smart agriculture through different modes of extension services on cluster basis should be planned at the micro level for the benefits of farmers.

2. To provide better exposure/information to the farmers about climate smart agriculture, the following agencies may be involved:

(a) Agricultural universities in the state

(b) Various agriculture related departments like horticulture, forestry, fisheries, animal husbandries, etc.

(c) Institutions and programs like the following:

- ATMA
- NABARD
- MGNREGA
- RKVY
- All educational institutions
- All nationalized banks

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- All co-operative banks and organizations
- All NGOs, SHGs, Farmers' Groups.

(d) Different information and communication technologies like TV, radio, mobile phones, newspapers, special bulletins, and printed literature for the farmers.

### **1. Develop a Comprehensive Insurance Policy for the Farmers**

The agriculture sector in the state is highly affected by natural parameters like temperature, rainfall, wind velocity, sunlight intensity, etc. To provide safety nets to farmers for these calamities, the government should develop a comprehensive insurance product.

### **2. Link Climate Change with MGNREGA and other National Disaster Management Programs**

To deal with the situation of rehabilitation of the farming community and provide better sustainability of livelihood, the climate change issue should be linked with programs like MGNREGA, disaster management, etc.

### **3. Promotion of Value Added Agricultural Policy**

- The state and central governments should provide access to new technology, facilities for establishment of cold storages, green houses, poly houses and net houses, contract farming, organic farming, etc. for getting higher yields and more income even under adverse conditions.
- The government should promote establishment of agro-processing units to transform the agri-commodities into value-added products

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which may provide 25–30 percent additional income under the climate change scenario.

#### **4. Amending of Existing Marketing Policy of Agri-Commodities to Obtain Better Prices of Agriculture Produce**

- Develop facilities of warehousing, cold storage, agro-processing and transportation in every village on cluster-based approach to provide higher prices to the farmers.
- Restructure the APMC norms and administration, and hand over the APMC to the Farmers' Group.
- APMC may follow the rules and regulations being adopted by 'Amul', which is an ideal model of co-operative marketing in the state of Gujarat, to get full benefits of integration.

#### **4. Farmers' Capacity Building Program**

Educating farmers about climate smart agriculture would help increase the levels of agricultural production and income of the farmers.

- Use of crop varieties and animal breeds which are resistant to the impact of climate change, such as drought, excess rainfall, heat wave, cold wave and incidence of pest and diseases
- Utilize the developments in biotechnology such as Bt cotton hybrid seeds, tissue cultured plants of banana, pointed guard/perval, raising of chandan (sandalwood) and teakwood nurseries and use of various vegetable and horticultural plants for higher productivity.

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- Use of bio-fertilizers and bio-pesticides
- Adoption of contract farming
- Adoption of organic farming
- Adoption of mulching in farming
- Undertake value addition and agro-processing to generate 20-30 percent more income for the farmers
- Adoption of crop diversification in terms of using long-duration deep-rooted crops instead of short-duration and shallow-rooted crops
- Increase the use of micro irrigation system and mulching to conserve and save soil moisture
- Intensive use of water harvesting and water conservation technology.

## **5. How to carry forward agreement advisory among farmerstoget information about the climate smart agriculture?**

Information can be obtained from/through following agencies:

- i. Agro-advisory services through mobile phones
- ii. By utilizing the services of Kisan Call Centres
- iii. Communications through T V, radio, public television bulletins
- iv. Agricultural universities and officers of the line departments of agriculture

## **6. Documentation of Successful Cases Studies**

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