

## Food Security in India

### The Interactions of Climate Change, Economics, Trade & Politics

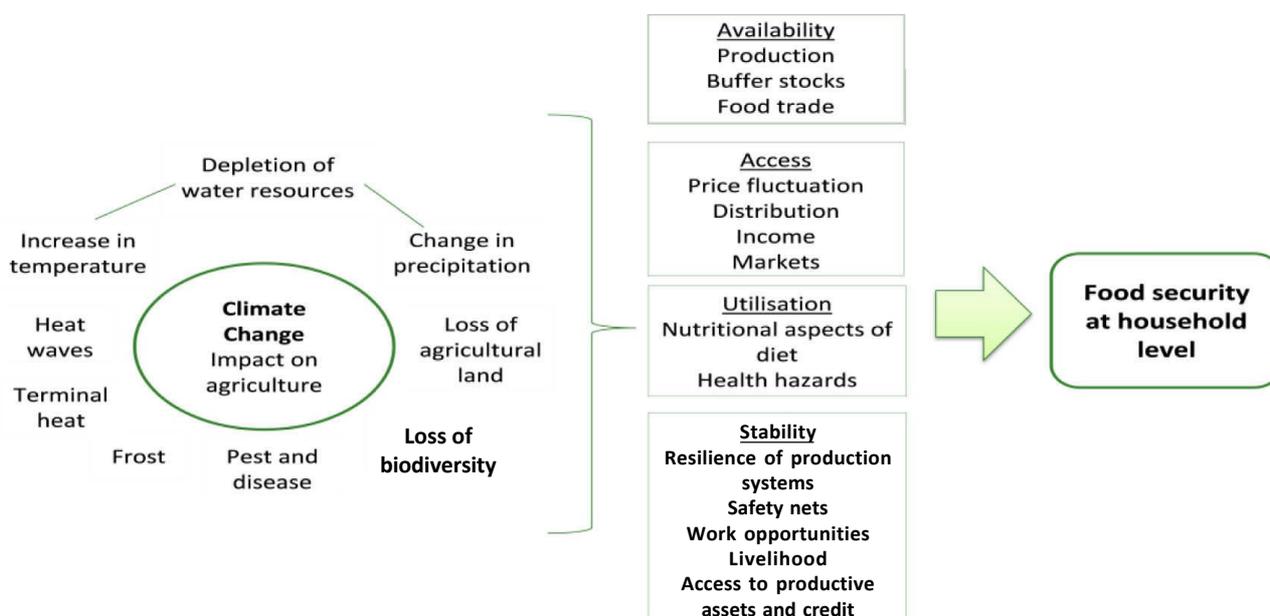
Despite the significant achievements in economic growth and food grain production, India ranked 80<sup>th</sup> in the 2015 Global Hunger Index (GHI) report with a score of 29. Existing geographical and socio-economic variations have resulted in wide disparities in food production, distribution systems as well as the status of malnutrition among different states of India. The advent of climate change is also likely to threaten the cereal production systems in the country (IPCC, 2014).

The potential impacts of climate change on agriculture are multi-faceted, directly influencing productivity, yields and the availability of arable land and water, as well as food prices and trade patterns for staple and high-value products alike; creating a serious challenge for food security in the country. Thus there exists an intrinsic linkage among food production, distribution, public policy and trade which determines food security at the household level.

The price-income relationship for basic food commodities is fundamental for many vulnerable households, both for understanding everyday procurement of food and strategies of handling risk such as failure of harvest or external income. While settings throughout India are considerably varied, access and availability, either through local markets or the function of public programmes and social safety nets, is crucial for low-income household food security.

This document aims to consolidate the various dimensions of the food security scenario in India. An attempt has been made to identify distinct policy recommendations and change agents for the multiple dimensions. Acting as an interface for advocacy among relevant stakeholders, the document will focus on the next steps ahead pertaining to achieve concrete policy discourse for the Sustainable Development Goal No. 2 to 'End hunger, achieve food security and improved nutrition, and promote sustainable agriculture'.

### Linking Climate Change to Food Security at Household Level



## Climate Change Impacts on Agricultural Production Zones

The International Model for Policy Analysis on Agricultural Commodities and Trade (IMPACT) shows that production losses in rice production are greater and diverge more strongly for the north-western region of India. In terms of wheat, there is a potential for gains in a number of regions. The impacts on potato production are shown to be mostly positive across the sub-regions of India (Rosegrant, et al., 2008). The management of cereal buffer stocks in managing food price and supply variability also needs to be considered due to its potential for improvement in its efficacy (Msangi, 2015). There is also scope for providing government support for staple tuber crops like potato because of its importance as the fourth staple crop among the vulnerable house holds (Vidyadharan & Mathew, 2016).

### Expanding the food spectrum

Food security in today's context has to consider availability, affordability and accessibility to adapt to the climatic shifts. Since cereals are susceptible to climate shocks and high irrigation water consumption, increasingly focus has been diverted to pulses and millets as alternative source of nutrition and food security. Interestingly, pulses and millets were usually consumed by the poor, but now the 'healthy' versions of ragi, oats and other minor millets are packaged as 'diet food' for the urban population. Diversifying sources of daily food intake from cereals to other crops will help to ensure a sustainable and long-term nutrition uptake.

*Source: Insights from stakeholder meetings by CUTS (<http://www.cuts-citee.org/FOODSEC/Outputs.htm>)*

Studies have also shown quantitatively the role that India's groundwater plays in providing a 'buffer stock' against variability in precipitation – and the importance of managing it better. The uncertainties in precipitation have led to further dependence on groundwater resources (Msangi, 2016). The unregulated access coupled with power subsidies for irrigation has resulted in over exploitation of groundwater. The increasing reliance on groundwater for meeting water deficits calls for better management, regulation and conservation of groundwater resources.

### Advocacy Points for Climate Change Resilient Agriculture Practices

Policy Recommendations	Change Agents
Strengthen agricultural research and extension for developing climate resilient technologies and innovations (stress tolerant varieties, efficient use of resources - water, energy and nutrients)	Ministry of Agriculture, State Department of Agriculture/Irrigation; Civil Society Organisations
Promote resource conserving practices through incentives (price support and market for hardy crops; subsidies for water saving technologies)	Ministry of Agriculture, Commission for Agricultural Costs and Prices, Department of Irrigation/Energy/Agricultural Marketing, Food and Civil Supplies
Build resilience through diversification of agriculture (including pulses, millets which are hardy; integration with fisheries, animal husbandry, developing integrated farming system suited for agro-ecological zones)	Department of Fisheries/ Department of Animal Husbandry/department of Agriculture under Ministry of Agriculture, Agricultural Universities
Awareness generation and demonstrations on climate resilient agricultural practices	Extension agents, Civil Society Organisations, Progressive farmers

Integrated approach that complements groundwater regulation, management and conservation strategies (rationalising irrigation and power subsidies for efficient use of water resources, clubbing irrigation subsidies with water conservation practices)

Ministry of water resources; Department of Agriculture/irrigation/power

Aquifer level planning for the use of groundwater resources and promote aquifer recharging

Central Department of Ground water Resources, Water User Association, Communities

## Analysis of Economic Geography of Food Trade

Looking at food prices across Indian states during 2004-2014, it is evident that large and persistent variations prevail in the price of food commodities. Extensive and fragmented value chains cause higher price difference at wholesale and consumer levels. Studies suggest that India should eliminate obstacles to inter-state trade in order to promote food security at affordable prices for its citizens. The cost of distance and cost of inter-state trade is the key driver of food price gaps in India (Melchior, 2016).

### Reverse Migration

Farm labour in the food basket of India – Punjab – has gradually been composed of human capital (especially from lower caste) from Bihar. The migration of subsistence farmers from villages in Bihar to Punjab has also left a considerable weight on the women of these farm households. While the men's labour is away in Punjab, the crop varieties as well as the food available for the women to consume at household level in Bihar come from Punjab. So while human capital migrates from East to West, the food grains migrate from West to East and other parts of the country. Non-availability of labour, resource poor farmers, fragmented value chains and lack of market support for produce thus manifests Bihar's relatively low potential of agricultural productivity.

*Source: Insights from stakeholder meetings by CUTS (<http://www.cuts-citee.org/FOODSEC/Outputs.htm>)*

Developing modern value chains and linking farmers with high-value markets to provide greater opportunities in the variety of market outlets with which to sell (and to be employed) will facilitate trade. Improvements in marketing, distribution, and technology can increase productivity and reduce post harvest losses, lower the margins between farmers and consumers and enhance food security. For example, system dynamic model of the potato value chain in Bihar show that reducing storage costs, either through subsidies or increased competition, could reduce the price variability inherent with climatic shocks. On the other hand, encouraging conventional types of cold storage could have additional feedback effects that exacerbate climatic shocks, suggesting a need to consider "climate-smart" investments (Rich & Dzyee, 2016).

## Advocacy Points for Efficient Food Trade in India

Policy Recommendations	Change Agents
Develop market infrastructure and interstate connectivity through Public Private Partnerships	Ministry of Agriculture, Farmer Producer Companies
Address asymmetry in storage capacity across states	Department of Agriculture, National Horticulture Board, Horticulture Mission on North East and Himalayan States, Agricultural and Processed Food Products Export Development and Authority, Ministry of Food Processing Industries and Department of Animal Husbandry and Fisheries, Farmer Producer Organisations
Market reforms (delisting fruits and vegetables from Agricultural Produce Marketing Committee)	Agricultural Produce Marketing Committee under state governments of India
Remove multiple taxes which act as trade barriers (Goods and Services Taxes)	Ministry of Agriculture
Procurement of locally produced food grain	Ministry of Consumer Affairs, Food and Public Distribution; Food Corporation of India
Strengthen Farmer Producer Organisations	Small Farmer's Agribusiness Consortium, Civil Society Organisations, Department of Agriculture

## Implications of Agricultural Politics, Production and Trade on Household Food Security

The concrete empirical evidences described in the previous sections show that an institutional approach is the need of the hour. Various kinds of food production and distribution institutions operate and interact to produce a combination of entitlements that can ensure household food security.

Field evidences from the vulnerable households of Bihar and Karnataka. indicates that the size of the household budget and thereby purchasing power is crucial for access to sufficient food. The entitlement approach emphasises a need to address the whole bundle of entitlements, including not only income through employment, but even own production and social rights (Dulsrud, Kjærnes, Vidyadharan, & Mathew, 2016).

### Small is Nutritious

The *Musahar* community in Bihar and Uttar Pradesh of India and *Terai* region of Nepal are known as rat catchers and also consume rats as a source of protein in their daily diet. The *Mangs* of *Marathwada* also consumed the 'nose to tail' method of cooking where everything that the upper caste didn't eat was leftover food for the lower caste. It is interesting to note that in the absence of protein rich diet sources, the lower caste turned to the most convenient and easily available source which were small animals like rats, rodents, rabbits and reptiles. While some still look down upon such foragers, multiple studies have shown that across the world, small animals are a nutritious means of ensuring food security. As time changes and the society consciously moves away from such traditional means of food security, the above mentioned caste are quite often stigmatised and forced to opt out of their traditional food patterns.

Source: Insights from stakeholder meetings by CUTS (<http://www.cuts-citee.org/FOODSEC/Outputs.htm>)

Of the various government sponsored entitlements, public distribution system (PDS) seems to be widely availed and found to have a significant role in household level food security for accessing staple cereal grains. Additionally, when addressing access to sufficient food, local markets are widely used for the supply of all food commodities including fruits, vegetables and edible oil. It was also found that production from own/rented/sharecrop agricultural land was able to meet the food grain requirements (staples) of rural households to a certain extent but the vulnerable urban households were completely dependent on PDS and markets for their food security. The subsidised food grains supplied through PDS were not enough to meet the nutritional requirement of most households, especially for protein-based dietary requirement (Kjærnes, Vidyadharan, Dulsrud, & Mathew, 2016). Specifically looking at PDS, it was found that errors in the selection of eligible households, lack of storage facilities, anomalies in procurement process, regularity in working hours as well as opening time of Fair Price Shops, poor quality and insufficient quantity of food grains are major challenges. Thus, the size of household budgets, access to employment and thereby purchasing power are crucial considerations for access to food.

Advocacy Locus for Institutional Mechanisms Determining Food Security	
Policy Recommendations	Change Agents
Ensure access to Fair Price Shops to migrants and homeless people, particularly in urban slums	Department of Food and Civil Supplies of State Department, CSOs
Improve the nutrition value of food provided through PDS by including pulses and millets	Food Corporation of India, Department of Food and Civil Supplies of State Department, Department of Agriculture
Procure and distribute locally produced and preferred food grains	Food Corporation of India, Department of Food and Civil Supplies of State Department, Department of Agriculture

The Mid day Meal (MDM) programme and Integrated Child Development Services (ICDS) play significant role in providing nutritious food to growing children. The MDM programme has clearly reduced the number of school dropouts. Nutritious food items like milk, egg and banana have to be provided at least thrice a week as per Supreme Court order (2004), although it is yet to be adopted in many states. The apex court has also directed state governments to provide MDM even during summer vacations in drought prone areas. Field insights have also revealed that food distribution has become the primary and single mandate of many *anganwadis* under the ICDS. *Anganwadis* lack proper infrastructure, cooking facilities and growth monitoring mechanisms. We found that appointments of staff were influenced by local politics and the staff still required capacity building. Mobility of staff was also a serious concern. With regard to the food provision in public programmes of MDM and ICDS, the guidelines of Food Safety and Standards Act (FSSA) should be followed.

The employment guarantee programme Mahatma Gandhi National Rural Employment Act (MGNREGA) has facilitated a reduction in migration and increasing agricultural wage rates. However, poor implementation and administrative delay with regard to payment was highlighted in certain areas. It has been also observed that caste and other social elements played a decisive role in getting employment cards.

## Withstanding the Tests of NABL

Since 2013, the National Accreditation Board for Laboratories (NABL) recognised laboratories have been mandated to engage in the improvement of the mid-day meal scheme. The NABL recognised labs have been asked to collect the samples from the government-run school and government-aided schools in Indian states for testing on parameters such as microbiological-presence or absence of e-coli, chemical parameters such as moisture content, fats, proteins and calorific value of the meal. More technical details regarding this is available here: [http://mhrd.gov.in/sites/upload\\_files/mhrd/files/document-reports/Guidelines\\_\\_Food\\_Safety\\_and\\_Hygiene.pdf](http://mhrd.gov.in/sites/upload_files/mhrd/files/document-reports/Guidelines__Food_Safety_and_Hygiene.pdf)

Source: *Insights from stakeholder meetings by CUTS* (<http://www.cuts-citee.org/FOODSEC/Outputs.htm>)

## Inter-linkages between Climate Change, Trade and Institutional Mechanisms to Ensure Food Security

Rather than focussing on relief measures, it is important to enhance the adaptive capacities of farmers in response to climate change. With production losses being predicted in different parts of the country for water intensive crops like paddy and wheat, it is crucial for India to diversify its cropping pattern with the inclusion of climate resilient crops like pulses and millets. This would enable efficient use of water, nutrients and other resources as well as reduce risk of crop failure.

Field interactions in Karnataka show that ragi (finger millet) is popular in South Karnataka whereas jowar (sorghum) is popular in North Karnataka. Similarly, ragi and sattu (gram flour) was part of traditional diet in Bihar decades back. Nevertheless the popularisation of rice and wheat cultivation as part of the green revolution, the ever growing MSP of these crops, government procurement and higher income have shifted the farming as well as food practices from the rural household. A commendable step taken by the Karnataka government which can be replicated elsewhere is the inclusion of millets in the PDS so as to create a demand for its production as well as consumption adding nutritional value to daily diets.

Other than sustaining the production side, access to food is the key to household level food security. This in turn is determined by market forces, household income, safety nets and entitlements. Importantly, the role of women in assuring food security at household level is becoming more prominent owing to the feminisation of agriculture and migration of men in search of more remunerable jobs in urban areas or other states. The entry of women as producers, buyers and consumers has brought a change in the functioning of the Indian food market. A remarkable policy step in India in this direction has been the issuance of ration cards in the name of female head of the family, which would ease the stress of procuring food in the first place.

## Uniting through JAM

The government of India is currently focussing on distributing entitlements through efficient distribution chains. The strategy is to unite the *Jandhan-Aadhar-Mobile* (JAM) interventions in a bundle. The *Pradhan Mantri Jan-Dhan Yojana* scheme would provide financial inclusion and access to bank accounts for citizens. The *Aadhar* card would facilitate direct benefit transfer of multiple public subsidies to the bank accounts. Ensuring mobile connectivity to users of Jandhan and Aadhar schemes will inform user of transaction information and also pave the way for mobile banking and related digital financial services.

Source: *Insights from stakeholder meetings by CUTS* (<http://www.cuts-citee.org/FOODSEC/Outputs.htm>)

Furthermore, inclusion of nutritious food items like pulses, meat and millets in daily diet with the support of food entitlements and public programmes having an approach to secure livelihood and household income would help to address India's food insecurity and malnutrition. Anti-poverty measures, economic growth and reforms aimed at stimulating the efficiency of markets will also assist in improving food security in India. Building storage capacities, efficient and integrated supply chains would reduce the transactional costs and improve the quality of food grains whereas a combination of cash and kind transfers of food entitlements would meet the household requirements.

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## Useful Resources:

Dulsrud, A., Kjærnes, U., Vidyadharan, V., & Mathew, S. (2016). Food insecurity in the midst of plenty. (Working Paper)

IPCC. (2014). *Climate Change 2014: Impacts, Adaptation, and Vulnerability*. Retrieved from [https://ipcc-wg2.gov/AR5/images/uploads/WG2AR5\\_SPM\\_FINAL.pdf](https://ipcc-wg2.gov/AR5/images/uploads/WG2AR5_SPM_FINAL.pdf)

Kjærnes, U., Vidyadharan, V., Dulsrud, A., & Mathew, S. (2016). Food security and public services in two Indian states: Karnataka and Bihar. (Working Paper)

Melchior, A. (2016). Food price differences across Indian states. Oslo, Norway: Norwegian Institute of International Affairs (NUPI). (Working Paper)

Msangi, S. (2015). Climate Change Impacts on Indian Agriculture: An Overview of Key Issues. (Working Paper)

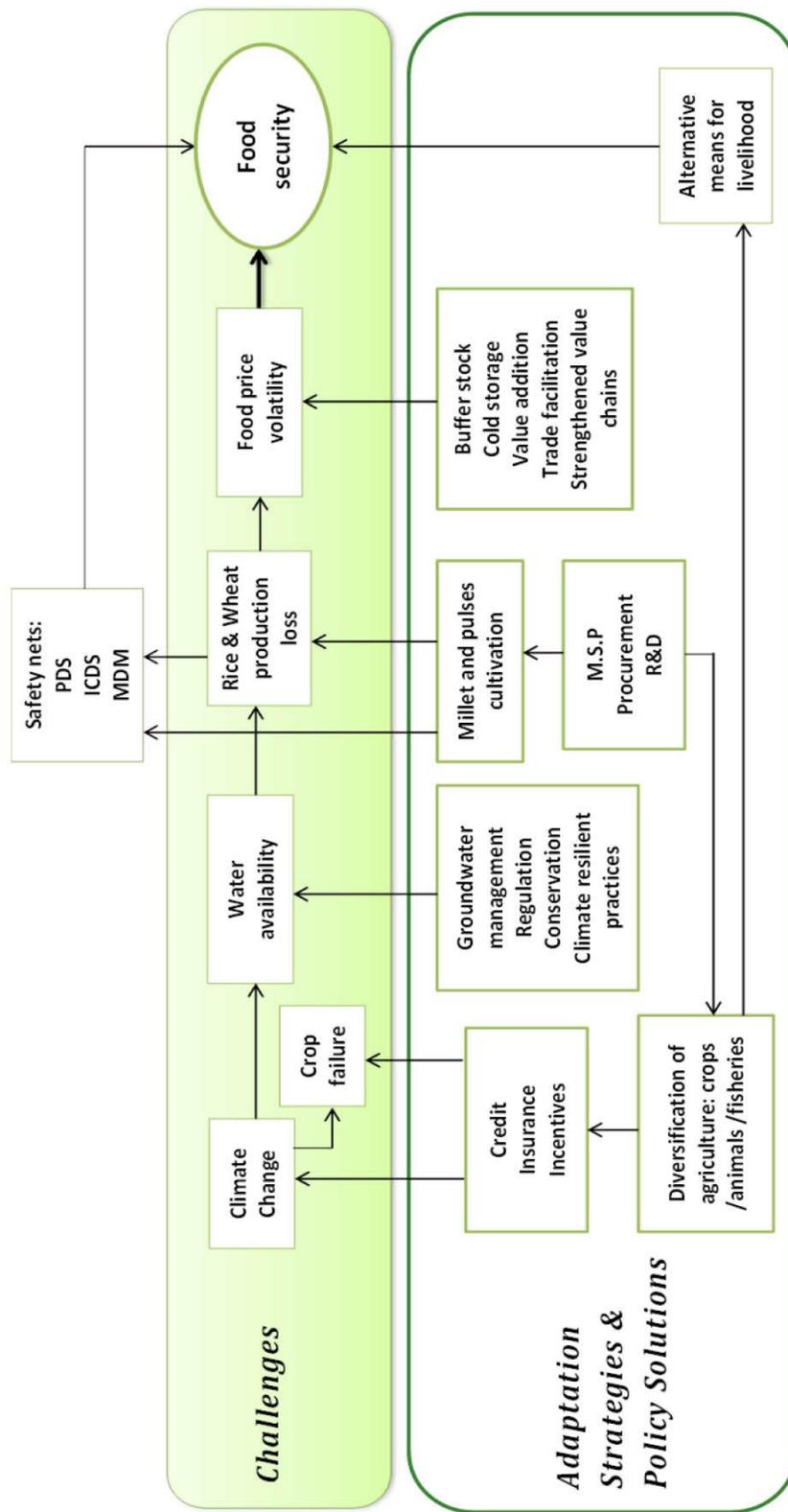
Msangi, S. (2016). Key policies to address the vulnerabilities of Indian agriculture to climate change: Strengthening the 'shock absorbers'. Washington, DC: International Food Policy Research Institute. (Working Paper)

Rich, K., & Dizeye, K. (2016). Policy options for sustainability and resilience in potato value chains in Bihar: a system dynamics approach. (Working Paper)

Rosegrant, M., Ringler, C., Msangi, S., Sulser, T., Zhu, T., & Cline, S. (2008). *International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT): Model Description*. Retrieved October 1, 2015, from <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/12735/filename/12736.pdf>

Vidyadharan, V., & Mathew, S. (2016). Climate change impacts on Indian agriculture: Staple crops and food security scenarios. CUTS International. (Working Paper)

## Interlinkages between Climate Change, Trade and Institutional Mechanisms to Ensure Food Security



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