

Climate Change, Food Security and Trade Linkages in South Asia

Ram Kumar Jha* and Nitesh Kumar Singh**

The South Asian region is particularly vulnerable to climate change owing to high population density, concentrated poverty and overly utilisation of natural resources. About 571 million people in the region survive on less than US\$1.25 a day and they constitute more than 44 percent of the developing world's poor.

South Asian countries are largely dependent on agriculture for employment and subsistence. Cereals are the most important staple food in South Asia but no single country has significant comparative advantage for production of all cereals. This makes trade policies at the national and regional levels an important tool for ensuring food security. This Briefing Paper examines the linkages between climate change, food security and trade in South Asia.

Introduction

Climate change¹ has become a leading environmental issue. It is now a challenge for the entire world in the context for ensuring food security, with the potential of compounding prevailing development problems. It also increases pressure on key resources needed to sustain growth.

The South Asian region is particularly vulnerable to climate change owing to high population density, concentrated poverty and limited natural resources. About 571 million people in the region survive on less than US\$1.25 a day and they constitute more than 44 percent of the developing world's poor.²

The adverse impact of climate change includes increased variability in both monsoon and winter rainfall pattern; increase in temperature, with warmer winters; increased salinity in coastal areas as a result of rising sea

level and pollutant discharge in major rivers; weakening ecosystems; the recession of glaciers in the Himalayas; and severity of extreme weather events such as floods, cyclones, droughts. As a result of these factors, land and water are becoming more scarce and difficult to access. This makes it difficult to achieve high agricultural productivity. This, in turn, is generating regional disability in food security (FAO, 2006).³

Climate change is predicted to have severe consequences on agricultural productivity though it is heavily reliant on the monsoon. For example, in India, the area affected by floods more than doubled in the 50 years between 1953 and 2003. In Bangladesh, 60 percent of the area is already flood-prone. The 2010 floods in Pakistan affected 20 million people. Other countries of the region suffer in similar ways (Majaw, 2012).⁴

* Policy Analyst, CUTS Centre for International Trade, Economics & Environment, Jaipur (rkj@cuts.org)

**Research Assistant, CUTS Centre for International Trade, Economics & Environment, Jaipur (nk@cuts.org)

At present, per capita growth in agriculture productivity in South Asia is less than 2 percent, which is comparatively lower than in other regions such as East Asia and Pacific (3.1 percent) and Latin America (2.8 percent) (World Bank, 2009).⁵

Therefore, trade is an important instrument in ensuring food security as it has potential to ensure free flow of products leading to greater production efficiency and larger available quantities at lower prices. Trade policies at the national and regional levels have an important role to play in ensuring food security. Hence, countries' dependency on imported food is predicated on increased food availability in the world market.

Food availability for the importing country may also depend on the country's ability to produce and export goods to generate enough foreign exchange to acquire food at international market prices. For people, trade is the means by which they can increase their purchasing power, enabling them to buy food at the higher expected prices.

However, trade can also adversely impact on food security when subsidised food imports displace domestic production and when international trade rules and agreements (e.g., related to the protection of intellectual property rights) obstruct the access to and utilisation of all the needed policy tools (e.g., to acquire the relevant technologies on affordable terms).

Therefore, this Briefing Paper examines the linkages between climate change, food security and trade in South Asia.

Dimensions of Food Security

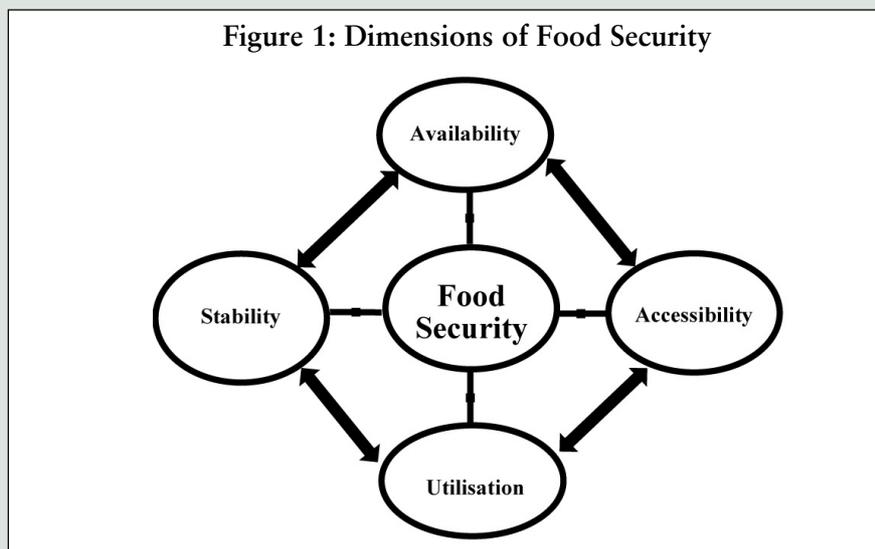
Factors of trade and climate change influence the four dimensions of food security,⁶ i.e. availability, accessibility, utilisation and stability (Figure 1) (FAO, 2006; 2008).

Linkages between Climate Change and Food Security

Climate change is a constraint in agricultural as well as economic development in the region. The impact and consequences of global warming for agriculture tend to be more severe in the region. Global warming has the potential to damage irreversibly the natural resource base on which agriculture depends, with grave consequences for food security.⁷

Studies suggest that in Asia the heat stress due to climate change will reduce crop yields in the lower latitude areas, such as South Asia, while it will raise yields in the cooler mid- to high-latitude areas (Lou and Lin, 1999).⁸

Temperature rise is expected to lessen yields of important crops such as wheat and rice in parts of South Asia where they are cultivated close to their upper temperature threshold. Cereals production is expected to decline at least 4-10 percent by the end of the 21st century. Non-irrigated wheat and rice will be hard hitting since a temperature increase of 2.2⁰C is expected, or may incur loss in net farm revenue between 9-25 percent (Lal 2007).⁹



In the midst of challenges, food security requires that the aggregate availability of physical supplies of food is sufficient, that households have adequate access to those food supplies through their own production, through the market or through other sources, and the utilisation of food supplies is appropriate to meet the specific dietary needs of individuals. Box 1 shows how climate change impacts food security.

Linkages between Trade and Climate Change

Trade and climate change, and the respective domestic and international rules and institutions governing them, are linked in multiple ways. For example, governments may introduce a variety of policies, such as regulatory measures and economic incentives, to address climate change. This complex web of measures may have an impact on international trade and the multilateral trading system.

Global climate change affects a region integrated in international trade in such a way that changes in the regional climate conditions might affect production, which causes direct losses or benefits for the exposed region. Since regions are linked to each other through trade, changes in the other region's climatic conditions may affect their own welfare as well. If agricultural production in South East Asia declines, then prices for such commodities will increase in South Asian economies and lead to

deterioration of their terms of trade. These are the indirect effects of climate change.

The potential for conflict between trade and climate change policy is real. However, trade policy can also be used to support climate change action. In particular, an international trade negotiation to reduce trade barriers to goods developed using low-carbon processes could support climate change policy and incentivise businesses to reduce their greenhouse gas (GHG) emissions. Regarding food storage, restrictive trade policies adopted by member-countries, and export restrictions and bans – such as those imposed by India on rice and by Pakistan on wheat – have aggravated food shortages in the region. In general, trade policies for agriculture are more restrictive in South Asia than other regions (Ahmed, 2008).¹⁰

Linkages between Trade and Food Security

South Asian countries trade little with each other but trade much with other nations of the world. Table 1 presents the cereals trade between South Asian Association for Regional Cooperation (SAARC) countries in 2011. Mostly, trade is conducted by India, Pakistan and Sri Lanka with member-countries. Within SAARC countries, Pakistan was the highest exporter of cereals to the member-countries while India got second position. No single country has significant comparative advantage

Box 1: Climate Change Impact on Food Security in South Asia

In South Asia, climate change is expected to influence crop and livestock production, hydrologic balances, input supplies and other components of agriculture. It leads to drier weather, shorter growing seasons and is predicted to reduce the area of cultivable land, render certain crops uncultivable, increase in incidence of crop loss owing to flood erratic rainfall, extreme weather events and related calamities. Climate change may also change the types, frequency and intensities of various crop and livestock pests, the availability and timing of irrigation water supplies and the severity of soil erosion. These negative impacts of climate change on food security induced through lack of accessibility may result with or without the occurrence of non-availability. Decrease in production and supply of food items puts inflationary pressure on markets even when such decrease is not large enough to cause non-availability or the incidence of per capita availability of food falling below per capita sufficiency. Food inflation severely affects the affordability of the vulnerable population and in turn, their accessibility to food markets.

Source: Chatterjee, Bipul and Manbar Khandka (2011), "Climate Change and Food Security", CUTS International, Jaipur, November. Pp. 15-16.

Table 1: Intra-Regional Trade in Cereals in SAARC Countries in 2011 (Unit: Thousand US Dollar)

		Import								
Export	Countries	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka	SAARC
	Afghanistan	-	0	0	0	0	0	0	0	0
	Bangladesh	0	-	0	0	0	0	0	0	0
	Bhutan	0	0	-	0	0	0	0	0	0
	India	64	257890	2309	-	8945	41996	30176	12610	353990
	Maldives	0	0	0	0	-	0	0	0	0
	Nepal	0	0	0	183	0	-	0	0	183
	Pakistan	184344	285212	0	14	2336	0	-	86068	557974
	Sri Lanka	0	0	0	16	141	0	0	-	157
	SAARC	184408	543102	2309	213	11422	41996	30176	98678	-

Source: ITC Trade Map, 2012-13

Note: 1. Cereals include rye, barley, rice, grain sorghum, maize (corn), buckwheat, and millet and canary seed, oats and wheat and meslin. 2. The import-export data of Bangladesh is not available at the ITC trade map after 2007 for cereal crops.

for production of all cereals. All the countries are rich in labour but strapped for cash. India's economic prevalence and comparative advantage in a wide range of products has resulted in asymmetric trade relations with her neighbours. Further, until a few years back, all countries were pursuing import substitution policies, which never allowed development of a particular area of expertise in the production chains.

In South Asia, some of the countries are facing agricultural production shortages. These countries are heavily dependent on food imports, which are not sourced in the region because of a number of trade barriers and supply-side constraints. Trade offers the possibility to stabilise domestic prices, to balance food deficiency and to harness comparative advantage. Trade can enhance food security by increasing livelihood opportunities directly through improved profitability and spin-off and multiplier effects. However, it also exposes a country to prices volatility in international markets which can threaten food security.

Linkages between Climate Change, Food Security and Trade

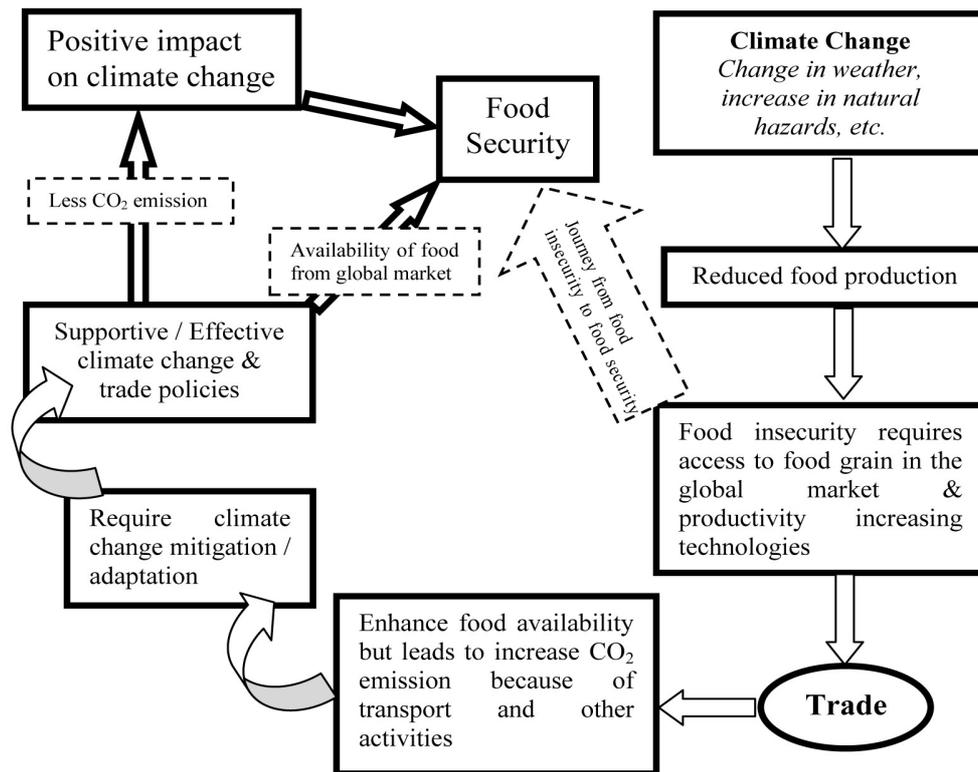
About 870 million people are estimated to have been undernourished (in terms of dietary energy supply) during 2010-12. This figure represents 12.5 percent of the global population.

The vast majority of these 852 million live in developing countries, where the prevalence of undernourishment is now estimated at 14.9 percent of the global population. In South Asia, 304 million people are undernourished and estimated at 17.6 percent of the global population.¹¹

Thus, food insecurity is continuing in the region. Farmers face a number of constraints ranging from high dependency on rainfed production to high production risk, low crop yields. South Asian agriculture is vulnerable to external shocks (economic crises, food prices, etc.) and emergencies (droughts, floods, etc.) and the stability of food availability is hampered by the lack of satisfactory national and international trade and climate change policies. For example, in terms of trade policies, South Asian countries have recognised the importance of signing free trade agreements for overall economic development and poverty alleviation purposes.

Figure 2 explains a positive food security-trade linkage to face climate change challenges. Targeting trade policy and its instruments to ensure steady imports in case of structurally food-deficient countries; improving export performance to garner resources to pay for needed food imports; adjustment of production and trade patterns according to climate change adaptation and mitigation plans.

Figure 2: Journey from Food Insecurity to Food Security



Source: Authors

Role of SAARC in Ensuring Food Security

SAARC was formally established in 1985 as a permanent organisation with a Secretariat in Kathmandu, Nepal.¹² Under the SAARC regime, food security, water diplomacy and trade were brought together by operationalising the concept of ‘virtual water’.¹³

When dealing with water scarcity, it is more suitable to trade products from areas where water is most efficiently utilised in production than to build elaborate water transfer systems.¹⁴ Essentially, the key to South Asian food security in a changing climatic situation is the development of better regional trade pacts to allow for food flows.

Trade is an essential aspect of alleviating food security challenges and fostering cooperation in the SAARC region. In 2007, SAARC took a bold step to establish a ‘food bank’¹⁵ in the region with clear specifications and risk assurance mechanisms. Despite procedural challenges, as of May 2012, the bank had successfully stockpiled about 486,000

tonnes of food for emergency in member countries.¹⁶

Food security is an important strategy for fostering regional environmental cooperation and ties in with the broader strategy of developing the kind of adaptive responses to climate change that are gaining traction in related areas. That is why SAARC has the potential to ensure food security through searching solutions for impact of climate change and better trade relations among the South Asian countries.

Concluding Remarks

It is evident that the South Asia is suffering from food insecurity and low economic growth. Climate change is likely to be a constraint for agricultural development. Trade is the only medium to get food security. Though, the trade of cereals within SAARC countries was negligible in 2011, Pakistan was the highest exporter of cereals to the member countries while India got second position. No single country has significant comparative advantage for production of all cereals. Efforts to reduce

tariff and non-tariff barriers to trade in environmental goods and services may reduce the costs and increase the availability of climate-related technologies, goods and services. This may help to mitigate CO₂ emission. Liberalisation of trade in agriculture may increase or decrease pressures on agricultural communities struggling to adapt to climate change. Thus climate change, food security and trade are strongly interlinked to each other.

There is a dire need to design suitable trade policies at national level. Agreements should be

implemented at regional level along with a process of trade liberalisation by progressively eliminating trade barriers and facilitating market access of exported products. Participatory approach should be followed by policymakers when planning and implementing food security policies and programmes to achieve food security. Inclusive growth model should be approached for regional balanced growth. Governments should frame region-based policies for protecting environmental degradation and these should be implemented assiduously.

Endnotes

1. Climate is the average weather conditions of a particular place over a long period of time, usually 30 years or more with regard to temperature, rainfall and air pressure. Climate Change is a drastic change in weather / climatic partners attributed directly/ indirectly to human activities that alter the composition of the global atmosphere over time.
2. <<http://www.worldbank.org/en/news/feature/2012/09/25/south-Asia-Regional-Brief>>
3. Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food, enabling them to meet their dietary needs and food preferences for an active and healthy life (FAO, 2006).
4. Majaw, Banialeilang (2012), "Climate Change and South Asian Association for Regional Cooperation: A Regional Response", *International Journal of Social Science and Humanity Studies*, Vol 4, No 2, pp. 71-80. (ISSN: 1309-8063)
5. World Bank (2009), "South Asia: Shared views on development and climate change", Washington, D. C.: The World Bank.
6. Availability: availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid). Accessibility: access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements: the set of commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which he / she lives (including traditional rights such as access to common resources). Utilisation: utilisation of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional wellbeing where all physiological needs are met. Stability: to be food secure, a population, household or individual must have access to adequate food at all times, without the risk of losing access to food as a consequence of sudden shocks (e.g., an economic or climatic crisis) or cyclical events (e.g., seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.
7. If current global GHG emission trends remain unchanged, global emission levels will have to be reduced by at least 75 percent by 2050 to keep temperature rise within a 2.5 degree limit.
8. Lou, Q. and E. Lin (1999), "Agricultural vulnerability and adaptation in developing countries: The Asia Pacific region", *Climate Change* 43: 729-43.
9. Lal, M. (2007), "Implications of climate change on agricultural productivity and food security in South Asia. Key vulnerable regions and climate change identifying thresholds for imports and adaptation in relation to Article 2 of the UNFCCC". Dordrecht: Springer.
10. Ahmed, Sadiq (2008), "Global food prices inflation and implications for South Asia", Washington, D. C.: The World Bank.
11. FAO: 2012 State of Food Insecurity in the World. <<http://www.fao.org/publications/sofi/en/>> Accessed on April 12, 2013
12. Recognising the importance of development partners and broader strategic interests, SAARC has also granted observer status to Australia, China, the European Union, Japan, Iran, Mauritius, Myanmar, South Korea and the United States.
13. A term used to indicate that all commodities require certain amounts of water, which is then indirectly traded.
14. The concept was first noted by J.A. Allan in 1997 in a working paper in the context of resolving Middle East water disputes. Allan has since synthesised the matter in a recent book. Allan, Tony. *Virtual Water: Tackling the Threat to Our Planet's Most Precious Resource*. Original. I.B.Tauris, 2011.
15. SAARC regional food bank mandate document accessed online, <http://saarc-sec.org/areaofcooperation/cat-detail.php?cat_id=44> April 5, 2013.
16. There has been concerned citizen activism around making the SAARC food bank more transparent and effective, which may have led to improvements. A policy brief was prepared by the Bangladeshi NGO EquityBD for the Peoples' SAARC Summit in 2011.

This Briefing Paper has been prepared by CUTS Centre for International Trade, Economics & Environment (CUTS CITEE).

© CUTS International 2013. This **Briefing Paper** is published by CUTS International, D-217, Bhaskar Marg, Bani Park, Jaipur 302016, India. Ph: +91.141.228 2821, Fx: +91.141.228 2485, E-mail: citee@cuts.org, Website: www.cuts-citee.org. CUTS Briefing Papers are to inform, educate and provoke debate on specific issues. Readers are encouraged to quote or reproduce material from this paper for their own use, but CUTS International requests due acknowledgement and a copy of the publication.
