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World has enough food for all, but it does not reach everyone

The Delhi Sustainable Development Summit (DSDS), from February 6 to 8, is focusing on the theme 'Attaining Energy, Water and Food Security for All'. The set of issues defining the importance of the theme can be gauged from an assessment of the situation that we are facing. There are 1.3 billion people who have no access to electricity, and over twice the number are dependent on the use of biomass for cooking and space heating.

The use of kerosene lanterns and burning of biomass in traditional cookstoves gives rise to emissions of pollutants that adversely affect the health of women and children exposed to them. In the case of water, the Intergovernmental Panel on Climate Change (IPCC) has estimated that by the 2080s 1.1 to 3.2 billion people would be at risk of increasing water stress.

In Africa, by 2020, 75-250 million people are projected to be exposed to water stress due to climate change. We in India and South Asia are likely to see half a billion people in the Himalaya-Hindu Kush region being seriously affected as a result of melting of glaciers due to climate change along with 250 million people in China who are dependent on glacial melt for water supply. The world also has a serious problem of malnutrition and hunger. The Food and Agriculture Organization estimates that 870 million people suffered from under-nourishment between 2010 and 2012.

There is, therefore, not only an important need for us to understand the concept of security related to energy, water and food, but also an urgent need to devise solutions far beyond what has been attempted so far.

The 1996 World Food Security Summit provided a definition for food security as a condition 'when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life'. The definition transcends the major concept of physical availability of food, but includes economic variables that would ensure access to food for meeting people's dietary needs as well as their food preferences. In some parts of the world there is a real problem involving dietary excess, and this is an issue that has to be seen in the context of malnutrition.

There are three aspects of food security: adequacy in quantitative terms, accessibility in economic and physical terms, and an understanding of what constitutes healthy nutrition. The world has enough food to take care of the needs of the entire population, but food does not reach everyone who needs it. Given the projected growth of population worldwide and increases in income, current levels of production are not likely to meet the demands of a population which is projected to stabilise around 9 billion from the current figure of over 7 billion. The complexity of the challenge facing us requires a long-term vision and a comprehensive assessment of how agricultural output can be increased to match demand. This is an issue that is being discussed in detail within the context of not only food security, but also energy and water during the DSDS.

Any discussion on food security should cover the impacts of climate change on agriculture. This has been assessed in successive reports of the IPCC. The Fourth Assessment Report (AR4) of the IPCC determined that more frequent extreme events may lower long-term yields by damaging crops at specific developmental stages, such as temperature thresholds during flowering, or by making the timing of field applications more difficult, thus reducing the efficiency of farm inputs.

Today it is possible to carry out simulation studies based on a substantial amount of lab research by which projections can be arrived at on possible production losses resulting from climate change. These losses could be the result of excessive soil moisture, heat waves and thereby induced heat stress during the growing season as well as extreme precipitation events which could even damage crops.

For instance, some researchers have found increased crop losses in Bangladesh from increased flood frequency under climate change. Studies have also been able to map out through a set of global simulation studies the changes in yield for key crops against changes in temperature. The sensitivity of yield of cereals to climate change has been determined for maize, wheat and rice. It is found that in low latitudes the reduction of yields from temperature increase above a certain level for maize and wheat can be quite significant. Some of the poorest communities in the world are located in low latitude areas, and malnutrition is already very high in several of these locations.

In the AR4 it was found that in some countries in Africa, yields from rain-fed agriculture could be reduced by up to 50% on account of climate change and climate variability. Agricultural production including access to food in many African countries is projected to be severely compromised. This would further affect food security adversely and exacerbate malnutrition. Food security has important links with the security of water supply and energy security. The DSDS would be focusing on the triad of these factors which are at the heart of sustainable development.

For instance, if we look at agriculture in Punjab, it is dependent largely on groundwater irrigation for which electricity is used. Where security of electricity supply is inadequate, farmers install diesel pump sets, which raise the cost of irrigation pumping and the cost of production. With climate change, an altered scenario in the availability of water for agriculture can be projected, which may require a new set of solutions involving stable and secure energy supply.

Hence, looking at the issue of food security in isolation of the vital inputs of energy and water would be inadequate and flawed. A comprehensive assessment of the link between food, water and energy is essential for the formulation of comprehensive policies which would ensure a secure future in all three.

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The views expressed by the author are personal