FOOD SECURITY: THE BIG QUESTION OF RESOURCES

Eliminating hunger and malnutrition has been a pertinent challenge for India since Independence. Despite the tremendous growth and phenomenal industrial and economic performance, India is still home to 190.7 million under nourished people (FAO and UN, 2014, The State of Food Insecurity in the World), a quarter of all undernourished population in the world. Moreover, projections of India's population reaching 1.6 billion by 2050 (UN, Department of Economics and Social Affairs, June 2013, World Population Prospect) shall entail much higher food requirements than today. It is of highest priority for India to ensure secure access to food by every one of its citizens, now and for the future.

Climate change, resource constraints, distribution and storage are some concerns that threaten India's food security. Agriculture, the soul of food security, is a highly intensive resource sector. Agriculture accounts for 70 percent of total global freshwater withdrawals, making it the largest user of water. At the same time, the food production and supply chain consumes about 30 percent of total energy consumed globally (FAO 2011, Issue Paper: Energy-smart Food for People and Climate). Food security is related to the nexus between water and energy, and while water and energy are required for irrigation, energy is vital for water access, and water is critical for energy production. While water scarcity in the region increases, food price hikes and food access become grave concerns for many. A balance is crucial for the nexus approach. Agriculture is undeniably a resource intensive sector and this fact comes along with a need for efficient and effective management of finite resources, in order to ensure long term sustainability of agriculture and thus food security for all.

With increasing population and socio-economic development needs, access and availability of resources for food production can be seen as a critical constraint on ensuring food security. Finite resources like fresh water shall compete for its usage for drinking, sanitation, agriculture, construction and industrial purposes. Similar shall be the case with land, energy and other finite natural resources. Such resource demand may raise the prices of resource making agriculture more expensive and thus affecting food prices.

The *Water-Energy-Food security* (W-E-F) nexus[1] not only looks into these inter-linkages of resources mentioned above, it also analyses the relationship between resources and socio-economic systems.

[1] Nexus means 'binding together', a connected group or series; also the core or center of a situation. Water security, energy security and food security are inextricably linked. Actions in one area will impact in one or both of the others. The nexus approach applies at all levels of society; from local competition over access to water for irrigation or livestock, to global connections between policy on bio-fuels, food & water security. Sometimes the synergies lead to improvements in another. Often, the trade-offs are negative; e.g.: increased use of fertilizers to enhance food production lead to higher energy use and GHG emissions, and pollution of surface and underground water. Such trade-offs are often poorly understood, unanticipated or overlooked.

The socio economic systems, determine the choices that individual makes in their consumption, under due influence of the markets and other such factors. These consumption decisions of the people have a huge impact on the choice of crop for production and thus affect the use of resources with respect to the nature of the crop sown and its suitability in a given ecosystem. The rationale for choice of crop for production is also studied with respect to available financial and policy support provided in the system. Social and environmental capacities of a system also affect the choice of crop for production. In this way, the W-E-F nexus revolves around the issues of socio-economic, socio-institutional and socio-cultural reforms, socio-technical innovations; and climate change and induced environmental concerns.

The W-E-F Nexus approach provides an integrated view and comprehensive information on relative resource scarcity and productivity, and on the potential for resource intensification in different regions. It also points to the opportunities and synergies for increasing total resource use efficiency, and possibly also substitutions between resources. Through this ***trialogue* 2047**, we aim to explore the implications of this nexus in context to India and what are the synergies or trade-offs India can make with respect to resource use to ensure food security for all.

Through ***trialogue* 2047**, we would like to address the following questions:

- What policy interventions (trade, investment, natural capital, climate) are needed to build co-ordination among water, energy and food sectors to address the issue of resource conflicts?
- What are the technology solutions in agriculture that can support in attaining optimum efficiency and utilisation of resources along with the balance in the nexus? Are there market mechanisms required to mainstream such technologies?
- What are the strategies needed to prevent incoherence of macro policies with local problems of resource availability and usage?
- What changes in consumer choices of food consumption and other consumption of resources can ensure long term food security?
- How can farmer ensure efficient use of resource keeping the Water-Energy-Food nexus in perspective?
- How do we facilitate synergies between inter-sectoral policies (water, land, agriculture, energy) to avoid resource trade-offs and achieve resource efficiency?