

Keynote Address 2

Prof. K. D. W. Nandalal

PhD (Wageningen Agricultural University, Netherland), MEng (AIT, Thailand),

B.Sc., Eng. (Hons) (University of Peradeniya)

Professor,

Department of Civil Engineering, University of Peradeniya, Peradeniya, 20400, Sri Lanka



WATER, ENERGY AND FOOD NEXUS AND SUSTAINABILITY

Water, energy and food are essential for all. Demand for these has increased in the past and that trend will continue over the decades to come. Among others, population growth, urbanization, economic development, cultural and technological changes, international trade, and climate change are considered as the main reasons for this increase.

At present agriculture accounts for about 70 percent of total global freshwater withdrawals while food production and supply chain consumes about 30 percent of total global energy consumption. Water for energy currently amounts to about 8 percent of global water withdrawals while energy is often required for supplying water for diverse purposes. Likewise, water, energy and food sectors are interlinked in many ways as well as these sectors are highly inter-dependable.

About 60 percent more food will need to be produced to feed the world population in 2050. Global energy consumption is projected to grow by nearly 50 percent by 2035. Total global water withdrawals for irrigation are projected to increase by about 10 percent by 2050. These increases will result in raising competition for resources among water, energy and agriculture sectors with unpredictable impacts on livelihoods and environment.

Recently Water-Energy-Food Nexus approach emerged as a useful concept to describe and address the complex and interrelated nature of the global resource systems on which we depend to achieve different social, economic and environmental goals. It presents a conceptual approach to better understand and systematically analyze interactions between natural environment and human activities, and to work towards a more coordinated management and use of natural resources across abovementioned three sectors.

Undoubtedly, achieving water, energy and food security for all is very vital. However, managing supply-side of these sectors to achieve this security has become impossible. Since resources in all the three sectors are limited, efforts are essential to be made towards increased resource use efficiency, demand management and more sustainable consumption patterns to achieve water, energy and food security. Apparently, an integrated view across the nexus provides more comprehensive information on relative resource scarcity and productivity, and on the potential for sustainable intensification of services. Further, concepts such as Integrated Water Resources Management need to evolve towards partnerships with water-using sectors whose policies and strategies are governed by many factors outside the water sector. This new Water-Energy-Food Nexus approach identifies mutually beneficial responses and provides an informed and transparent framework for determining trade-offs and synergies that meet demand without compromising sustainability.