

## **DYNAMICS OF CLIMATE CHANGE ON CROP PRODUCTIVITY AND FOOD SECURITY IN PAKISTAN**

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### **Abstract**

Climate change defined by high atmospheric carbon dioxide (CO<sub>2</sub>) concentration ( $\geq 400$  ppm); increasing air temperature (2-4 °C or greater), significant and/abrupt changes in temperature (daily, seasonal and inter-annual); intensive rainfall and storms; extreme frost and extended drought spill; changing wet/dry cycles and increased fire frequency. All these factors are expected to significantly impact territorial system, soil properties, surface water, and stream, flow and as consequence food security and environment quality. Agriculture is the mainstay of Pakistan contributed over 21% to Gross Domestic Product (GDP) in 2014-15 and source of livelihood of 45% rural population. Out of total 80 million hectare (mha), 38% (30 mha) is cultivable land mass, 20 mha of which is currently cultivated. More than 80% of total cultivated is irrigated, while remaining 20% is rain-fed. Agro-climatically two third of Pakistan lies in semi-arid to arid region. Being dependent on snow melting, and rainfall agriculture and crop production related activities in and mostly semi-arid to arid agro-climate (Chaudhry, 2004), Pakistan could have proportional respond in term of resource productivity and dynamics to change in climate. The irrigated agriculture of Pakistan seems to be more vulnerable to climate change. The rising temperature and changing rainfall pattern could induced water scarcity and subsequently have impacts on agriculture.

Wheat is an important staple food grown across the diverse agro-climatic conditions in the country. One of the prime reason for the difference in wheat yield, is irrigation practice mainly in the Punjab and Sindh provinces. There exist up and down in wheat production. The climate change induces raise in temperature would have significant effect on wheat yield, as 1 °C increase in temperature over entire growing season would reduce grain yield by 6-10%, mainly due to shortened growing period. The increased temperature during grain felling stages could results shriveled grain due damaging fertilization in grain making. Wheat cultivars currently sowing in low land would be rendered unfit due to increase in temperature. It is therefore realized that to cope up with climate changes the review address the option for looking to climate smart farming system so that resources could be adjusted to gradual changes and without compromising on its productivity.