

THE CONTRIBUTION OF HIMALAYAS ECOSYSTEMS IN WATER, ENERGY, AGRICULTURE AND FOOD SECURITY IN SOUTH ASIA

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Abstract:

The green economy calls for resource efficient and low carbon development and investment in conservation and development of ecosystems for their sustained flow. Despite growing concern of food security in entire South Asia, the linkage between Himalayan ecosystem services and food production and food security in South Asia is poorly understood. Conventionally, the mountains are seen as a food deficit area or as a source of food items such as fruits, vegetables, spices and other niche products and their intangible contribution to water, irrigation, energy, agriculture and food security are rarely taken into account. In view of that this article briefly examines the role of the Himalayan mountain systems in food production and agricultural sustainability in South Asian countries looking at the emerging challenges posed by the increasing water stress and climate change.

The analysis suggests that a common challenge is being faced by all South Asian countries—for increased food production to meet the demand of burgeoning population, the growing stress of water as rice and wheat, the staple food in South Asia, require huge amounts of water. Moreover,

the increased food production in South Asia has to come from the same amount of land, by increasing productivity through bringing additional land under irrigation, as the frontier for expansion of agricultural land has almost been exhausted. The availability of irrigation water is, therefore, critical for increased food production and agricultural sustainability in entire South Asia.

Climate change introduces a new challenge to agriculture and food security in South Asia. Recent studies suggest that the impact of climate change on cereal production in South Asia could be negative and that may be as high as 18.2–22.1 per cent. Our analysis reveals that the Hindu Kush-Himalayan mountain systems play a significant role in agriculture and food security in South Asia through water supply, climate and wind regulation, groundwater recharge and in sustaining wetland ecosystems. It is the major source of dry season water for several large river systems, such as the Indus, the Ganges and the Brahmaputra from the snow and glacier melt of the Himalayas, which provide the main basis for surface and groundwater irrigation. These three rivers form the largest river basins (Indo–Ganga–Brahmaputra) which are the major source of rice and wheat in South Asia. Besides surface water, the contribution of mountain discharge to groundwater is also significant, which makes it an important resource for agriculture and food security in South Asia. In addition to providing surface and groundwater, the Himalayan mountain system provides huge inputs to agriculture through regulating micro-climates as well as wind and monsoon circulation, and by supporting river and wetland ecosystems in South Asia. It is estimated that the Ganges river ecosystem alone supports 25,000 or more species, ranging from micro-organisms to mammals, which support agricultural sustainability and provide livelihoods for millions of people. This article concludes that the long-term agricultural sustainability and food security of South Asia is heavily dependent on the water and other ecosystem services it receives from the Himalayan ecosystems. Attention therefore must be paid to conserve the

Himalayan ecosystems in order to ensure sustained flow of ecosystem services required for agriculture, food production and overall well-being of Himalayan and downstream population. Options and opportunities for enhancing the agricultural sustainability and food security by sustainable utilization of Himalayan resources and ecosystem services are briefly analyzed and suggestions have been made.