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General Note
Article is recommended to print as color version in recycled paper. *Save Plants, Save Climate.*

The Energy-Water-Food Nexus and Climate Change: Implications for Policy-making, Research, and Business

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Energy, water and food resource systems are critically inter depended. Energy is needed to produce food and to treat and move water; water is needed to cultivate food crops and to generate many forms of energy; and food is vital for supporting the growing global population that both generates and relies on energy and water services. In addition, land availability is an important element in each of these three resource systems. Even if this interdependence is currently perceptible and defined as the "energy-water-food nexus", these three individual resource systems are still organized, managed and researched more or less independently. Yet, current pressing challenges, mainly environmental/climate threats and population growth, are increasingly generating more risks which have the potential to undermine the viability of these resource systems in interrelated way, thus jeopardizing the human security of many regions, especially in the Global South.

More precisely, these resource systems are currently in an uncertain shift and transformation with many security implications. Water scarcity and water supply-demand imbalance for instance already affects every continent and it is projected that an increased number of people in the Global South will be living in areas of high water stress with a likely impact on energy and food security. In addition, energy and water are inextricably linked. Non-renewable energy sources are still dominating the global energy generation landscape, and these thermal sources of

energy generation mostly derived from fossil fuels are at present particularly water-intensive, mainly due to the cooling systems they use that require large amounts of water. A push towards a less carbon-intensive energy sector with a larger share of renewable, stimulated by global mitigation efforts, requires careful consideration of the potential impacts of such energy transition on the other nexus sectors. Energy and water are also interconnected to food and agricultural production systems which are the largest user of fresh water globally and a key source of both GHG emission and mitigation. An increasing population and shifting dietary trends, especially in developing and emergent countries, mean demand for food and feed crop cultivation is rising. Food production and its associated supply chain account for approximately one-third of the world's total energy consumption. Rising food production has led not only to agricultural land expansion, largely at the expense of forests, but also I n many regions an intensification of agricultural processes on existing land. This expansion and intensification places more stress on agricultural input resources, such as water and energy.

According to current scientific evidence and projections, climate change has the potential to severely impact these resource systems. Climate impacts are likely to reduce the agricultural production and to make water stress in many regions worse, threatening the livelihood and food and health security of vulnerable communities. The rise in the number of food insecure people in the world during the previous decade, coupled with incidences of crop failure due to adverse weather, have made world leaders increasingly aware that future climate scenarios may severely limit our ability to feed the growing population during the next decades. This may increase the risk of conflicts over scarce resources, and pushes people to experience additional water and food stress if temperatures increase by a few degrees.

Based on this, it is becoming increasingly perceptible that every policy option and action adopted with regard to these interrelated systems may meaningfully affect the others, positively or negatively. Thus, it seems growing lyimperativeand effective to adopt a "nexus approach" to analyzing these resource systems (energy-water-food), especially within a climate adaptation and mitigation

perspective. Conventional policy- and decision-making with regards to each of these domains in isolation is not necessarily anymore the most optimal course of planning or action. A “nexus approach”, which refers to a multidisciplinary type of analysis of the relationship between energy, water, food, and climate change, can help to reduce trade-offs and to build synergies across these different systems, thus leading to a better and more efficient resource use as well as cross-sectoral policy coherence. Such a perspective is also a source of transformation for the research and business spheres. Actors in these areas should adapt their values, practices and investments in order to subscribe in the nexus perspective, thus boosting the policy-making processes related to the resource systems mentioned above.