

Climate Variability and Variability in Lebanon: Impact on Land Use and Sustainable Agriculture Development

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Summary

Twentieth century climate was dominated by near universal warming. Almost all parts of the globe had temperatures at the end of the 20th century, that were significantly higher than when it began. In addition, increased levels of greenhouse gases appear to explain the unusual warming in the 20th century.

As remarked in the Agenda 21 of the UN Conference on Environment and Development of Rio de Janeiro (1992) and in the UN Convention to Combat Desertification of Paris (1994), the insufficient knowledge of the desertification processes and the lack of relevant information stimulate a series of priority actions. One of them mentions the necessity of the strengthening of the basic knowledge and the development of information and monitoring systems for the regions prone to desertification, including climatic, hydrological, land use and human aspects.

Establishing permanent systems for monitoring the degree of desertification and land degradation, with the main aim of improving the living conditions of the local populations, are nowadays being a priority.

In Lebanon, varying conditions of water shortage as regarding the availability of the hydraulic resources have been experienced in the last decade. This is aggravated by a rapid population growth, urbanization, industry and irrigation developments. At the dawn of the 21st century, it is estimated that the water availability per capita will in Lebanon below the scarcity level of 1000 m³/capita/year indicated by the Food and Agriculture Organization of the United Nations.

People have observed detrimental changes in hydrology over recent decades. Ground water levels have fallen, springs and wetland areas have dried up, and rivers, mainly Litany, no longer flow in the dry season. The main causes are thought to be land degradation, changes in rainfall and interactions between these two factors. Furthermore, reduced vegetation cover, due to deforestation, overgrazing and low rainfall, and poor surface management of cultivated lands, have led to reduced infiltration rate, increased runoff and soil erosion, and a decline in groundwater

recharge. The extent to which the deterioration in hydrology is reversible with improved land management and rainfall conditions is nowadays being a critical issue. Add to this agricultural activities, which are extremely sensitive to the large year-to-year climate fluctuations that are observed.

This paper deals with:

1. The status and potential future of climate change in Lebanon, including climate monitoring and information systems;
2. The current and expected future value of the above climate information in contributing to the effectiveness of agricultural management and water resources endowment in the country, with emphasis to land use associated with climate variability;
3. The evaluation of specific methodologies of how climate monitoring may reduce the impacts of climatic risks at the national level, in order to support and plan mitigation activities.