

Climate Change

11- AGRICULTURE

EXECUTIVE SUMMARY

11.1 GOALS

The expected increasing in the mean annual temperature up to 4.1°C during the coming Century, accompanied by a doubling of CO₂ concentration and a shortage rainfall, will deeply affect the Lebanese agriculture. Some crops will be displaced to higher altitudinal elevation, while others, more tolerating varieties will take place instead of older ones. Furthermore, a possible change in the planting dates and in the irrigation practices in term of timing and quantity will take place. These changes necessitate an appropriate technical, financial and legislative measure to be taken.

The goal of impact evaluation is to provide means of early awareness of the problem by the decision makers on both central and regional levels.

11.2 SCOPE

The exposure unit used to reflect the vulnerability of the Lebanese agriculture to climate change are 4 typical plants growing in different agroclimatic zones: citrus in coastal thermo-Mediterranean zone, olive in EU-Mediterranean zone, apple in oro-Mediterranean zone, and sugar beet in the internal subarid zone. Others large planted crop such as grapes or potatoes were excluding in spite their economic importance because of their adaptability and flexibility to grow in different agroclimatic zones, that can mask the yield variability due to climate change.

11.3 METHODS AND UNCERTAINTIES

The methods followed to evaluate the climate change's impact are analogs and expert judgments. The analogic with warmer climatic condition was used to predict the future expected yield, growth and pathological state of these selected crop. Missing data or delay in its updating was substituted by expert judgment. More objective methodological approach such as modeling was not used due to reasons beyond our control.

Based on previous studies, some interpolations were made to predict land use changes during the coming 2020, 2050 and 2080 years.

11.4 VULNERABILITY AND IMPACT ASSESSMENT

According to a population growth rate of 1.5%, the coastal lands known as thermo-Mediterranean zone, will be by the 2080 year entirely covered by construction and relevant

infrastructure.

The demographic pressure accompanied by climate change tolerates the geographical dislocation of citrus, olive and apple plantation to a new, higher areas. This situation necessitate terraces building, soil reclamation, dams construction, artesian wells digging and plantation of new, more adapted crop varieties. The mountainous characteristic of the Lebanese territory, known by the climatic phenomenon named “the altitudinal zonation”, (which indicates, that the temperature decreases by half degree with each 100m elevation above sea level), can be used to overcome the negative thermal impact on cited above three crops.

As for sugar beet, it tolerates the temperature increasing, the soil salinity and the doubling of CO₂ concentration. These physiological characteristics can encourage the government on keeping the currently adapted subsidization policy.

11.5 ADAPTATION MEASURES

To combat with climate change impact, some recommendations were provided to be adopted on governmental, private sector and individual levels. These measures are: decrease of population growth rate, sustainable and economic water use, soil fertility conservation by land reclamation, low regulation to mitigate the disintegration of estate ownership, advanced agriculture technique use and governmental subsidence policy for social reasons.