

## **Abstract**

Many studies and researches have been conducted all over the world in order to analyze and study the impact of climate change on the agricultural sector specially the rainfed agriculture. Moreover, the potential impacts of climate change have not been quantified at local level yet. Based on this fact, this study aims to evaluate and study the potential impact of climate change on rainfed agriculture in Jenin district.

Jenin has been chosen because it is considered one of the largest agricultural areas in West Bank and it has large agricultural activities. The district contributes with about 16.2% of the agricultural production in the Palestinian market.

The analysis has been conducted using computer programming (CropWat) to estimate the change in yield reduction with increasing temperature (1, 2 and 3° Celsius) and decreasing precipitation (10, 20 and 30 %).

The results show that with increasing temperature by 1 °C for wheat (as example) yield reduction changes by (35.7%), and for T+2 °C and T+3 °C the changes rate were (36.6 %) and (37.3 %) respectively taking into consideration no changes in the precipitation.

But if all the climate parameter has changed it will be more significant; (41.7 %) the changes will be, if combined the increase in temperature (+3 °C) and reduction in precipitation (-30%).

Also, the impact of temperature increase was examined on irrigation requirement; from analyzing the results it was shown that the main driving factor to increase irrigation requirement is the increase in temperature. A sensitivity analysis on wheat (for example) was prepared for temperature increase by (+1, +2 and +3 °C), the analysis was based on the result obtained for the last ten years. The result was; (499.41 mm), (514.61 mm) and (530.13 mm) which indicate to the amount of water required by wheat crops to have the optimum yield. But for decreasing precipitation by (10%, 20% and 30%) the amount of water required were (506.54 mm), (517.38 mm), (531.74 mm) respectively. The results

clearly show that the scenario of increasing temperature gets worse when combined with the scenario of decreasing precipitation; where (T+3, P-30%) being the worst scenario.

There have been significant changes in rainfall pattern in Jenin district over the last ten years. These changes resulted from the climate change which affect the rainfall distribution, all the available data was analyzed and drawn for the last ten years. The results obviously show that there are variations in rainfall in the following months; January : has a very little increase, February: has a significant increase, April: has an increase and November; has a significant increase. Also the following months have variations in the amount of rainfall; March: has a significant decrease, May: little decrease, September and October: little decrease, December: significant decrease. During June, July and August there were no precipitation record ever in the district.

It is clear that Winter season is shifted a little bit toward November in the beginning of the season and toward April in the end of the season.

Finally, the economical loss is increased according to the increase in temperature and decrease the precipitation; for example, the losses occurred in wheat crops during the last ten year was expected to be about 1,461,606 (\$). If the temperature is expected to increase by 1°C with no decrease in precipitation, then a loss is about 1,495,110 (\$) which will be achieved in wheat crops, as well as the decrease in precipitation which has more effect of losses. If temperature doesn't change and the amount of precipitation decrease by 10 %, the losses will be 1,557,930 (\$), so the impact will be doubled or tripled if combined with changes in temperature and precipitation.