

Review Form 1.6

Journal Name:	Asian Journal of Environment & Ecology
Manuscript Number:	Ms_AJEE_84600
Title of the Manuscript:	Impacts of Climate Change on the Water Sector in Mexico
Type of the Article	Original Research Article

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<u>Compulsory</u> REVISION comments	<p>In analysing the impact of climate change on the water sector, there are 3 things that need to be considered, namely: the danger of flooding, the danger of drought and the danger of decreasing water availability. In this article, we have analysed the dangers of flooding and the dangers of drought. So it is necessary to add an analysis of the danger of decreasing water availability</p>	<p>The following paragraphs in the article refer to the analysis of the decrease in water availability. If the analysis is included in the article: Mexico is located in one of the regions of the world where rainfall is most likely to decrease under climate change [16]. These reductions in rainfall combined with large increases in temperature imply a large increase in potential evapotranspiration and a substantial reduction in the availability of water and soil moisture, affecting Mexico's seasonal and irrigated agriculture and with them agricultural productivity that could put food security at risk. Thus, in general, the expected magnitude of negative changes in rainfall is expected by the end of the century to be between -5 and -10%. Natural climate variability produces larger changes in annual precipitation than those estimated by climate change. However, if a large negative anomaly in precipitation resulting from natural variability is combined with the negative trend in precipitation due to the effect of climate change, then the effect would be magnified.</p> <p>The magnitude of the projected precipitation change is less than the dispersion between the models as can be seen in the large standard deviation values of the change in % precipitations. This makes precipitation scenarios for the present century more uncertain than those for temperature. An additional and important source of uncertainty is the fact that the availability of water in some regions depends on the passage of tropical cyclones as is the case of the Baja California peninsula.</p> <p>Regional climate change scenarios suggest that by the end of the 21st century, water availability in northern Mexico may be reduced by up to 30% due to global warming, result of possible reductions in rainfall and temperature increases. Historically, droughts have had serious consequences on primary activities such as agriculture, livestock, forestry and the environment. To examine the impact of climate change, conditions during a similar anomalous hot and dry period can be analyzed. Anomalous high temperatures in northern Mexico persisted during the summers of 1998-2002 (around +2 °C) with below-normal rainfall (-20 to -30%), leading to a prolonged drought. Such climatic anomalies resulted in a severe deficit of soil moisture and water stress in crops and vegetation that increased the potential for forest fires. The spring of 1998 turned out to be the season with the highest number of forest fires in Mexico in recent decades, not only due to hydrological stress in the vegetation, but also due to slash and burn practices in the agricultural sector [21]. Vulnerability in northern Mexico has not been reduced since then [22] and consequently, the risk of a major environmental disaster is still present [23] and the effects of climate change (increase in temperature and decreases in rainfall) will be greatly complicated.</p> <p>The map of droughts (Figure 16 d) shows the current droughts, where practically the entire country has suffered from moderate droughts (Center and South of the country) to extremely strong (North of the country). Under the climate change scenarios SSP2-4.5 and SSP3-7.0 with conditions of strong increase in temperatures and decrease in rainfall, the panorama of droughts in Mexico will continue and worsen between now and the end of this century, with the social (food security and health), economic (well-being), political implications, (public expenditure), associated cultural.</p> <p>The monsoon season is projected to have a late start in North America [2]. Given the conditions presented in the regional projections, it is estimated that the North American monsoon will increasingly be delayed as the century</p>

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		<p>progresses and together with the decrease in precipitation will cause great storage problems in the water bodies of the north of the country.</p> <p>In general, in the middle latitudes and subtropical zones (location of Mexico), significant decreases in precipitation and runoff are expected, which will cause an increase in the conditions of scarcity and greater pressure on diversified water resources in the different regions.</p> <p>In various regions of the world and in several of Mexico, there are already conditions of scarcity that are expected to increase, even without climate change, due to the effect of projected population growth, growing urban concentration, pollution of water bodies and overexploitation of water resources, in particular underground, coupled with a scarce culture of water resources. To this scenario must be added the effects of climate change, which in Mexico will be mostly a reduction in the natural availability of water as a result of the increase in temperature and decrease in rainfall, which together poses very great challenges for the management and sustainable use of water.</p> <p>In the case of Mexico, this effect of climate change will increase vulnerability in basins in southern and southeastern Mexico such as the Grijalva-Usumacinta systems in Chiapas and Tabasco, Papaloapan in Veracruz to name a few examples that already register flooding problems [24]. The existence of heavier rainfall is compatible with the forecast of minor annual runoff. On the other hand, the increase in the occurrence of droughts in the north of the Mexican territory is evident, which is consistent with the predictions of decreased precipitation and runoff and is expected to occur more frequently and intensely. In the absence of major adaptation measures, the availability of water resources in quantity and quality and, as a consequence, the food security and health of the population of Mexico could be at great risk.</p>
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Minor REVISION comments	<p>In the abstract there needs to be a match between goals and results. In your abstract....</p> <p>Aims: The objective of this study is:</p> <ol style="list-style-type: none">to present a set of regional temperature and rainfall projections for Mexico under the IPCC's AR6 climate change scenarios,improving the projections of the Ocean-Atmospheric General Circulation Models andestimating the possible impacts of climate change on Mexico's water resources <p>Results:</p> <ol style="list-style-type: none">The regional models for Mexico show temperature increases ranging from 0.5 to 5 °C, while the % change in rainfall will range from -20.3% to 13.5% depending on the scenario and analysis period.Low soil moisture (mm), negative changes in NDVI and SPEI 12 show that the North, West and Bajío areas presented reductions in precipitation and increase in temperature that caused a severe deficit of soil moisture and water stress in plants considering these areas with scarce vegetation and presence of semi-permanent meteorological drought.Under these scenarios it is expected that practically the entire country will be subjected to moderate droughts (Central and South) to extremely strong (North) that will last and sharpen between now and the end of the century. These conditions have already been registered in the main hydrological basins of Mexico and if adaptation and mitigation measures are not adopted, the country's food security is put at risk . Also, in addition to the decrease in rainfall, it is estimated that they are more intense with the presence of extreme events, which will increase the vulnerability of some basins throughout the country, in the Central and Northern areas with extreme drought events, while in the Southeast with floods	<p>The objectives were matched with the results in the abstract:</p> <p>Aims: The objective of this study is:</p> <ol style="list-style-type: none">to present a set of regional temperature and rainfall projections for Mexico under the IPCC's AR6 climate change scenarios,estimating the possible impacts of climate change on Mexico's water resources <p>Results:</p> <ol style="list-style-type: none">The regional models for Mexico under the IPCC AR6 climate change scenarios show temperature increases ranging from 0.5 to 5 °C, while the % change in rainfall will range from -20.3% to 13.5% depending on the scenario and analysis period.Low soil moisture (mm), negative changes in NDVI and SPEI 12 show that the North, West and Bajío areas presented reductions in precipitation and increase in temperature that caused a severe deficit of soil moisture and water stress in plants considering these areas with scarce vegetation and presence of semi-permanent meteorological drought. Under these scenarios it is expected that practically the entire country will be subjected to moderate droughts (Central and South) to extremely strong (North) that will last and sharpen between now and the end of the century. These conditions have already been registered in the main hydrological basins of Mexico and if adaptation and mitigation measures are not adopted, the availability of water is put at risk and with it the food security of the country. Also, in addition to the decrease in rainfall, it is estimated that they are more intense with the presence of extreme events, which will increase the vulnerability of some basins throughout the country, in the Central and Northern areas with extreme drought events, while in the Southeast with floods. Both scenarios would put at risk the availability of water both in quality and quantity throughout the country. To reduce the effects of climate change on water resources in Mexico
Optional/General comments	<p>This article is very good and deserves to be published</p>	<p>I'm glad you thought it was suitable for publication.</p>

PART 2:

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Are there ethical issues in this manuscript?	(If yes, Kindly please write down the ethical issues here in details)	