



# Climate change impacts in Iran: assessing our current knowledge

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## Abstract

During recent years, various studies have focused on investigating the direct and indirect impacts of climate changes in Iran while the noteworthy fact is the achievement gained by these researches. Furthermore, what should be taken into consideration is whether these studies have been able to provide appropriate opportunities for improving further studies in this particular field or not. To address these questions, this study systematically reviewed and summarized the current available literature ( $n = 150$ ) regarding the impacts of climate change on temperature and precipitation in Iran to assess our current state of knowledge. The results revealed that while all studies discuss the probable changes in temperature and precipitation over the next decades, serious contradictions could be seen in their results; also, the general pattern of changes was different in most of the cases. This matter may have a significant effect on public beliefs in climate change, which can be a serious warning for the activists in this realm.

## 1 Introduction

Climate change has emerged as one of the most important paradigms in the earth sciences for last few decades and is referred to any significant change in the average and/or variability of the climate system lasting for an extended period of time. According to the recent reports of the Intergovernmental Panel on Climate Change (IPCC), which is legally responsible for preparing climate change reports in order to provide a scientific support for the United Nations Framework Convention on Climate Change (UNFCCC), the Earth has become 0.85 °C warmer over the last century. Additionally, based on the RCP8.5 scenario (the highest forcing scenario with 8.5 W/m<sup>2</sup> total radiative forcing), a rise in temperature is projected to be approximately equivalent to 2.6 up to 4.8 °C by the year 2100. Moreover, the amount of warming over the following hundred years will probably be greater than any seen in the last 10,000 years (IPCC 2001). With respect to

the importance of climate change effects on the global environment and its inhabitants, numerous studies have been conducted on this subject in different regions of the world by using various statistical, synoptic, remote sensing, and paleontological models. Reviewing the carried out studies and proposed theories during the previous decades revealed that there are a wide range of opinions toward climate change once we get into the details (Slingsby 2001; Reynolds et al. 2010; Weber and Stern 2011). On the one hand, the environmental activists have introduced climate change as a sort of possible imminent apocalypse; on the other hand, the rejectionists basically do not accept the occurrence of this phenomenon (e.g., Michaels 2004), or at least believe that this is a minor issue (e.g., Lomborg 2003). The second group suggests that an effective scientific solution will eventually be found for climate change, although this group of scientists has become the minority during recent years (Doran and Zimmerman 2009; Pew Research Center 2015; Anderegg et al. 2010; Cook et al. 2013). Nonetheless, it can be decisively stated that in spite of some disagreements over the origin of global warming (Leiserowitz et al. 2013), the warming trend and its impacts have become undeniable (Zimmerman 2008; Lewandowsky et al. 2013; Blunden and Arndt 2015).

In Iran, same as other countries, special attention has been given to climate change, and since the last decade, a major part of conducted researches in climatology have focused on investigating the climate change and its effects (e.g., Samadi et al. 2012; Samadi et al. 2013). However, a notable feature detected from national studies is that in many cases, the

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