

Assessing the Effects of Climate Change on Apple Yield in District Anantnag of J&K

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ABSTRACT

The increase in the events of climate change has a huge impact on the different crops grown in the different regions. The reduction of climate changes helps in protecting the apple yield in Anantnag in the district of Jammu and Kashmir. In these research secondary data collection methods has been used as it helps in the collection of information's as well as data from different secondary sources and from the different authentic online websites. The Reflexivity theory along with greenhouse theory has been used in this research in order to identify the mitigation strategies effectively. The findings of this research include information related to climate change along with challenges related to climate change algorithms.

Key Words: Jammu and Kashmir, Climate change, Apple yields, Greenhouse theory, Reflexivity theory, Anantnag and Carbon footprints.

INTRODUCTION

The increased pollution from the different developing and developed nations has a huge impact on the climate. The changes in the climate are one of the major issues as it is impacting the environment negatively. The changes in the climate are also a crucial factor as the increased temperature is negatively impacting the different yield such as apple yield in Jammu and Kashmir. The northernmost regions of India such as Jammu and Kashmir are facing drastic changes in the climate. According to the ideas of Prakash (2021), the changes in the climate have drastic impacts due to different reasons such as hotter temperatures. The increased temperature in India lays a negative impact on the vegetation of India. The highest temperature in India is recorded in Prayagraj with 45.03 degrees Celsius (statista.com, 2023). The increase in the temperature in different locations of India is impacting the crops negatively. The rising of temperature lays a negative impact on the vegetation as the rainfall patterns change and the melting of the glaciers.

The increase in the melting of the glaciers due to the high temperature of India lays a

negative impact on the Anantnag district of Jammu and Kashmir. This research also highlights the factors of global warming as it is one of the major contributors for the changes in climate. In 2022, the temperature of Jammu will increase by 40 degrees Celsius which is highest in comparison with the other years (thehindu.com, 2022). The increase in such high temperatures in Jammu reflects that it has a large impact on the different districts such as Anantnag. This is also considered as one of the major reasons for the melting of glaciers and the impact on the vegetation.

The collection of information is one of the crucial components in the research in which different forms are used. The acquisition of data as well as information is majorly relied on in different forms such as by observations from different journals and others. In this research, the usage of linear processes is beneficial as it helps in apprehending the changes in the climate effectively. The aim of this study is to analyses the effects of climate change on the apple yield in district Anantnag of J&K. The appropriate analysis helps in comprehending the core aspects of climate change and its impact on vegetation

effectively. In the findings, the interpretation of the collected data and information helps in understanding the core concepts.

MATERIALS AND METHODS

OBTAINING INFORMATION RELATED TO CLIMATE CHANGE

The drastic changes in the climate have a huge impact on the vegetation of the different locations. According to the ideas of Parkas, (2021), the presence of crop diversification in the different states of Jammu and Kashmir has taken place due to the new implementation reforms. In the implementation of the new reforms, the changes in the climate are addressed as the changes in the apple yield are observed. The changes in the climate such as increased temperature reflect the decrease in the amount of apple crops in comparison with the previous years. On the other hand, it is reported that 80% reduction in yield as the major reason is the irrigation shortages (researchgate.net, 2023). In this context, this lays a negative impact on the harvesting of apple crops in the different regions of Jammu and Kashmir.

Anantnag in Jammu and Kashmir is a well-known horticulture sector in south Kashmir. The agro-climatic conditions of the respective state are renowned for the

growing of fresh fruits such as apple, apricot and others. According to the ideas of Thakur and Gupta (2021), changes in the climate deal with the modification in the natural variability and one of the major reasons is human activities. The increase in industrialisation within the different states of India is negatively impacting the environment. The increase in industrial activities is leading to increased pollution which is leading to global warming. The increase in global warming increases the temperature of India in which Anantnag, a district of Jammu and Kashmir, has faced drastic changes. One of the noteworthy aspects is apart from the average rising temperature the climate change also encompasses extreme weather events such as rising of sea levels and others.

The focus on carbon footprints is significant as it helps in analysing the factors affecting climate change. Figure 2 of this research reflects that in the lockdown phase the carbon footprint is decreased (Thakur and Gupta, 2021). The decrease in the carbon footprints helps in maintaining the climate appropriately which helps in the successful plantation of different crops in the different regions such as in Jammu and Kashmir. As opined by

Thakur and Gupta (2021), the reduction of the carbon footprint was reduced to -9.2% in the months of March along with July in a similar timeframe. The reduction of carbon footprints is significant as it is adversely affecting the climate.

CHALLENGES RELATED TO CLIMATE CHANGE ALGORITHM

The changes in the climate lay a negative impact on the vegetation of the different regions. There is the presence of different challenges in the changes of climate as the patterns of rainfall change. The changing in the patterns of rainfall lays a negative impact on the growing of crops. According to the views of Skendžić *et al.* (2021), the changes in the climate reflect a major challenge as the temperature increases drastically. The increase in the temperature in different regions worldwide such as India led to the melting of glaciers which is leading to the rising of sea levels. One of the major factors that are impacting the climate is the greenhouse gases as it is leading to desertification of the different fertile areas along with the melting of glaciers. On the contrary, Zhang *et al.* (2021) stated that the melting of the glaciers increases coastal erosion. This lays a negative impact on the plantation of crops in Anantnag especially in the growing of apples.

The inclusion of the different theories is

significant as it helps in dealing with the challenges effectively. The inclusion of the Reflexivity theory is beneficial as it helps in apprehending the factors which reflect how societies are connected with the positive and negative impacts of climate change. According to the ideas of Nightingale *et al.* (2020), the inclusion of societies regarding the changes in the climate is significant as it helps in the development of different policies. The development of different policies is beneficial as it helps in reducing the negative impacts of climate change. On the contrary, engaging different businesses in the reduction of carbon emissions is significant by decreasing the excess manufacturing of the products (worldwildlife.org, 2023). The introduction of the greenhouse theory is beneficial as it helps in providing an appropriate knowledge to the people regarding the adverse impacts on the environment which is negatively harming the climate. According to the ideas of Dahlmann and Roehrich (2019), the advanced policies to deal with climate change is beneficial as it helps in the reduction of greenhouse gases emissions. Spreading knowledge to different businesses is significant as it assists in the reduction of carbon emissions.

METHODS FOR THE RESEARCH

The usage of the different methods for the collection of data as well as information is significant as it helps in the better interpretation of the information. In this research secondary data collection method is used as the information as well as data are collected from authentic journals as well as articles. According to the views of Corti et al. (2019), the collection of the data along with information from the authentic sources helps in analysing the information effectively. The information of this research is also collected from different authentic online websites in order to get deeper insights regarding the effects of climate change and its impact in the growing of crops. The usage of the positivist research philosophy is helpful as it helps in observing the factors of climate change. This strategy is also effective for the better collection of the information. One of the significant tools used in this research is thematic analysis which helps in segregating the topic related to the effect of climate change into different themes which helps in interpreting the information effectively. The themes which are used in this research to complete the entire aspect are listed in the below table.

RESULTS AND DISCUSSION

CLIMATE CHANGES IN DIFFERENT DISTRICTS OF INDIA

The climate changes in India have a huge impact in the production of different types of crops. In the different regions of India the temperature has increased at an extensive rate. The increase in the temperature lays a negative impact on the different locations as it impacts in the production of crops. In 2022 April 27, India faced an intense heat wave and the temperature increased extensively (statista.com, 2023). This reflects that the increase in the temperature is one of the major reasons for which the climate in the different regions such as Jammu and Kashmir is changing drastically. This is negatively impacting the growing of crops in the regions of Kashmir such as apples. It is noted that, appropriate climate is required for the growing of apples as the production of apples is not possible in the other regions such as North Western parts of India.

The other states in which the highest temperature in India is recorded include Kanpur, Agra, Lucknow and others. The temperature range of Jammu and Kashmir is approximately between -2°C and 12°C (indianholiday.com). This justifies that appropriate temperature is required for the growing of different crops such as apples.

The increase in the temperature in Kashmir lays a negative impact in the growing of crops as well as in getting high-quality of fruits.

The manufacturing industry in India is increasing at an extensive rate for which the greenhouse gases are increasing at an extensive rate. The annual growth rate in the manufacturing industry in India will increase by 11.4% in the year 2022 (statista.com, 2023). This is one of the major reasons for which the climate is changing drastically. In the Vulnerability Index the ranking of Anantnag is in the 7th position with 0.47 (Farooq et al. 2021). This reflects that Anantnag is facing huge changes in the climate for which the apple yields are negatively impacted.

IMPACT OF CLIMATE CHANGE ON GROWING CROPS

Climate change has a drastic impact on the growing of crops for which the reduction of the carbon footprints is necessary. According to the views of Leal Filho et al. (2023), dealing with climate change is one of the crucial factors that help in the protection of biodiversity. The increase in the temperature has a negative impact in the growing of certain crops in the different regions such as apples as in the growing of

such fruits winter weather along with certain temperature is required. Figure 6 of this research assists in representing that the increase in the temperature in Jammu and Kashmir led to the increase in horticulture crops in comparison with agricultural crops. The entire deviation of area is increased for the horticulture fruits by 6,194.7 hectares and the area for the agricultural crops is - 6,908 hectares (Prakash, 2021). Therefore, the climate has a negative impact on Jammu and Kashmir on the apple yield.

SHIFT OF GROWING CROPS

The changes in the climate lay a negative impact on the growing of crops as it changes in the cultivation of different crops. The changes in the climate are negatively impacting the apple yields as the weather is warm in comparison with the required weather for the cultivation of crops. According to the ideas of Prakash, (2021), the paddy fields in the Anantnag district have shrunk in comparison with the last decade. In this context, the apple yields are also negatively impacted by climate change and there is shrinkage of area for the crops of apples. In 2015, the area for apple crops increased in comparison with the previous year. This lays a positive impact on the apple yields. On the contrary, in 2022, the

temperature of Jammu and Kashmir was 40 degrees Celsius which is extremely high for the cultivation of apples in the respective state of India (thehindu.com, 2022). This justifies that in the present situation, the changes in the climate such as high temperature is negatively impacting apple yields.

APPLE PRODUCTION IN DIFFERENT REGIONS OF KASHMIR

The apple production in Kashmir varies as the climate is changing and negatively impacting the apple yields. The different regions of Kashmir have differences in the production of apples. According to the reports of Ahmad et al. (2021), the production of Apples in the Anantnag region of Kashmir is low in comparison with Baramulla. This reflects that the increased carbon footprints as the manufacturing industries are increasingly changing the climate of Kashmir negatively. The reduction of carbon footprints can lay a positive impact on apple yields through the increased cultivation of crops.

CONCLUSION

In this research the changes in climate are addressed along with its impact on the apple yields. The increase in global warming lays a negative impact on the growing of crops in

the different regions such as in Kashmir. The increase in the temperature of Jammu in 2022 laid a negative impact on the cultivation of crops. The highest temperature is recorded in India and has a negative impact on biodiversity. The carbon footprint rate during the lockdown was low which helps in the protection of the depletion of the ozone layer. The increase in the depletion of the ozone layer also sheds a negative impact on the plantation of apple crops. The usage of the Reflexivity theory lays a positive impact in dealing with climate change as it helps in setting measures for the adaptation of changes. The Vulnerability Index helps in the identifying the percentage of hazards. The changes in the climate lay a negative impact on the biodiversity as well. The applicability of the different theories lays a positive impact in dealing with the challenges related to climate effectively. Moreover, the changes in the weather also impact the shift of growing crops in Jammu and Kashmir.

REFERENCES

1. Ahmad, R., Hussain, B. and Ahmad, T., (2021). Fresh and dry fruit production in himalayan Kashmir, sub-Himalayan Jammu and trans-himalayan Ladakh, India. *Heliyon*, 7(1).
2. Corti, L., Van den Eynden, V., Bishop, L. and Woollard, M., (2019). Managing and sharing research data: A guide to good

- practice. Sage.
3. Dahlmann, F. and Roehrich, J.K., (2019). Sustainable supply chain management and partner engagement to manage climate change information. *Business Strategy and the Environment*, 28(8), pp.1632-1647.
 4. Farooq, M., Singh, S.K. and Kanga, S., (2021). Inherent vulnerability profiles of agriculture sector in temperate Himalayan region: A preliminary assessment. *Indian Journal of Ecology*, 48(2), pp.434-441.
 5. Indianholiday.com (2023). Best Time to Visit Kashmir. Available at: <https://www.indianholiday.com/kashmir/best-time-to-visit.html#:~:text=Winters%20in%20Jammu%20and%20Kashmir,roughly%20between%20%2D2%E2%81%B0C%20and%2012%E2%81%B0C>. [Accessed on: 24th July 2023]
 6. Leal Filho, W., Nagy, G.J., Setti, A.F.F., Sharifi, A., Donkor, F.K., Batista, K. and Djekic, I., 2023. Handling the impacts of climate change on soil biodiversity. *Science of The Total Environment*, 869, p.161671.
 7. Nightingale, A.J., Eriksen, S., Taylor, M., Forsyth, T., Pelling, M., Newsham, A., Boyd, E., Brown, K., Harvey, B., Jones, L. and Bezner Kerr, R., (2020). Beyond technical fixes: Climate solutions and the great derangement. *Climate and Development*, 12(4), pp.343-352.
 8. Prakash, S., (2021). Impact of Climate change on Aquatic Ecosystem and its Biodiversity: An overview. *International Journal of Biological Innovations*, 3(2) (2023).
 9. Skendžić, S., Zovko, M., Živković, I.P., Lešić, V. and Lemić, D., (2021). The impact of climate change on agricultural insect pests. *Insects*, 12(5), p.440.
 10. Statista.com (2023). Annual growth rate of production in the manufacturing industry in India from financial year 2013 to 2022. Available at: <https://www.statista.com/statistics/661391/manufacturing-industry-production-growth-rate-india/>. [Accessed on: 24th July 2023]
 11. Thakur, A. and Gupta, P., (2021). Farmer's Perceptions of Climate Change On Farming Practices: A Case Study of Kharal Valley, District Kullu, Himachal Pradesh. *Frontiers in Science and Technology in India: An Overview*, p.207.
 12. Thehindu.com (2022). Jammu records season's hottest day at 40° C. Available at: <https://www.thehindu.com/news/national/other-states/jammu-records-seasons-hottest-day-at-40-degrees-c/article65362598.ece>. [Accessed on: 24th July 2023]
 13. Worldwildlife.org (2023). OVERVIEW. Available at: <https://www.worldwildlife.org/threats/effects-of-climate-change#:~:text=Impacts,-%C2%A9%20USGS.gov&text=Humans%20and%20wild%20animals%20face,on%20people's%20livelihoods%20and%20communities>. Accessed on: 24th July 2023]
 14. Zhang, T., Li, D., East, A.E., Walling, D.E., Lane, S., Overeem, I., Beylich, A.A., Koppes, M. and Lu, X., (2022). Warming-driven erosion and sediment transport in cold regions. *Nature Reviews Earth & Environment*, 3(12), pp.832-8.