Global Academic and Scientific Journal of Multidisciplinary Studies (GASJMS)

Volume 3 | Issue 9, 2025 Journal Homepage: https://gaspublishers.com/gasjms/ ISSN: 2583-8970
Email: gaspublishers@gmail.com

Watermelon farming in the era of Climate Change in Manipur

Ashem Rahul Singh, Gurumayum Devmanjuri Devi, Heisnam Loidang Devi & Rajkumar Kishan Singh

Directorate of Environment and Climate Change, Government of Manipur

Received: *20.08.2025* | ***Accepted:*** *12.09.2025* | ***Published:*** *16.09.2025*

***Corresponding Author:** Ashem Rahul Singh

DOI: *10.5281/zenodo.17136423*

Abstract **Original Research Article**

An interaction with the watermelon farmers in three valley districts (Bishnupur, Thoubal and Kakching) of Manipur was organised with the team of State Climate Change Cell, Directorate of Environment and Climate Change, Government of Manipur. Farmers are witnessing the sign of rising temperature, sudden and erratic rainfall, frequent floods and droughts on this era. At this uncertain climate, most farmers believed that the need of the hour is to promote crop that are both resilient and profitable. One option is the cultivation of watermelon (Citrullus lannatus), a species well suited to Manipur's changing environment.

Keywords: interaction, watermelon, farmers, districts, climate, environment.

INTRODUCTION:

In Manipur**,** most people believed the cultivation of watermelon for domestic purposes starts in the early seventies (70s). Others suggest the fruit become a major productive species in the 2000s. Overall, in this decades, watermelon cultivation has become a favorable fruit species in Manipur with the rising temperature. The districts, Bishnupur, Thoubal and Kakching already started the watermelon cultivation, especially in their farms and river banks areas. Now-a-day, the growing popularity of watermelon shows its potential to become a climate smart fruit in the State. The cultivation practices not only improve yields but also making the farming more resilient to unpredictable climate conditions. Thus, promoting watermelon contributes both to nutrition security and public health resilience during extreme summers. Addressing these challenges requires coordinated efforts from farmers, concerned departments, research institutes and market agencies. Based on its importance in adding value for productivity and income, the article aimed to determine the influence of climate variability on the quantity of watermelon production. Meanwhile, scientific community has not largely engaged in doing research works or factors affecting the production of watermelon. For instance, no study was found in relation to the spatial distribution of watermelon production in Manipur.

The cultivation of watermelon usually starts in the middle week of January till the time of harvesting that is the month of May. The State generally records an average temperature ranging from 1.8°C to 39.9°C between the month of January to May (as shown in the Table, 2013 to 2025). This is the phase of winter ends and arrival of pre monsoon season, where abundant rainfall is received which is more favorable to watermelon farming. Trend analysis of weather variables in Imphal valley under National Innovations on Climate Resilient Agriculture revealed that the mean annual maximum temperature has been increasing (0.1°C per decade). This changing climate is playing a major role in adaptation of several climate resilient crops in Manipur. The compatibility of the increasing temperature and other growing parameters is an indicative of a new possibility of a wide production of watermelon in Manipur. According to the report of National Horticulture Board, Manipur's watermelon production data was recorded to be 1750 tonnes in 2021. This records an increase from the previous number of 110 tonnes in 2020.

The following table shows the temperature range during January-May in comparison to the productivity rate of Watermelon production in the state. The production in '000 tons for the year, 2023, 2024 and 2025 is taken from the CEIC database (Source from India's Department of Agriculture and Farmers Welfare)

Sl No	Year	Maximum Temperature (°C)	Production in '000 tonnes
1	2013	36.8	-
2	2014	37.0	0.60
3	2015	39.9	0.76
4	2016	39.8	0.68
5	2017	38.3	0.72
6	2018	38.8	0.7
7	2019	39.9	1.59
8	2020	39.7	0.11
9	2021	39.9	1.75
10	2022	39.9	1.75
11	2023	40	2.3
12	2024	42.1	2.3
13	2025	41	2.3

Source: Directorate of Environment and Climate change, Manipur; National Horticulture Board and India's Department of Agriculture and Farmers Welfare [2,3, 4]

Although there isn't sufficient data of watermelon production of the state, the little information so collected and evaluated indicates that watermelon cultivation is slowly expanding and adapting to the influence of climate change and gives the possibility of a profitable business for farmers in the future.

MATERIALS AND METHODS:

1. Meeting the farmers with suggested questionnaire
2. Field experiment
3. Primary and Secondary data collection
4. Review Literature
5. Studies on weather reports of study area collected from the Directorate of Environment and Climate Change
6. Oral interview related to temperature and rainfall in the study area

Primary data were collected through survey and the secondary data were obtained from government periodicals, unpublished thesis, journals, local newspaper etc. No detailed information on watermelon cultivation is yet available in Manipur. In most cases existing data is inadequate. There is lack of studies on watermelon cultivation in terms of climate change mitigation and adaptation. Importantly adaptation is an important factor that will shape the impacts of climate change on food production **[1].** More awareness through various seminars, workshops, events and meetings by the concerned Department is the need of time.

RESULT AND DISCUSSION

The authors investigated the influence of climate and weather parameters to the annual and seasonal production of watermelon in valley districts of Manipur (Bishnupur, Thoubal and Kakching). Household survey suggests the rising temperature is one factor for the suitability of watermelon cultivation in the State. During the interaction with one of the farmers, Laishram Simon Singh of Sunusiphai, Bishnupur District, expressed that climate has been playing a major role in his fifteen (15) years of cultivating watermelon. Simon has a farm covering an area of 1.87 acre (3 Sangam) where he grows paddy in paddy season and shifts to plantation of watermelon coupled with pumpkin, cucumber, maize, etc. after the paddy season. He has been observing an increased in productivity of watermelon over the last few years with climate change playing a major role in it. He harvested more than 5000 kg of watermelon every year, earning a profit of around 3 Lakh Rupees, which is quite higher compared to other crops. It was told that he has experienced both the positive and negative impacts of Climate change during his 15 years of cultivation. The rise in temperature has definitely helped in his farming while the fluctuation in rainfall pattern, both excess and deficiency, did cause him problems. Recently, the pre-monsoon rain caused huge damage to the crops leading to a great loss in his business. Other than the climate issues, it was told that the plantation is labour intensive. In continuation, Pukhrambam Binita Devi of Langathel, Thoubal District, grows watermelon on a 1 lourak (2 sangam, approx. 1.25 acres) farm. Pumpkin, cucumber, ash gourd, and sponge gourd are all grown alongside watermelon. Cultivation on the plantation typically starts in the month of February and lasts until May. For the past seven years, she and her family have been growing watermelons. They saw a rise in production in the early years, but yields have decreased over time, perhaps as a result of soil deterioration from ongoing cultivation. It's interesting to note that, in contrast to many other farmers, she believes that climate change and natural disasters have had little effect on their farming methods. While, Watermelon producer Kshetrimayum Memthoibi Devi and her family which hails from Khunou Kshretri Leikai, Kakching District have been growing watermelons from the past twelve (12) years. Currently, about 10,000 kg of watermelon are produced annually on about 2 sangam, approx. 1.25 acres, of land. She practices mixed cropping, growing watermelon alongside bitter gourd, pumpkin, Thai melon (known locally as chinar), and other crops, just like many other farmers in the region. According to her experience, farming is significantly impacted by climate change. Unpredictable rainfall has become a persistent problem, even though the recent temperature

increase has been beneficial for watermelon growth. Waterlogging from excessive rainfall frequently results in spoiled fruit and significant financial losses. The other watermelon cultivators had similar stories regarding the favorability of watermelon to the changing climate. Several districts in Manipur have started adopting watermelon cultivation after hearing the success stories of such watermelon farmers.

CONCLUSION

Changing weather patterns and climate change have profound impact on watermelon cultivation in Manipur. However, farmers can overcome the challenges and build a resilient future by embracing proactive measures to mitigate change changes effects and improve agricultural practices. The combined efforts of concerned department, farmers and researcher are crucial in safeguarding the sustaining growth of watermelon in the face of climate change. Facilitating training programs and educational workshops for farmers on climate-smart practices will enhance their understanding of climate change impacts and equip them with the necessary skills to adapt effectively. Knowledge-sharing platforms can help disseminate best practices across the industry. Now, watermelons produced by the state farmers can meet the requirement of the state and thus watermelon from West Bengal is no more brought in to the State. However, some watermelons imported from Myanmar are still available in the state. Availability of Myanmar watermelons is mainly during the period of February and March when Manipur farmers do not start production while May and June is the season during which state farmers produce huge quantities of watermelon for production.

REFERENCES

1. Lobell, D.B.; Burke, M.B.; Tebaldi, C.; Mastrandrea, M.D.; Falcon, W.P.; Naylor, R.L. Prioritizing climate change adaptation needs for food security in 2030. Science 2008, 319, 607–610. [CrossRef] [PubMed]
2. Directorate of Environment and Climate Change, Government of Manipur
3. National Horticulture Board
4. India's Department of Agriculture and Farmers Welfare