



OPEN ACCESS

Received: 24-11-2024

Accepted: 14-12-2024

Published: 25.12.2024

Citation: Suryawanshi DS, Kate AM, Patil KV. (2024). Hot Springs: A New Hope Ray for Medical Tourism in Maharashtra State. *Geo-Eye*. 13(2): 26-33. <https://doi.org/10.53989/bu.ge.v13i2.43>

* **Corresponding author.**
patilkv123@gmail.com

Funding: None

Competing Interests: None

Copyright: © 2024 Suryawanshi et al. This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Published By Bangalore University,
Bengaluru, Karnataka

ISSN

Print: 2347-4246

Electronic: XXXX-XXXX

Hot Springs: A New Hope Ray for Medical Tourism in Maharashtra State

Dnyaneshwar S Suryawanshi^{1*}, Asha M Kate², Kailas V Patil³

¹ Head & Research Supervisor, Post Graduate Research Centre, Department of Geography, Vws Dr. M. Y. Vaidhya Arts, Prof P. D. Dalal Commerce & Dr. D. S. Shah Science College, Dhule, Maharashtra, India

² Assistant Professor, Vws Dr. M. Y. Vaidhya Arts, Prof P. D. Dalal Commerce & Dr. D. S. Shah Science College, Dhule, Maharashtra, India

³ Research Scholar, Department of Geography, VWS Dr. M. Y. Vaidhya Arts, Prof P. D. Dalal Commerce & Dr. D. S. Shah Science College, Dhule, Maharashtra, India

Abstract

Present research paper is based on medical tourism of hot springs in Khandesh region as a new hope ray of medical tourism in Maharashtra. The term Geopharmacology consist with geography and pharmacology in which geographical components are studied from medicinal and tourism point of views. These points of views are useful for the wellness of human being. In Khandesh region, there are three perennial hot springs namely Ramtalab, Unapdev and Anakdev. The present research has been of geopharmacology work as a multi-disciplinary and multi applicability discipline of geography of health. The research methodology for geopharmacology is comprehensively elucidated encompassing a diverse array of approaches. The hot springs are holding significant cultural and medicinal importance. Traditionally revered for their healing properties, these natural thermal waters have attracted visitors seeking relief from various ailments for centuries. In the research on hot springs in Khandesh, Maharashtra, offers valuable insights into their social, cultural, religious, and economic significance. By comparing this research with studies conducted in other regions, we can identify common themes and variations in the perceptions and attitudes towards hot springs across different cultural contexts. While the research in Khandesh highlights the need for awareness initiatives, preservation of cultural heritage, and inclusive development practices, similar concerns and priorities are evident in studies from other regions as well. Overall, understanding the multifaceted nature of hot springs and their importance to local communities is crucial for promoting sustainable development and preserving cultural and environmental integrity.

Keywords: Geopharmacology; Hot Springs; Khandesh Region; GIS Mapping; Medical Tourism; Cultural Heritage; Wellness; Sustainable Development

1 Introduction

In many cultures, hot springs are regarded as sacred places with healing properties for both the body and the mind. Practices such as thermal bathing,

spa treatments and wellness retreats centred on hot springs are deeply intertwined with cultural beliefs surrounding health, rejuvenation and holistic well-being. Khandesh region of Maharashtra

has been known for its socio-cultural use of hot springs since ancient times, the hot springs are largely recognized through the cultural system. The significance of natural thermal springs for health has been recognized for centuries. Ramtalab, Unapdev and Anakdev have potential for medical tourism.

Regions rich in thermal waters, such as Japan, Iceland, and Hungary, have long attracted international visitors seeking therapeutic benefits. Medical tourism, particularly around hot springs, is a growing global industry, combining health benefits with travel. Research has shown that hot springs can offer relief from conditions like arthritis, skin diseases, and stress-related disorders (Kumar & Raj, 2021). In Europe, destinations like Hungary's Hévíz Lake are recognized for their healing properties and attract medical tourists globally (Varga *et al.*, 2019). In Japan, onsen therapy is deeply integrated into health tourism, with over 27,000 hot springs promoting both wellness and cultural experiences (Takahashi, 2020). Additionally, studies have noted that the economic impact of medical tourism is significant, boosting local economies and creating jobs in the healthcare and hospitality sectors (Smith & Chang, 2022). As awareness increases, the market for medical tourism linked to hot springs is expected to expand, driven by both traditional healing and modern wellness trends.

2 Study Area

Hot springs in Khandesh region located at Unapdev (A) Hot Spring, Adawad, $21^{\circ}15'57''\text{N}$ $75^{\circ}25'52''\text{E}$, Ramtalav (B) hot spring, Near Vardi Village, Chopda $21^{\circ}16'58''\text{N}$ $75^{\circ}24'31''\text{E}$, Anakdev (C), Dara Shahada, $21^{\circ}43'47''\text{N}$ $74^{\circ}26'31''\text{E}$. All these three hot springs are situated along the Dolerite dyke faults and fractures with almost parallel to the strike line of southern Satpura mountains foot hill of river Tapi valley.

3 Objectives

The concept of geopharmacology, which links the medicinal properties of these springs with their geographical features, is the underlying principle of this study. By elaborating on the cultural, medicinal and economic significance of these hot springs. The research attempts to understand their broader value in the context of medical tourism. The main objective of this paper is to explore the medicinal properties of these hot springs and their relationship with medical tourism.

4 Method and Materials

GPS (Geographical Position System) mapping has been used to study the distribution of hot springs and the accessibility of these sites. This method allowed for detailed spatial analysis to assess the environmental surrounding conditions of the springs and their suitability for tourism development. In the

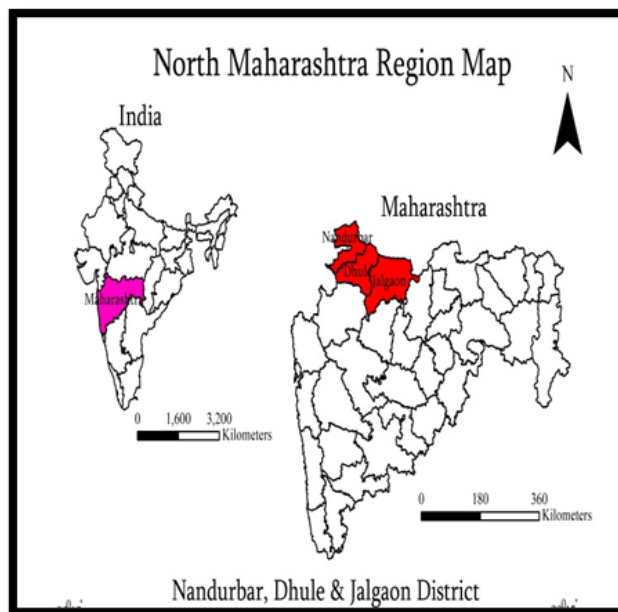


Fig. 1. North Maharashtra Region



Fig. 2. Hot Spring Location of Khandesh

current study, the researchers had to complete sampling from different hot spring locations in the Khandesh region in accordance with the 2011 Census of India. Researchers have selected 300 Male & Female citizens from respective areas of the hot spring region of Khandesh, by using the purposive sampling method for his research study. The data has analyzed to identify the health benefits, cultural significance, and economic impact of the hot springs. So, the present research studies to investigate socio-cultural as well as medical tourism importance through the local citizens in the Khandesh region by using Chi-square techniques.

5 Results and Discussion

Across the world, hot springs are significant both medically and culturally. Known for their medicinal qualities, their mineral-rich waters provide relief from stress, skin disorders, and arthritis (Kumar & Raj, 2021). Hot springs are an important aspect of many cultural traditions; in Japan, taking an onsen bath is a health and relaxation ritual (Takahashi, 2020) and in Hungary, thermal baths are a vital component of social life that combines community and wellbeing (Varga et al., 2019). Hot springs are becoming more and more popular in international medical tourism due to its combination of health advantages and cultural value. In Maharashtra (Dnyaneshwar & Kailas 2024)^(1,2), studies highlight the therapeutic properties of hot springs in Unapdev and Ramtalav, proving beneficial for treating conditions like arthritis and skin problems. Chavan and Joshi (2020) explore their role in medical tourism in Maharashtra, while Patil and Shinde (2017) focus on the geothermal resources and their environmental and human health benefits. These studies underscore the importance of Maharashtra's hot springs in conventional medicine and medical tourism.

5.1 Socially contact

Hot springs are social hubs that promote leisure and social contact; they are essential to global cultural practices. They play an important role in the ritual and recreational aspects of Iceland's geothermal baths and Japan's onsen culture (Steyn & Pienaar, 2008)⁽³⁾. Furthermore, hot springs have long been regarded by native American cultures for their medicinal qualities and spiritual purification practices (Hendricks, 2010)⁽⁴⁾. According to Robson (2007)⁽⁵⁾, the long-standing traditions and manners connected to onsen bathing demonstrate the hot springs' ongoing cultural significance in Japan. Therefore, tourists recorded the following responses regarding the social and religious utility of studying of hot springs in Khandesh.

Table 1 reveals that, the results of the chi-square test indicated a statistically significant difference between the observed and expected values, $\chi^2 = 147.12$, $df = 2$, $p < .001$. The result is significant at $p < .05$. Analysis of the data indicated

Table 1.

Response	View of Pilgrims	Percentage	Chi-Square Obtained value	Table value
Yes	174	58	147.120	77.929
No	120	40		
Neutral	6	02		
Total	300	100		

Source: Computed by Researchers, 2023

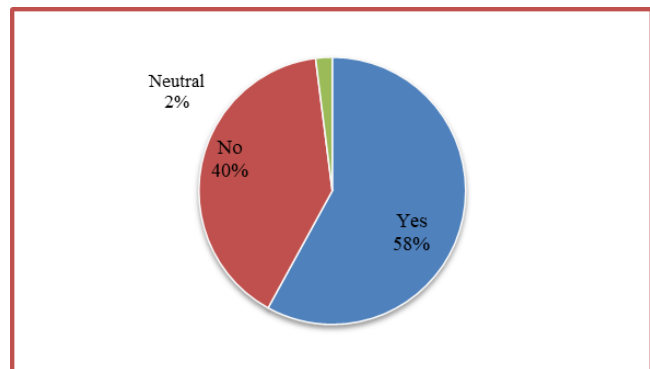


Fig. 3. Socially contact

according to most of the local springs in Khandesh is socially and religiously important. Their importance is more evident from the social and religious point of view among the locals of Khandesh. There are ancient temples near every spring. From the data collection in the present research, it is observed that as per Figure 3 indicate that the 58% of the local's peoples says, these hot springs are important from a social and religious point of view. According Figure 3 shows to 40% of locals, these hot springs are not important from a social and religious point of view while 02% of locals are neutral about it. That is, according to most of the locals, these hot water springs are important from a social and religious point of view.

5.2 Health and Tourism

Smith, J., & Jones, A. (2021)^(6,7) found the relationship between water quality in hot springs and its impact on health, presenting case studies to illustrate best practices for tourism management. Chen, Y., & Liu, Q. (2020)^(8,9) a comparative study of thermal spa tourism destinations, analyzing their health-related offerings and tourist perceptions. Pilgrims responded to the statement that hot springs in Khandesh are a centre of health and tourism.

The results of the chi-square test in Table 2 indicated a statistically significant difference between the observed and expected values, $\chi^2 = 188.72$, $df = 2$, $p < .001$. The result is significant at $p < .01$. Analysis of the data indicated according to most of local's says, is it necessary to promote

Table 2.

Response	View of Pilgrims	Percentage	Chi-Square Obtained value	Table value
Yes	210	70	188.72	77.929
No	64	21		
Neutral	26	09		
Total	300	100		

Source: Computed by Researchers, 2023

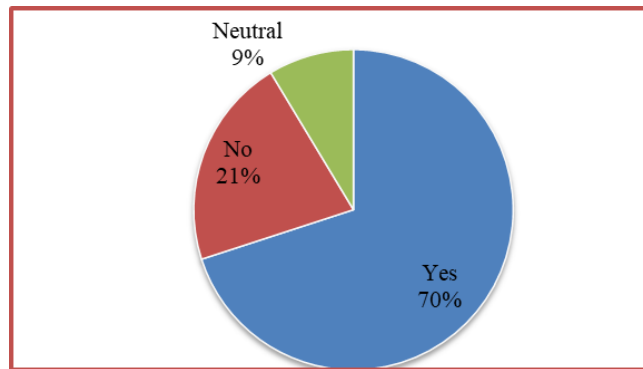


Fig. 4. Health and Tourism

and disseminate hot water springs in Khandesh from the point of view of health and tourism. As per the Figure 4, 70% of respondents in favour, the study on health and tourism facilities in Khandesh's Ramtalav, Unapdev, and Anakdev hot springs demonstrates considerable local support. However, 9% are neutral and 21% oppose because to environmental concerns. For inclusive and sustainable development, the study highlights the importance of careful engagement and taking into account a range of viewpoints.

5.3 Cured of diseases

Fioravanti, A., & Cantarini, L. (2022) address the effectiveness and mechanisms of action of balneotherapy, which includes hot springs, in the management and treatment of rheumatic disorders. The therapeutic effects of thermal mineral waters on a variety of skin illnesses are reviewed by Lotti, T., & Ghersetich, I. (2022), Tourists responded as follows regarding medical tourism and natural treatment at hot springs in Khandesh.

The results of the chi-square test in Table 3, indicated a statistically significant difference between the observed and expected values, $\chi^2 = 213.5$, $df = 2$, $p < .001$. The result is significant at $p < .05$. Analysis of the data indicated according to most of local's says skin diseases can be cured medicinally by the hot spring water of Khandesh region. It's important to evaluate these claims cautiously and to

Table 3.

Response	View of Pilgrims	Percentage	Chi-Square Obtained value	Table value
Yes	215	72	213.5	77.929
No	70	23		
Neutral	15	05		
Total	300	100		

Source: Computed by Researchers, 2023

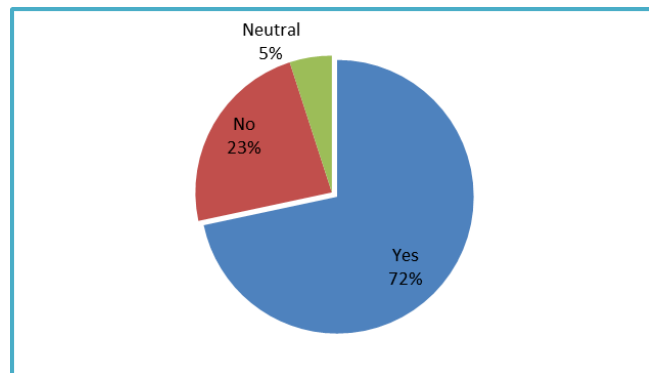


Fig. 5. Cured of diseases

speak with medical experts about any illnesses you may be experiencing. Hot springs should not be utilized in place of conventional medical care, even if they may offer brief relaxation and comfort. (Dnyaneshwar & Kailas 2024)^(1,2). When considering locals' viewpoints, it is clear as per Figure 5 that 72% of them believe that skin disorders can be treated by hot springs. It's hot, according to 23% of locals.

5.4 Development of Balneotherapy and Spa

Lee, S., & Park, K. (2022)⁽¹⁰⁾ examine spa management practices and service quality at hot springs, emphasizing best practices for enhancing customer satisfaction and operational efficiency. Tan, L., & Wu, Y. (2022)⁽¹¹⁾ discuss innovations in spa technology and thermal treatments at hot springs, highlighting current trends and future directions in enhancing therapeutic experiences. The statement that hot water springs in Khandesh is useful for balneotherapy and spa therapies were reported by tourists as follows:

The results of the chi-square test in Table 4, indicated a statistically significant difference between the observed and expected values, $\chi^2 = 98$, $df = 2$, $p < .001$. The result is significant at $p < .05$. Analysis of the data indicated according to most of local's says Balneotherapy, spa etc. treatment methods have been developed using hot water springs in the country and abroad, just like the hot water spring in Khandesh region. The Khandesh region's Ramtalav, Unapdev, and Anakdev hot springs are attracting interest

Table 4.

Response	View of Pilgrims	Percentage	Chi-Square Obtained value	Table value
Yes	180	60	98.00	77.929
No	50	17		
Neutral	70	23		
Total	300	100		

Source: Computed by Researchers, 2023

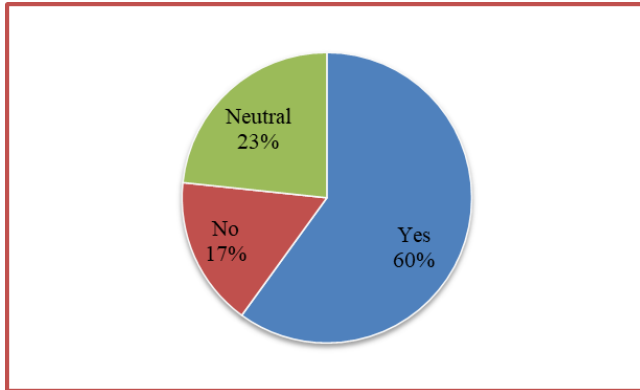


Fig. 6. Development of Balneotherapy and Spa

for balneotherapy and spa facilities (Dnyaneshwar & Kailas 2024)^(1,2). According to Figure 6 say to 60% of residents supporting the idea. However, 17% voice doubts due to cultural preservation concerns and 23% are neutral, requiring further research and community engagement for informed decision-making and long-term sustainability.

5.5 Skin Disorders and Mental Health

A meta-analysis by Garcia, M., & Martinez, E. (2022)⁽¹²⁾ on the effects of hot spring balneotherapy on atopic dermatitis emphasizes the treatment's effectiveness in symptom management. Dubois, O., & Spaak, J. (2022)⁽¹³⁾ pay particular attention to stress relief and mental health. In the statement about hot springs in Khandesh for skin disorders and mental health, tourists responded as follows.

Table 5.

Response	View of Pilgrims	Percentage	Chi-Square Obtained value	Table value
Yes	193	64	129.98.	77.929
No	50	17		
Neutral	57	19		
Total	300	100		

Source: Computed by Researchers, 2023

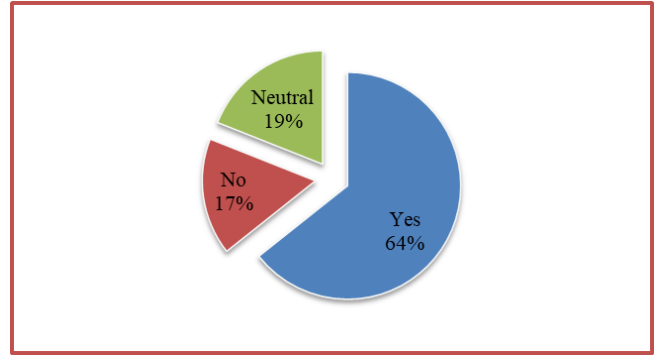


Fig. 7. Skin Disorders and Mental Health

The results of the chi-square test in Table 5 indicated a statistically significant difference between the observed and expected values, $\chi^2 = 129.98.$, $df = 2$, $p < .001$. The result is significant at $p < .05$. Analysis of the data indicated according to most of local's says hot springs in Khandesh are useful for skin disorders and mental health. Extensive studies are needed to evaluate the impact of Ramtalav, Unabdev and Anakadev hot springs on skin disorders and mental health. Local sentiment supports their therapeutic benefits, while a minority (17%) holds reservations and 19% are neutral, indicating a need for further research.

5.6 Economic Heritage

Wang, L., & Zhang, H. (2021)⁽¹⁴⁾ examine various conservation strategies and policies aimed at preserving hot springs ecosystems. The research highlights the importance of sustainable management practices to mitigate environmental degradation and ensure long-term viability of these natural resources. Chen and Liu (2020)^(8,9) highlight hot springs' ecological importance and advocate integrated conservation to protect their unique biodiversity. Regarding the economic value of hot water springs in Khandesh and its utility, pilgrims responded as follows.

Table 6.

Response	View of Pilgrims	Percentage	Chi-Square Obtained value	Table value
Yes	209	70	185.82.	77.929
No	65	22		
Neutral	26	08		
Total	300	100		

Source: Computed by Researchers, 2023

The results of the chi-square test in Table 6 indicated a statistically significant difference between the observed and expected values, $\chi^2 = 185.82.$, $df = 2$, $p < .001$. The result is significant at $p < .05$.

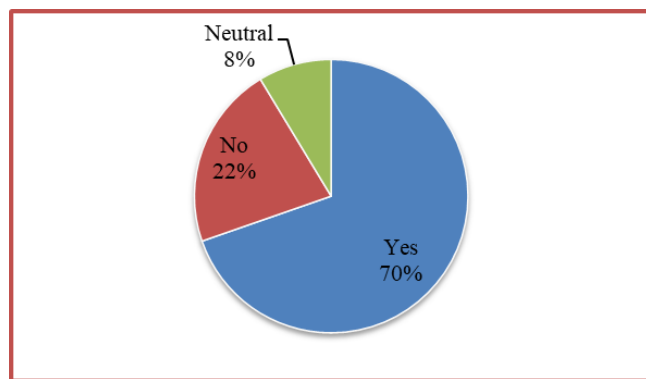


Fig. 8. Natural Projection

Analysis of the data indicated according to most of local's its preferred about protection of Hot springs water is needed. The Khandesh region in Maharashtra is renowned for its natural heritage, including the diverse GEO heritage sites Ramtalav, Unpadev, and Anakdev. A Figure 8 reveals that 70% of locals believe hot springs' natural heritage is being preserved, while 22% believe it is not, and 8% do not express opinion.

6 Conclusion

Based on all the above discussion, the Khandesh region has a rich heritage of hot springs, and these hot springs have highly social cultural as well and ritual customs and beliefs. It is valuable insights into their social, cultural, religious, and economic significance. By comparing this research with studies conducted in other regions, we can identify common themes and variations in the perceptions and attitudes towards hot springs across different cultural contexts. While the research in Khandesh highlights the need for awareness initiatives, preservation of cultural heritage, and inclusive development practices, similar concerns and priorities are evident in studies from other regions as well. Overall, understanding the multifaceted nature of hot springs and their importance to local communities is crucial for promoting sustainable development and preserving cultural and environmental integrity (Suryawanshi & Patil 2019)⁽¹⁵⁾. Future research should focus on the long-term impacts of medical tourism on the local economy, environment, and cultural heritage, as well as the potential for expanding similar initiatives in other regions of Maharashtra.

7 Appendix

Geo-Pharmacology of Hot Springs in the Khandesh Region

- **Respondent's Name:** _____
- **Gender:** Male / Female

- **Location:** Urban / Rural
- **Age Group:** 18-25 / 26-40 / 41-55 / 55+
- **Address:** _____
- **Taluka:** _____
- **District:** _____

Instructions:

Dear Respondent, the following questionnaire is primarily based on the "Unpadev Hot Springs" and consists of 15 questions. You are required to select one option from 'Yes', 'No', or 'Uncertain' for each question. There is no right or wrong answer, as the purpose is to gather information/opinions. The information you provide will be kept confidential and will be used solely for research purposes. There are no time constraints, and if you face any difficulties in understanding a question, feel free to ask the researcher.

Section A: General Information about Hot Springs			
Question	Yes	No	Uncertain
1. Are you aware that there are hot springs in the Khandesh region?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Do you know about the hot spring located here?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Do you think the hot spring has social and religious significance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Do you think the hot spring is culturally significant?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Do you participate in festivals or rituals held near the hot spring?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Do you pass on the importance of hot springs to the next generation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Do you think the hot springs in Khandesh are important from a social and cultural perspective?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Is the sanctity of the hot springs in Khandesh being maintained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Do you think the hot springs in Khandesh are a natural heritage that needs to be preserved?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Can the hot springs in Khandesh play a significant role in the socio-economic development of locals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section B: Health Benefits of Hot Springs			
Question	Yes	No	Uncertain
11. Are you aware that bathing in the hot spring water can cure skin diseases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Are you aware that bathing in the hot spring water regularly reduces fatigue and stress?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Do you know that the hot spring contains minerals and microorganisms beneficial for skin diseases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Are you aware that hot springs worldwide are used for Balneotherapy and spa treatments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Do you think Unpadev hot spring water should be used to develop modern Balneotherapy and spa centers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Do you think the hot springs in Khandesh are beneficial for skin disorders and mental health?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Should the hot springs in Khandesh be developed as health and tourism centers by the government or NGOs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Do you think there is a lack of tourism and healthcare facilities near the hot springs in Khandesh?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Do you think there should be more promotion of the health and tourism aspects of Khandesh's hot springs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Do you think the hot springs in Khandesh will play an important role in the development of the tribal and hilly areas in the future?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section C: Medical Tourism and the Future of Hot Springs			
Question	Yes	No	Uncertain
21. Do you think the Unpadev hot spring area is suitable for a tourism center?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Are you aware that hot springs are being developed as medical tourism centers globally?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Are there medical tourism facilities available in the Unpadev hot spring area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Do you regularly use the Unpadev hot spring area for medical tourism purposes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Do you think the Unpadev hot spring area should be developed as a medical tourism center?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Do you think using the hot springs in Khandesh for medical purposes can benefit people's health?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Do you think the hot springs in Khandesh should be developed into medical tourism centers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Do you think the government should provide world-class facilities at the hot spring sites in Khandesh?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Do you think the hot springs in Khandesh can boost the tourism industry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Do you think the hot springs in Khandesh will play a significant role in the development of social, cultural, and medical tourism in the region?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

References

- 1) Suryawanshi DS, Vaidhya MY, Dalal PD, Shah DS, Patil KV. Physicochemical and Heavy metals-contents Analysis of hot springs water in Khandesh province of Northern Maharashtra for balneotherapy. *International Journal of Engineering, Management and Humanities*. 2024;5(6):322–330.
- 2) Suryawanshi DS, Patil KV, Patil. Exploring the Future Potential of Balneotherapy at Unapdev Hot Spring in Khandesh of Maharashtra. *IOSR Journal of Humanities and Social Science*. 2024;29(9):1–4.
- 3) Steyn HS, &pienaar J. The role and importance of the hot spring resort in tourism: A South African study. *Journal of Quality Assurance in Hospitality & Tourism*. 2008;9(1-2):71–88.
- 4) Hendricks GM. Hot springs and health: Healing waters, sacred springs, and mineral waters through history. 2010.
- 5) Robson S. Hot springs and bath houses in Japan: Rest, relaxation and ritual. *Japan Forum*. 2007;19(3):387–408.
- 6) Smith J, Jones A. The socio-economic impacts of hot springs tourism in rural communities: A case study. *Journal of Tourism Economics*. 2021;36(2):201–215.
- 7) Smith J, Jones A. Water quality and health implications for hot springs tourism: Case studies. *Environmental Health and Tourism*. 2021;42(2):201–215.
- 8) Chen Y, Liu Q. Thermal spa tourism and health: A comparative study of thermal resorts. *International Journal of Thermal Spa Tourism*. 2020;15(4):511–526.
- 9) Chen Y, Liu Q. Ecological significance and natural protection of hot springs: Biodiversity and conservation challenges. *Journal of Environmental Biology*. 2020;15(4):401–415.
- 10) Lee S, Park K. Spa management and service quality at hot springs: Best practices and customer satisfaction. *International Journal of Hospitality Management*. 2022;94.
- 11) Tan L, Wu Y. Innovations in spa technology and thermal treatments at hot springs: Current trends and future directions. *Journal of Thermal Biology*. 2022;100.
- 12) Garcia M, Martinez E. Impact of balneotherapy on atopic dermatitis: A meta-analysis. *Journal of Clinical Dermatology*. 2022;45(3):301–315.
- 13) Dubois O, Spaak J. Psychological benefits of hot springs for stress relief: A systematic review. *Psychology & Health*. 2022;37(4):511–526.
- 14) Wang L, Zhang H. Natural protection of hot springs: Conservation strategies and policies. *Environmental Management*. 2021;36(4):511–526.
- 15) Suryawanshi DS, Pawar K, Vasan K, Patil. Hot spring: classification and situation in India. *Peer Reviewed International Research Journal of Geography Maharashtra Bhugolshastra Sanshodhan Patrika*. 2019;36(1):12–15.