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The Role of the Natural Resources Defense Council (NRDC) in Addressing Heatwaves in India (2022–2023)

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ABSTRACT

India is the third-largest emitter of greenhouse gases (GHG) in the world, following China and the United States. The increase in GHG emissions has led India to face various climate-related challenges, one of which is extreme heatwaves. To address this issue, the Indian government has collaborated with the Natural Resources Defense Council (NRDC). This study applies John McCormick's theory on the role of environmental NGOs. According to McCormick, environmental NGOs utilize nine strategies: collaborating with government officials, fundraising, organizing public protests, promoting media coverage of environmental issues, engaging in litigation and regulatory monitoring, facilitating information exchange, conducting research, managing property, and involving local communities in environmental protection. The research relies on data collected from literature sources including books, journal articles, reports, and other publications, which are analyzed using a document analysis method. In supporting India in tackling heatwaves, NRDC has played a role in the development of the country's Heat Action Plan (HAP) in collaboration with the Indian government. NRDC has also supported the India Cooling Action Plan (ICAP) by working with the Indian organization The Energy and Resources Institute (TERI) on the implementation of cool roofs. In addition, NRDC has worked with another local Indian organization, the Self-Employed Women's Association (SEWA), to develop the Hariyali Green Villages program.

Introduction

Currently, environmental issues have become an important topic of discussion in international political dynamics. The phenomenon of heatwaves, which result in environmental problems, has become a serious concern. Extreme climate changes, such as shifting weather patterns and long-term temperature changes, are caused by human activities, particularly the excessive use of energy. Heatwaves are now occurring in various parts of the world, one of which is India. India is one of the countries with a population exceeding one billion people. This large population has led to rapid industrial growth due to urbanization, as rural communities migrate in hopes of improving their economic conditions. The rapid development of industrialization and urbanization has made India a contributor to the occurrence of heatwaves.[1]

[1] Khaiwal Ravindra, "Temperature Projections and Heatwave Attribution Scenarios Over India: A Systematic Review," *Heliyon* 10 (2024).

Greenhouse gases (GHGs) such as carbon dioxide, methane, and nitrous oxide are released through human activities like the burning of fossil fuels and industrial waste. These activities significantly raise air temperatures above normal levels, and when this condition persists for extended periods, it can result in heatwaves. According to the 2023 report from the Emissions Database for Global Atmospheric Research (EDGAR), India is one of the largest greenhouse gas emitters in the world, ranking third after China and the United States.

The issue of heatwaves is still ongoing in India. In 2022, India recorded its highest temperature at 49.2 degrees Celsius.[2] In response, the Indian government has issued early warnings through the India Meteorological Department (IMD) using various media channels and digital platforms to inform the public and local governments to take appropriate preventive measures. However, these efforts are not considered sufficient. Therefore, to help address the increasing heatwaves, the Indian government has collaborated with international actors, one of which is the Natural Resources Defense Council (NRDC).

NRDC is the first national environmental advocacy group focusing on legal action, with a commitment to environmental protection. It combines the strength of over 3 million members and online activists with the expertise of around 700 scientists, lawyers, and other environmental specialists to confront the climate crisis, protect wildlife and natural habitats, and ensure everyone's right to clean air, clean water, and healthy communities.[3]

NRDC began working in India in 2009 with the aim of encouraging collaboration between the United States and India on climate issues, partnering with organizations such as The Energy and Resources Institute (TERI) and the Council on Energy, Environment and Water.[4] In this context, NRDC participated in the collaboration between the United States and India through the U.S.-India Energy Partnership Summit. The success of this summit paved the way for the two countries to form a green partnership focused on climate change and clean energy.[5] The cooperation between the United States and India has opened the door for NRDC's programs in India, and by 2023, NRDC decided to open a branch office located in New Delhi, officially inaugurated on January 18, 2023. This step was taken because NRDC recognized the importance of its programs in India to achieve its mission.[6] Based on this, the author is interested in further researching the role of the Natural Resources Defense Council (NRDC) in addressing heatwaves in India.

[2] "IMD Issues Red Alert In Delhi-NCR As Mercury Soars Above 45°C," Newsx, diakses 24 Mei 2024,https://www.newsx.com/health-and-environment/imd-issues-red-alert-in-delhi-ncr-as mercury-soars-above-45c/.
[3] "About NRDC,"NRDC, diakses 24 Mei 2024, https://www.nrdc.org/about.
[4] "India's Climate Change Challenge," NBR, diakses 13 Juli 2024, https://www.nbr.org/indias-climate-change-challenge/.
[5] "U.S.-India Cleantech Cooperation: Energy Partnership Summit," NRDC, diakses 13 Juli 2024, https://www.nrdc.org/bio/anjali-jaiswal/us-india-cleantech-cooperation-energy-partnership-summit.
[6] "India," NRDC, diakses 7 Juli 2024, https://www.nrdc.org/india diakses tanggal 7 Juli 2024.

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Heatwaves are one of the global issues that require the involvement of various parties to address both the phenomenon itself and its impacts. India, as one of the world's largest greenhouse gas (GHG) emitters contributing to heatwaves, undoubtedly needs the support of non-state actors to assist the government in tackling heatwaves and their consequences. One of the key non-state actors in this context is Non-Governmental Organizations (NGOs). NGOs are considered to have closer ties to the lives of people in developing countries and are capable of providing development assistance at significantly lower costs compared to states or intergovernmental organizations.[7]

Methodology

In this writing, the author obtained and collected data through library research, using literary sources such as books, articles, journals, publications, and other relevant materials that support the study. This qualitative research employs document analysis as the method for data analysis. This method involves skimming or superficial examination, thorough review, and interpretation. To apply this method, the author must reread and carefully review the data to maintain objectivity in the writing of the material.[8]

Literature Review

This study utilizes the theory of Environmental NGOs proposed by John McCormick. In this theory, McCormick states that environmental NGOs emerged due to the lack of political action concerning environmental policies. This situation led citizens to take matters into their own hands by forming Non-Governmental Organizations designed to exert pressure for change and, when necessary, to take independent action. As organizations operating outside of government structures, environmental NGOs, according to McCormick, employ nine methods to achieve their objectives: collaborating with government officials, fundraising, organizing public protests through activities such as campaigns, promoting media coverage on environmental issues, engaging in litigation and regulatory monitoring, exchanging information through education or training programs, conducting research, managing property, and involving local communities in environmental protection.[9]

Level of analysis refers to the explanatory factor that becomes the focus and theoretical basis of a study. Mohtar Mas'oed, in his book Ilmu Hubungan Internasional: Disiplin dan Metodologi, divides the levels of analysis into five categories: individual, group, nation-state, interstate (among nations), and international system.[10] In this research, the author will analyze

[7]"*Nongovernmental Organizations (NGOs),"* Carolyn Stephenson, diakses 25 Mei 2024, https://www.beyondintractability.org/essay/role_ngoly-close/.
[8] Glenn A Bowen, "Document Analysis as a Qualitative Research Method," *Qualitative Research Journal* 9.2 (2009): 27-40.
[9] John McCormick, *The Role of Environmental NGOs in International Regimes* (The global environment, 2023).
[10] Mohtar Mas' oed, *Ilmu Hubungan Internasional: Disiplin dan Metodologi* (Jakarta: PT Pustaka LP3ES, 1994).

the role of the Natural Resources Defense Council (NRDC) in addressing heatwaves in India by using the group behavior level of analysis, which examines NGOs involved in international relations.

Discussions

India is one of the countries located in South Asia, divided into 28 states and 7 union territories. It is among the world's largest greenhouse gas (GHG) emitters. According to the 2023 report by the Emissions Database for Global Atmospheric Research (EDGAR), India ranks third in global GHG emissions, following China and the United States. Greenhouse gases (GHGs) are atmospheric gases such as carbon dioxide (CO_2), methane (CH_4), and nitrogen dioxide (NO_2). The increase in GHG emissions is largely driven by human activities such as the burning of fossil fuels, industrial operations, agriculture, and deforestation. India's high population significantly contributes to the rise in its GHG emissions.

According to data from the World Population Review, India—whose capital is New Delhi—had a population of 1,450,940,000 in 2024.[11] This large population has spurred rapid industrial activity, largely driven by urbanization, as people from rural areas migrate to cities in search of better economic opportunities. In 2012, India's urbanization rate was 31.634%, increasing to 36.364% by 2023.[12] This wave of urbanization has contributed to climate change, making India a significant contributor to the occurrence of heatwaves caused by aerosol emissions from fossil fuels such as coal, gasoline, and diesel. These fossil fuels are used in various industrial processes, including power generation, iron and steel production, oil refining, household energy use, and transportation.[13]

According to the World Health Organization (WHO), a heatwave is considered to occur when the maximum temperature in a region reaches at least 40°C or more in plains and at least 30°C or more in hilly areas.[14] In 2022, the average annual land surface air temperature in India was +0.51°C above the long-term average for the 1981–2010 period. The year 2022 was recorded as the fifth hottest year in India since national records began in 1901.[15]

The heatwaves have affected the plains of northwestern India, central and eastern regions, as well as parts of the northern Indian peninsula. From 2019 to the present, 23 out of 29 Indian states have been declared heatwave-prone areas. These include Arunachal Pradesh, Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Goa, Odisha, Telangana, Maharashtra,

[11] "World Population by Country 2024," World Population Review, diakses 28 Oktober 2024, https://worldpopulationreview.com/.
[12] "India-Urban Population (% Of Total)," Trading Economics, diakses 28 Oktober 2024, https://tradingeconomics.com/india/urban-population-percent-of-total-wb-data.html.
[13] S, Ramachandran dan Ribu Cherian, "Regional and seasonal variations in aerosol optical characteristics and their frequency distributions over India during 2001–2005." *Journal of Geophysical Research: Atmospheres* 113.D8 (2008).
[14] "Heat Wave," WHO, diakses 29 Oktober 2023, https://www.who.int/india/heat-waves.
[15] IMD Pune, *Annual Climate Summary 2023* (IMD,2024).

Chhattisgarh, West Bengal, Jharkhand, Madhya Pradesh, Gujarat, Rajasthan, Uttar Pradesh, Bihar, Delhi, Haryana, Uttarakhand, Punjab, Himachal Pradesh, and Jammu & Kashmir. This marks an increase compared to 2018, when only 19 Indian states were affected by heatwave-related issues.[16]

Heatwaves have serious impacts on public health, including heatstroke, dehydration, fatigue, and the spread of other infectious diseases. These health issues have contributed to a rising number of fatalities in India. From 1902 to 2015, a total of 24,223 heatwave-related deaths were reported. The National Disaster Management Authority (NDMA), a government agency in India responsible for natural disaster management, stated that most victims of heatwaves are from impoverished communities and those working in the informal sector, such as daily wage laborers, street vendors, and individuals forced to work outdoors to meet their economic needs.[17]

In its efforts to address climate-related challenges, India has ratified international agreements such as the Kyoto Protocol and the Paris Agreement. India is a party to the United Nations Framework Convention on Climate Change (UNFCCC), a convention established during the Earth Summit held in Rio de Janeiro in 1992. The UNFCCC provides a framework for countries to address climate change issues. The enforcement of this convention marked the beginning of the Conferences of the Parties (COP), which serve as a platform for member states to agree on commitments and follow-up actions under the UNFCCC. The convention also laid the foundation for major climate agreements such as the Kyoto Protocol and the Paris Agreement.

The Indian government ratified the Kyoto Protocol in 2002. However, India is classified as a Non-Annex country, meaning it was not obligated to reduce its greenhouse gas emissions. This status drew criticism, particularly regarding the lack of emission reduction targets for developing countries, which led to concerns that the Kyoto Protocol did not appropriately assign responsibilities between developed and developing nations. These discrepancies, along with differing national interests and low compliance among major GHG-emitting countries, hindered the effectiveness of the protocol's implementation and ultimately led to the creation of the Paris Agreement.

Unlike the Kyoto Protocol, the Paris Agreement brings all countries together under a unified goal to address climate change and adapt to its impacts. The primary objective of the Paris Agreement is to strengthen the global response to the climate crisis by striving to limit global temperature rise within this century. It also aims to enhance the capacity of climate-vulnerable nations to manage the impacts of climate change. To support this, the Paris Agreement requires all parties to submit periodic reports every five years, known as Nationally Determined Contributions (NDCs), outlining their emissions and mitigation efforts. These

[16] NRDC, *Expanding Heat Resilience Across India: Heat Action Plan Highlights 2022* (NRDC International India, 2022).
[17] NDMA, *Beating The Heat* (NDMA, 2020).

reports serve to assess progress and confirm the actions each party intends to take toward meeting the agreement's goals.[18]

In addition to ratifying international agreements, India has also collaborated with international actors, one of which is the Natural Resources Defense Council (NRDC). Founded in 1970 in New York, NRDC began its work in India in 2009 through a collaboration between the United States and India as part of the U.S.-India Energy Partnership Summit. The success of this summit paved the way for a green partnership between the two countries, focusing on climate change and clean energy.[19]

Since then, both governments have worked closely to develop one of the partnership initiatives known as the Program to Advance Clean Energy (PACE), which focuses on research and the dissemination of clean energy technologies. Indian and American laboratories have jointly collaborated on the development of solar energy and energy-efficient technologies. Within this initiative, several third-party partners were involved, including NRDC. The collaboration between the United States and India, as well as NRDC's involvement, has opened the door for the implementation of NRDC's programs in India.

During 2022 and 2023, NRDC has played a role in the development of Heat Action Plans (HAP), supported the India Cooling Action Plan (ICAP) through the promotion of cool roofs, helped establish green villages known as Hariyali Green Villages, and organized various workshops aimed at jointly addressing ongoing climate challenges.

Heat Action Plan (HAP)

NRDC collaborates with the National Disaster Management Authority (NDMA) and the India Meteorological Department (IMD) to address climate-related issues. NDMA and IMD are government agencies in India that focus on disaster management and climate-related problems. One of the key partnerships between NRDC, NDMA, and IMD is the development of India's Heat Action Plan (HAP), which is currently being expanded to several states and cities across India to improve heat resilience. The Heat Action Plan (HAP) is an initiative by the Indian government to help vulnerable populations cope with the challenges posed by heatwaves. Currently, the Indian government is working with 23 heatwave-prone states to implement the plan.

The first HAP was launched in 2013 in Ahmedabad, Gujarat, making it the first city in South Asia to comprehensively address the threat of extreme heat caused by climate change. The development of the HAP could not be achieved by the Indian government alone, so it required cooperation with various other stakeholders. The creation of HAP involved collaboration between several organizations, including the Ahmedabad Municipal Corporation (AMC), the Indian Institute of Public Health, Gandhinagar (IIPH), the Public Health

[18] "Key aspects of the Paris Agreement," UNFCCC, diakses pada 01 November 2024, https://unfccc.int/most-requested/key-aspects-of-the-paris-agreement.
[19] *Op,. Cit*. NRDC.

Foundation of India (PHFI), Mount Sinai School of Medicine, the Climate & Development Knowledge Network (CDKN), and the Natural Resources Defense Council (NRDC).[20]

The HAP integrates a heatwave early warning system to ensure that timely warnings reach vulnerable populations. It also emphasizes solutions such as investing in infrastructure, adopting climate-resilient agricultural practices, and implementing sustainable urban planning measures like creating green corridors and cool roofs. By applying the short-term and long-term measures outlined in the HAP, the government can mitigate the impacts of heatwaves on human lives and the economy.[21]

NRDC plays a critical role in India's HAP by developing evidence-based strategies for managing extreme heat. This partnership focuses on creating early warning systems and frameworks related to heat and enhancing community preparedness. NRDC's involvement includes research, training healthcare workers, and educating the public to raise awareness about the heat risks, thereby reducing mortality rates and economic impacts of heatwaves.

In 2023, NRDC assisted India in developing a heat action plan in the city of Jodhpur, Rajasthan. The creation of the Jodhpur Heat Action Plan was necessary because Jodhpur is one of the regions most vulnerable to heat, consistently experiencing high temperatures from March to June. In 2022, the city faced six instances where temperatures exceeded 45°C. The high temperatures in Jodhpur are characterized by low and inconsistent rainfall, high air and soil temperatures, intense solar radiation, and high wind speeds. Due to the potential for more frequent heatwaves in the area, NRDC and the Mahila Housing Trust (MHT) jointly held workshops with Jodhpur Nagar Nigam North (JNNN) to start a dialogue on the development of a local HAP.

However, the HAP needs to continue evolving by involving stakeholders and vulnerable populations to gather input and guidance from those directly affected by heatwaves. This input will help in the development and revision of the HAP to address the specific needs and challenges of those most impacted. Additionally, the HAP must also consider long-term climate projections and models to effectively address the ongoing challenges posed by increasingly frequent heatwaves in the future.[22]

India Cooling Action Plan (ICAP)

ICAP is a document aimed at addressing the cooling needs of rapidly developing countries while also tackling climate action requirements. The goals of ICAP are broad and encompass various considerations, including thermal comfort, energy efficiency through building design, as well as standards and labeling for appliances, while taking into account

[20] NRDC, Ahmedabad Heat Action Plan (NRDC,2016).
[21] "Can India's Heat Action Plans cope with the heat?," IDR, diakses 23 November 2024, https://idronline.org/article/climate-emergency/can-indias-heat-action-plans-cope-with-the-heat/
[22] "As heat waves increase, are India's Heat Action Plans effective?," Mongabay, diakses 23 November 2024, https://india.mongabay.com/2023/07/explainer-as-heat-waves-increase-are-indias-heat-action-plans-effective/.

energy poverty, energy access challenges, and the emission impacts from increased cooling demand.

As a country experiencing extreme hot weather, India has a high rate of air conditioner (AC) usage, which contributes to global warming due to the reliance of AC units on chemicals like hydrofluorocarbons (HFC) for cooling. In support of ICAP and the Kigali Amendment, NRDC and TERI have partnered to implement cool roof programs to reduce cooling energy demand and refrigerant usage. To support ICAP, several organizations, including The Energy and Resources Institute (TERI), NRDC, and partners, have launched a cooling innovation platform designed to promote domestic innovations in cooling technology. Leading cities such as Ahmedabad and Hyderabad are developing cool roof programs across the city, while the states of Telangana and Andhra Pradesh are implementing energy-efficient building programs to improve thermal comfort.[23]

Before the cool roof policy in Telangana was established, NRDC had already collaborated with various knowledge partners, such as the Administrative Staff College of India (ASCI) and the International Institute of Information Technology-Hyderabad (IIIT-H), to pilot the cool roof policy. The initial phase of the program involved awareness campaigns, partnerships with businesses, and targeting cool roof installations in low-income communities.

In this context, NRDC played a role in the creation of ICAP for Telangana in 2023, alongside the Minister of Urban Administration and Development, IT, and Industries of India. The cool roof policy in Telangana aims to provide low-cost, climate-friendly solutions to tackle extreme heat. The cool roofs will reflect sunlight and absorb less heat, offering protection from extreme heat while helping save energy and reduce AC bills. Through this initiative, Telangana plans to install cool roofs across 300 square kilometers of the state by 2028, with an expected saving of 600 million kWh of electricity annually after five years of implementation, and a reduction of 30 million tons of CO2 emissions that contribute to climate warming.[24]

Hariyali Green Villages

Since 2014, the Natural Resources Defense Council (NRDC) has partnered with the Self-Employed Women's Association (SEWA) to promote the adoption of clean energy solutions at the grassroots level. NRDC and SEWA have collaborated with women supported by SEWA to implement sustainable energy programs. One of the key initiatives currently being developed by NRDC and SEWA is the Hariyali Green Villages program. This initiative aims to enhance the accessibility and affordability of clean energy technologies while improving livelihood opportunities at the household level in rural India. Each Green Village incorporates a range of environmentally friendly and clean energy technologies, including light-emitting diode (LED) bulbs and energy-efficient fans for lighting and thermal comfort, biogas plants

[23] "India's Ambitious Plan to Cool a Growing Population," NRDC, diakses 28 November 2024 https://www.nrdc.org/bio/anjali-jaiswal/indias-ambitious-plan-cool-growing-population.
[24] "Telangana Announces a Groundbreaking Cool Roof Policy," NRDC, diakses 7 Desember 2024, https://www.nrdc.org/bio/prima-madan/telangana-announces-groundbreaking-cool-roof-policy.

for clean cooking, solar-powered water pumps for irrigation, and cool roofs to reduce heat stress in homes. With the goal of scaling up to 100 villages by 2025, NRDC and SEWA successfully demonstrated these solutions in over 10 villages during 2021–2022, benefiting more than 300 families.[25]

Together with the Association of Renewable Energy Agencies of States under the Ministry of New and Renewable Energy (AREAS-MNRE), NRDC and SEWA are implementing the Hariyali Green Villages program to improve energy affordability, increase household energy supply, enhance livelihoods, expand clean energy and energy efficiency, improve living conditions and reduce manual labor, and promote better health, air quality, and environmental sustainability by lowering greenhouse gas emissions. The Hariyali Green Villages will feature a range of clean and environmentally friendly energy technologies such as Light-Emitting Diode (LED) bulbs and energy-efficient fans for lighting and thermal comfort, biogas plants for clean cooking, solar-powered water pumps for irrigation, and cool roofs to reduce heat stress inside homes.[26]

Some of the Hariyali Green Villages programs include expanding the use of energy-efficient appliances, increasing biogas installations, promoting the use of solar-powered water pumps, and expanding the adoption of cool roofs. In addition, NRDC and SEWA have also developed several other climate-friendly technologies, such as the use of solar energy for irrigation, solar-powered light traps, and hydroponic feed systems powered by solar pumps. The Hariyali Green Villages initiative began in 2019 and continues to expand. Villages are selected based on several criteria, including large rural populations, limited access to electricity, restricted access to banking services, low asset ownership, and the presence of SEWA members. The program is being implemented in various villages across Indian states such as Gujarat and Rajasthan.

Workshops on Climate Issues

From 2022 to 2023, NRDC conducted various workshops related to climate issues, including the workshop titled "Maximizing the Benefits for Climate-Friendly Cooling through Successful Implementation of the Kigali Amendment." Held on August 4, 2022, this workshop was a collaboration between NRDC and TERI, aimed at promoting climate-friendly cooling. It brought together stakeholders representing the government, industry, academia, and financial institutions.[27]

The workshop also marked the launch of NRDC and TERI's latest publication on cooling. NRDC and TERI released a journal article titled "Scenarios for Future Indian HFC Demand Compared to the Kigali Amendment," published in Environmental Research Letters.

[25] "Hariyali Green Villages NRDC, SEWA & AREAS," Ministry of New and Renewable Energy, diakses 27 November 2024, https://mnre.gov.in/en/hariyali-green-villages-nrdc-sewa-areas/
[26] NRDC, Hariyali Green Villages (NRDC, 2022).
[27] "Discussing Climate Friendly Cooling in India," NRDC, diakses tanggal 5 Desember 2024, https://www.nrdc.org/bio/prima-madan/discussing-climate-friendly-cooling-india.

This research explored how different scenarios of compliance with the Kigali Amendment would affect HFC demand in India.[28]

Another workshop, "Role of Utilities and Power Sector in Growing the EV Market," was organized by NRDC and the Administrative Staff College of India (ASCI). It focused on knowledge exchange among Indian states regarding electric vehicles (EVs). The discussions highlighted that state-level agencies can support the involvement of power utilities in the EV market through the development of state-specific programs.[29] Additionally, NRDC and SEWA held a workshop titled “Policy and Intervention for Women in Renewable Energy” on October 11, 2022. This event brought together key union ministries, state nodal agencies, technology suppliers, entrepreneurs, and beneficiaries to engage in dialogue and collaboration on empowering women through renewable energy. The workshop included discussions on various initiatives from different institutions focused on promoting women's participation in renewable energy, funding, enterprise development, capacity building, skill enhancement, impact assessment, and on-the-ground implementation.[30]

Conclusion

This research has outlined the role of an environmental NGO in assisting a country in addressing environmental issues. As an international NGO, the Natural Resources Defense Council (NRDC) has provided technical support to India to help address the challenges of heatwaves during 2022 and 2023.

Heatwaves in India have intensified and spread across more regions. Since 2019, 23 out of 29 Indian states have been identified as heatwave-prone areas, a significant increase from 2018, when only 19 states faced heatwave-related issues. These heatwaves have led to various consequences, including fatalities, health problems, environmental degradation, and economic losses.

To address climate challenges, including heatwaves, the Indian government has taken several measures, such as ratifying international agreements like the Kyoto Protocol and the Paris Agreement, and collaborating with various governmental and non-governmental organizations, including NRDC, to jointly combat climate change.

In its efforts to address heatwaves in India, NRDC has focused on strengthening the capacity of both the government and local communities. NRDC supported India in developing the Heat Action Plan (HAP) in collaboration with the Indian government. It also supported the India Cooling Action Plan (ICAP) by working with the local organization, The Energy and Resources Institute (TERI), to implement cool roof initiatives. Additionally, NRDC

[28]“Cooling India Calls for Timely Action,” NRDC, diakses tanggal 5 Desember 2024, https://www.nrdc.org/bio/prima-madan/cooling-india-calls-timely-action.
[29] “Utilities Vital to the Success of India’s EV Transition,” NRDC, diakses 5 Deember 2024, https://www.nrdc.org/bio/charlotte-steiner/utilities-vital-success-indias-ev-transition.
[30] “Implementing Women-Led Clean Energy Solutions in India,” NRDC, diakses 5 Desember 2024, https://www.nrdc.org/bio/sameer-kwatra/implementing-women-led-clean-energy-solutions-india.

collaborated with another local organization, the Self-Employed Women's Association (SEWA), to develop the Hariyali Green Villages program, which aims to support women—who are particularly vulnerable to heatwaves due to their outdoor work—in coping with extreme heat.

NRDC's role in addressing heatwaves aligns with the environmental NGO strategy outlined by McCormick, which includes collaborating with government officials, fundraising, organizing public protests, promoting media coverage of environmental issues, engaging in litigation and regulatory monitoring, facilitating information exchange, conducting research, managing property, and involving local communities in environmental protection. However, as an NGO, NRDC faces challenges in assisting India with heatwave mitigation. Due to resource limitations, NRDC cannot provide support to all regions in India. Therefore, continued collaboration with the government and communities is necessary to raise awareness of environmental issues and the policies required to collectively reduce greenhouse gas emissions that contribute to heatwaves.

Referensi

Bowen, Glenn A. "Document Analysis as a Qualitative ResearchMethod." *Qualitative Research Journal* 9.2 (2009): 27-40.

IDR. "Can India's Heat Action Plans cope with the heat?." Diakses 23 November 2024, https://idronline.org/article/climate-emergency/can-indias-heat-action-plans-cope-with-the-heat/.

IMD Pune. *Annual Climate Summary 2023*. IMD,2024.

Mas'oed, Mohtar. *Ilmu Hubungan Internasional: Disiplin dan Metodologi*. Jakarta: PT Pustaka LP3ES, 1994.

McCormick, John. "The Role of Environmental NGOs in International Regimes." dalam buku The Global Environment, diedit oleh Norman J. Vig. Routledge, 2023, 92-110.

MNRE. "Hariyali Green Villages NRDC, SEWA & AREAS." Diakses 27 November 2024, https://mnre.gov.in/en/hariyali-green-villages-nrdc-sewa-areas/

Mongabay. "As heat waves increase, are India's Heat Action Plans effective?." Diakses 23 November 2024. https://india.mongabay.com/2023/07/explainer-as-heat-waves-increase-are-indias-heat-action-plans-effective/.

NBR. "India's Climate Change Challenge." Diakses pada 13 Juli 2024. https://www.nbr.org/publication/indias-climate-change-challenge/.

NDMA. *Beating The Heat*. National Disaster Management Authority, 2020.

Newsx. "IMD Issues Red Alert In Delhi-NCR As Mercury Soars Above45°C." Diakses pada 24 Mei 2024. newsx.https://www.newsx.com/health-and-environment/imd-issues-red-alert-in-delhi-ncr-as-mercury-soars-above-45c/.

NRDC. "About NRDC." Diakses pada 24 Mei 2024. https://www.nrdc.org/about.

_____. *Ahmedabad Heat Action Plan*. NRDC, 2016.

_____. "Cooling India Calls for Timely Action." Diakses tanggal 5 Desember 2024. https://www.nrdc.org/bio/prima-madan/cooling-india-calls-timely-action.

_____. “Discussing Climate Friendly Cooling in India.” Diakses tanggal 5 Desember 2024. https://www.nrdc.org/bio/prima-madan/discussing-climate-friendly-cooling-india.

_____. *Expanding Heat Resilience Across India: Heat Action Plan Highlights 2022*. NRDC International India, 2022.

_____. *Hariyali Green Villages*. NRDC, 2022.

_____. “Implementing Women-Led Clean Energy Solutions in India.” Diakses 5 Desember 2024. https://www.nrdc.org/bio/sameer-kwatra/implementing-women-led-clean-energy-solutions-india.

_____. “India.” Diakses pada 7 juli 2024. https://www.nrdc.org/india.

_____. “India’s Ambitious Plan to Cool a Growing Population.” Diakses 28 November 2024. https://www.nrdc.org/bio/anjali-jaiswal/indias-ambitious-plan-cool-growing-population.

_____. “Telangana Announces a Groundbreaking Cool Roof Policy.” Diakses 7 Desember 2024. https://www.nrdc.org/bio/prima-madan/telangana-announces-groundbreaking-cool-roof-policy.

_____. “US.-India Cleantech Cooperation: Energy Partnership Summit.” Diakses 13 Juli 2024. https://www.nrdc.org/bio/anjali-jaiswal/us-india-cleantech-cooperation-energy-partnership-summit.

_____. “Utilities Vital to the Success of India’s EV Transition.” Diakses 5 Deember 2024,. https://www.nrdc.org/bio/charlotte-steiner/utilities-vital-success-indias-ev-transition.

Stephenson. “Nongovernmental Organizations (NGOs).” Diakses pada 25 Mei 2024. https://www.beyondintractability.org/essay/role_ngoly-close/.

Ramachandran, S., and Ribu Cherian. "Regional and seasonal variations in aerosol optical characteristics and their frequency distributions over India during 2001–2005." *Journal of Geophysical Research: Atmospheres* 113.D8 (2008).

Ravindra, Khaiwal, et al. "Temperature Projections and Heatwave Attribution Scenarios Over India: Systematic Review." *Heliyon* 10 (2024).

Trading Economics. “India-Urban Population (% Of Total).” Diakses 28 Oktober 2024. https://tradingeconomics.com/india/urban-population-percent-of-total-wb-data.html.

UNFCCC. “Key aspects of the Paris Agreement.” Diakses pada 01 November 2024. https://unfccc.int/most-requested/key-aspects-of-the-paris-agreement

WHO. “Heat Wave.” Diakses 29 Oktober 2023, https://www.who.int/india/heat-waves.

World Population Review. ”World Population by Country 2024.” Diakses 28 Oktober 2024. https://worldpopulationreview.com/.