

DESIGNING A GENDER TRANSFORMATIVE DROUGHT EARLY WARNING SYSTEM

Perspective of Women Farmers from Dharashiv, Maharashtra

1. INTRODUCTION

India is highly vulnerable to climate change impacts and is the third-worst affected country due to natural calamities globally (Charak et al., 2024). Over 80% of India's population lives in districts that are highly vulnerable to extreme hydro-met disasters (Mohanty and Wadhawan, 2021). With the pace of climate change increasing exponentially, the occurrence of natural disasters that plague the country has also increased manifold in recent years. As per a report by Centre for Science and Environment, India witnessed some form of natural disaster nearly every day between January and September 2022 (Pandey and Sengupta, 2023). These disasters include cyclones, floods, droughts, landslides, extreme weather, and earthquakes, among others, each leaving in their wake loss and destruction in multiple forms.

Impacts Of Droughts

Droughts result in a range of economic, environmental and social impacts, which are often long-term, non-structural and difficult to quantify.

They lead to:



Economic Impacts including loss in agricultural production and allied sectors, loss of income, poverty, unemployment.

Two-thirds of India's area is prone to droughts, whose frequency, duration and severity has increased in recent decades and is estimated to be exacerbated due to climate change (Chuphal et al., 2024). Drought is a temporary aberration and an extended period of low precipitation when the rainfall is deficient in relation to the multi-year average for a region over an extended period of a season or year (Gol, 2009). There are no standard definitions of drought and its parameters and definition remain context and area-specific.

Droughts are described as "creeping disasters" since they develop over a period of time (usually over months), and their effects are also visible over time, unlike other disasters, which occur suddenly with immediate visible impacts (Mohanty, 2020). Maharashtra has 35% of its geographical area which is drought prone (Gaikwad 2003). In 2015, the Maharashtra government declared a "drought-like condition" in 14,708 of the state's 43,000 villages, covering 34% of the state. The worst hit region in Maharashtra is Marathwada, which accounts for 58% of the drought area in the state and requires special attention to prevent and deal with drought (Patil, Chougule and Jadhav, 2018).

I.I Drought Response and Management

The administration monitors a range of meteorological, hydrological, agricultural, remote-sensing and socio-economic data to identify and declare drought and put in place contingency measures for relief. Short-term measures are primarily reactive, focusing on in-season drought management through contingency planning and relief efforts. Conversely, long-term mitigation measures adopt a proactive approach, aiming to restore ecological balance and adapt to climate change through sustainable agricultural practices, conservation efforts, and informed crop selection.

An Early Warning System (EWS) is a comprehensive system that allows individuals, communities, governments, and businesses to take proactive measures to mitigate disaster risks by combining hazard monitoring, forecasting, risk assessment, communication, and preparedness processes to enable action before hazards occur (Dash, 2024). Drought Early Warning Systems (DEWS) are vital for managing drought risks and minimising their impacts. By monitoring various indicators like weather, agriculture, and socio-economic factors, they identify early signs of



Environmental Impacts including loss of vegetation, forests, flora and fauna, loss of domesticated and wild animals, loss of water sources and bodies, and degradation of the biodiversity.



Social Impacts including loss of life, food insecurity and starvation, hunger and malnutrition, worsening health, poverty, indebtedness, unemployment, migration, human trafficking and violence, school drop-outs and child labour, among others.

drought, issue timely alerts and inform decision-making. This enables proactive measures, such as water conservation and adjusting farming practices, as well as emergency responses, including aid distribution and drought relief. DEWS are critical to building resilience to drought, safeguarding lives and livelihoods, and managing sustainable resources in drought-prone areas, thereby minimising the losses due to droughts now and in the future.

A significant focus on EWS has been to improve the technology and technical capabilities to ensure accurate and timely information. The mediums of imparting this knowledge also remain largely technology-dependent, leaving women and other marginalised groups largely unreached. This approach has been criticized as being over-reliant on technology at the cost of inclusivity, giving rise to discussions around the need for "people centered early warning" and community-centric EWS which focus on risk management and involving community in all aspects of EWS (Basher, 2006; Macherera and Chimbari, 2016; Dash, 2024). These approaches emphasise that

EWS's focus should not just be about early detection and warning but also ensuring that the most impacted populations receive, comprehend, and respond appropriately and timely in response to the alert.

1.2 Absence of a Gendered Approach in Drought Response and Management

A critical gap in disaster risk reduction and early warning systems is the absence of gender concerns and women's voices, especially those from disadvantaged groups and the failure to address gender specific needs and priorities. Women's "gender-specific contributions and solutions remain unleveraged because their voices are often absent in the design and decision-making processes" (Pudmenzky et al., 2022). A gender-responsive EWS needs to recognise both direct and indirect gendered impacts of a disaster, understand vulnerabilities shaped by gender and intersectionality, and address biases in disaster preparedness, warnings, and responses (UN Women, 2022).

Women's voices need to be heard and their meaningful participation ensured throughout. Additionally, EWS should consider the gendered power dynamics that influence decision-making, gendered aspects of information dissemination, and the role of gender in shaping disaster responses. Brown et al. (2019), in their study on gender transformative early warning systems, highlight the importance of adopting an intersectional approach and identify five themes - vulnerability, participation, dissemination, response, and power and decision-making - which are important in the context of gender and early warning systems. It is important to adopt an inclusive, people-centered approach and acknowledge the diversity of gendered experiences, identities, and lives.

The importance of women's leadership in EWS to bring diverse perspectives and differential needs ensuring inclusivity is widely recognised. Women's leadership in EWS is also critical in designing gender-responsive solutions and enhancing EWS communication, given their strong social networks within the community, their own empowerment and improved resilience (UN Women, 2022; van Ginkel and Biradar, 2021).

Women farmers play an important role in drought management and EWS since they hold knowledge about the local context - climate patterns, seasonal variations, soil and crops - making their knowledge valuable for designing effective EWS. Their involvement not only helps design the EWS better but also improves its reach and uptake (since they are deeply embedded in community networks and social structures) and enables women farmers themselves to be more resilient to drought impacts and manage it better (Mishra and Gadeberg, 2022). However, in India, while women carry out 80% of the agricultural work, only 13% of them own land (Oxfam, 2018). Due to a lack of land ownership, they are not recognised as 'farmers,' which prevents them from accessing assistance for farmers by the government in times of disasters like drought (Smile Foundation, 2025). This is an important issue that needs to be considered in the Indian context on drought response and management.



The key objectives of the brief are to:

Analyse existing mechanisms for early warning systems on drought in Maharashtra across all levels of governance and within communities.

Explore how women affected by droughts perceive early warning systems and identify what is needed to make these systems more gender-responsive and community-centered.

Develop practical recommendations for designing a gender-transformative early warning system for drought, informed by community insights.

2. METHODOLOGY

2.1 Framework for Gender Transformative Early Warning Systems

This research adopts the gender-transformative EWS framework developed by Practical Action, which emphasizes five critical dimensions: vulnerability, participation, dissemination, response, and power and decision-making (Brown et al., 2019). These dimensions shaped the core lines of inquiry throughout the research, particularly guiding the design of focus group discussions (FGDs) and listening exercises with women farmers.

2.2 Study Sites

The research was conducted in Dharashiv district of the Marathwada region of Maharashtra, India - one of the most drought-prone areas in the country. Dharashiv is characterised by high drought vulnerability with limited adaptive capacity and frequent exposure to drought (Khetwani and Singh, 2020). It ranks among the top 20 districts in India for drought exposure (Mohanty and Wadhawan, 2021). Four blocks - Dharashiv, Tuljapur, Lohara, and Kallamb - were selected as study sites where FGDs and listening exercises were conducted.

2.3 Research Methods

A mixed-methods approach, combining primary and secondary research, was adopted to gather a comprehensive understanding of drought, existing EWS, and women's roles in disaster management. The research methods included:



An in-depth review of academic papers, research studies, government policies, and online publications was conducted to understand drought management in India, with a focus on Maharashtra and Dharashiv. The literature review explored the policy framework, EWS existing mechanisms, and best practices for women-led EWS. Key search terms included drought, climate change, early warning systems, women, gender, and drought management policies.

Focused Group Discussions (FGDs) and Listening Exercises



Seven FGDs were conducted with groups of 10-12 women farmers in the selected study blocks. Discussions explored women's understanding of droughts, experiences with traditional and modern EWS, drought impacts, their roles in prevention and response, and participation in drought management. A semi-structured, open-ended questionnaire guided the discussions, which were transcribed in Marathi and later translated into English. Listening exercises with women from socially marginalized communities provided deeper insights into the most excluded voices.

2.4 Data Analysis

Insights from the literature review informed the development of FGD and listening exercise guides. The primary data was analysed thematically, aligning with the five dimensions of gender-transformative EWS. Key findings were synthesised with insights from the literature and media scan, forming the basis for the study's results and recommendations for a gender-responsive drought EWS.





systematic review А of Marathi-language newspaper coverage on droughts in Maharashtra was conducted using the Meltwater media monitoring tool, covering January I, 2024, to December 31, 2024. Keywords included drought, agriculture, Maharashtra, climate change, and women. Articles from newspapers, digital platforms, and broadcast media were analyzed to understand media narratives and the information channels farmers rely on for drought-related updates.

3. KEY FINDINGS

3.1 LITERATURE REVIEW

3.1.1 National Drought Management

At the national level, the India Meteorological Department (IMD), Department of Agriculture and Cooperation and Farmers Welfare, and National Disaster Management Authority (NDMA), play key roles in monitoring, declaration and management of drought, in coordination with several other departments, technical agencies and bodies, and universities. Crop Weather Watch Group for Drought Management has been set up within the Department of Agriculture and Cooperation, which acts as a key inter-ministerial body for drought management. It comprises members from various ministries and agencies and facilitates the management of drought by coordinating efforts across ministries and with state and local governments. It is headed by the Central Drought Relief Commissioner.

At the state level, there are State Level Drought Monitoring Committees headed by the State Drought Relief Commissioner (Secretary in Relief and Rehabilitation of Revenue and Forest Department). In addition, there are State Drought Monitoring Centres, staffed by a multi-disciplinary team of meteorologists, hydrologists and agriculture scientists to provide critical inputs to the State Executive Committee / State Disaster Management Departments / Other Institutional Structures established by the States.

Similarly, at the district level, the District Level Drought Monitoring Committee has been set up in each district under the Chairmanship of the District Collector with officers from various departments.

To deal with the impacts of droughts, each state has a detailed plan of action with the roles of various departments defined.

3.1.2 State Level Drought Management

Maharashtra, in it's State Disaster Management Plan (SDMP), lists detailed roles of the Departments of Disaster Management, Agriculture, Minor Irrigation, Water Resources, Food and Consumer Protection, The district level drought monitoring committees monitor the following parameters that may indicate an onset of drought-like conditions:



Health and Family Planning, Public Health and Women and Child Development and Education for drought management at the state level. At the district level, district administration under the leadership of the District number of line departments and field agencies working on the ground with well-defined roles.

Panchayati Raj institutions (PRIs) - Zilla Parishads, Panchayat Samitis, and Village Panchayats - play an important role in the implementation of drought management programmes. PRIs can provide funds for water conservation and maintenance of water supply schemes, make efforts to identify the projects related to sustainable natural resource management, and water conservation to support drought mitigation in the vulnerable regions.

As per the Maharashtra State Disaster Management Plan (SDMP), the State Governments will declare drought through a notification specifying clearly the geographical extent and administrative units such as Gram Panchayats,

3.1.3 Drought Early Warning Systems

The quality of drought monitoring, as well as the methodologies and parameters used to declare drought, varies significantly across states. Once a drought is officially declared, state governments initiate relief operations, utilizing resources such as the State Disaster Response Fund (SDRF). In cases of severe drought, states may request additional support from the Central Government, including financial assistance through the National Disaster Response Fund (NDRF).

Regular and periodic monitoring of drought parameters is an ongoing activity throughout the year, especially in the months preceding the monsoons. The Department of Agriculture is the nodal agency that announces droughts and uses popular media to issue warnings about droughts. It has strong technological integration, using satellite data, weather forecast and ground observations to monitor drought conditions, and uses a comprehensive framework for its early warnings and management. However, while the system is robust, the nature of droughts itself makes ensuring timely dissemination of warnings to vulnerable communities and integration in local knowledge into the systems a challenge (Gol, 2009).

The Government of India recognises that for EWS to be effective, they need to have high-precision early warning, effective monitoring through technological enhancement, effective decision support system, well-defined standard operation procedure, timely forecasts and sharing and Blocks, Mandals, Taluks, Sub Divisions, and Districts. Such notification will also indicate the level of intensity of the drought (moderate or severe). The validity of such notification will not be for more than 6 months unless de-notified earlier. The declaration of Kharif drought should not be made later than 31st October, and the Rabi drought should be declared by 31st March.

The drought situation in Maharashtra is generally monitored based on the progress of the onset and the withdrawal of the southwest monsoon. The agriculture department of the government of Maharashtra is the nodal agency to declare it. Drought situation reports are released by the agriculture department from time to time. The IMD issues the rainfall report in this regard through All India Radio, Doordarshan and other print and electronic media.

codifying the severity (Gol, 2022). Cell broadcasting technology and the use of phones have also been seen as important tools to ensure wide reach of the early warnings across large areas and populations due to their ability to disseminate information within seconds (Wadhawan, 2023).



There are also several examples of communities leading the efforts to prevent and manage natural disasters successfully, and these pose great learning opportunities for replication. Furthermore, several communities have successfully led efforts to prevent and manage natural disasters, providing valuable examples for replication.

Case Study:

Adoption of Agricultural Calendar based on Farmers' Traditional Knowledge and Field Observations in Wayanad, Kerala, to Overcome Climate Vagaries

Farmers in Wayanad, India, are relying on an agricultural calendar prepared and updated with community consultation and leverage traditional farming knowledge to adapt to climate variabilities. The calendar, now in its seventh year, is updated annually based on farmers' observations, feedback and changes in weather patterns. The calendar follows the moon phases, which is typically followed by Wayanad's farming community. Farmers are urged to document their daily observations on weather conditions and crop status in the feedback section of the calendar. This information is then utilised to revise and improve the next year's calendar, ensuring it incorporates the most accurate and relevant details for efficient agricultural planning. In addition, the calendar provides a comprehensive list of precautions and activities necessary

as per predicted weather conditions, which helps farmers plan their activities better.

The initial calendar was centered around paddy farming, while the later editions expanded to include other widely grown crops like coffee and pepper. The most recent calendar provides guidance on various horticultural crops commonly cultivated in Wayanad, such as tubers, okra (ladies' finger), and amaranth. This new system helps farmers anticipate and plan for extreme weather events, like floods, droughts and pest attacks, by combining traditional wisdom with modern technology. Farmers expect that the calendar will comprehensively address these challenges, ultimately aiding in climate resilience and agricultural productivity.

Source: Menon (2024)





Image credit: Mongabay India

3.2 FOCUS GROUP DISCUSSIONS AND LISTENING EXERCISES

Insights were gathered from FGDs and listening exercises on how women farmers perceive droughts and their impact, their coping mechanisms and drought preparedness, and early warning systems for drought. These insights are summarised below.

Women were well aware of disasters - both natural and man-made and felt that natural disasters should get greater focus as their impact is much greater. They viewed drought as periods of dry-spell during the months it should rain and shared that in the last ten years, they have witnessed both dry (no rains) and wet (unseasonal rain and flooding) droughts. During the FGDs, women farmers shared that of all disasters that their region experiences, dry droughts have the maximum, lasting impact on their lives. They felt that dry drought needs urgent attention for prevention and management.

3.2.1 Impact of Droughts

Women shared that droughts have profound and wide-ranging effects on their lives and well-being. These impacts include a scarcity of drinking water and irrigation resources, leading to agricultural challenges, food shortages, financial hardships, and fodder shortages for livestock. Droughts also deplete water tables and result in health issues such as mental health struggles, heat strokes, water-borne diseases due to poor water quality, and malnutrition caused by limited access to nutritious food. Additionally, they noted adverse effects on children's education and a rise in gender-based violence during such crises.

Within households, the situation becomes critical, as family members dedicate significant time and effort to collecting and storing water while also cutting back on fuel usage, food purchases, and expenses to save money, creating daily stress. Food shortages from crop failures and economic instability exacerbate malnutrition and illness. Women highlighted that overall economic activity has slowed down as the entire community remains in crisis mode.

While droughts affect everyone, their impacts vary across different groups. Men often bear the burden of providing for their families, facing significant economic losses due to their reliance on agriculture and livestock. Many are forced to migrate in search of work and endure immense mental stress. Crop failures drive farmers into debt as they take loans they cannot repay, pushing some to extreme measures, including suicide, due to financial pressures and the inability to support their families. Small business owners also struggle as reduced economic activity leads to a decline in the consumption of goods and services. Livestock owners face additional challenges, often having to sell their animals due to shortages of fodder and water, as well as rising maintenance costs.

Small and marginal farmers from Scheduled Castes, Scheduled Tribes, Notified Tribes, and Backward Caste

3.2.2 Coping with Drought

During drought, women adopt various measures to cope with the situation. Within families, they coordinate with the household head to stock essential food items for the months ahead, including grains like jowar, wheat, millets

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Communities bear significant impacts during droughts. As landless individuals, they primarily rely on farm labor for their livelihoods. When agricultural activities slow down and cultivation decreases, they lose their primary source of income. Without work on farms, their dependence on farmers leaves them vulnerable. If they secure employment through government schemes like the National Rural Employment Guarantee Scheme (NREGS), they remain in their villages. However, in its absence, they are forced to migrate to urban areas in search of work. Being mostly unskilled workers, they face limited opportunities and additional hardships in these unfamiliar settings. During these challenging times, they work tirelessly to meet their families' needs but often struggle to sustain themselves. Financial constraints prevent them from participating in festivals or ceremonies, further highlighting the social and emotional toll of droughts on their community.

Women shoulder a disproportionate burden of droughts. They are responsible for providing for families' daily needs and requirements - they spend inordinate time fetching water, they have to provide at least two meals per day for the family amidst the food shortage and economic hardships, when someone falls sick they shoulder the care burden, their malnutrition increases since they eat last and least. They endure stress every day of providing for their families' most basic needs and working doubly hard. Operating amidst financial hardships, they put all their efforts into minimising the use of fuel and other energy costs, saving water, making the same food last for more meals, minimising household expenses, and living in constant stress. They are asked to manage (reduce) household expenses amidst increasing financial distress in families and are stretched to save as much as they can while ensuring everyone's needs are fulfilled. Women farmers struggle since not being recognised as farmers, they are not able to benefit from the government's relief measures for farmers amidst drought. They shared that their entire lifestyle is impacted by droughts.

and pulses such as red gram, green gram, black gram, and gram, along with dry vegetables like spinach, fenugreek, and coriander. They also prepare long-lasting foods such as papads and pickles. Water collection, storage, and conservation become their primary focus. Women take extra care to ensure water cleanliness, using methods like boiling or adding Mediclor (a disinfectant) to drinking water. They minimise water wastage and find ways to reuse it - for instance, redirecting used water to kitchen gardens and plants.

Maintaining health and hygiene becomes crucial to prevent diseases, as additional illnesses would exacerbate

financial hardships. Women prioritise cleanliness, fresh food consumption, and special care for children and the elderly. Families strive to save money by cutting down on major expenses such as weddings and festivities, simplifying meals, and purchasing only essential items. During periods of drought, women take on a central role in implementing various coping strategies.

3.2.3 Perspectives on Drought Preparedness and Management

The women shared that early drought warnings would enable them to plan effectively for and better manage the situation. Their key priorities include:

Ensuring food security for their families by storing and preserving food items for at least 6-9 months. They make pickles and papads, dry vegetables, cultivate vegetables in the backyard, do short-term crop cultivation and ensure that they collect their Public Distribution System (PDS) rations every month. At the community level, they emphasised the importance of monitoring the PDS to ensure the timely and consistent distribution of food grains to families in need. They also stressed the need for regular and high-quality meals provided through anganwadis and school programs. Encouraging communities to create vegetable gardens and grow diverse crops for household consumption was highlighted, with government seed banks serving as a valuable resource. Additionally, distributing food kits to economically vulnerable families, including women-headed households, was seen as a critical measure to support those most affected.



Women shared that they would plan to engage in NREGS activities on their own farms, focusing on conservation tasks. They would avoid purchasing storage materials, prioritizing

essential items instead. Efforts will center on cultivating short-duration, water-efficient crops that can also be sold for income. At the community level, they emphasized the need to generate employment and secure incomes by linking individuals with government schemes. Opportunities should be created through initiatives like water and soil conservation projects, tree plantations, and support from rojgar sevaks in preparing job cards. Additionally, women shared that activities such as constructing farm bunds and trenches would not only support agricultural efforts but also create vital job opportunities.



Focus on collective efforts like ensuring water storage in ponds and trenches, adopting water-saving devices, and improving crop planning to reduce water consumption in cultivation. They shared that practices such as building farm bunds, reusing water, and watering plants with used water, like that from hand washing, should also be implemented.

At the community level, they would prioritise surveying village drinking water resources to identify needs for repair and rejuvenation, such as fixing pipelines and desilting public wells. They shared that Gram Panchayats should be encouraged to ensure regular water bleaching, periodic cleaning of water tanks, and maintaining cleanliness around water bodies. Additionally, creating awareness among community members about water treatment, purification, conservation, and reuse is vital.

Initiatives like wastewater management through vegetable gardens and soak pits are emphasised to promote sustainable water practices.

They would work to ensure adequate and nutritious food, with special attention to children and the elderly, to maintain their well-being and strengthen immunity. Women would take preventive measures to reduce the risk of infections.

For those working under NREGS, they recommend prioritising health by scheduling work during cooler hours-mornings and evenings-while avoiding peak heat periods to minimise the risk of heat-related illnesses.



Women shared that at present there are government initiatives implemented by various departments and bodies like Gram

Panchayat, health department, MGNREGS, ICDS and PDS which are helping communities cope with droughts by providing access to drinking water, fodder, food grains, nutritious food, agricultural inputs, crop loans, electricity bill rebates, health, employment opportunities and social safety nets.



Women will minimise the expenditure on agricultural inputs such as seeds, fertilisers, and pesticides by preparing them locally whenever

possible. They will limit spending to essential needs, avoiding unusual or unnecessary expenses. Additionally, they would rely on home remedies for illnesses to reduce medical costs and save money.

3.2.4 Existing Early Warning Systems in the Community for Droughts

The women saw early warning systems as critical to help them prepare and deal better with drought impacts. At present, the community uses two kinds of early warnings about droughts - traditional methods and modern warnings by the government.

Traditional systems of EWS:

The religious scholar (Maharaj) reads the Panchang which foretells the amount of rain that will happen during the year and whether there will be drought (short-term and long-term). It also highlights which crops should be cultivated in a particular year with the colour of crops¹. The community looks for signs in nature to predict the occurrence of droughts or other climatic patterns. Some of these include the number and height of birds' nests (less nests and on top of trees signify drought), colour of moon in the sky in different months (if surround light is white in May and June then there will be drought; it is called Khala), shouting of chatak bird (if they don't shout then there will be no rain), low temperature in previous year, less flowering and fruits on trees like mango, tamarind., looking for specific constellations in the sky, movement of insects and butterflies (if they move less, then no rains).



Women spoke about forming а Y Y community-level committee to raise awareness among farmers about adopting water-efficient, short-duration crops. Promoting the transition from flood irrigation to more sustainable methods like sprinklers, drip irrigation, and rain pipes to conserve water was also seen as important. They shared that farmers should prioritise using self-produced and locally sourced agricultural inputs to reduce costs and transition to bio-farming practices, such as replacing chemical fertilisers with manure and adopting mulching techniques.

Additionally, they recommended utilising bunds for cultivating oilseeds, short-term fruits, drumsticks, and other crops that support small-scale farmers while enhancing local food consumption.

Modern EWS:

The government shares the drought declaration or warnings through technical mediums like television, radio, applications (like Punjab Dakh), online media, mobile messages, and YouTube. However, women shared that these mediums are not very accessible to them since their use and access to technology remains limited. They also shared that most often, weather forecasts are inaccurate, which leads to confusion. For example, rainfall information is only given a day in advance. Late warnings also pose a problem and prevent farmers from planning their agricultural activities and crops appropriately.

¹ The colour of crops indicates to the community which crops they should cultivate. Black - Black gram, Oil seeds, sunflower, flax I Yellow - Maize, Millet, Gram, Wheat I Green - Green gram, pea, gram I White - Soybean, Sorghum, Sesame, I Red - Red gram lentil, chili, flax

For women, more effective mediums of communication for early warning would include mediums that are accessible to them. They cited mediums like a village dawandi system (speakers in temples), updates over community speakers at prominent places, speakers on garbage collection vehicles which travel through the villages, through meetings attended by women (such as peasant women meetings, women farmer or self-help group meetings) and women gram sabhas, as being more effective mediums for EWS communication. Even on information given on television, they cited that they wanted information to be simple, casual and easy to understand.

Another important aspect of EWS for drought highlighted was the timing. Women shared that they would prefer to receive alerts at least in the month of May or June to give them time to prepare for any upcoming drought. This, they said, is especially critical as farmers buy inputs for agriculture from the market and late warning leads to high costs for them. If they get information in May and June, when it is time to prepare the fields for cultivation and buy seeds, farmers can plan their crops and farm use better.

Women shared that at present, their involvement in drought EWS is very limited both at the family and community level. Most of these discussions happen at the village level between men and only 30% of households involve women in discussions on issues like sowing, droughts, weather, education, etc. Women are involved in these decisions if they are earning and have some decision-making power. Most households perceive that

3.3 MEDIA SCAN

Data from the media scan showed that there were 804 mentions of the keywords 'drought' and 'Maharashtra' in the given year. A large number of stories appeared during the months of April-July, as they included news articles on severe summers and also had weather predictions for the monsoon season of 2024. Many stories also reported political statements on the issue and the announcement of schemes and benefits for farmers at the national and state levels. Water emerged as a prominent keyword in most of these stories³.

The media coverage on the drought crisis largely focused

women lack understanding on such issues and should only be involved in smaller matters (like buying groceries, etc.), especially for women who lack financial literacy. Moreover, men do not like women taking initiative and place restrictions on women's mobility. At the community level, only 10% of women are able to participate in EWS discussions. They shared that their voices and opinions matter if they are involved in social work (like frontline workers), leaders in social organisations, members of gram panchayat committee, school committee or zila parishad and if they are educated and financially literate. Timing of the meeting also hinders their participation most of these villages and farmer meetings are held in the morning or night when they cannot step out and have domestic chores. Uneducated women are not valued at home, and hence not valued in the community and their participation in meetings is considered inappropriate.

Women strongly feel that they should be included in discussions on droughts or any other natural disasters and that they are better at managing in times of crisis. They also shared that there are several platforms at the village level that can be leveraged and used for EWS where women can be active members of this planning. Some of these include Grampanchayat, Gramsabha (Women & Genera)], school, saving groups, Gramsangh (Village level Federation), Prabhagsangh (Cluster level federation), Talati Sajja², anganwadi, and several block and district-level programmes. They also shared that public events like festivals, mahila melava, community ceremonies and events, and meetings by ASHA and anganwadi workers can be used for disseminating warnings about disasters like drought and planning for them.

on drought predictions, emphasising low rainfall, rising temperatures, and identifying the regions most at risk. As early as March 2023, news stories began highlighting the likelihood of drought-like conditions, predicting declining groundwater levels and severe drinking water shortages, particularly in the Marathwada region. The rising number of water tankers deployed to affected areas was a recurring theme in news reports. Financial losses faced by farmers due to insufficient rainfall, detailing the impact on crop yields - especially for onion, soybean, and jowar was also a recurrent theme. Media coverage largely framed the crisis from a systemic and statistical perspective, with limited attention to its long-term impact on farmers' lives and livelihoods. While water scarcity was a dominant theme, there was a noticeable absence of human-interest narratives exploring how individuals, particularly women, were coping with the crisis. Even in reports on crop losses and compensation, farmers' voices were largely missing. Strikingly, fewer than 10 reports explicitly linked the drought, water scarcity, and erratic weather patterns to climate change (havaman badal), indicating a gap in connecting immediate crises to broader climatic shifts (Patil, 2025).

Visual storytelling played a crucial role in shaping the perception of the crisis. Images of withered crops, cracked earth, and rotting produce frequently accompanied reports on agricultural losses. Coverage of the water crisis predominantly featured women - shown rushing to fill vessels at handpumps or crowding around water tankers, underscoring their burden in securing daily essentials.

A few stories in Agrowon (a specialised agricultural publication) highlighted the case of farmers who have



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adopted various climate-resilient agricultural practices and have successfully cultivated millets, fruits, vegetables, etc. A few stories on how farmers are supplementing their farm incomes with dairy, animal rearing and such allied businesses appeared across both papers. However, there is little exploration of the everyday struggles farmers face in adjusting to erratic weather patterns, soil degradation, or shifting water availability.

The analysis reveals that while drought is a widely reported issue in Maharashtra's media landscape, its coverage tends to be reactive, focusing primarily on seasonal weather patterns, government schemes, and economic losses rather than the long-term impacts on communities. The lack of connection between drought and climate change suggests a gap in the understanding of the linkages between the two. Similarly, the limited representation of women's voices and experiences in drought-related reporting indicates a serious absence of including the most vulnerable populations in the media narrative.

4. RECOMMENDATIONS

Based on the findings from the literature review, listening and conducting focus group discussions with women farmers in Dharashiv, Maharashtra and in addition, conducting an assessment of media reporting on the issue in Maharashtra. We recommend the following design towards a gender transformative early warning system for droughts.

01. Localised Early Warning Mechanisms:



- Use accessible communication channels like village speakers (dawandi), community centers, and garbage collection vehicles to disseminate warnings.
- Ensure information is timely, simple, in local languages, and tailored to women's realities including practical guidance on crop choices, water management, and health measures.
- Train women in self-help groups (SHGs) and farmers' collectives to interpret weather forecasts and share timely updates with their communities.

03. Food and Water Security:



- Strengthen public distribution systems (PDS) to guarantee uninterrupted monthly rations, with special provisions for single women, widows, and female-headed households.
- Promote women-led initiatives to build and maintain water storage structures, such as ponds and trenches.
- Facilitate women's access to drought-resistant seeds, kitchen garden resources, and community seed banks through government schemes.

02. Women's Leadership and Participation:



- Form women-led drought management committees at the village level to plan, implement, and monitor drought preparedness efforts.
- Ensure representation of women in Gram Panchayat and village-level drought preparedness meetings.
- Schedule community meetings at times that are suitable for women to increase their participation.

04. Financial Resilience and Livelihoods:



- Expand women farmers' access to credit, insurance, and financial literacy training to help them better manage drought-induced economic shocks.
- Link women farmers and laborers with drought-specific MGNREGS activities, such as soil and water conservation projects, with flexible working hours to accommodate caregiving responsibilities.
- Offer subsidies and resources for women to transition to water-efficient farming practices (e.g., drip irrigation, bio-farming, and local input production).

05. Health and Well-Being:



- Strengthen health services, with special attention to women's and children's nutrition and mental health during droughts.
- Ensure that ASHAs and Anganwadi workers are trained to identify and address drought-related health risks and that they receive adequate support and resources.
- Provide safe spaces for women to access support services for gender-based violence, which tends to rise during drought-related crises.



06. Media and Policy Support:



- Institutionalise women's participation in disaster management planning at district and state levels.
- Establish gender-responsive drought preparedness policies, with funding specifically allocated to support women's resilience initiatives.
- Invest in localised weather monitoring systems and strengthen coordination with meteorological departments.
- Develop a structured protocol for timely forecast dissemination, ensuring early warnings reach remote villages.
- Design drought forecasts to include gender-specific risks, with information tailored to help women make decisions about food storage, livestock care, and migration.
- Encourage local journalists to feature women's leadership in drought resilience efforts and showcase community-driven solutions.
- Partner with radio and TV channels to run regular programs on drought preparedness, with segments highlighting women's perspectives and leadership.
- Develop media toolkits to help reporters understand the intersection of gender and climate resilience, fostering more inclusive coverage.

5. CONCLUSION

India's heightened vulnerability to droughts, compounded by climate change, underscores the urgent need for more gender-transformative and effective drought early warning systems. These systems are crucial for enabling communities to better prepare for droughts, enhance resilience, and minimise losses. For women, whose care responsibilities often expand during droughts from securing water and food to caring for children and the elderly, early warnings can be life-saving. Timely alerts can help reduce their drudgery and provide crucial lead time to make informed decisions for their livelihoods. households and communities.

While institutional frameworks and technological advancements play a key role, adopting a gendered approach is essential. This means placing women and other diverse genders at the forefront of drought planning and management, valuing their traditional knowledge, fostering gender inclusivity, and ensuring timely and accessible EWS communication. Women's more holistic view of drought response, shaped by their roles as caregivers, water stewards, and food providers, enriches community resilience. Their active involvement is vital in strengthening adaptive capacities and mitigating the far-reaching impacts of droughts, particularly in vulnerable regions like Maharashtra.



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