

Enhancing Early Warning and Anticipatory Action in Yemen: Stakeholder Mapping Summary

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Introduction

Yemen ranks among the most climate-vulnerable countries globally, where recurrent floods and prolonged droughts intersect with a complex humanitarian crisis. In 2022, the country experienced a dramatic shift from extreme drought to torrential rainfall, triggering flash floods in even the driest regions. By August, over 300,000 people, many of them already displaced, had been affected across 18 governorates. These climate shocks, growing in frequency and intensity, underscore the urgent need for robust early warning systems and anticipatory action frameworks that can help communities act before disaster strikes. In this context, the initiative “*Enhancing Early Warning and Anticipatory Action in Yemen*” aims to shift the paradigm from reactive emergency response to proactive risk management.

Stakeholder mapping is a foundational step in achieving this shift. By systematically identifying who the key actors are, across national ministries, local authorities, UN agencies, NGOs, civil society, and vulnerable communities, this exercise reveals the landscape of capacities, mandates, and gaps in Yemen’s DRM and AA ecosystem. It highlights not only where collaboration is strong, but where coordination is lacking and inclusivity is limited. Understanding these dynamics is critical to designing systems that are both effective and equitable. This report distills the findings of the stakeholder mapping exercise for a donor audience, providing strategic insights into which actors should be engaged, empowered, or supported, and how. Ultimately, it demonstrates that improved stakeholder coordination and inclusive governance are not peripheral tasks, but central pillars for building a credible and impactful early warning and anticipatory action system in Yemen.

Objectives of the Stakeholder Mapping

- Identify and categorize key stakeholders involved in climate risk management to understand who they are, what roles they play, and where they operate.
- Assess stakeholder influence and interest to determine their capacity and motivation to engage in early warning and anticipatory action systems.
- Support inclusive engagement by recognizing and integrating the roles of marginalized groups, including women, youth, and persons with disabilities.
- Strengthen coordination and partnerships by identifying priority actors for collaboration, capacity building, and strategic alignment.

- Inform program design and resource allocation by using the mapping to align interventions with stakeholder needs and donor priorities for maximum impact.

Methodology

The stakeholder mapping employed a mixed-methods approach to gather and analyze information. The team began with an extensive desk review of relevant documents – including existing stakeholder lists, project reports, government policies, and climate risk assessments for Yemen. This provided a foundation of who the known actors are in early warning, disaster risk reduction (DRR), and climate adaptation spaces. Building on the literature review, the team conducted key informant interviews with diverse participants: government officials (e.g. meteorological service, civil defense, line ministries), UN and NGO practitioners in Yemen, local community leaders, and cluster coordinators. These interviews and focus group discussions yielded qualitative insights into stakeholder roles, relationships, and challenges in coordinating early warnings and anticipatory actions. With data in hand, the stakeholders were then categorized and analyzed using standard tools. They were classified by sector (e.g. government, humanitarian, private, community), by level (national, governorate, local), and by type (public sector, civil society, donors, etc.), to ensure all perspectives were captured. A classic Influence-Interest Matrix was applied to plot each stakeholder group according to their relative power and interest in early warning/anticipatory action. This analytical step helped identify “key players” (high influence, high interest) versus those who might require more engagement or support (for instance, high influence but low interest actors, or highly interested local groups with little influence). The methodology emphasized inclusion – special efforts were made to capture voices of women’s groups, youth volunteers, and representatives of vulnerable populations so that their perspective informs the mapping. Finally, the information was synthesized into a structured report with clearly defined sections (Introduction, Objectives, Methodology, Stakeholder Categories, Influence-Interest Matrix, GESI considerations, Recommendations). Detailed profiles of major stakeholders and a visual matrix chart were compiled in annexes for reference. (For brevity, the detailed profiles and charts are not included in this summary, but the key points are integrated.) This rigorous process ensured that the mapping is evidence-based and comprehensive, giving donors confidence that the findings and recommendations rest on solid ground.

Stakeholder Categories

1. National Government Stakeholders

At the national level, Yemen's government institutions are central to any early warning and anticipatory action system. Core ministries and agencies under the internationally recognized government (based in Aden) have formal mandates for disaster management, although years of conflict have severely strained their capacity.

The Ministry of Water and Environment and the Ministry of Agriculture, Irrigation and Fish Wealth are two pivotal actors. These ministries jointly oversee water resources, irrigation, and food security – sectors that sit at the core of climate adaptation. Both ministries exhibit high interest in building climate resilience and hold significant influence through policy-setting and public investment.

The Ministry of Water leads efforts on water scarcity management and collaborates closely with donors and UN partners on climate initiatives. The Agriculture Ministry, meanwhile, spearheads drought preparedness measures such as rainwater harvesting and the promotion of drought-tolerant crops, alongside post-disaster recovery programs for farmers.

The Civil Aviation and Meteorological Authority (CAMA) is Yemen's national meteorological agency and is responsible for weather forecasting and the issuance of early warnings. However, CAMA operates with outdated infrastructure and insufficient forecasting capabilities due to conflict-related damage and chronic underinvestment. Strengthening CAMA through technical assistance, new equipment, and partnerships with regional meteorological services is an urgent priority.

Another critical actor is the Civil Defense Authority, under the Ministry of Interior. It is legally mandated to lead national disaster response operations, including flood evacuations and search-and-rescue. Yet, like CAMA, it has been severely weakened by the conflict. In places like Aden, Civil Defense operates with minimal equipment and staffing. Despite this, Civil Defense maintains formal authority (high influence) and strong motivation (high interest) to participate in anticipatory action systems. Humanitarian partners such as WFP have been instrumental in bolstering its capacity through fuel support, equipment provision, and joint planning.

Finally, the Ministry of Local Administration and affiliated Governorate Authorities are essential for preparedness and response at the community level. Local authorities play a key role in organizing emergency committees, designating evacuation areas, and working directly with tribal leaders and humanitarian agencies. Their on-the-ground knowledge and proximity to affected populations make them highly influential locally, though their overall capacity varies by governorate. Ensuring these local offices are empowered and adequately resourced is essential for functional early warning systems.

2. Local and Community Stakeholders

Local actors, especially at the governorate, district, and community levels are the frontline responders in any anticipatory action system. They are the ones who must translate early warnings into real-time, life-saving actions on the ground.

Each governorate, including Marib and Hadramaut, has Emergency Committees at both governorate and district levels. These are composed of local officials (civil defense, health departments, police) and sometimes humanitarian representatives. They are activated when hazards threaten and are responsible for disseminating alerts, initiating evacuations, and organizing emergency shelter and relief distribution.

Because they work closest to affected communities, these stakeholders have extremely high interest in ensuring early warning systems function effectively. When well-organized, their local influence is also considerable, district authorities and committees have the power to trigger decisive actions that prevent loss of life and mitigate damages.

Traditional tribal leaders such as sheikhs and village elders are also critical actors. In many parts of rural Yemen, tribal structures supplement or replace formal governance. Their authority is respected, and they can mobilize community efforts to prepare for climate hazards. This includes tasks like clearing flood channels or identifying higher ground for temporary relocation. Their support often determines whether preparedness measures succeed.

A vital yet often underrecognized component of Yemen's risk management system is its volunteer and civil society base. Organizations like the Yemen Red Crescent Society (YRCS) and numerous grassroots NGOs operate as first responders, particularly in areas underserved by formal structures. When disasters hit, YRCS volunteers are often the first on the scene, rescuing people and distributing aid. These groups possess rich local knowledge and are trusted within their communities. Although many operate with limited formal power and resources, their dedication makes them essential actors in the "last mile" of early warning systems.

In agricultural areas, water user associations and farmer cooperatives contribute to climate adaptation and hazard preparedness. These groups share information about water availability, climate trends, and planting schedules. They are an important channel for communicating climate services and warnings to rural producers.

Collectively, these local stakeholders are highly motivated to participate in early warning and disaster preparedness. However, their influence in national or strategic planning remains low. Empowering these actors by formally including them in planning processes, providing training, and resourcing their work will make the early warning system more inclusive and effective. Donor support targeted at these groups can bridge the gap between national policies and local realities.

3. International and Humanitarian Stakeholders

International organizations play a decisive role in Yemen's disaster risk management, given the country's prolonged conflict and chronic humanitarian need. Their involvement spans life-saving response, early warning integration, and long-term resilience building.

The United Nations system is heavily involved in coordinating and delivering humanitarian relief. The World Food Programme (WFP) not only leads food distribution but also co-chairs the Food Security and Agriculture Cluster (FSAC). WFP integrates early warning indicators, like rainfall forecasts and food price shocks, into food security planning and has led several anticipatory action pilots, particularly for floods.

The Food and Agriculture Organization (FAO) complements this by focusing on drought mitigation and food security resilience. FAO provides farmers and herders with seeds, tools, and early warnings tied to crop cycles. It also collaborates in regional monitoring networks like FEWS NET.

OCHA, the UN's coordination body for humanitarian affairs, plays a unique strategic role. It oversees the Yemen Humanitarian Fund and facilitates anticipatory action financing. OCHA was instrumental in implementing Yemen's first anticipatory action pilot, releasing pre-positioned aid in anticipation of floods. Its strong convening power and access to pooled funding make it a key influencer.

UNICEF and WHO also play specialized roles. UNICEF focuses on WASH and child health, while WHO leads the Health Cluster, particularly in responding to disease outbreaks exacerbated by floods or droughts. UNDP, although more development-oriented, supports climate adaptation, DRR policy planning, and community-based resilience programming.

International NGOs, including CARE, NRC, Mercy Corps, and Islamic Relief, implement a wide range of preparedness, DRR, and emergency projects. Their flexibility and deep community presence allow them to test innovative models, such as forecast-based cash assistance or community-led flood defenses. They often serve as vital intermediaries between local communities and international agencies.

The Red Cross and Red Crescent Movement, particularly the Yemen Red Crescent Society (YRCS), stands out for its local legitimacy and coverage. Supported by IFRC and ICRC, YRCS provides emergency response, first aid, and climate awareness campaigns at the grassroots

level. The IFRC Climate Centre also offers technical assistance on integrating climate science into early action systems.

Research institutions and universities, while having less operational influence, generate critical data and analysis that inform project design and risk mapping. Institutions like Aden and Hadramout Universities and research groups like REACH contribute to flood modeling and climate trend analysis.

Stakeholder Influence–Interest Matrix

To prioritize engagement, the mapping exercise plotted stakeholders on an Influence–Interest Matrix. This tool classifies each actor by how much power they have to shape outcomes (influence) and how strongly invested or affected they are by the issue (interest). The analysis for Yemen’s early warning stakeholders yielded four broad groupings:

High Influence, High Interest – “Key Players”: These are the stakeholders who both have the authority/resources and the motivation to drive early warning and anticipatory action. They emerge as natural leaders and partners in coordination. In Yemen, this quadrant includes important national institutions, UN agencies, and donors. For example, ministries like Water & Environment and Agriculture have clear mandates and want to mitigate floods and droughts (thus high interest), and they can enact policies or direct funds (high influence). UN agencies such as WFP, FAO, and OCHA, as well as the Civil Defense, also fall in this category – they have substantial operational capacity or coordinating authority and are committed to disaster risk reduction. Donors are explicitly identified here as well: with funding leverage comes high influence, and most donors involved in Yemen share a high interest in promoting stability through disaster prevention measures. These high-high stakeholders are deemed key partners for collaboration. The strategy should fully involve them in planning and decision-making forums, as their buy-in and leadership will be critical for success. Maintaining their interest is not an issue (they are already motivated), but ensuring they coordinate with each other is – hence, platforms for joint planning (like cluster meetings, task forces, or a national early warning working group) are vital.

High Influence, Low Interest – “Influence to Engage”: This quadrant covers actors who have substantial power or resources but are not (yet) fully engaged or interested in early warning and anticipatory action. In the Yemen context, this might include certain government bodies or private sector entities whose primary focus is elsewhere. For instance, the telecommunications companies wield high influence in that they control SMS networks and radio/TV infrastructure – channels crucial for disseminating warnings – but their core business interest is not necessarily climate resilience. Indeed, telecom operators were mapped as having high influence (due to their reach across the population) but only medium interest, since early warning is a peripheral part of their corporate agenda. To harness such stakeholders, the initiative should undertake advocacy and partnerships that align early

warning with their interests – for example, encouraging telecom firms to see public disaster alerts as part of their corporate social responsibility, which some have started doing by offering free SMS alerts during crises. Another example might be high-level political actors or security institutions whose support is needed for facilitation and scale-up, even if they are not actively involved in DRR day-to-day. The donor audience should note that providing incentives (or policy nudges) can convert these influential-but-less-engaged stakeholders into active supporters. For example, donors can condition certain funding on government partners prioritizing early warning, or they might engage the private sector by supporting public-private partnerships that make early warning economically or reputationally beneficial for companies. The matrix highlights that turning high influence into high interest through strategic engagement is a key opportunity – doing so would unlock powerful capacities for the early warning system that currently might be untapped.

Low Influence, High Interest – “Empower and Include”: This category is filled by grassroots stakeholders – those who care deeply and are directly affected by climate hazards, but who lack decision-making power or resources. Community members, vulnerable populations, and local civil society groups typically reside here. In Yemen, rural families, farmers, internally displaced persons (IDPs), women’s groups, and local NGOs have high stakes in effective early warning (it can be life-saving for them and their neighbors) and are often very keen to participate in resilience efforts. Yet individually they hold little influence over national policy or large programs. The stakeholder mapping emphasizes that these voices must be heard and these actors included through formal mechanisms – for instance, establishing community committees, feedback channels, and consultation processes so that local knowledge and needs shape early warning services. Empowering this group can also mean building their capacity: e.g. training community volunteers, funding local NGOs to implement preparedness activities, and ensuring marginalized groups have representation in planning meetings. Donors can play a pivotal role here by financing community-based projects and insisting on participatory approaches in larger grants. Importantly, while each individual community member has low institutional influence, collectively their cooperation is what determines whether early warnings are heeded. The matrix analysis notes that from a moral and practical standpoint, these are the stakeholders at the heart of the issue – any early warning system that fails to reach and involve them will not achieve its objective. Thus, raising the influence of high-interest local actors (indirectly, by giving them platforms and integrating their input) is both an ethical imperative and a smart investment for effective anticipatory action.

Low Influence, Low Interest – “Monitor (Keep Informed)”: A few stakeholders may have relatively low stakes in climate disaster issues and also little power. These might be peripheral private sector actors or segments of the public not currently engaged. In Yemen’s context, given the widespread impact of floods and droughts, there are arguably few truly disinterested parties – however, one could include certain businesses or local politicians for

whom climate risks are overshadowed by other immediate concerns. While not a priority for proactive engagement, the strategy would still monitor these actors in case their influence or interest grows (for example, a company might become more interested if floods repeatedly disrupt its operations, or a local figure may gain influence after a political change). The idea is not to put significant resources into this quadrant, but to remain aware and keep communication open so no stakeholder is completely overlooked.

The Influence–Interest Matrix helps ensure the initiative’s efforts are calibrated correctly: “Key players” (high-high) should be closely collaborated with and given leadership roles; high-influence but less interested actors should be lobbied and co-opted into the effort; high-interest communities with less power should be uplifted and included so they can effectively contribute; and the rest should be monitored for any changes. By using this lens, donors and program managers can allocate their time and resources to the stakeholders that matter most. Notably, the analysis reaffirms that donors themselves are key high-influence, high-interest stakeholders – their funding priorities can galvanize broader cooperation and ensure that disaster risk reduction (DRR) remains high on everyone’s agenda. Meanwhile, the at-risk communities are high-interest but need continued support to have a voice – reminding us that improving Yemen’s early warning system is not just about technology or infrastructure, but also about inclusively engaging those it is meant to protect.

GESI Considerations (Gender Equality and Social Inclusion)

A strong finding of the stakeholder mapping is that effective early warning and climate resilience in Yemen cannot be achieved without deliberately addressing gender and social inclusion. Yemen’s society – marked by patriarchal norms, ongoing conflict, and deep poverty – faces highly differential impacts from climate shocks. Any flood or drought inevitably hits the most vulnerable groups the hardest. For instance, women and girls often bear a disproportionate burden. Culturally, Yemeni women are typically responsible for household water collection, cooking, and caring for children and the elderly. During droughts, as water sources dry up, women and girls must trek longer distances to find water, exposing them to safety risks and consuming time that might otherwise be spent on schooling or income-generating activities. In floods, women (especially mothers with young children) are less mobile – they are more likely to be caught in homes or shelters when flash floods strike, and they face privacy and security challenges in crowded displacement camps. Men, on the other hand, may have more mobility or access to information in some cases, but they suffer different stresses – for example, loss of crops or income can increase economic pressures on men and potentially lead to negative coping strategies (like risky migration for work). The key point is that gender roles shape how people experience and respond to disasters, and thus the early warning system must be sensitive to these differences. Ensuring that women receive timely warnings is critical – yet many Yemeni women, especially in rural or conservative areas, may not have personal phones or direct access to early warning

messages. Therefore, communication channels need to be tailored: working through female community volunteers, women's associations, or even leveraging trusted female social networks can help alerts reach women and girls. Involving women in the design and dissemination of early warnings leads to more effective solutions. Women often know best how and where messages should be delivered in their communities, and they can advise on practical measures (for example, where to place water tanks or latrines in a camp so that women feel safe using them during a flood emergency). Humanitarian programs in Yemen have increasingly recognized this, and many now form Women's Committees in IDP camps to ensure women have a voice in decision-making and feedback. Compounding gender disparities is the reality of many female-headed households in Yemen. Years of conflict have led to large numbers of widows or women caring for families alone (with husbands killed, missing, or fighting on frontlines). These female-headed households are among the poorest and most vulnerable. In an IDP camp in Marib, for example, a widow living with her children might have less physical ability to reinforce a tent against floods, fewer resources to buy extra water during droughts, and may face cultural barriers in accessing aid distribution (since public spaces are male-dominated). The mapping report notes that agencies like WFP deliberately prioritize female-headed households for assistance – including giving cash transfers to women – to empower them and ensure they can make preparedness decisions for their families. This practice aligns with donors' GESI objectives: putting resources in the hands of women often has multiplier effects on community resilience. Beyond gender, children and youth form another critical vulnerable group. Children are physically more susceptible to malnutrition and disease outbreaks that often follow climate disasters (e.g. a flood can contaminate water and spur cholera, affecting children severely). Floods can also disrupt schooling if classrooms are damaged or used as shelters. The long-term toll on children's education and health can be devastating, perpetuating cycles of vulnerability. On the flip side, youth (adolescents and young adults) are a tremendous asset if engaged – many youths in Yemen are already active as volunteers in emergency response, as first aiders, messengers, and community mobilizers. Programs run by NGOs and UNFPA have tapped into this by training youth as "climate ambassadors" and disaster preparedness educators. The stakeholder mapping suggests leveraging Yemen's youth bulge by equipping young men and women with skills in early warning dissemination, search and rescue, and basic firefighting. Not only does this improve community response, it also gives purpose and leadership opportunities to young people who might otherwise feel disenfranchised. The elderly and persons with disabilities are another group that faces unique challenges. An elderly person or someone with a mobility impairment cannot easily flee from a rapidly approaching flood, and they may be isolated or unable to receive warning messages if those are delivered only through technology they don't use. Thus, evacuation plans must include provisions to reach and assist these individuals (for example, community emergency teams assigned to help bed-bound or disabled neighbors). Early warning signals should be multi-modal – not just text alerts, but also auditory (sirens, mosque announcements) and visual

cues – to ensure people with visual or hearing impairments can be alerted. In Yemen, where literacy is not universal, using radio broadcasts and pictorial messaging can help those who cannot read SMS. The mapping report highlights that inclusive early warning systems (e.g. combining high-tech and low-tech channels) greatly expand reach. Critically, Yemen has a historically marginalized ethnic minority called the Muhamasheen (often referred to as the “marginalized” community) who suffer from social exclusion. Living mostly in slums and informal settlements, the Muhamasheen are often the last to receive help and information. A climate disaster can hit their substandard housing hard, yet due to discrimination they might be overlooked in aid efforts. Applying a GESI lens means proactively including such marginalized groups in community consultations and ensuring aid is distributed equitably. Humanitarian partners in Yemen increasingly strive to collect sex-, age-, and disability-disaggregated data in assessments to identify exactly who is affected and tailor interventions accordingly. For example, a post-flood survey might reveal that a disproportionate number of those who didn’t evacuate were elderly or disabled – prompting a change in warning dissemination or evacuation assistance next time. In summary, the GESI considerations emphasize that climate resilience must include social resilience. Early warning systems and anticipatory actions will only be fully effective if they account for the different needs, roles, and vulnerabilities of all genders and social groups. The stakeholder mapping calls for practical measures: involving women in planning committees; setting up women-friendly spaces and feedback mechanisms; youth volunteer empowerment; disability-friendly alert systems; and culturally sensitive community outreach. This is not just a matter of equity – it directly affects outcomes. Inclusive approaches have been shown to improve effectiveness: communities are far more likely to trust and use early warnings if they have been part of the design process and if their specific concerns are addressed. Conversely, if warnings or preparedness plans neglect large segments of the population, the response will falter. Donors reading this summary should recognize that funding GESI integration is not an “optional add-on” but a foundational component of building a robust early warning and anticipatory action system. Encouragingly, many donors already require and support such measures, ensuring that projects actively involve women, youth, and marginalized people. By continuing to prioritize GESI, donors will help Yemen not only save lives when disasters strike, but also advance gender equality and social cohesion in the process.

Recommendations

The stakeholder mapping reveals a clear picture: to enhance early warning and anticipatory action in Yemen, all hands must be on deck – and donors have a pivotal role in enabling this comprehensive approach. The following recommendations synthesize the key actionable insights, system-level improvements needed, and opportunities for donor support:

1. Strengthen Multi-Stakeholder Coordination and Governance

To build an effective early warning and anticipatory action system in Yemen, coordination among all actors is essential. Donors should support mechanisms that bring together government ministries, UN agencies, NGOs, local leaders, and the private sector. This could include a national coordination task force or a government-led early warning working group.

At the governorate level, funding regular meetings of emergency committees will ensure plans align from national to community levels. Donors should also promote collaborative project models, such as consortiums, instead of isolated efforts. Supporting updates to contingency plans, joint simulations, and clarified roles will help turn fragmented efforts into a cohesive national system.

2. Invest in Early Warning Infrastructure and Anticipatory Action

Yemen's early warning infrastructure, especially meteorological and hydrological systems, is underdeveloped. Donors can fill this gap by funding upgrades for the Civil Aviation and Meteorology Authority (CAMA), including new weather stations, forecasting tools, and staff training.

In parallel, anticipatory action systems should be scaled. Building on successful pilots, donors can support forecast-based financing mechanisms that release aid when hazard thresholds are triggered. Strengthening communication channels such as SMS alerts, community radio, and mobile apps will also ensure warnings reach all communities. Such investments save lives and reduce long-term humanitarian costs.

3. Build Local Response Capacities and Community Resilience

Local actors are the backbone of early response. Yet many lack the equipment or training to act effectively. Donors should fund capacity-building for civil defense teams and local emergency committees, including tools like rescue boats, radios, or first aid kits.

Investing in community preparedness through volunteer training, youth engagement, and local NGO support creates a trusted last-mile response system. Programs that build both resilience and livelihoods (like cash-for-work for flood defenses or rainwater harvesting) offer dual benefits and reduce future humanitarian needs. With donor support, communities can lead their own risk reduction.

4. Promote Inclusive and Participatory Early Warning Systems

Inclusivity must be embedded in every step of Yemen's early warning approach. Donors should ensure women, youth, people with disabilities, and marginalized groups are involved in program design and implementation. This includes support for women-led preparedness groups, inclusive communication strategies, and education campaigns in schools and mosques.

Inclusive systems build trust, which in turn increases response effectiveness. Modest investments like translating alerts, hiring diverse outreach staff, or funding women's awareness initiatives can have a significant impact. Donor requirements and funding can help ensure that early warning systems truly leave no one behind.

5. Support Policy Integration and Sustainable Financing for Resilience

To institutionalize anticipatory action, climate risk management must be woven into Yemen's development and recovery planning. Donors can help by supporting policy updates that integrate early warning protocols and forecast-based actions into national frameworks.

Moreover, climate resilience should be mainstreamed into broader sectors like water, agriculture, and infrastructure. Yemen also needs more predictable, multi-year financing, beyond humanitarian funding, to maintain and expand early warning systems. Donors are encouraged to promote innovative mechanisms, such as contingency funds or insurance-linked finance, to build sustainability into Yemen's climate risk approach.