

# Stakeholder Analysis to Guide Co-production of Nature-based Solutions to Address Livelihood Vulnerability: The Case of Dolo Ado and Bokolmayo Districts, Somali Regional State, Ethiopia



INITIATIVE ON  
Fragility, Conflict,  
and Migration

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Cover photo: Solar-based irrigated agriculture at the study site, developed as part of a resilience program. (Photo: Wolde Mekuria).

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## Acronyms and Abbreviations

|                 |                                                         |
|-----------------|---------------------------------------------------------|
| DPSIR.....      | Driver-Pressure-State-Impact-Response framework         |
| DRC .....       | Danish Refugee Council                                  |
| IDPs.....       | Internally displaced people                             |
| NbS .....       | Nature-based solutions                                  |
| NGO .....       | Nongovernmental organization                            |
| OWDA...         | Organization for Welfare and Development in Action      |
| PDM.....        | Postdistribution monitoring                             |
| SEE .....       | Save the Environment Ethiopia                           |
| UNHCR.....      | United Nations High Commissioner for Refugees           |
| VSF Suisse..... | Vétérinaires Sans Frontières Suisse                     |
| Wa-PYDO .....   | Women and Pastoralist Youth Development<br>Organization |
| WASH .....      | Water, Sanitation and Hygiene                           |
| WFP .....       | World Food Programme                                    |

# Summary

Stakeholder analysis of natural resource management practices and challenges and the associated vulnerability of resource-dependent people can inform strategies for stakeholder engagement across various sectors and levels of natural resource governance structures and foster the co-creation of knowledge and co-planning of nature-based solutions (NbS) to address livelihood vulnerability. With this consideration, we conducted stakeholder mapping and analysis in the Dolo Ado and Bokolmayo districts in the Somali Regional State of Ethiopia. The study was aimed at improving our understanding of how to co-create and co-plan NbS to address the vulnerability of displaced people and host communities to natural hazards such as floods and drought. The issue addressed in this analysis was the vulnerability of refugees, internally displaced people (IDPs) and host communities to natural hazards; and the change objective was to reduce such vulnerability through improved planning, design and implementation of NbS.

Data for the study were collected through inception workshops, reconnaissance surveys, key informant interviews and literature review. We used the Driver-Pressure-State-Impact-Response (DPSIR) framework to assess the state of the system and its implications for the vulnerability of displaced people and host communities. Stakeholder analysis was performed by mapping the stakeholders and analyzing their power and power resources, their interest, influence and participation in the process, the degree of trust among them, and exclusion and empowerment issues.

The results of our analysis indicate that vulnerability of refugees, IDPs and host communities involves complex factors and interrelated drivers. These include, among others, degradation of natural resources, limited livelihood assets, poor land-use practices, lack of knowledge of and experience in agriculture, and pressures induced by drought, floods, deforestation and climate change. Specifically, changes in the state of the environment (e.g., decline in water productivity, more frequent floods and droughts, low agricultural productivity, conflicts over resource use) due to these existing drivers and pressures lead to food and water insecurity, poverty and reduced capacity to cope with disasters. Multiple responses have been implemented in the past to address these drivers, pressures, environmental changes, and their impacts. However, they were constrained by low community involvement throughout the intervention cycle, lack of context-specific technologies, lack of local capacities to manage the agricultural landscape and natural resources, and lack of sustainability of such interventions.

Diverse stakeholders such as government development agencies, nongovernmental organizations (NGOs), research and development institutions, international humanitarian entities, the private sector, communities and community-based organizations participate in the planning, design and

implementation of NbS in multiple ways. The modes of their participation include provision of expertise, material and financial support, community mobilization, implementation of interventions, and monitoring and evaluation. Such involvement and interest of stakeholders could be attributed to the alignment of the change objective with their mandate and field of action. Our analysis found that most of the stakeholders have strong perceived legitimacy in their field of endeavor. This facilitates access to political support and helps in the mobilization of local communities. However, the constraints faced by most of the stakeholders, especially in respect of resources, suggest a need for financial and material support and capacity-building to implement solutions more effectively.

There were similarities among various stakeholder groups in respect of strategic aims, such as development vision, relationships, management, conflict resolution, and capitalizing on experience. This suggests there is great potential for collaboration among stakeholders. Organizational objectives could be better achieved through collaboration than competition. As most of the stakeholders were government development and research entities, they also had similarities in terms of legitimate power. Specifically, as stakeholders possess similar perceived legitimate power with regard to setting objectives, norms, quality control parameters and structuring participation in decision-making processes, it provides them an opportunity to regulate or balance the influence of influential stakeholders on the outcomes of participatory processes for marginalized stakeholders.

Although stakeholders had similar views on the importance of NbS in addressing societal challenges, they differed in terms of the degree of influence they have on planning, design and implementation of NbS. Stakeholders from the government sector and humanitarian organizations were influential enough to support, accelerate, obstruct or block the process at several points. On the other hand, most of the stakeholders classified as NGOs and community and community-based organizations did have influence in some areas or on specific issues but no veto on the process.

Our results indicate that there is a low degree of trust among government agencies, international humanitarian organizations, NGOs and the private sector. This can lead to increased transaction costs when planning, designing and implementing NbS. Specifically, although all stakeholders classified as NGOs showed considerable trust in other stakeholders, they themselves were 'considerably trusted' only by 22% of the stakeholders. This trust deficit could be attributed to the lack of continuous communication between stakeholders and also to the lack of efforts by stakeholders to make their interests and intentions more transparent to others.

The strength of alliances or relationships between different stakeholders in terms of continuing information exchange, coordinated action and co-production with common resources ranged from weak to intermediate. This can affect the implementation of NbS to address the vulnerability of livelihoods to natural hazards and efficient use of limited resources, leading to productivity reduction. Analysis of empowerment and exclusion in the stakeholder groups suggested that most of those from the government sector lack full access to and control of resources. Regarding competencies, we found that most government agencies lack the basic skills to plan, design and implement NbS, though they can communicate societal challenges and suggest possible solutions.

We think it is important to build the capacities of local practitioners and government agencies in environmental management, livelihood resilience and disaster risk management. In addition, ensuring meaningful participation by all stakeholders and engaging them throughout the project cycle can help in reducing the vulnerability of refugees, IDPs and host communities by developing context-specific solutions and ensuring effective planning, design and implementation of NbS. Furthermore, improving communication among stakeholders by setting up local platforms can assist them in making their interests and intentions clearer to other stakeholders, thereby building trust among them.

# 1. Introduction

Climate change, environmental degradation and natural hazards are some of today's most widespread global environmental threats. For example, Tabari et al. (2021) indicated a substantial increase in flood and drought risk in most parts of the world toward the end of the century and identified South America and Africa as hotspot regions where a sizeable simultaneous increase in flood and drought risk is projected. A review by Ward et al. (2020) indicated that natural hazards caused over 1.6 million fatalities globally since 1990; economic losses have been estimated at around USD 260-310 billion per year.

Ethiopia is one of the countries most vulnerable to climate change, environmental degradation and natural hazards (World Bank Group 2020). This is partly attributed to its high dependence on rainfed agriculture and natural resources and a relatively low adaptive capacity to deal with the expected changes (World Bank Group 2020). Ethiopia is also among countries most affected by internal displacement arising from conflict and violence. In 2022, it was host to about 4.4 million IDPs, the third highest figure in sub-Saharan Africa (IDMC 2022). The growing conflict and violence in the Oromia Regional State has contributed to this increase in displacement. According to IDMC (2022), this high figure illustrates the persistent challenge of displaced people not returning home even after the signing of a peace agreement and underscores the need for investment in durable solutions.

The number of displacements due to disasters too has increased significantly. Ethiopia recorded 873,000 such movements in 2022, more than a threefold increase over 2021 (IDMC 2022). Floods in August and October 2022 led to no less than 185,000 displacements in the western region of Gambella. However, the bulk of displacements due to disaster, approximately 688,000, were attributed to the drought that affected the Horn of Africa.

Our study area, the Somali region of Ethiopia, is prone to environmental degradation, recurrent drought and climate-induced displacement. It has the highest number of refugees

and IDPs due to drought in Ethiopia, hosting 542,807 individuals or 79% of the IDPs in the country. The government of the Somali Regional State recognizes environmental degradation and climate change as one of the main drivers of displacement and has identified people displaced by drought as a target group in its Durable Solutions Strategy for 2022-25 (GoSR 2022).

Nature-based solutions (NbS)—which include several types of ecosystem-based approaches such as protection, restoration and sustainable management of natural resources and ecosystems, as well as natural/green and hybrid infrastructure—can help communities prepare for, cope with and recover from natural hazards such as floods and droughts (IUCN 2020). A global analysis of NbS case studies (Debele et al. 2023) indicated that 63% of the solutions are employed to deal with natural hazards, climate change and loss of biodiversity while the remaining 37% address socioeconomic challenges (e.g., economic development, social justice, inequality and cohesion). This study also showed that most (88%) of these solutions received national policy support and contributed to multiple goals of sustainable development and strategic biodiversity.

Planning of NbS and their implementation to address the vulnerability of refugees, IDPs and host communities are particularly pressing imperatives as the nature of emergency response is shifting to longer-term, multigenerational refugee and IDP scenarios (Tsegay and Gezahegne 2023). In addition, the urgent need for better food and water security and more secure livelihoods in rural and urban communities, including refugees, IDPs and host communities, underscores the need to massively scale up efforts to implement NbS for environmental sustainability, resilience and disaster risk management (Battistelli et al. 2022). Such a transformation requires an understanding of the social challenges and the need to address the underlying causes of such challenges. In addition, planning and design of NbS need to be done with a full awareness of the local context, including respect for



and an understanding of the local communities and local and federal policies.

Furthermore, a review by Kumar et al. (2020) highlighted that inter- and transdisciplinary approaches are needed to better plan, design and implement NbS. This study elaborated that better operationalization of NbS could be achieved by fostering co-creation processes by engaging stakeholders across sectors and levels, inspiring more effective use of skills, diverse knowledge, manpower and resources, and connecting and harmonizing the adaptation aims.

Stakeholder mapping and analysis for the purposes of planning, designing and implementing NbS to address livelihood vulnerability to natural hazards could help in the adoption of an institutional framework to involve and engage multiple actors in decision-making processes (Laird et al. 2022; Tsegay and Gezahegne 2023). It could also foster co-creation of knowledge and co-planning of NbS (Missonier and Loufrani-Fedida 2014). Zhang et al. (2020) indicated that the success of NbS depends on equitable, inclusive and consistent stakeholder participation. The benefits of such engagement include (i) improved long-term project maintenance and management, (ii) reduced conflict in project design and outcomes, (iii) increased trust and agency among participants and beneficiaries, and (iv) improved overall

environmental and social outcomes. Furthermore, Maguire et al. (2012) indicated that stakeholder analysis is key to connecting and harmonizing adaptation aims as it can help shape strategies to manage stakeholders and identify opportunities to mobilize their support for a particular goal.

The present study was carried out in the Dolo Ado and Bokolmayo districts of the Somali Regional State of Ethiopia to (i) identify and characterize the key stakeholder groups involved in planning, designing and implementing NbS to build the resilience of refugees, IDPs and host communities; (ii) assess the priorities, interests, influence, and power and power resources of stakeholder groups; and (iii) assess how various stakeholder groups contribute directly or indirectly to addressing the vulnerability of refugees, IDPs and host communities to natural hazards such as floods and drought.

The term 'stakeholders' in this study refers to various entities such as government development agencies, NGOs, research and development institutions, international humanitarian organizations, the private sector, communities and community-based organizations that participate in the planning, design and implementation of NbS. The term 'nature-based solutions' refers to diverse land and water resource management practices grouped into four broad



Photography by Wolde Mekuria

categories: rainwater harvesting, agroforestry, rangeland management and ecological restoration practices.

Our study was focused on the issue of vulnerability of refugees, IDPs and host communities to natural hazards with improved planning, design and implementation of NbS as the change objective. To understand the system, we first investigated the underlying causes of relevant societal challenges and causal relationships between various environmental problems and the consequent vulnerability of refugees, IDPs and host communities to natural hazards. Then, stakeholders involved in planning, designing and implementing NbS were identified

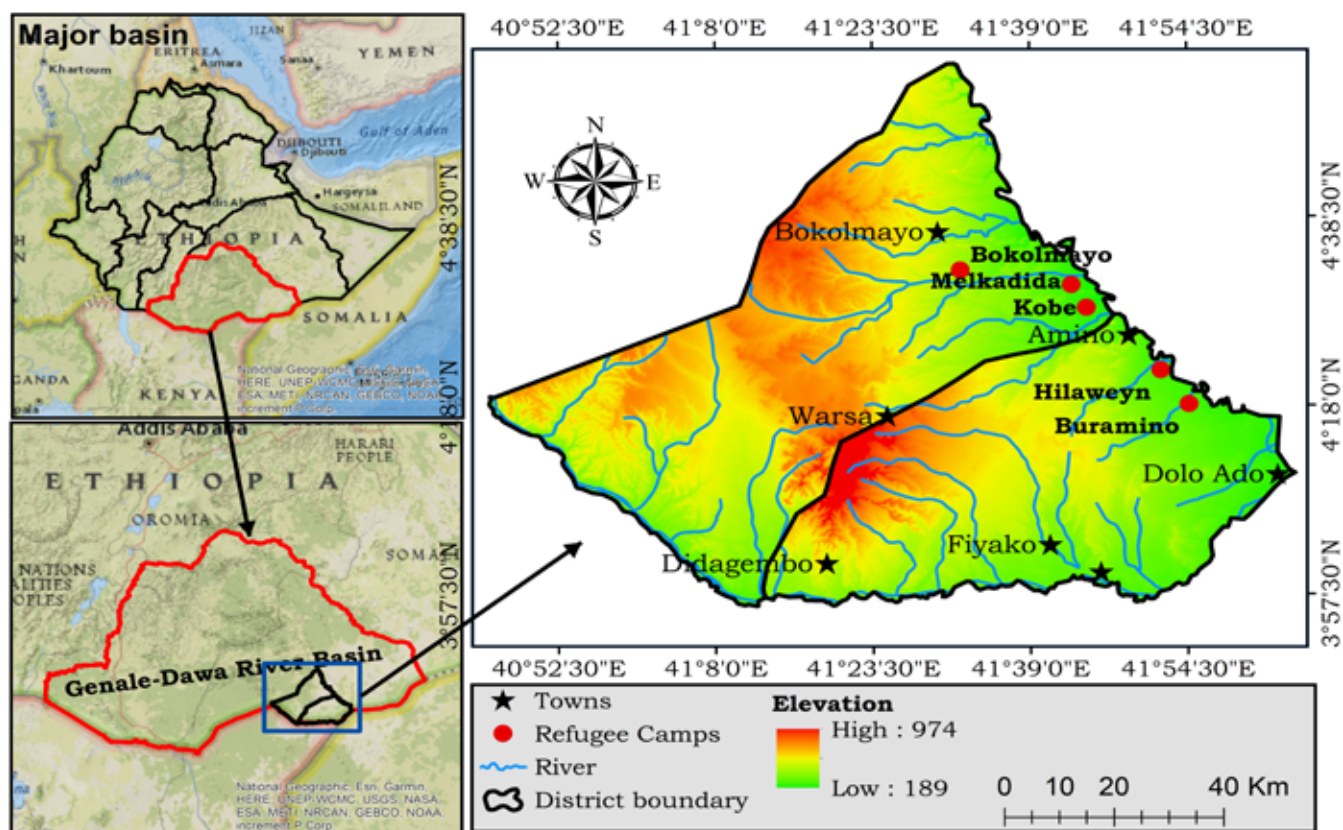
and mapped. Finally, an analysis of their diverse interests, influence, power and power resources, and interactions between stakeholders was performed to suggest strategies for better stakeholder participation. By including these three objectives—investigation of the system, understanding the stakeholder landscape, and analyzing their role in addressing the vulnerability of refugees, IDPs, and host communities to natural hazards—our goal was to improve our system understanding, suggest the most effective, acceptable and practical strategies to better plan, design and implement NbS, and draw inferences relevant to future stakeholder engagement.

## 2. Method

### 2.1. Study Area

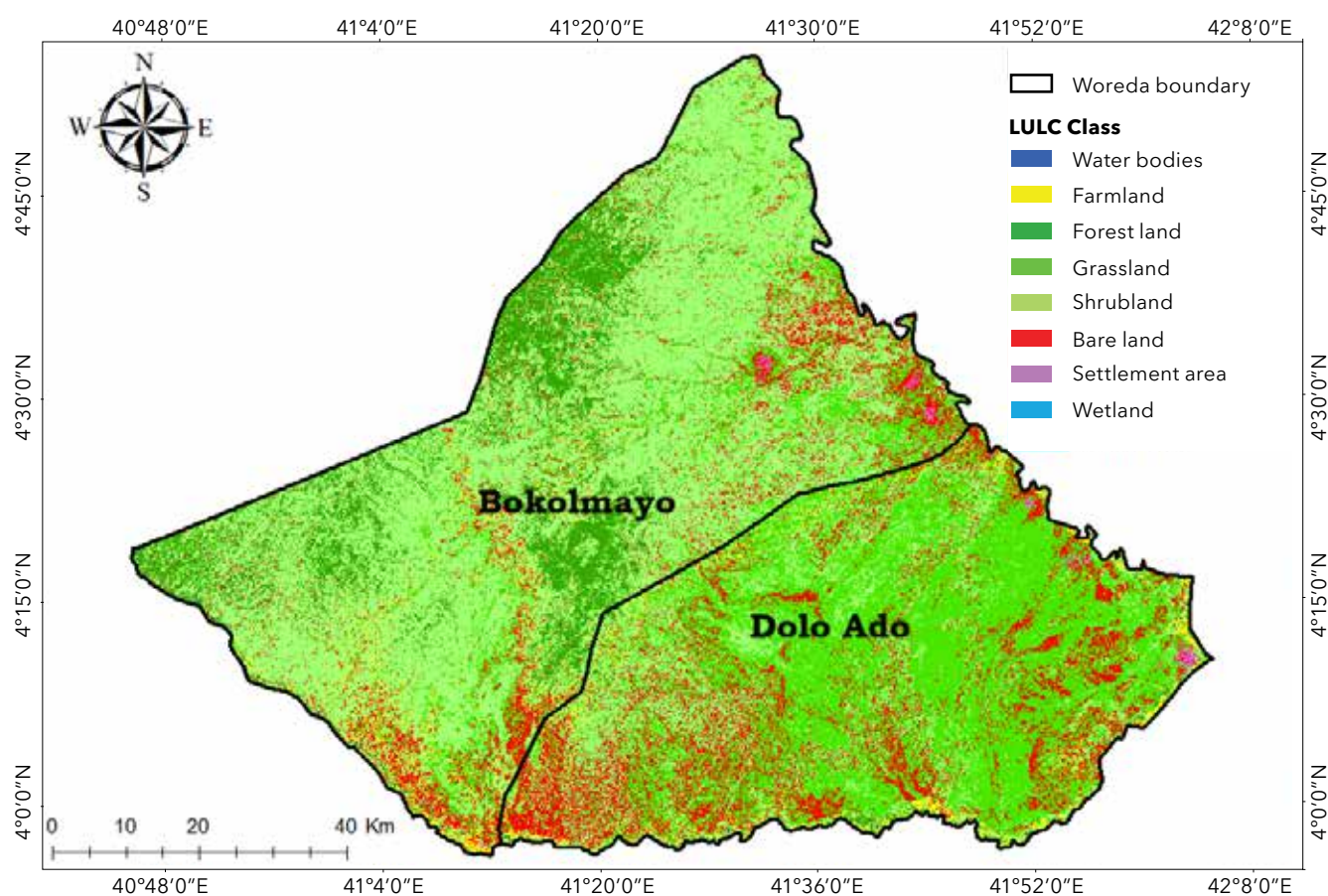
Our study, covering an area of 8,133 km<sup>2</sup>, was conducted in Dolo Ado and Bokolmayo districts (*woredas*) in the Liben zone of the Somali Regional State in southeastern Ethiopia (Figure 1). Elevation in the study area ranges from 189 m to 974 m. Long-term (1981-2023) mean annual rainfall is 238 mm in Dolo Ado district and 308 mm in Bokolmayo. Long-term (1981-

2023) mean annual minimum and maximum temperatures are, respectively, 27.3°C and 28.9°C in Dolo Ado, and 26.0°C and 27.7°C, respectively, in Bokolmayo. Shrublands and grasslands are the two main types of land-use and land-cover classes, occupying approximately 75% of the total land area (Figure 2; Table 1).



**Figure 1. Location map of the study area.**

Source: Authors.



**Figure 2. Land-use and land-cover map of the study woredas for the year 2024.**

Source: Authors.

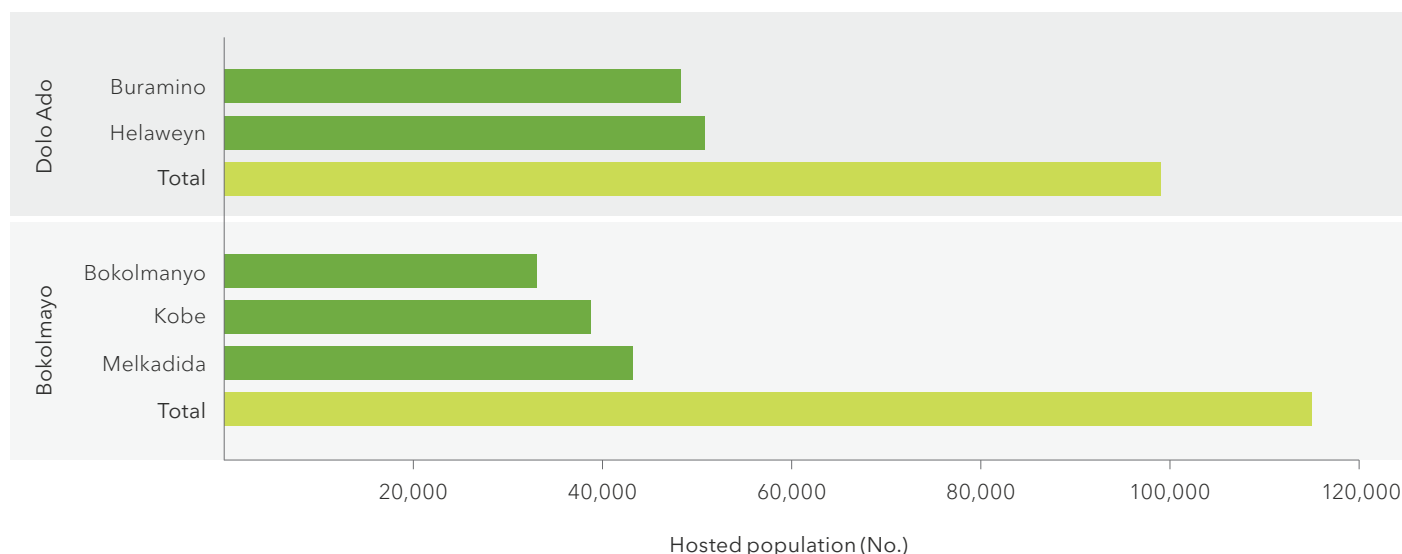
**Table 1. Land-use land-cover (LULC) classes in the study area (2024).**

| LULC Type       | Area (ha)        |                |                  | Area (%)     |
|-----------------|------------------|----------------|------------------|--------------|
|                 | Dolo Ado         | Bokolmayo      | Total            |              |
| Water bodies    | 585.6            | 649.5          | 1,178.2          | 0.15         |
| Farmland        | 9,003.0          | 9,099.3        | 18,167.7         | 2.23         |
| Forest land     | 3,436.2          | 75,189.6       | 78,589.8         | 9.67         |
| Grassland       | 191,426.2        | 53,765.1       | 245,426.7        | 30.14        |
| Shrubland       | 75,420.5         | 288,905.0      | 364,664.9        | 44.79        |
| Bare land       | 64,175.7         | 40,004.0       | 104,168.3        | 12.81        |
| Settlement area | 850.2            | 782.6          | 1,179.8          | 0.20         |
| Wetland         | 8.3              | 76.9           | 85.6             | 0.01         |
| <b>Total</b>    | <b>344,905.7</b> | <b>468,472</b> | <b>813,377.7</b> | <b>100.0</b> |

Source: Authors.

The total population of Dolo Ado and Bokolmayo districts (UNHCR 2020), including refugees, is 453,068 with an estimated 238,987 people belonging to host communities. These host communities, with an average family size of six, account for, respectively, 58.2% (138,980) and 41.8% (100,007) of the population of Dolo Ado and Bokolmayo districts. Refugees are accommodated in five camps that

were established between 2009 and 2011 (Figure 3; Betts et al. 2019). According to registration data (updated in January 2024) maintained by the United Nations High Commissioner for Refugees (UNHCR), these camps located in semi-arid and isolated border districts host around 214,081 refugees (Figure 3), almost exclusively Somali refugees.



**Figure 3. Number of refugees hosted in camps in Dolo Ado and Bokolmayo districts in the Somali Regional State of Ethiopia.**

Source: Authors.

## 2.2. Study Design

The design for this study included five basic stages of conducting stakeholder analysis, following Reed et al. (2009) and Mekuria et al. (2021).

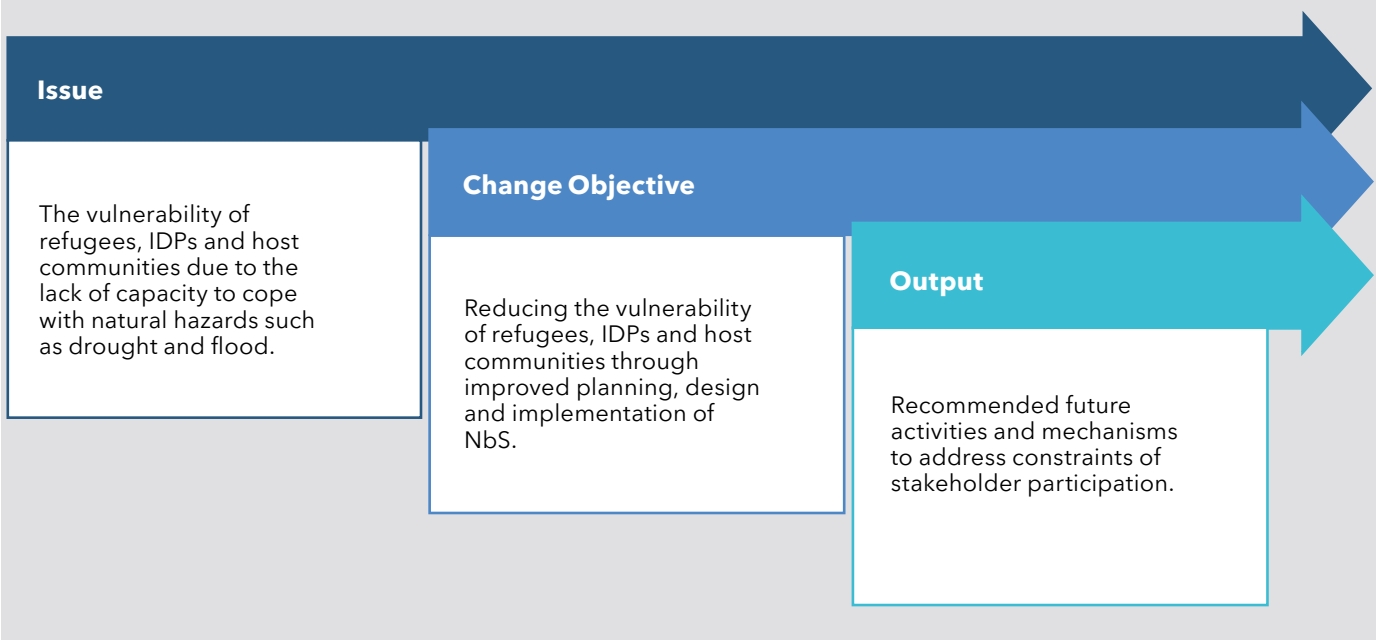
- In the first stage, the main issue or problem area and an anticipated change objective were identified on the basis of several discussions and meetings with the main stakeholders operating on the ground, including the

World Food Programme (WFP) and UNHCR, as well as a literature review (Figure 4).

- The second stage focused on assessing societal challenges, the underlying causes of livelihood vulnerability to natural hazards and the responses to address them as a system. Current decision-making processes were assessed as well. Specifically, we assessed

the decisions made and key activities taken up during planning, design and implementation of NbS, stakeholder participation and the impact monitoring mechanisms, and how these in turn informed further decision-making. Furthermore, we assessed areas that needed improvement in planning, design and implementation, stakeholder evaluation on the role of NbS to building resilience in the communities, and the actual and perceived costs and benefits for a particular stakeholder.

- The third stage of the study dealt with the identification of stakeholders and stakeholder groups. The selection criteria considered all groups that would in some way affect or be affected by the issue being addressed and the change objective adopted for the study (Mekuria et al. 2021). This could include those groups with interests in, or claims or rights (ethical or legal) to, the benefits of the NbS, or might bear the costs and adverse impacts of the NbS.
- The fourth stage was focused on investigating changes in the stakeholders' interest in the issue and the change objective, and the characteristics and circumstances of stakeholders. This investigation was supported by several key areas of information, such as any actual or potential conflict of interest between stakeholders, the importance of the main issue to specific stakeholder groups, and the relative importance of the stakeholder groups themselves and their power and influence.
- In the fifth stage of the study, we investigated the different forms of interaction between different stakeholder groups, including conflict, cooperation and dependency. Additionally, we focused on drawing and synthesizing lessons and suggesting future activities and mechanisms to address constraints to stakeholder participation.



**Figure 4. The issue, change objective and output of stakeholder analysis.**

Source: Authors.

**2.3. Data Collection**

Data for the study were gathered between December 2023 and February 2024 by a range of methods including an inception workshop, reconnaissance surveys, key informant interviews and a review of published and gray literature. The research team obtained the verbal consent of each participant before the interview after clearly explaining the purpose of the study and assuring confidentiality. The review of literature covered topics related to natural resources management and impacts on livelihoods due to natural hazards such as floods and drought.

*Inception workshop.* The inception workshop brought together 24 participants from various sectors including government offices (8), NGOs (1),

international humanitarian organizations (7), private sector (3), community-based organizations (2) and local administrative bodies (3). Data were collected on societal challenges, efforts made to address the challenges, and the effectiveness of past efforts from the perspective of different groups in a community.

Two breakout sessions were held during the inception workshop with the participants organized into three groups: (i) international humanitarian organizations and their partners (group 1), (ii) government offices and communities (group 2), and (iii) private sector and community-based organizations (group 3). The three groups were given a common topic to discuss, thus generating different perspectives.

*Reconnaissance surveys.* Guided by the results of the inception workshop, three-day reconnaissance surveys were carried out on two irrigation schemes, one in Bokolmayo district and the other in Dolo Ado. This aspect of the study included discussions with members of irrigation cooperatives.

*Key informant interviews.* To get a better understanding of the focus issue and the change objective, 24 key informant interviews were conducted with people familiar with the matter. The key informants included representatives belonging to various stakeholder categories such as government agencies, agricultural

research institutes, nongovernmental organizations, international humanitarian organizations, private sector, local administrative bodies, communities, and community-based organizations (Table 2). The respondents were assured anonymity, and discussions were based on their understanding of the issue from the perspective of their organization or institute. Structured and semi-structured questionnaires were used.

Table 3 summarizes the types of data recorded and issues covered in the inception workshop, reconnaissance surveys and key informant interviews, along with their linked objectives and research questions.

**Table 2. Stakeholders consulted in Dolo Ado and Bokolmayo districts.**

| Stakeholder category                                     | Description of stakeholders                                                                                                                            |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Government offices (10<sup>a</sup>)</b>               | This category included district-level agriculture, water, livestock, disaster risk management and cooperative offices.                                 |
| <b>Agricultural research institutes (1)</b>              | This was the Somali Regional State Agriculture Research Institute in Dolo Ado district.                                                                |
| <b>Local administrative bodies (2)</b>                   | These refer to the respective district administrative bodies.                                                                                          |
| <b>Communities and community-based organizations (6)</b> | This category included water users' associations and representatives of host communities.                                                              |
| <b>Humanitarian organizations (2)</b>                    | This refers to the international humanitarian organizations operating in the study area.                                                               |
| <b>NGOs (3)</b>                                          | This refers to NGOs working in refugee hosting communities and engaged in building the resilience of refugees, IDPs <sup>b</sup> and host communities. |
| <b>Private sector entities (2)</b>                       | The category included stakeholders involved in providing agricultural inputs and working on developing solar energy.                                   |

Notes:

<sup>a</sup> Number of stakeholders; <sup>b</sup> IDPs = Internally displaced people.

**Table 3. Methods of data collection, types of data and issues, and linked objectives and research questions.**

| Method                          | Types of data gathered                                          | Linked objective                                                                                                                                       | Linked research questions                                                                                                        |
|---------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Understanding the system</b> |                                                                 |                                                                                                                                                        |                                                                                                                                  |
| <b>Inception workshop</b>       | ○ Societal challenges                                           | Develop the conceptual DPSIR <sup>a</sup> framework for assessing vulnerability of refugees, IDPs <sup>b</sup> and host communities to natural hazards | How is vulnerability of refugees, IDPs and host communities influenced by environmental, social, economic and political factors? |
|                                 | ○ Efforts made to address challenges                            |                                                                                                                                                        |                                                                                                                                  |
|                                 | ○ Effectiveness of past efforts to address natural hazards      |                                                                                                                                                        |                                                                                                                                  |
| <b>Reconnaissance surveys</b>   | ○ Observe the extent of impacts of natural hazards              |                                                                                                                                                        |                                                                                                                                  |
|                                 | ○ Societal challenges from the perspective of local communities |                                                                                                                                                        |                                                                                                                                  |

Continued >

| Method                          | Types of data gathered                                                                                                                                                                 | Linked objective                                                                  | Linked research questions                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Key informant interviews</b> | <ul style="list-style-type: none"> <li>○ Drivers, pressures, state, impact and responses</li> <li>○ Decision-making processes in the co-production<sup>c</sup> of solutions</li> </ul> |                                                                                   |                                                                                                                                                      |
| <b>Stakeholder analysis</b>     |                                                                                                                                                                                        |                                                                                   |                                                                                                                                                      |
| <b>Key informant interviews</b> | <ul style="list-style-type: none"> <li>○ Mandate and area of action of stakeholders</li> <li>○ Forms of involvement of stakeholders during co-production of solutions</li> </ul>       | Assess involvement of stakeholders in co-production of nature-based solutions     | Do stakeholders diverge in their mission, interest and strategic options?                                                                            |
|                                 | <ul style="list-style-type: none"> <li>○ Interests and influence of stakeholders</li> </ul>                                                                                            | Assess stakeholder interests concerning the change objective and their priorities | How does assertion of stakeholder influence affect implementation of the change objective?                                                           |
|                                 | <ul style="list-style-type: none"> <li>○ Power and power resources</li> </ul>                                                                                                          | Assess the power and power resources of stakeholders                              | How do power and power resources influence the contribution of stakeholders to the change objective?                                                 |
|                                 | <ul style="list-style-type: none"> <li>○ Interactions or relationships among stakeholders</li> </ul>                                                                                   | Assess strengths and weaknesses of relationships between stakeholders             | How can trust-building among stakeholders be improved?<br>Are empowerment measures needed to better plan, design and implement the change objective? |
| <b>Literature review</b>        | <ul style="list-style-type: none"> <li>○ Mission, mandate and area of action of stakeholders</li> <li>○ Stakeholder participation or engagement</li> </ul>                             | Document the key characteristics of stakeholders                                  |                                                                                                                                                      |

Notes:

<sup>a</sup> DPSIR = Driver-Pressure-State-Impact-Response framework. <sup>b</sup> IDP = Internally displaced people. <sup>c</sup> Co-production refers to joint planning, design and implementation of nature-based solutions to address livelihood vulnerability to natural hazards such as drought and floods.

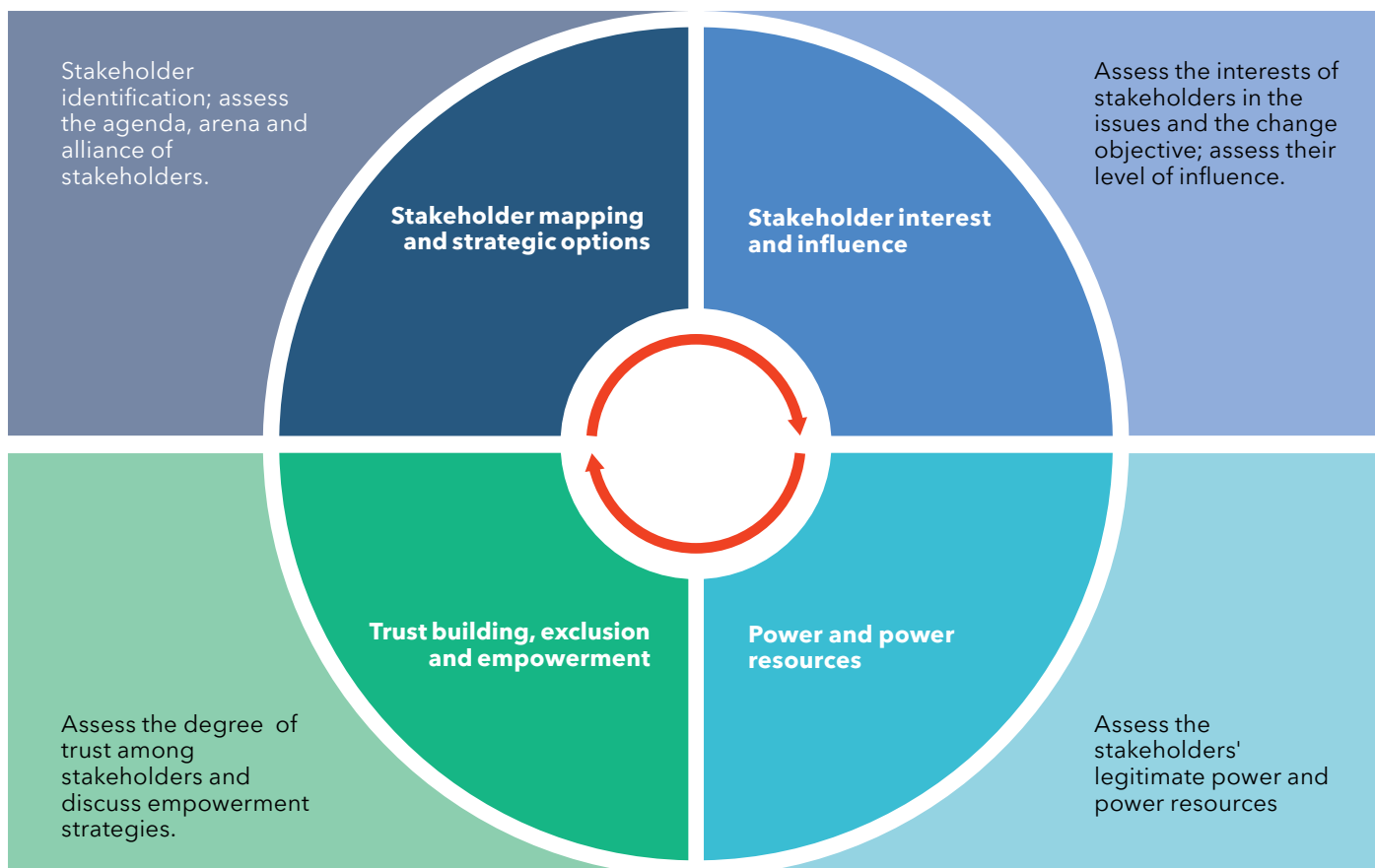
Source: Authors.

## 2.4. Data Analysis

To understand causal links leading to vulnerability of refugees, IDPs and host communities, we used the DPSIR framework (Kristensen 2004) because it enables us to gain a substantial understanding of both ecological and social systems involved in vulnerability. This helps in making decisions on when and how to intervene to reverse the vulnerability of refugees, IDPs and host communities through planning, design and implementation of NbS.

We used procedures indicated by Mekuria et al. (2021) to analyze the qualitative data. Themes such as drivers, pressures, state of the environment, impact and

responses, as well as decision-making processes, were identified and coded manually. Subsequently, further deductive coding was employed to understand the system and stakeholder engagement. As indicated by Mekuria et al. (2021), more codes were added when new issues emerged from the textual data. We used tools outlined by Zimmermann and Claudia (2007) to conduct stakeholder mapping, describe strategic options, and analyze stakeholder power and power resources, stakeholders' interests and scope of action, influence and participation, trust and exclusion, and empowerment (Figure 5).



**Figure 5. Criteria and approaches used for stakeholder analysis.**

Source: Authors.

## 3. Results and Discussion

### 3.1. Conceptual DPSIR Framework for Vulnerability of Refugees, IDPs and Host Communities

#### 3.1.1. Vulnerability of Refugees, IDPs and Host Communities

The three target communities for this study—refugees, IDPs and host communities—are all vulnerable to natural hazards such as droughts and floods. However, the level of vulnerability<sup>1</sup> can vary among communities due to their different characteristics. For example, refugees are registered with UNHCR as non-nationals and get continued support from humanitarian organizations. This can improve their ability to cope<sup>2</sup> with natural hazards. On the other hand, people belonging to host communities are nationals and have the right to move from place to place during disasters. They may have relatively better adaptive capacities. In terms of the length of stay, IDPs can be classified as people displaced for

the short term (temporary), medium term (those who expect an improvement in conditions so as to be able to return home), and long term (no prospect of return). These groups often have difficulty getting humanitarian and life-changing support until they become registered and recognized.

However, results from our inception workshop, reconnaissance surveys and key informant interviews indicate that drivers of livelihood vulnerability to natural hazards do not vary among the target communities (Figure 6). For instance, the livelihoods of refugees, IDPs and host communities tend to be very limited or insecure because they are based on fragile and degraded natural resources such as land, water and forests. Also, the target communities lack knowledge and capacity to cope with disasters, and have

<sup>1</sup> Vulnerability is defined in this study as the degree to which a system is susceptible to, or unable to cope with, the adverse effects of climate change, including climate variability and extremes (IPCC 2012).

<sup>2</sup> Coping is defined as the use of available skills, resources and opportunities to address, manage and overcome adverse conditions with the aim of achieving basic functioning in the short to medium term (IPCC 2012).

insufficient experience in agriculture. In addition, limited and insecure livelihoods are compounded by pressures such as floods, droughts, deforestation and climate change. These drivers and pressures and the resulting state of the environment (e.g., decline in water productivity, decline in soil fertility, low agricultural productivity, conflict over resource use) all subject refugees, IDPs and host communities to vulnerable conditions. Specifically, changes in the environment due to these drivers and pressures lead to food and water insecurity, poverty and reduced capacity to cope with disasters (Figure 6). This finding is consistent with earlier studies (e.g., van der Heijden et al. 2020; UNEP 2022) that indicated that changes in the environment in recent years, including more frequent droughts and degradation of natural resources, have undermined the adaptive strategies of local communities, thereby increasing their vulnerability.

### **3.1.2. Responses to Address Vulnerability**

Multiple responses aimed at addressing vulnerability drivers (e.g., land degradation), pressures (e.g., drought, flood), changes in the environment (e.g., decline in water productivity, decline in soil fertility, low agricultural productivity, conflict over resource use) and impacts (e.g., food and water insecurity, poverty) have been implemented in the past (Figure 6). These efforts can be categorized as NbS (e.g., water harvesting, solar-based irrigation, exclosures), life-saving activities (e.g., food and feed aid, temporary resettlement) and capacity-building (e.g., agronomic practices such as planting and cultivation, irrigation water management). One key informant in Dolo Ado district told us that some responses addressing vulnerability to drought and flood have been implemented to help the vulnerable communities cope with weather extremes. “Such responses, specifically NbS, helped us to adapt to and mitigate the adverse impacts of drought and floods,” he said.

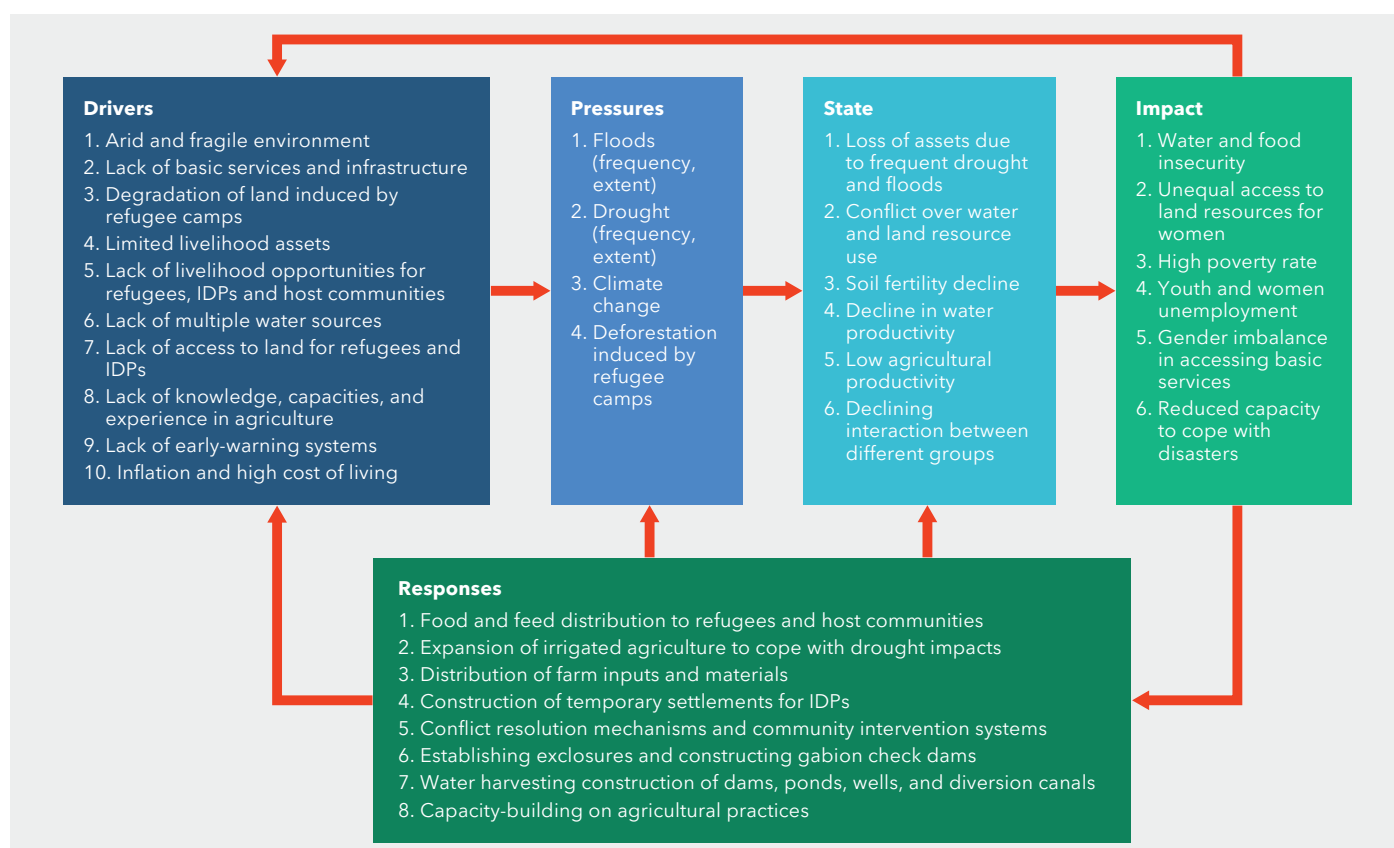
Nature-based solutions such as water harvesting were mentioned by all stakeholder groups, while other lifesaving activities were mentioned by groups representing humanitarian organizations, private sector entities and cooperatives (Table 4). Humanitarian organizations’ responses in the form of NbS and lifesaving activities indicate their desire to supplement emergency responses with sustainable solutions.

### **3.1.3. Participation of Stakeholders in Responses to Address Vulnerability**

Multiple stakeholder groups are involved in these efforts to address vulnerability. These include government agencies, NGOs, humanitarian organizations, private sector entities and local communities. Government offices are primarily involved in developing conducive frameworks and policies, mobilizing the community, and implementing interventions. Humanitarian organizations, NGOs and the private sector provide financial and technical support. Local communities primarily contribute labor and provide locally available materials (Table 4). In general, participants in our workshop, surveys and interviews indicated that the activities implemented to address vulnerability were practical but not enough considering the extent of the problem.

### **3.1.4. Factors in the Success and Failure of Past Efforts**

Analyzing past lifesaving and life-changing efforts, inception workshop participants identified several success and failure factors (Table 4). Perception of success factors varied among the stakeholder groups. For example, participants representing humanitarian organizations and NGOs indicated that government support, continued donor support, private sector involvement and availability of sunshine were key success factors in (i) increasing access to water for both humans and livestock; (ii) reducing environmental pollution; (iii) increasing agricultural production; (iv) improving restoration of degraded ecosystems; and (v) mitigating drought and floods (Table 4). Participants representing the government sector suggested that cooperatives, friendly host communities and local knowledge were key to successful efforts. The group representing the private sector and cooperatives indicated that improved communication and coordination, as well as a sense of ownership among beneficiaries, contributed to the success of past interventions. In respect of failure factors, the participant groups showed similarities in perception. The key failure factors that hindered the benefits of past efforts included low community engagement throughout the project cycle, and the lack of context-specific technologies, skilled staff and sustainability of interventions.



**Figure 6. The DPSIR framework for understanding the vulnerability of refugees, IDPs and host communities.**

Source: Authors.

**Table 4. Past efforts to address the social challenges faced by refugees, IDPs<sup>a</sup> and host communities.**

| Past efforts                                                                            | Who is involved                                  | Roles                                                                                                                                                                                                                                                                       |                                                                     | Benefits/disbenefits                                                                                                                                                                                                   | Mentioned                      |
|-----------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <b>Water harvesting through construction of dams, ponds, wells and diversion canals</b> | Government, WFP <sup>b</sup> , NGOs, communities | Government provides the regulatory framework/policies, community mobilization and intervention implementation; WFP and NGOs provide financial and technical support during construction and capacity-building; communities contribute labor and locally available material. | The efforts were effective in mitigating drought in the short term. | Benefits: Increased access to water for humans and livestock and for crop production.<br>Disbenefits: Outbreaks of waterborne diseases; conflicts over resource use; lack of sustainability; trigger for displacement. | Groups <sup>c</sup> 1, 2 and 3 |
| <b>Solar-based irrigation</b>                                                           | WFP, UNHCR <sup>d</sup> and NGOs                 | <ul style="list-style-type: none"> <li>○ Funding</li> <li>○ Design and installation</li> <li>○ Market linkage</li> <li>○ Maintenance of solar panels</li> </ul>                                                                                                             | Very effective in climate adaptation solutions                      | Benefits: Reduces environmental pollution; increases production; encourages agriculture.<br>Disbenefits: Requires backups during rainy season; repairs may be costly.                                                  | Group 1                        |

Continued >

| Past efforts                                                             | Who is involved                                                  | Roles                                                                                                                                                                                                                           |                                          | Benefits/disbenefits                                                                                                                                                                                 | Mentioned      |
|--------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Solar pump to access water for domestic use</b>                       | Government, private sector, community                            | Government's role was mainly to mobilize and ensure security. NGOs support the effort by providing funds. Private sector involved in supplying material and services.                                                           |                                          | Benefits: Addresses water scarcity or insecurity; improves access to safe drinking water; reduces operating costs.                                                                                   | Group 3        |
| <b>Hydrophobic technologies</b>                                          | WFP and NGOs                                                     | Funding, capacity-building, market linkages for inputs, promotion of hydrophobic technologies                                                                                                                                   | Effective for water and soil utilization | Benefits: Water-saving; no soil required; less labor; high yields; high quality products.<br>Disbenefits: High installation cost; high technical skills; requires long-time for community to buy in. | Group 1        |
| <b>Establishing exclosures; constructing gabion check dams</b>           | Government, NGOs such as Wa-PYDO <sup>e</sup> , SEE <sup>f</sup> | Government's role was mainly mobilization and ensuring security. NGOs support the effort by providing funds. The private sector is involved in supplying materials and services.                                                | Not mentioned                            | Benefits: Supported restoration of degraded landscapes surrounding refugee camps such as Helwan, Kobe, Melika-Dida.<br>Disbenefits: Exclosures triggered conflict over natural resource use.         | Group 3        |
| <b>Conflict resolution mechanisms and community intervention systems</b> | Government, refugee communities, UNHCR, elders                   | Government's role was mainly mobilization and ensuring security. Humanitarian organizations and NGOs supported efforts by providing funds. Private sector entities were involved in supplying materials and providing services. |                                          | Benefits: Addresses conflicts over resource use.                                                                                                                                                     | Groups 1 and 3 |
| <b>Food and feed distribution</b>                                        | Government; humanitarian organizations;                          |                                                                                                                                                                                                                                 |                                          | Benefits: Support to addressing drought.                                                                                                                                                             |                |
| <b>Distribution of farm inputs and materials</b>                         | private sector; Mercy Corps                                      |                                                                                                                                                                                                                                 |                                          | Benefits: Support to addressing drought, improved food security.                                                                                                                                     |                |
| <b>Capacity-building</b>                                                 |                                                                  |                                                                                                                                                                                                                                 |                                          | Benefits: Support for improvement of skills and knowledge of practitioners.                                                                                                                          |                |
| <b>Temporary settlements</b>                                             |                                                                  |                                                                                                                                                                                                                                 |                                          | Benefits: Lifesaving support for IDPs and refugees.                                                                                                                                                  |                |

*Notes:*

<sup>a</sup> IDPs = Internally displaced people; <sup>b</sup> WFP = World Food Programme; <sup>c</sup> Group 1 = International humanitarian organizations and their partners; Group 2 = Government offices and communities; Group 3 = Private sector and community-based organizations; <sup>d</sup> UNHCR = United Nations High Commissioner for Refugees; <sup>e</sup> Wa-PYDO = Women and Pastoralist Youth Development Organization; <sup>f</sup> SEE = Save the Environment Ethiopia.

## 3.2. Decision-making Processes and Strategies for Improving Resilience Programs

### 3.2.1. Activities and Decisions

The stakeholder categories we identified and consulted for this study (Table 2) carry out multiple activities and take decisions during the planning, design and implementation of NbS to address the vulnerability of refugees, IDPs and host communities. These activities and decisions vary according to the mandate and field of action of the stakeholder groups (Table 5). For example, humanitarian organizations and

NGOs focus more on collecting baseline information prior to implementing their resilience programs and assessing the impacts of interventions (e.g., solar-based irrigated agriculture and livestock feed distribution). Government agencies and communities and community-based organizations mainly engage in the implementation of NbS solutions. Private sector entities mainly focus on awareness creation and delivery of agricultural inputs.

**Table 5. Activities taken up and decisions made by stakeholders during planning, design and implementation of the change objective.**

| Stakeholder group                 | Key activities and decisions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Who is involved                                                                                                                                               | Beneficiaries                                                                                                                                                          |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Humanitarian organizations</b> | <ul style="list-style-type: none"> <li>○ Confirming the alignment of the change objective (i.e., planned projects or programs) with government initiatives, and needs and priorities of beneficiaries (communities and households).</li> <li>○ Assessing the potential benefits of planned projects and programs.</li> <li>○ Assessing the suitability of interventions to the existing specific context/conditions.</li> <li>○ Assessing the availability of resources (land, water, human resources, funding, etc.).</li> <li>○ Implementing resilience-building programs such as solar-based irrigation and planting trees for firewood.</li> </ul>                                                                                                                                    | Representatives of refugees, IDPs and host communities, government offices, local administrative bodies, private sector entities and collaborating NGOs       | Refugees and host communities                                                                                                                                          |
| <b>Government agencies</b>        | <ul style="list-style-type: none"> <li>○ Pond rehabilitation and construction, maintenance of ponds, training, etc.</li> <li>○ Distribution of vaccines and construction of health posts.</li> <li>○ Awareness creation.</li> <li>○ Impact assessment, monitoring and evaluation.</li> <li>○ Distribution of agricultural inputs and farm implements.</li> <li>○ Implementation of multiple soil and water conservation practices such as check dams, exclosures, soil beds, terraces, afforestation/ reforestation, etc.</li> <li>○ Identification of needy and vulnerable people.</li> <li>○ Establishing cooperatives.</li> <li>○ Distribution of loans.</li> <li>○ Identification of problems to research; testing of adaptable technologies</li> <li>○ Capacity-building.</li> </ul> | Appropriate government offices (depending on the type and nature of projects), NGOs, community, private sector entities, local administration, model farmers. | Mostly host communities. Refugees and IDPs also benefit from some specific activities (e.g., identification of needy and vulnerable people and distribution of loans). |

Continued >

| Stakeholder group                                    | Key activities and decisions                                                                                                                                                                                                                                                                                                                                            | Who is involved                                                                                                                              | Beneficiaries                                                                                           |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>Private sector</b>                                | <ul style="list-style-type: none"> <li>Organizing awareness campaigns on the benefits of solar panels and pumps.</li> <li>Selection of solar panels and pumps.</li> <li>Identification of installation locations and capacity-building.</li> <li>Identification of required agricultural inputs and availing them in the market.</li> </ul>                             | Humanitarian organizations, government offices, NGOs and private sector                                                                      | Host communities, refugees and IDPs. Capacity-building programs also benefit government sector offices. |
| <b>NGOs</b>                                          | <ul style="list-style-type: none"> <li>Conducting need assessment.</li> <li>Organizing consultative meetings with communities, representatives of refugees and IDPs, government offices, and implementing partners.</li> <li>Identifying and prioritizing the problem.</li> <li>Designing interventions.</li> <li>Piloting technologies such as solar power.</li> </ul> | District administration, kebele <sup>a</sup> leaders, community leaders, women, girls, youth representatives and other implementing partners | Refugees, IDPs and host communities                                                                     |
| <b>Communities and community-based organizations</b> | <ul style="list-style-type: none"> <li>Contributing free labor during implementation of interventions.</li> <li>Participating in problem identification and prioritization.</li> </ul>                                                                                                                                                                                  | Consultations are usually done with representatives of humanitarian organizations, government offices and NGOs.                              | Mostly host communities                                                                                 |

Note:

<sup>a</sup> Kebele is the smallest administrative unit in Ethiopia.

Source: Authors.

### 3.2.2. Decision-making Processes during Co-production of Nature-based Solutions

To understand the system and the decision-making environment of stakeholder groups, we evaluated the processes followed by them when they plan, design and implement NbS. Such an evaluation can provide insights into how different stakeholder groups interact, discuss and make decisions.

**Need assessment.** Inferences from our key informant interviews indicate that the decision-making processes followed by all stakeholder groups start with an assessment of needs in the target area. Participants from all stakeholder groups mentioned that assessment of needs primarily involves consultation with target communities and beneficiaries. Depending on the type and nature of the intervention, such consultations also involve government offices, private sector entities and implementing partners. For example, one informant highlighted the importance of engaging with local and regional government bodies thus:

*“The key lesson drawn from our experience was that better engagement with regional and local government bodies is needed to plan better, design and implement interventions.”*

All the stakeholder groups we consulted said information derived from consultation meetings is useful in identifying societal challenges, project sites and target beneficiaries, prioritizing the problems to address, and planning, designing and implementing interventions. Private sector entities mainly have decision-making processes aimed at obtaining information on agricultural inputs and other services such as availability of technologies.

**Impact assessment.** Key informants representing NGOs and humanitarian organizations reported that the impacts of interventions are monitored and assessed at different levels (e.g., field, suboffice, national level) using different approaches. For example, implementation is assessed by comparing the outputs against predefined indicators. Field visits are regularly undertaken, equipped with checklists prepared in advance. Furthermore, stakeholder groups use a predefined monitoring schedule, such as mid- and end-year monitoring, to assess service provisions, vulnerabilities, insecurities and outcomes. Achievements are evaluated against outcome indicators such as changes in food security, diet diversity, income and coping. Assessment is generally disaggregated by age, gender and diversity.

NGOs assess impacts mainly through postdistribution monitoring (PDM), field monitoring, complaint and feedback mechanisms and interviews with beneficiaries. The results of impact assessments are used to adjust measures, improve future decision-making and interventions, design future

projects and programs, and identify better implementing partners. Boxes 1 and 2 present the experience of the Danish Refugee Council (DRC) and Vétérinaires Sans Frontières Suisse (VSF Suisse) in using the results of impact monitoring to adjust, plan and design future projects and programs.

### Box 1. How DRC Adjusted Its Intervention.

- Following floods in Dolo Ado, DRC constructed communal latrines for IDPs as part of the Water, Sanitation and Hygiene (WASH) program. Feedback from beneficiaries indicated that the constructed latrines were not suitable for all groups of IDPs. Specifically, they did not meet the requirements of disabled people. The NGO then decided to change the design of the communal latrines to make them suitable for all beneficiaries.

### Box 2. How VSF Suisse Adjusted Its Intervention.

- VSF Suisse distributed livestock feed (mineral nutrient bundle, MNB) to 500 beneficiaries to address the problem of feed shortage. However, while the distributed feed had high protein content, it was not good for the health of animals in dry and high temperature areas. The NGO received this feedback during PDM and then decided to change the type of feed to total mixed ration (TMR).

*Areas needing improvement.* The stakeholder groups in our study (Table 2) mentioned multiple areas of improvement necessary to better plan, design and implement NbS (Table 6). All stakeholder groups agreed on the need to improve participation by and engagement of stakeholders, coordination among stakeholder groups, and due consideration of the needs and priorities of target

communities when planning, designing and implementing projects. Participants from NGOs advocated exclusion of interventions that harm nature, and recommended integrated interventions and pilot interventions prior to implementing them at a larger scale. Representatives of humanitarian organizations indicated a need to improve evidence-based decision-making and capacity-building.



Photography by Wolde Mekuria

**Table 6. Suggested areas of improvement, and rationale and strategies for improvement of interventions addressing vulnerability.**

| Areas needing improvement                                                                                                                                                                      | Categories                     | Reasons for improvement                                                                                                                 | Suggested strategy                                                                                       | Mentioned by                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------|
| <b>Generate evidence on the performance of irrigated agriculture managed by refugees and host communities (e.g., water use, agronomic practices).</b>                                          | Evidence generation            | Promotes evidence-based decision-making.                                                                                                | Enhance collaboration between development, humanitarian and research organizations.                      | HO <sup>a</sup>                   |
| <b>Generate evidence on refugee camp-induced land-use and land-cover changes.</b>                                                                                                              |                                |                                                                                                                                         |                                                                                                          | HO                                |
| <b>Capacitate government offices on natural resource and disaster risk management.</b>                                                                                                         | Capacity-building and learning | Enhances local capacities to adapt to natural hazards.                                                                                  | Improve coverage and diversity of capacity-building.                                                     | HO                                |
| <b>Pilot interventions targeting refugees, IDPs and host communities before implementing them on a larger scale.</b>                                                                           |                                | Reduces the unintended negative impacts of interventions (see the experience of VSF Suisse <sup>b</sup> in Box 2).                      | Collaborate with research institutions and establish demonstration sites in refugee-hosting communities. | NGOs <sup>c</sup>                 |
| <b>Implement experience-sharing campaigns.</b>                                                                                                                                                 |                                | Promotes learning through sharing of experiences.                                                                                       | NGOs and humanitarian organizations allocate resources.                                                  | PS <sup>d</sup> , GO <sup>e</sup> |
| <b>Increase participation and engagement of stakeholder groups, including refugees, IDPs<sup>f</sup> and host communities over the entire project cycle; specifically, women's engagement.</b> | Participation and engagement   | Promotes consideration of diverse views, interests and priorities.                                                                      | Establish local platforms facilitating communication among stakeholder groups.                           | HO, GO, PS                        |
| <b>Increase private sector engagement in addressing societal challenges of refugees, IDPs and host communities.</b>                                                                            |                                |                                                                                                                                         |                                                                                                          | HO, PS                            |
| <b>Empower women and youth groups.</b>                                                                                                                                                         |                                |                                                                                                                                         |                                                                                                          | HO                                |
| <b>Coordinate with government offices while developing projects targeting refugees, IDPs and host communities.</b>                                                                             | Coordination and co-production | Facilitates government support and easy access to refugee-hosting communities; promotes the use of limited resources for a common goal. | Establish local platforms facilitating communication among stakeholder groups.                           | HO, NGOs, PS, GO                  |
| <b>Align project ideas with government initiatives and programs.</b>                                                                                                                           |                                |                                                                                                                                         |                                                                                                          | HO                                |
| <b>Follow holistic or system approaches when designing interventions.</b>                                                                                                                      |                                |                                                                                                                                         |                                                                                                          | HO                                |
| <b>Design exit strategies in the beginning stages of project initiation and implementation.</b>                                                                                                | Sustainability                 | Promotes local ownership of projects from the start.                                                                                    | Promote impact-oriented planning to strengthen institutions.                                             | NGOs, GO                          |
| <b>Design integrated interventions (e.g., WASH programs integrated with afforestation/reforestation).</b>                                                                                      |                                | Reduces flood damage to WASH infrastructure and sustains interventions.                                                                 |                                                                                                          | NGOs                              |

Continued >

| Areas needing improvement                                                                      | Categories | Reasons for improvement                          | Suggested strategy | Mentioned by     |
|------------------------------------------------------------------------------------------------|------------|--------------------------------------------------|--------------------|------------------|
| Design interventions based on the needs and priorities of refugees, IDPs and host communities. |            | Promotes community ownership and sustainability. |                    | NGOs, HO, GO, PS |

Notes:

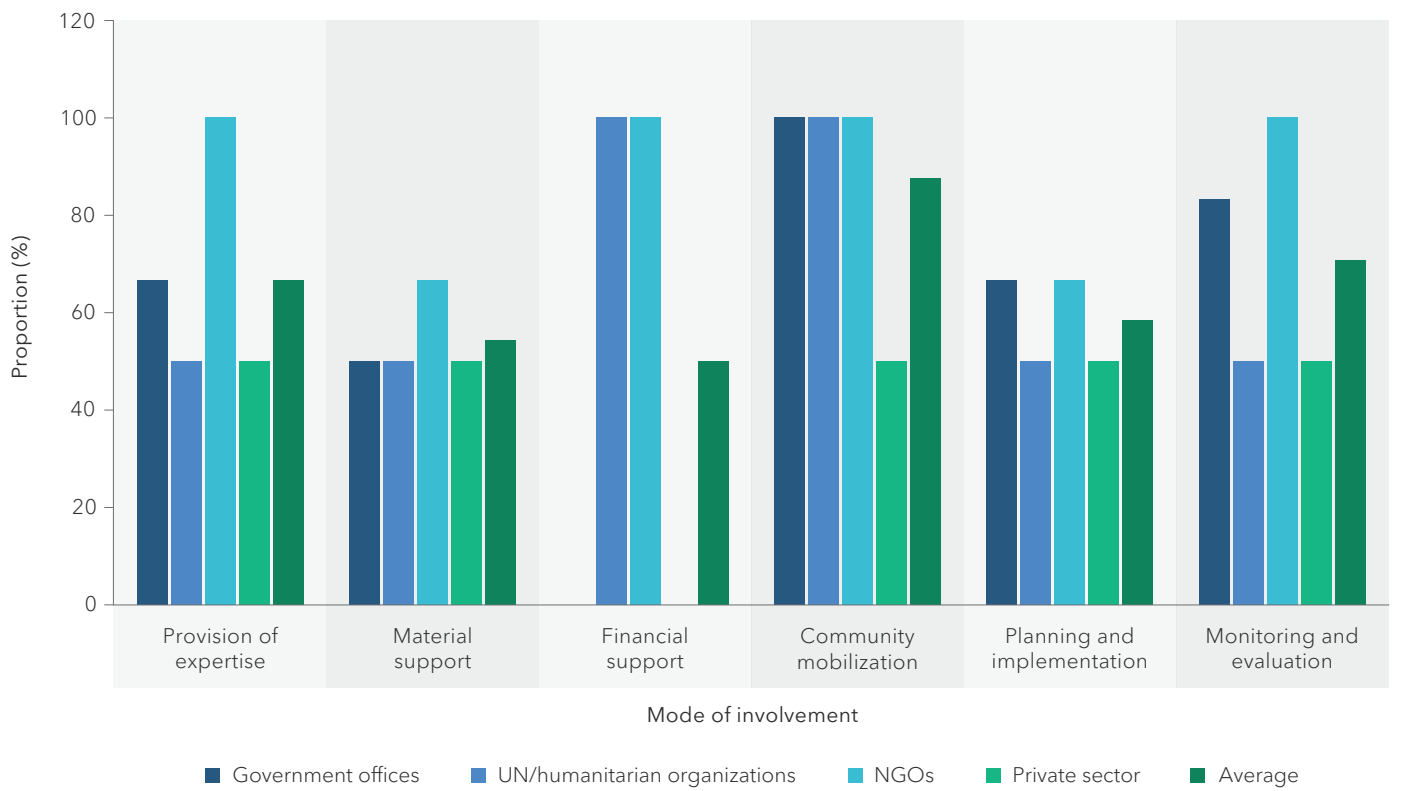
<sup>a</sup> HO = Humanitarian organization; <sup>b</sup> VSF = Vétérinaires Sans Frontières Suisse; <sup>c</sup> NGO = Nongovernmental organization; <sup>d</sup> PS = Public sector; <sup>e</sup> GO = Government office; <sup>f</sup> IDPs = Internally displaced people.

Source: Authors.

### 3.3. Stakeholder Involvement in Planning, Designing and Implementing Nature-based Solutions

Assessing the involvement of different stakeholder groups, government offices, humanitarian organizations, NGOs and private sector entities in the planning, design and implementation of NbS to address livelihood vulnerability, our study found that an average of 66.7% of the members of

all stakeholder groups participated in providing expertise, 54.2% in material support, 50% in financial support, 87.5% in community mobilization, 58.3% in planning and implementation, and 70.8% in monitoring and evaluation (Figure 7).



**Figure 7. Forms of participation of stakeholders in the change objective.**

Source: Authors.

These results show that stakeholder participation by all modes of involvement was at a good level, indicating their interest in participating in the change objective and addressing vulnerability. Such a good level of participation and interest could be attributed to the alignment of the change objective with the mandate and field of action of different stakeholders (Table 7). For example, all the

stakeholder groups consulted for this study work on building resilience, improving land and water resource management, and ensuring better disaster risk management. Accordingly, their mode of participation was in line with (i) better implementation of the change objective; (ii) capacity enhancement of local practitioners; and (iii) sustainability of interventions.

**Table 7. The mandate and field of action of stakeholders in relation to refugees, IDPs<sup>a</sup> and host communities.**

| Stakeholder groups                                   | Mandate                                                                                                                                                                                                                                                                | Field of action                                                                                                                                                                                                                                                           |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Government offices</b>                            | The diverse stakeholder groups considered in this category focus on supporting refugees, IDPs and host communities through improving access to water and livestock feed, expanding irrigated agriculture and introducing improved land and water management practices. | <ul style="list-style-type: none"> <li>○ Water supply</li> <li>○ Expanding small-scale irrigation</li> <li>○ Watershed development</li> <li>○ Production and distribution of livestock feed</li> <li>○ Access to loans and credit</li> <li>○ Capacity-building</li> </ul> |
| <b>UN/humanitarian organizations</b>                 | Delivering food assistance to refugees and IDPs, saving lives, and working with refugees and host communities to improve nutrition and build resilience                                                                                                                | <ul style="list-style-type: none"> <li>○ Providing life-saving assistance to refugees and IDPs</li> <li>○ Livelihood, resilience, self-reliance, and economic inclusion activities in refugee-host communities</li> <li>○ Protecting refugees and IDPs</li> </ul>         |
| <b>Local administrative bodies</b>                   | Support and coordinate stakeholder groups in delivering comprehensive services to refugees, IDPs and host communities                                                                                                                                                  | <ul style="list-style-type: none"> <li>○ Monitor implementation of projects and provide services in all sectors</li> <li>○ Allocate budgets and monitor expenditure</li> </ul>                                                                                            |
| <b>Communities and community-based organizations</b> | Manage small-scale irrigation and protect and conserve natural resources in refugee host communities                                                                                                                                                                   | <ul style="list-style-type: none"> <li>○ Participate in site selection</li> <li>○ Community mobilization</li> <li>○ Water allocation and canal maintenance on irrigated farms</li> <li>○ Deliver benefits and resolve conflicts</li> </ul>                                |
| <b>NGOs<sup>b</sup></b>                              | Contribute to national development goals, particularly in disaster risk management, resilience building and environmental sustainability in a refugee host community setting                                                                                           | <ul style="list-style-type: none"> <li>○ Plan, implement, and monitor resilience-building and livelihood activities</li> </ul>                                                                                                                                            |
| <b>Private sector</b>                                | Provide agricultural inputs and solar panels in a refugee host community setting                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>○ Assessment of groundwater potential</li> <li>○ Installation of pumps and evaluation of water quality</li> <li>○ Design and implementation of water infrastructure</li> </ul>                                                     |

Source: Authors.

Notes:

<sup>a</sup> IDPs = Internally displaced people; <sup>b</sup> NGOs = Nongovernmental organizations.

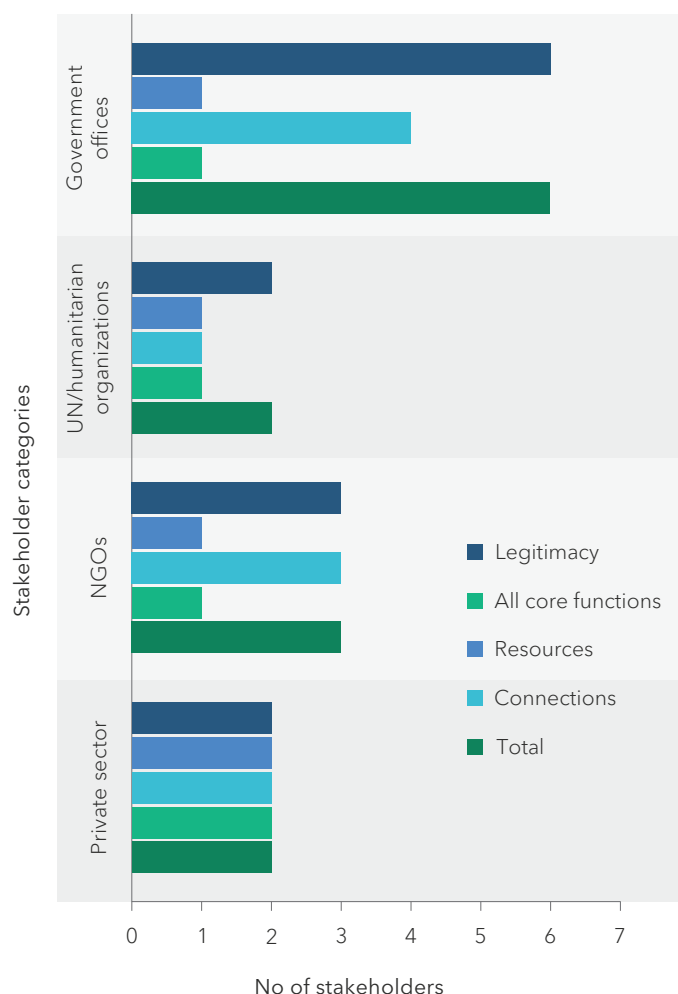
### 3.4. Core Functions

Our study found that stakeholder groups, government offices, humanitarian organizations, NGOs and private sector entities perceive that they have strong legitimacy (Figure 8). It is worth mentioning that this is self-assessment; our discussions were based on the participants' understanding of the issue from their organization's perspective. We found that most of the stakeholder groups (77%) perceive that they have strong connections but only a few (38%) of them think they have substantial resources. Of the participants representing government offices, only one had all three essential core functions that distinguished the stakeholder as outstanding.

Three had two essential core functions (mainly legitimacy and connections) that distinguished them as very important. All the private sector participants interviewed perceived strong legitimacy, resources and connections.

The legitimacy perception of many of the stakeholders suggests that they have a solid agency to change the course of events or influence the decisions of others (Sandström et al. 2014). This could facilitate their access to political support and mobilization of local communities. With this consideration, Masuda et al. (2022) suggested that the

presence of local governments with solid legitimacy improves participation by stakeholders and can enhance intermediary roles in partnership with multiple stakeholders. However, the constraints perceived by most stakeholders in respect of control over resources suggests a need for financial and material support and capacity-building efforts to implement the change objective effectively.



**Figure 8. Graphic representation of the core functions of stakeholders.**

Source: Authors.

### 3.5. Scope of Influence to Achieve the Change Objective and Strategic Options

Stakeholder groups operate in diverse fields of action related to planning, design and implementation of NbS in refugee-hosting communities (Table 7). Their scope of actions (i.e., in what fields are the actors active, where are they present?) and their performance are dependent on their mission and their resources (Hofmann et al. 2017). Most of the stakeholders in different categories studied by us, including those in the private sector, were intensely involved in implementing NbS to address the vulnerability of refugees, IDPs and host communities to natural hazards (Table 7). This indicates their shared interest in NbS and a potential for better collaboration and partnership among stakeholders.

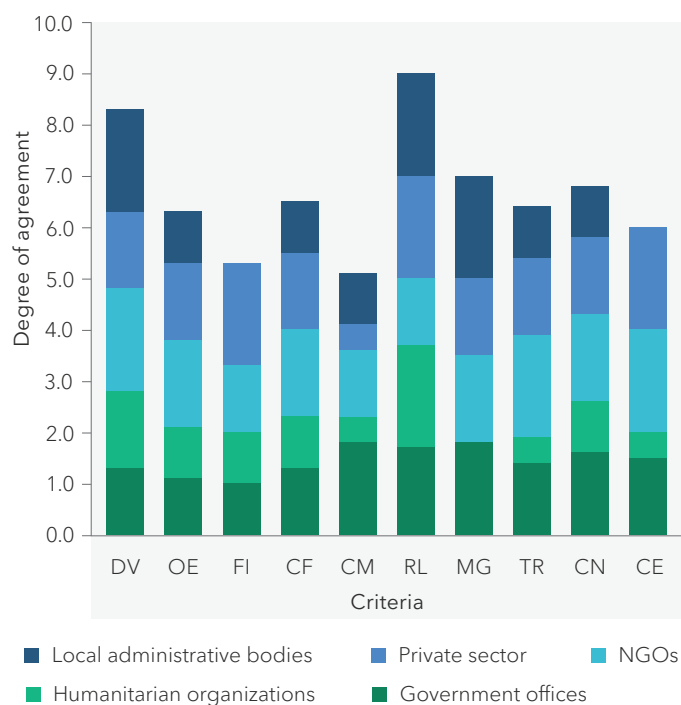
We evaluated the strategic options of different stakeholder groups using ten criteria (Box 3) and observed both differences and similarities among them (Figure 9). The assessment was done by documenting the degree of acceptance of each stakeholder group for the ten criteria. Different stakeholder groups showed similarities in respect of development vision, relationships, management, conflict resolution and capitalizing on experience. Of the five stakeholder groups analyzed, four strongly agreed (i.e.,  $\geq +1.5$ ) with the criteria that their organization implements development interventions based on participation and balance of interest, creates contacts and accommodates other ideas, and acts based on transparent guidelines. Similarly, three of the five stakeholder groups strongly agreed that they are quick to flag tensions and resolve conflicts, evaluate their experience and capitalize on it. These similarities among stakeholder groups can be attributed to similarities in organizational structure and principles. However, stakeholder groups did show differences in respect of operational effectiveness, flexibility and innovation, contractual fidelity and communication. These differences can be attributed to variations in resource access and control and mission priorities.

#### Box 3. Criteria for Assessing the Strategic Options of Stakeholder Groups.

- **Development vision:** The stakeholder supports a constructive vision of development based on democracy and balancing of interests.
- **Operational effectiveness:** The stakeholder works in a goal-oriented and results-driven way and periodically evaluates the extent to which goals have been achieved.
- **Flexibility and innovation:** The stakeholder is open to new ideas and adapts his/her/its organization to new challenges.
- **Contractual fidelity:** The stakeholder keeps to agreements and fulfils the relevant requirements and schedules.
- **Communication:** The stakeholder keeps others informed of his/her/its activities, participates in exchange of information and answers queries promptly.
- **Relationships:** The stakeholder facilitates contacts, creates spaces in which encounters can occur and adapts his/her/its actions to the capacity of his/her/its external partners.
- **Management:** The stakeholder acts on the basis of transparent guidelines and strategies and clarifies roles and responsibilities in his/her/its organization.
- **Trust:** The stakeholder informs others proactively about his/her/its intentions, objectives and expectations, and shows understanding of others' interests.
- **Conflicts:** The stakeholder is quick to flag tensions and conflicts and is prepared to tackle them constructively, openly and quickly.

○ **Capitalizing on experience:** The stakeholder evaluates his/her/its experiences, is open to criticism and shows a willingness to learn and to change.

These results indicate high potential for collaboration between stakeholders as they have shared views on most of the strategic options. More collaboration can better support the achievement of organizational objectives than competition (Valk et al. 2021). This in turn can help the whole range of stakeholder groups develop a better understanding of the issues and challenges related to addressing the vulnerability of refugees, IDPs, and host communities.



**Figure 9. Assessment of the strategic options of various stakeholder categories.**

Notes:

1. DV = Development vision; OE = Operational effectiveness; FI = Flexibility and innovation; CF = Contractual fidelity; CM = Communication; RL = Relationships; MG = Management; TR = Trust; CN = Conflicts; CE = Capitalizing on experience. The degree of agreement of each stakeholder with these strategic options varied between - - and ++.

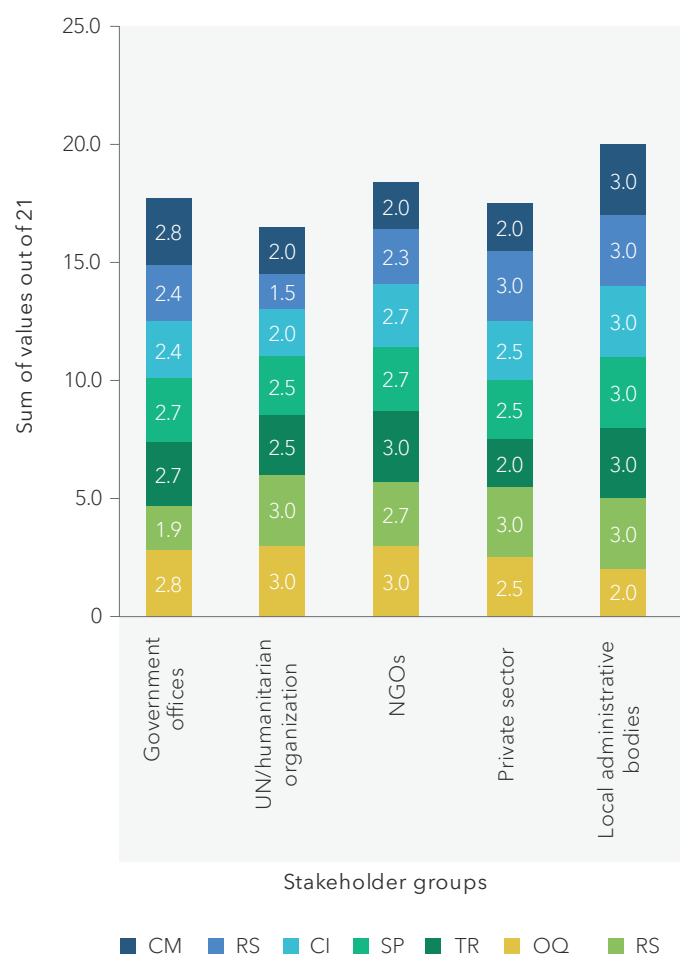
2. The sum of the ratings of the five stakeholder groups could range from -10 to 10.

Source: Authors.

### 3.6. Power and Power Resources

Stakeholders who contributed to the issue and the change objective of this study largely showed similarities in terms of perceived legitimate power based on seven key types of authority (Figure 10), as outlined by Zimmermann and Claudia (2007). However, there were differences in some authority attributes as well. For example, all stakeholders except local administrative bodies demonstrated strong legitimacy in

relation to setting objectives, norms and quality control processes. Stakeholders classified under the government sector do not have strong legitimacy in allocating or denying resources. On the other hand, the private sector does not have strong authority in defining roles, tasks and responsibilities. Surprisingly, stakeholders belonging to the government sector and humanitarian organizations had an intermediate degree of authority in controlling access to information and knowledge. On the other hand, stakeholders classified under the government sector and local administrative bodies were found to have strong authority to channel messages to superiors and external bodies. Specifically, the fact that stakeholders possess similar perceived legitimate power in setting objectives, norms and quality control processes and structuring participation in decision-making processes supports regulating or balancing the influence of influential stakeholders on the outcomes of the participatory process for marginalized stakeholders. Studies (e.g., Rahman et al. 2023) argue that stakeholders' power and resources can empower them to make their own decisions.



**Figure 10. Stakeholders' perceived legitimate power, based on seven types of authority.**

Notes:

1. OQ = Setting objectives, norms and quality control processes; RS = Allocating or denying resources; TR = Defining roles, tasks and responsibilities; SP = Structuring participation in decision-making

processes; CI = Controlling access to information and knowledge; RS = Allocating rewards, recognition and sanctions; CM = Channeling messages to superiors and external bodies.

2. A score of 3 denotes strong authority; 2 intermediate authority; and 1 weak authority.

Source: Authors.

### 3.7. Interest and Influence

The results of our interest and influence analyses indicated that stakeholders had moderate to strong interest in participating in the change objective (Table 8). All stakeholders agreed on the importance of NbS in addressing societal challenges. They appreciated the idea that nature-based solutions should include restoring natural resources, regreening and agroforestry activities as they are key to building resilience in the face of climate change and weather extremes. Furthermore, they acknowledged the role of NbS in addressing the vulnerability of communities, for example, through measures to prevent and stop soil erosion, reduce flood damage, increase

agricultural productivity, support asset building and restore the environment.

There were differences, however, among the stakeholder groups in terms of the degree of influence (Table 8). For example, all stakeholders classified under the government sector and humanitarian organizations were influential, suggesting that these groups can support, speed up or obstruct and block the process at several points. Most stakeholders classified as NGOs and community and community-based organizations were influential in some areas, indicating that stakeholders have influence regarding specific issues; however, they do not have a veto on the process and the change objective could be implemented against their will. Such diverse interests and influence support the principle that all relevant stakeholders be engaged when planning, designing and implementing the change objective. Ensuring meaningful participation by stakeholders could make planning and implementation of NbS more effective and help to reduce the vulnerability of refugees, IDPs and host communities (Sherman and Ford 2014).

**Table 8. Stakeholder interest in and influence on planning, design and implementation of nature-based solutions to address the vulnerability of refugees, IDPs and host communities.**

| Stakeholder                                                           | Interest in change objective | Influence/power           | Position   |
|-----------------------------------------------------------------------|------------------------------|---------------------------|------------|
| <b>Agriculture offices</b>                                            | Strong approval              | Influential               | Supportive |
| <b>Water offices</b>                                                  | Strong approval              | Influential               | Supportive |
| <b>Livestock offices</b>                                              | Moderate approval            | Influential               | Supportive |
| <b>Disaster risk management offices</b>                               | Strong approval              | Influential               | Supportive |
| <b>Cooperative offices</b>                                            | Moderate approval            | Influential               | Supportive |
| <b>Agricultural research institute</b>                                | Strong approval              | Influential               | Supportive |
| <b>World Food Programme</b>                                           | Strong approval              | Influential               | Supportive |
| <b>United Nations High Commissioner for Refugees</b>                  | Strong approval              | Influential               | Supportive |
| <b>Mercy Corps</b>                                                    | Strong approval              | Influential in some areas | Supportive |
| <b>Women and Pastoralist Youth Development Organization (Wa-PYDO)</b> | Strong approval              | Influential               | Supportive |
| <b>Organization for Welfare and Development in Action (OWDA)</b>      | Moderate approval            | Influential in some areas | Supportive |
| <b>Vétérinaires Sans Frontières Suisse</b>                            | Strong approval              | Little influence          | Supportive |
| <b>Danish Refugee Council</b>                                         | Moderate approval            | Influential               | Supportive |
| <b>Communities and community-based organizations</b>                  | Strong approval              | Influential in some areas | Supportive |
| <b>Local administrative bodies</b>                                    | Strong approval              | Very influential          | Supportive |
| <b>Agro-Inputs</b>                                                    | Strong approval              | Influential               | Supportive |
| <b>Energy Plus</b>                                                    | Strong approval              | Influential in some areas | Supportive |

3.8. Building Trust and Relationships among Stakeholders

Only 27% of the stakeholders from the government sector showed a considerable level of trust in other stakeholders (scoring an average value of > 4), while all the stakeholders classified as NGOs showed the same level of trust in others (Figure 11). Although all stakeholders in the NGO category showed considerable trust in other stakeholders, they received a similar level of trust from only 22% of the

stakeholders. Similarly, the proportion of government sector stakeholders receiving a considerable level of trust from others was only 42%. Such a low level of trust among stakeholders could be attributed to a lack of continuous communication among them. It can also be attributed to a lack of effort by the stakeholders to make their interests and intentions more transparent to other stakeholders.

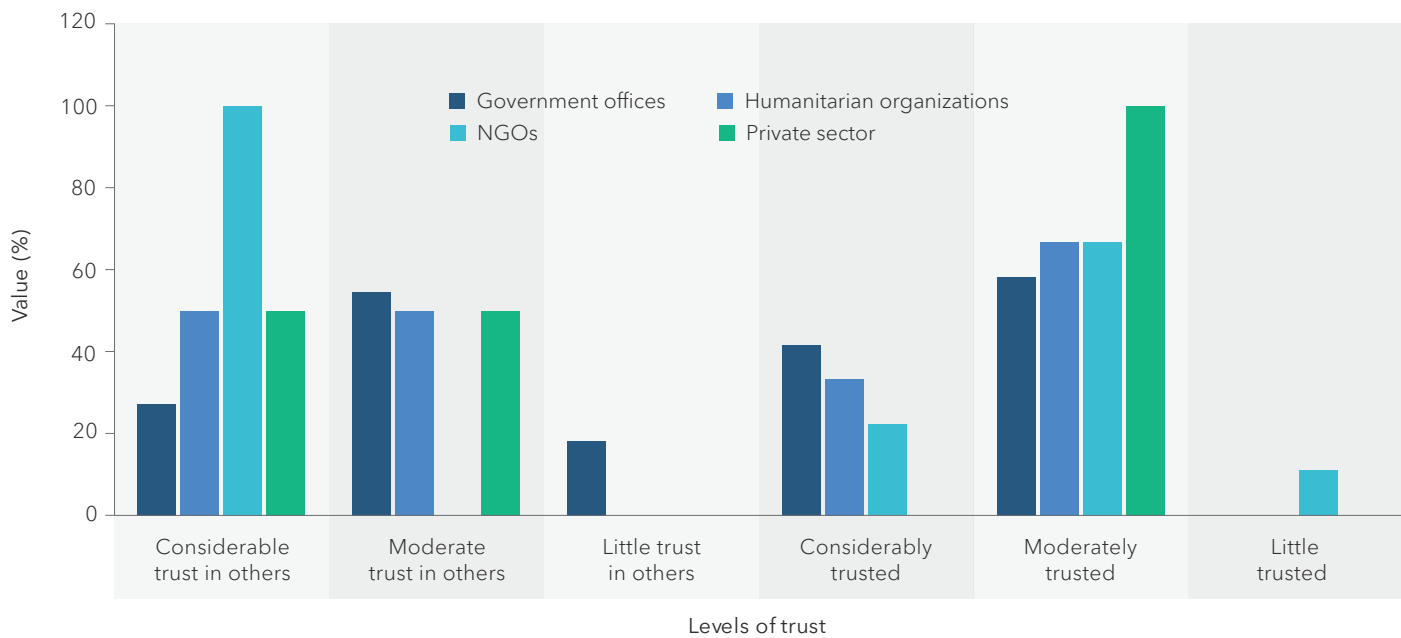
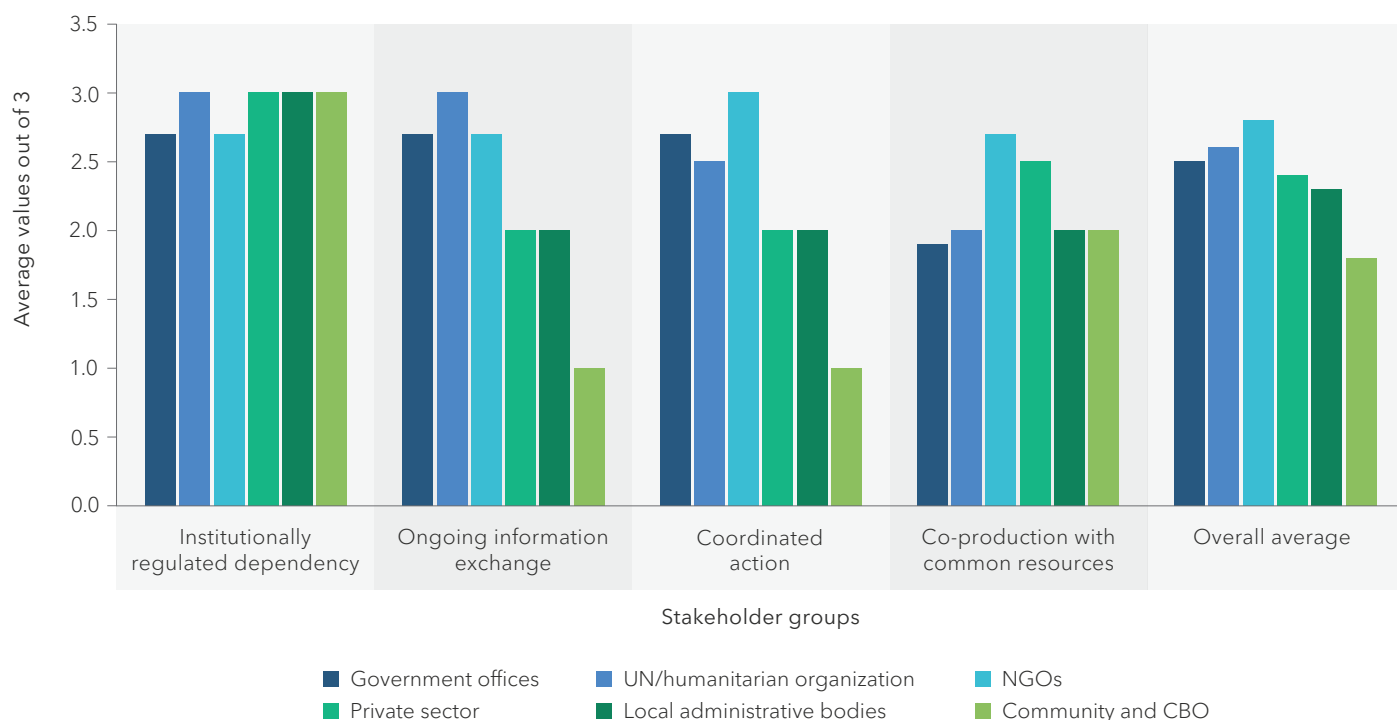


Figure 11. The level of trust among different stakeholder groups.

Source: Authors.

The low level of trust between government offices and other stakeholders can result in increased transaction costs during the planning, design and implementation stages of NbS. Our results also indicated that NGOs need to make efforts to make their interests and intentions more transparent to other stakeholders to build trust. We advocate implementing various communication strategies to improve trust levels among stakeholders. One option could be to set up a local-level platform to facilitate stakeholder communication. Local administrative bodies could take the lead in organizing such platforms as they are responsible for ensuring integration and collaboration among stakeholder groups. Trust among stakeholders partially mediates the relationship between stakeholder behavior and stakeholder management (Kabahinda and Mwesigwa 2023) and improves cooperative

intention and behavior and reduces harmful conflicts and transaction costs (de Oliveira and Rabechini 2019). These results show that there is a strong relationship among stakeholder groups in terms of institutionally regulated dependency (average value of > 2.5) (Figure 12). However, relationships among most of the stakeholder groups were not as strong in terms of ongoing information exchange, coordinated action and co-production with common resources. This could affect the successful achievement of the change objective and efficient utilization of limited resources, leading to reduced productivity. This suggests a need to strengthen collaboration and coordination among stakeholders, who suggested that this indeed was an area that needed improvement (Table 6).



**Figure 12. Alliance or relationships among stakeholder groups based on four criteria.**

Source: Authors.

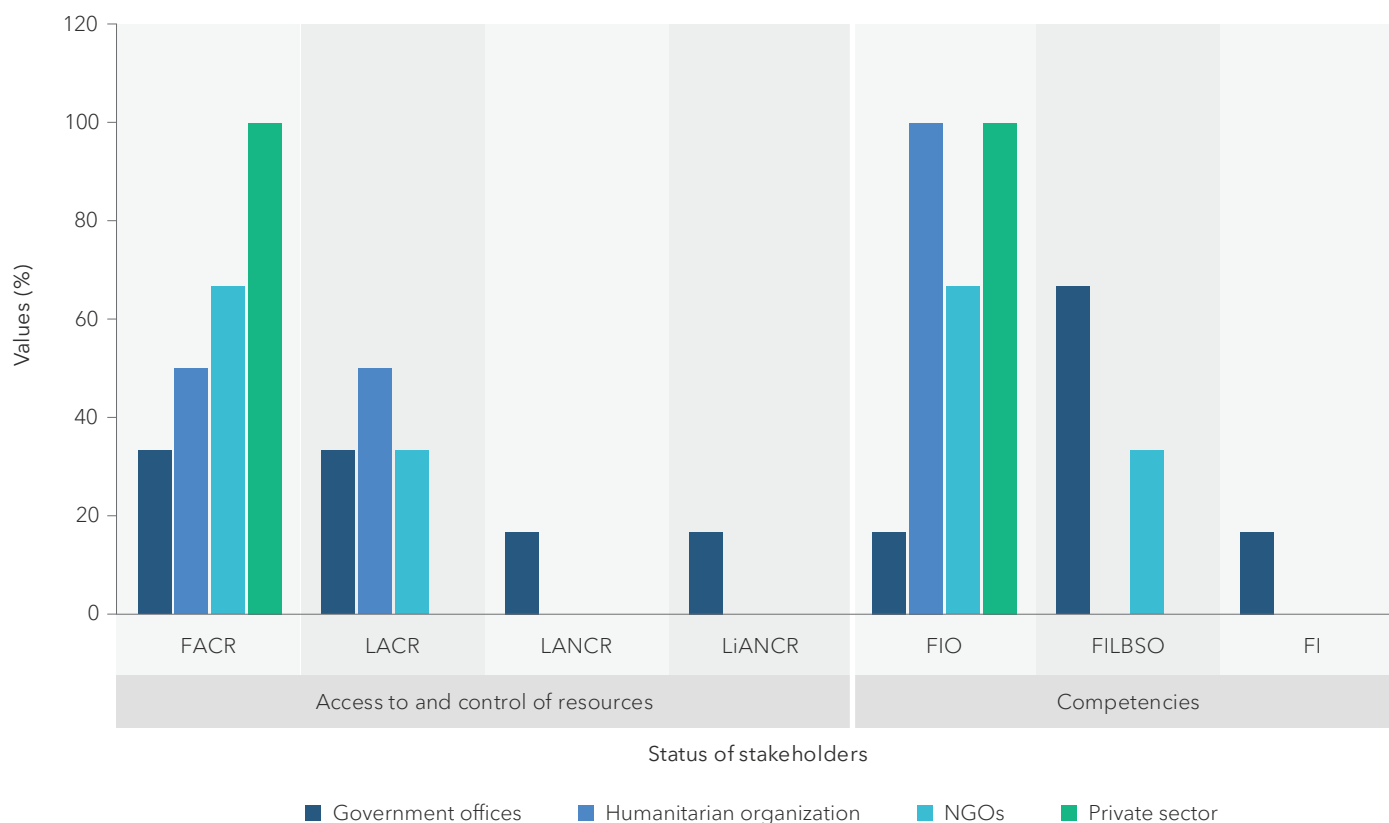
### 3.9. Exclusion and Empowerment

The study found that most of the stakeholders (67%) belonging to the government sector lack full access to and control of resources (Figure 13). Regarding competencies, the majority of government sector stakeholders (83%) lack the basic skills to plan, design and implement NbS, though they can formulate their interests. In contrast, NGOs and private sector entities fared better in terms of having full access to and control of resources. Humanitarian organizations and

private sector entities perceived that they could formulate their interests and do possess the basic skills to organize their interests. The results suggested that building local competencies and supporting local practitioners are crucial for effectively implementing the change objective. The results also suggested that empowerment measures should be based first and foremost on the capacity of actors to organize themselves toward implementation of the change objective.



Photography by Wolde Mekuria



**Figure 13. Differences in access to and control of resources and competencies among stakeholder groups.**

*Notes:* FACR = Full access to and control of resources; LACR = Limited access to and control of resources; LANCR = Limited access to but no control of resources; LiANCR = Little access to and no control of resources; FIO = Formulate interest and can organize; FILBSO = Formulate interest but lack basic skills to organize; FI = At least able to formulate interest.

*Source:* Authors.

## 4. Conclusions and Recommendations

This study conducted stakeholder analysis and mapping in the Dolo Ado and Bokolmayo districts of the Somali Regional State in Ethiopia. Addressing the vulnerability of refugees, IDPs and host communities to natural hazards such as floods and drought was the identified issue of the study. The change objective of the study was to reduce vulnerability to natural hazards through improved planning, design and implementation of NbS. Data were collected using inception workshops, reconnaissance surveys, key informant interviews and literature reviews. There have been multiple responses in the past addressing the vulnerability of refugees, IDPs and host communities to natural hazards. However, their effectiveness was constrained by low community engagement throughout the project cycle and a lack of context-specific technologies, skilled staff and sustainability of interventions.

Different stakeholder groups undertake multiple activities and make decisions during the planning, design and implementation of NbS, assess the impacts of their interventions, and use the results to inform their future decisions. The considerable interest and participation of these different stakeholder groups in the planning, design

and implementation of the change objective implies its alignment with their mandate and field of action. The presence of many similarities among stakeholder groups in respect of strategic options suggests that there is great potential for collaboration among stakeholders, which implies that organizational objectives could be better achieved through collaboration rather than competition.

However, the low level of trust between government offices and other stakeholders constrains effective collaboration and coordination among stakeholder groups. This is likely to increase transaction costs when planning, designing, and implementing NbS. The trust deficit among stakeholder groups could affect implementation of the change objective and efficient utilization of resources, thereby reducing productivity. Effective implementation of the change objective by these stakeholders is also constrained by a lack of full access to and control of resources as well as the basic skills required to plan, design and implement NbS.

The fact that the stakeholders possess similar perceived power in setting objectives, norms, and quality control and structuring the participation in decision-making processes supports

regulating or balancing the influence of powerful stakeholders on the outcomes of the participatory process for marginalized stakeholders. In line with this, differences between stakeholder groups in the degree of their influence suggest the importance of engaging all relevant stakeholders when planning, designing and implementing the change objective.

We provide the following recommendations to guide the planning, design and implementation of NbS to address the vulnerability of refugees, IDPs and host communities to natural hazards like drought and floods. The recommendations are categorized into evidence generation, capacity-building and learning, participation and engagement, coordination and coproduction, and sustainability of NbS.

## Evidence Generation

- Enhance collaboration among development, humanitarian and research organizations to generate evidence on the status and productivity of resilience programs (e.g., irrigated farms) and refugee camps that brought about changes in land use and land cover in refugee-hosting communities.

## Capacity-building and Learning

- Improve the coverage and diversity of capacity-building activities in the areas of environmental management, livelihood resilience and disaster risk management in collaboration with national and international research institutions so as to capacitate local practitioners and government offices and increase the adaptive capacity of refugees, IDPs and host communities to natural hazards.
- Support efforts by government agencies to improve basic skills of planning, design and implementation of NbS by establishing demonstration sites in refugee-hosting communities.
- Coordinate among NGOs and humanitarian organizations working in refugee-hosting communities to mobilize financial resources for capacity-building initiatives.

## Participation and Engagement

- Engage all stakeholder groups, including refugees, IDPs and host communities, throughout the project cycle through consultation, feedback and postdistribution monitoring.

## Coordination and Co-production

- Establish local platforms to facilitate communication among stakeholder groups and help them make their interests and intentions clearer to other stakeholders. Support efforts to build trust among stakeholder groups and co-production of NbS.

## Sustainability of Nature-based Solutions

- Develop context-specific technologies by generating evidence on the biophysical and socioeconomic profiles of refugees, IDPs and host communities.
- Promote integrated interventions (e.g., integrate afforestation with WASH programs).
- Pilot NbS aimed at addressing the vulnerability of refugees, IDPs and host communities prior to implementation at a larger scale.
- Support impact-oriented planning and strengthening of institutions.
- Develop exit strategies in the early stage of project initiation and implementation and empower refugees, IDPs host communities, and government offices.

Implementation of these recommendations will help in effectively addressing the vulnerability of refugees, IDPs and host communities to natural hazards by (i) facilitating evidence-based decision-making; (ii) promoting the development of context-specific solutions and ensuring effective planning, design and implementation of NbS; (iii) making stakeholders' interests and intentions clearer to other stakeholders, thereby building trust; and (iv) supporting sustainable interventions.

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