Study of Vulnerability to Climate Change from a Social Perspective

Final report

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Vital —Study of Vulnerability to Climate Change from a Social Perspective

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Summary

This document is the final report of the project "Study of vulnerability to climate change from a social perspective." In it, we summarize existing approaches and new proposals to address the issue of social vulnerability to climate change from a feminist and intersectional perspective. We do so using theoretical approaches based on scientific evidence and local knowledge, through a review of more than 200 global case studies published in scientific articles and 100 interviews with local actors associated with agroecosystems, fishing systems, and agroforestry systems.

It is structured in four sections: in the first section, we review the concept of social vulnerability as used by the Intergovernmental Panel on Climate Change (IPCC), how it is linked to gender, what the main criticisms of its use have been, and what alternatives have been proposed. In the second section, we present the main results obtained in a systematic review of existing case studies on resilience, vulnerability, and adaptation to climate change from a global gender perspective. In the third section, we apply some of the lessons learned and proposed alternatives to address vulnerability in four territories. Finally, in the last section, we will reflect collectively in science-politics-society workshops on how to change existing narratives on vulnerability and how to propose public policies that do not further vulnerable the most affected groups.

Background and theoretical framework

Social vulnerability to climate change

Vulnerability is a concept formally established in the United Nations Framework Convention on Climate Change (UNFCCC) and the IPCC. The sixth and latest report published by the IPCC[1] and also in the National Climate Change Adaptation Plan (PNACC) 2021-2020[2] defines it as "the propensity or predisposition to be negatively affected." It encompasses various concepts and elements, such as sensitivity or susceptibility to damage and the lack of capacity to cope and adapt. Climate risks thus result from the interaction between the hazards arising from climate change and the vulnerability and exposure of socio-ecological systems to these hazards (Figure 1).

[1] IPCC (2022): Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844.

[2] Ministry for Ecological Transition and Demographic Challenge (MITECO) (2020). National Plan for Adaptation to Climate Change 2021–2030. Madrid: MITECO

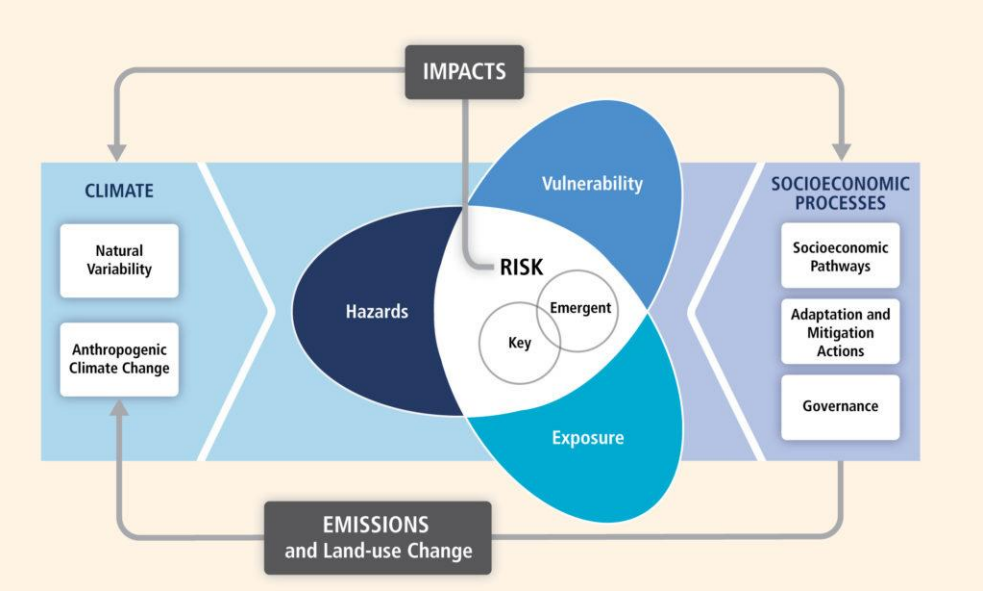

Figure 1. Representation of the components of climate risks (vulnerability, exposure, and hazard) and their drivers (changes in the climate system and socioeconomic processes). Source: PCC Fifth Assessment Report.

Research on climate change vulnerability has grown enormously in recent decades, and approaches to analyzing and assessing vulnerability have evolved. An initial emphasis on biophysical, top-down vulnerability assessment included, and often began with, exposure to climate risks in vulnerability assessment. At its core, it is a positivist concept: it is measurable, as it quantifies exposure and adaptive capacity to climate change impacts and allows for comparability between regions, geographic areas, economic sectors, and states[3] . Article 4 of the UNFCCC requires Annex II Parties to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation to those adverse effects. Therefore, it is necessary to identify vulnerability so that adaptation resources

[3] Weatherill, C. K. (2024). Resisting climate change vulnerability: feminist and decolonial insights. International Politics, 61(4), 661-682.

can be allocated to developing country Parties that are particularly vulnerable.

There are two key interventions that broaden the concept: social vulnerability and the feminist approach. The first gained relevance from the IPCC's third report[4] and shifts the focus to existing differences within social groups. It aims to repoliticize vulnerability by including the dimensions of power, class, and, to a lesser extent, racialization and gender. However, the need for indicators greatly reduces its potential. The second includes the gender dimension in assessments. It is again aimed at minority groups rather than adopting a broader understanding of gender, including indirect indicators such as "female literacy rates" and "female infant mortality rates."

From this starting point, attention has been paid to the social and contextual determinants of vulnerability, which often differ from the bottom up. In addition to this, concepts such as adaptation and resilience are central to framing analyses of socio-ecological change and the challenges of climate change and are used in both research and practice[5,6] . In this way, there has been a shift from describing and quantifying the effects of climate-related risks to understanding the links and other environmental, socioeconomic, institutional, and political stressors of climate change, as well as a focus on the agency and decision-making of

[4] IPCC (2001). Climate Change 2001: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. [J.J. McCarthy, O.F. Canziani, N.A. Leary, D.J. Dokken, K.S. White (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 1042 pp.

[5] Miller, F., Osbahr, H., Boyd, E., Thomalla, F., Bharwani, S., Ziervogel, G., ... & Nelson, D. (2010). Resilience and vulnerability: complementary or conflicting concepts?. *Ecology and Society, 15(*3).

[6] Turner Ii, B. L. (2010). Vulnerability and resilience: Coalescing or paralleling approaches for sustainability science? *Global Environmental Change, 20(*4), 570-576.

the social actors involved[7] . Vulnerability assessments are the dominant method for determining who and what is vulnerable to the negative effects of climate change. Researchers and practitioners often use assessments to measure material vulnerability in terms of imbalanced sets of assets and institutional vulnerability in relation to socially differentiated access to rights and decision-making processes.

Despite this, it has become clear that the integration of social sciences into climate change adaptation research and policy is still limited or very marginal, as in the case of feminist studies[8] . [9]As a result, there is currently less attention to structural inequalities and power relations as key factors in persistent vulnerabilities, and no response is given to the silences, gaps, and biases in addressing climate change from a feminist perspective. In the Spanish context, gender is included as a cross-cutting issue in the PNACC 2021-2030, and there is also a report on gender and climate change by the Women's Institute[10] .

One of the fundamental criticisms from critical and feminist studies is the naturalizing and essentializing effect of the discourse of vulnerability and the disempowering policies found in most of the work on climate change. "The vulnerable" becomes an object of research and a community to be identified and then

[7] Tschakert, Petra, et al. "Inequality and transformation analyses: a complementary lens for addressing vulnerability to climate change." *Climate and Development* 5.4 (2013): 340-350.

[8] MacGregor, S. (2009). A stranger silence still: The need for feminist social research on climate change. *The Sociological Review, 57*(2_suppl), 124-140.

[9] Iniesta-Arandia, I., & Ravera, F. (2025). Opening Editorial: The contested nature of climate change: Feminist and decolonial perspectives for transformative adaptation. *Environmental Science & Policy,* 104082.

[10] Instituto de la Mujer (2020). Gender and climate change. A diagnosis of the situation. https://www.inmujeres.gob.es/diseno/novedades/Informe_GeneroyCambioClimatico2020.pdf

"assisted," through a moral argument in favor of greater intervention to "solve" vulnerability. Conventional approaches to adaptation rely on vulnerability to justify external assistance to those in climate peril. Climate change ceases to be a planetary crisis and becomes a threat that one part of humanity should help another part address due to its financial (lack of funds), technological (lack of access to technology), and technical (lack of skills and knowledge) inferiority[11] . In this way, power relations are recreated in everyday practice[12] and the relationships of racial-patriarchal capitalism and colonialism are blurred. Vulnerability becomes an imaginary line that separates what and who is expected to be in danger and what and who is expected to be safe. It should be noted that this conventional approach is far from what could be understood as a more radical approach to restorative justice, in which responsibilities are shared but differentiated among all parties and, therefore, accountability must correspond to the idea of greater impact, greater responsibility, within a framework of shared responsibility at different levels, which does not nullify or render invisible the agency of all parties and what they are already doing.

Although it is a concept strategically used by climate justice advocates and states in the Global South, it has also generated resistance from academics and activists in regions considered vulnerable, such as the Pacific, long considered the charismatic icon of global climate vulnerability[13] . Counter-narratives from the

[11] Mikulewicz, M. (2020). The discursive politics of adaptation to climate change. *Annals of the American Association of Geographers, 110(*6), 1807-1830.

[12] Eriksen, S. H. (2022). Is my vulnerability so different from yours? A call for compassionate climate change research. *Progress in Human Geography, 46(*6), 1279-1297.

[13] Weatherill, C. K. (2023). Sinking paradise? Climate change vulnerability and Pacific Island extinction narratives. *Geoforum, 145,* 103566.

Pacific such as "To hell with drowning"[14] or "We're not drowning, we're fighting" do not seek to deny the magnitude of the consequences of climate change in the region, but rather to reject the passive and depoliticizing voice of "sinking island states" or "drowning islands."

Social vulnerability and gender

Similarly, feminist critics have denounced the feminization of this discourse, as vulnerability and gender are concepts that have been linked from the outset in climate policy. The identity centered on "women" as rural producers vulnerable to environmental change and crises enters climate policy as a solid and simplified concept in such a way that there is a group with a license to claim political space[15] .

Thus, claims that women, and especially women in the Global South, are more vulnerable to climate change or that women in the Global North display more pro-environmental attitudes, begin to emerge, often without any evidence to support them. For example, the claim that women are 14 times more likely to die in natural disasters, presented as a fact in several documents on natural disasters, originates from a presentation at a workshop on natural hazards held between 1994 and 1996, which was later included in a report[16] . Similarly, a section on heat stress in the

[14]https://www.theatlantic.com/culture/archive/2021/11/oceania-pacific-climate-change-stories/620570/

[15] Resurrección, Bernadette P (2013). "Persistent women and environment linkages in climate change and sustainable development agendas." *Women's Studies International Forum.* Vol. 40.

[16] Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender and climate change. Global environmental change, 21(2), 744-751.

IPCC's Fifth Assessment Report[17] notes a "generally greater physiological vulnerability in women" but does not support this with a reference, instead referring to a later section. However, this later section only presents evidence of the effect of heat stress on children and pregnant women[18] .

However, women are not inherently vulnerable, nor can they be attributed with distinctive or fixed vulnerability properties. Vulnerability makes negotiators receptive to gender issues, which makes it easier for institutions to formulate policies that address the complex factors that drive gender vulnerabilities and power relations. However, policy simplifications are unable to address the complex problems that policies must solve on the ground[19] .

The lessons learned from creating programs focused solely on women, using an imaginary special and distinct agency, is that this has often resulted in an additional burden of adapting to climate change. Similarly, transferring resources to women, based on the view that women are poor and vulnerable, does not necessarily benefit them specifically. Finally, discourses about oppressed women in the “third world” affect not only women in the global South, but also limit the possibilities for recognizing or addressing gender inequalities in the global North.

[17] IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1132 pp.

[18] Weatherill, Charlotte Kate. "Resisting climate change vulnerability: feminist and decolonial insights." *International Politics* 61.4 (2024): 661-682.

[19] Arora-Jonsson, Seema (2011). "Virtue and vulnerability: Discourses on women, gender and climate change." *Global environmental change* 21.2 : 744-751.

This is not to say that gender is not a relevant axis of analysis when addressing climate change. Gender here is not only an empirical category (i.e., men/women), but also a discursive construction that shapes social life. **Gender analysis must encompass the analysis of power relations between men and women, as well as the discursive and cultural constructions of hegemonic masculinities and femininities** that shape the way we interpret, debate, articulate, and respond to social, natural, and techno-scientific phenomena such as climate change. **Three areas in which the functioning of gender is evident** are considered**: (1) in the way climate change is framed (or "constructed"), (2) in the way climate change is experienced in everyday life, and (3) in the way states and individuals respond to the challenge** of "addressing" climate change.

New needs in climate change vulnerability research and policy

Recent feminist literature has highlighted three needs in relation to vulnerability, adaptation, and resilience to climate change:

(1) overcoming prevailing gender stereotypes in climate change impacts, policy planning, and adaptation programs, specifically the consideration of women as a vulnerable or virtuous group[20,21]

(2) understanding climate change adaptation as a sociopolitical process rather than a mere technical solution that is interwoven

[20] Ravera, F., Iniesta-Arandia, I., Martín-López, B., Pascual, U., & Bose, P. (2016). Gender perspectives in resilience, vulnerability and adaptation to global environmental change. *Ambio, 45(*Suppl 3), 235-247.

[21] Djoudi, H., Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Basnett Sijapati, B. (2016). Beyond dichotomies: Gender and intersecting inequalities in climate change studies. *Ambio, 45,* 248-262.

with gender, racialization, age, ethnicity, and other socially relevant hierarchies, as well as the functioning of power in general[22] .

(3) Overcome a dichotomy where we understand vulnerability as the opposite of resilience, where vulnerability is seen as something bad that must be reduced and resilience as something good that must be enhanced[23] . This dichotomy itself reproduces gender notions where vulnerability is associated with passivity (in need of active protection) and activity and agency with activeness[24][25][26] .

These needs point the way toward seeking alternatives to social vulnerability indicators and indices, which have been criticized for further reinforcing the static notion of vulnerability and hindering the path toward more just public policies for all citizens, as they frame, map and categorize groups, societies, or regions as inherently vulnerable to climate change without examining why people are vulnerable and what mechanisms create and maintain our vulnerability.

Methodologically, feminist approaches propose **a situated and bottom-up view**, that is, understanding the nature of vulnerability, people's experiences with changing conditions, and decision-making processes, ideally **through participatory approaches**

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[22] Eriksen, S. H., Nightingale, A. J., & Eakin, H. (2015). Reframing adaptation: The political nature of climate change adaptation. *Global environmental change, 35,* 523-533.

[23] Tschakert, P., & Tuana, N. (2013). Situated resilience: Reframing vulnerability and security in the context of climate change. *transformation,* 3*(*4), 75-96.

[24] Butler, J. (2016). Rethinking vulnerability and resistance. *Vulnerability in resistance,* 12-27.

[25] González-Hidalgo, M. (2023). Affected by and affecting forest fires in Sweden and Spain: A critical feminist analysis of vulnerability to fire. *Sociologia Ruralis, 63(*3), 729-750.

[26] Weatherill, C. K. (2025). Colonial fantasies of invulnerability to climate change. *International Feminist Journal of Politics, 27(*1), 34-55.

that involve the vulnerable populations themselves. To understand the nature of vulnerability, a relational perspective is also proposed, through the prism of socio-political and institutional barriers, asking **what specific provisions prevent certain poor, marginalized, and vulnerable populations from effectively exercising their adaptive capacities and preparing for and responding to** climate and other **disturbances** and stressors.

That is why this project proposes **to address climate vulnerability from a feminist, participatory, and transdisciplinary perspective in order to redefine the concept of social climate vulnerability, allowing us to address the future impacts of climate change as well as the diversity of adaptive capacities.**

Justification and objectives of the project

This project arises from the need to address current scientific and political approaches to climate change adaptation from a gender and feminist perspective. In this way, the project reflects the cross-cutting nature of the gender approach of the current PNACC 2021-2030, broadening the gender perspective to an intersectional perspective (taking into account variables such as race, age, origin, etc.) and applies it to the fields of agriculture, livestock, fishing, and food, as well as forestry, through four case studies (one on fishing, one on livestock, one on agriculture, and one on forest management) in Spain.

In this way, the overall objective of VITAL is to generate scientific evidence on vulnerability and adaptive capacity to climate change from a gender and feminist perspective in agri-food and agroforestry systems at different spatial scales. Within this overall objective, we propose three specific objectives:

(1) Identify the key factors that determine climate vulnerability at the global level from an intersectional gender and feminist analysis.
(2) Identify and characterize perceptions of vulnerability, drivers of change, and adaptive capacity in four case studies from the agri-food and agroforestry sector (livestock, fishing, agriculture, and forest management in four autonomous communities in Spain) from a gender and feminist perspective.

(3) Provide a definition and criteria for social climate vulnerability from a gender and feminist perspective in the Spanish context.

General methodology and structure

The project was developed using mixed methodologies: qualitative, quantitative, and participatory.

A methodology was proposed for each objective (Figure 2). Each objective and methodology fed into the next one with its results. Figure 2 shows the scale at which each methodology and objective was developed, as well as the questions that each phase fed into the next one.

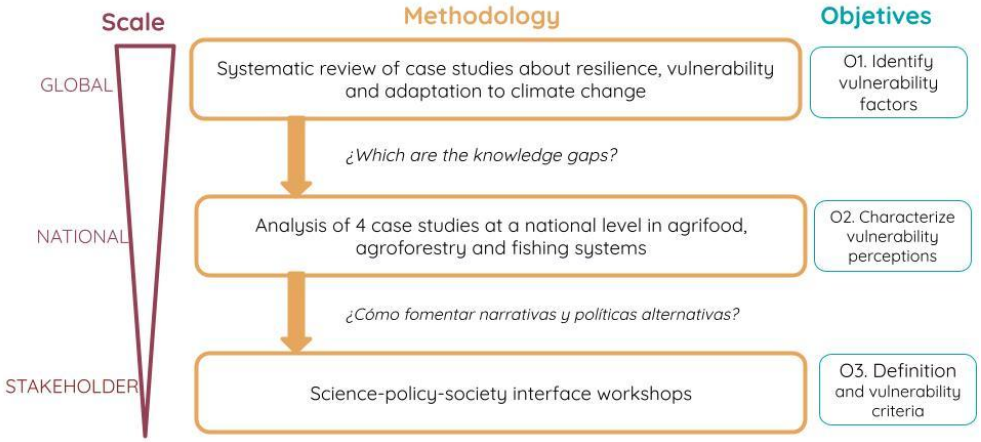


Figure 2. Outline of the phases of the VITAL project, showing the different objectives, methodologies followed, and the scale at which they took place.

For the first objective of identifying key vulnerability factors at the global level, a systematic review of more than 200 global case studies published in scientific articles on resilience, vulnerability,

adaptation, and gender was carried out. The articles were identified in scientific literature search engines using keywords.

For the second objective of identifying and characterizing perceptions of vulnerability, adaptive capacity, and drivers of change, 84 interviews and 4 focus groups were conducted in a total of 4 case studies. During the course of the project, we collaborated with the SUSTAIN project (Leading Sustainability Transitions in Rural Spain), which added a fifth case with 16 interviews.

Finally, to achieve the third objective of providing a definition and criteria for vulnerability, two participatory science-policy-society workshops were held. These involved the participation of social actors from the scientific, institutional, and organized civil society spheres.

The structure of the report therefore follows the three specific objectives and methodologies outlined above.

Global mapping with a gender perspective on research into vulnerability, gender, and climate change

Introduction

In 2010, feminist sociologist Sherilyn MacGregor[27] highlighted that the limited research available on gender and climate change has been carried out within the "gender, environment and development"[28] mainstream and by feminist researchers working for the UN, government ministries, and women's environmental organizations. She highlights that there is a predominance of studies on development and climate change in the global South, while it is the countries of the North, with their large carbon footprints, that are responsible for global warming. Similarly, in 2011 Seema Arora Jonsson[29] and in 2013 Bernardette Resurrección[30] conducted theoretical reviews on gender and climate change, suggesting that, despite criticism, the discourse

[27] MacGregor, S. (2010). 'Gender and climate change': from impacts to discourses. *Journal of the Indian Ocean Region,* 6*(*2), 223-238.

[28] Gender, environment, and development, or women, environment, and development, GED and WED for short, is the name given to a strand of ecofeminism that establishes natural connections between women and environmental resources, arguing that women are more affected by environmental degradation due to a gender-based division of labor that is a priori and largely universal (Resurrección 2013).

[29] Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender, and climate change. *Global environmental change, 21(*2), 744-751.

[30] Resurrección, B. P. (2013, September). Persistent women and environment linkages in climate change and sustainable development agendas. In *Women's Studies International Forum* (Vol. 40, pp. 33-43). Pergamon.

that women are intrinsically closer to nature, are most affected by environmental degradation, and possess special knowledge of natural resource systems, which since the 1980s has influenced development policy circles and intervention programs worldwide, continues to have a strong influence on current debates on climate change. They warn of the potential risk of this discourse shifting the burden of environmental care to women while exempting men from responsibility.

In 2016, Houria Djoudi and colleagues[31] conducted the first review of case studies analyzing 41 cases of climate change adaptation from a gender perspective. In this study, they highlight how evidence on gender vulnerability at the local level is very limited and much of the knowledge is based on surveys of households headed by women and men, which indicate that households headed by women are more vulnerable than those headed by men. However, most of the characteristics relevant to the vulnerability of these households are not independent but related, such as education and gender. However, they also find that in other studies, the conclusions are not so clear and suggest that, although women and men have different assets and face different contextual constraints, it is not useful to summarize these differences as a simple comparison of the vulnerability of men and women, due to the multiple dimensions of vulnerability and the diversity of contexts. Ultimately, they conclude that it is difficult to make general comparisons, especially in the absence of a gender framework or contextual power analysis.

Today, almost 10 years after this last review, we want to update and expand it in order to make a new diagnosis of the state and

[31] Djoudi, H., Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Basnett Sijapati, B. (2016). Beyond dichotomies: Gender and intersecting inequalities in climate change studies. *Ambio, 45(*Suppl 3), 248-262.

evolution of studies on resilience, adaptation, and resilience from a gender perspective. We first conducted a literature review because it helps consolidate existing knowledge to support and facilitate the development of new knowledge for a specific field. Literature reviews play a facilitating role for future studies by (1) presenting an overview of the knowledge and main research trends in an area, (2) highlighting important gaps where there is conflicting knowledge, emerging areas, and under-explored areas, and (3) suggesting theoretical, contextual, and methodological opportunities and solutions as ways forward for the knowledge area[32] .

In addition, we want to use three approaches to develop an agenda for future research: (1) theoretical, where we propose potentially valuable but under-explored or unexplored concepts, (2) contextual, where we highlight complex and underrepresented contexts that deserve attention, and (3) methodological, where we make suggestions for research design, data, or analytical techniques that can be used.

Design and methodology

We conducted a search in ISI Web of Knowledge using the terms "wom*" OR "gender*" OR "feminis*" OR "feminiz*" OR "female" AND "resilien*" OR "adapt*" OR "vulnerab* AND "climate change" OR "global environmental change" OR "land use change" OR "pollution" OR "overexploitation" OR "invasive species." A total of 2,235 documents were collected, which were reduced to 240 after reading the abstract or the full article according to the following

[32] Lim, Weng Marc, Satish Kumar, and Faizan Ali. "Advancing knowledge through literature reviews: 'what', 'why', and 'how to contribute'." *The Service Industries Journal* 42.7-8 (2022): 481-513.

exclusion criteria: i) they were case studies and not theoretical studies; ii) the case studies were related to human communities; iii) gender was not solely a quantitative variable that was not discussed in the articles; and iv) the studies had a socio-ecological context.

To collect the data, a matrix with eight sections was designed to collect data from each article regarding: (1) characteristics of the article's authorship, (2) conceptual framework of resilience, vulnerability, or adaptation used, (3) geographical location and characteristics of the case study, (4) drivers of change analyzed, (5) methodology used, (6) gender framework used, (7) gender dimensions analyzed, and (8) adaptations described and whether they are mediated by gender. The sections on the characteristics of the case studies and variables related to the gender dimensions analyzed in the matrix emerged from a qualitative analysis of the documents.

A quantitative and qualitative analysis of the data was carried out to characterize the articles collected.

Results and discussion

Temporal, geographical, and territorial distribution

The temporal distribution of the case studies analyzed in this review shows a clear upward pattern (Figure 3), as the period 2020-2024 is not complete because this project began in 2023 and studies take an average of six months from publication to

indexing in the Web of Science. The number of studies has risen exponentially since the 2016 review by Houria Djoudi et al.[33] .

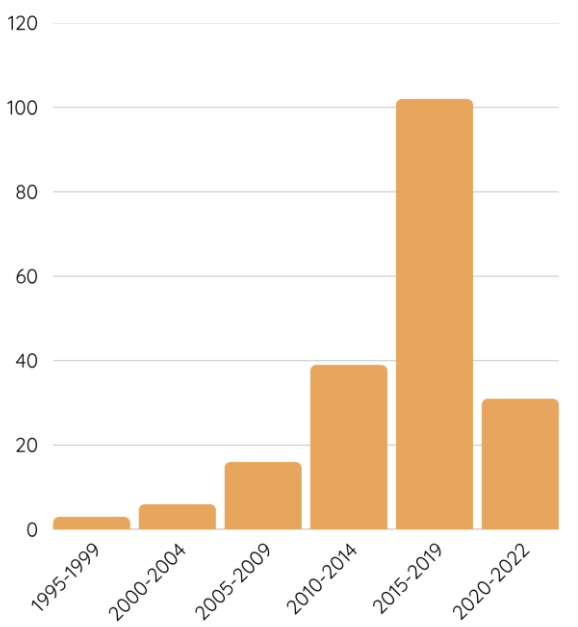


Figure 3. Temporal distribution of the number of studies included in the review.

In terms of spatial distribution, the review shows a very uneven distribution across different regions of the world. Almost half of the studies (48%) are located in Africa, followed by 35.5% in Asia, around 10% in the Americas, and less than 5% in Europe and Oceania (Figure 4A), with the majority in rural settings (around 78%). Our results are consistent with other studies, such as the recent review of the effects of climate policies on gender

[33] Djoudi, H., Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Basnett Sijapati, B. (2016). Beyond dichotomies: Gender and intersecting inequalities in climate change studies. *Ambio, 45(*Suppl 3), 248-262.

inequalities[34] , which found that only 12% of studies focused on high-income countries, while 60% of the literature reviewed focused on low- or lower-middle-income countries.

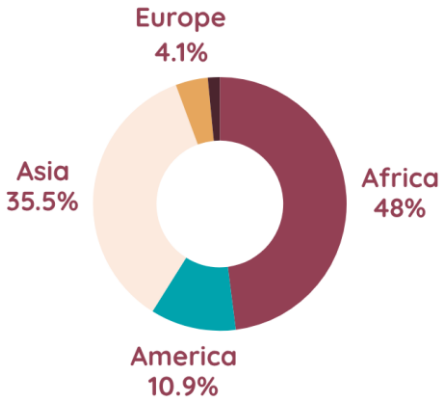


Figure 4. Distribution of studies by continent.

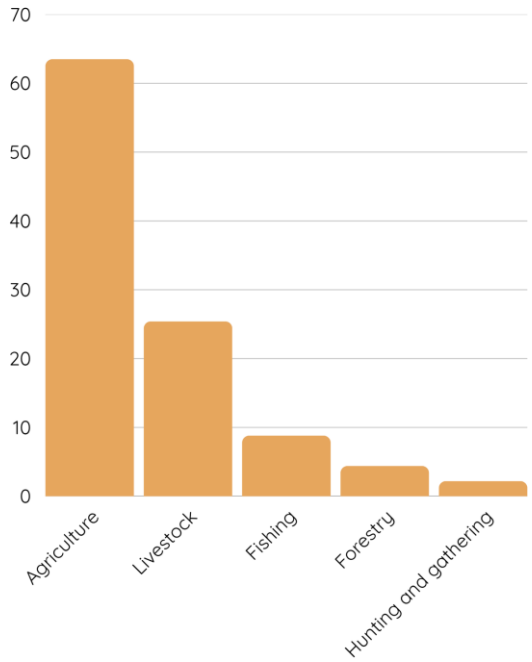
We found two general explanations for this uneven distribution. First, the literature on gender and climate change continues to be linked to development studies. Second, it coincides with what has been called the "colonial imagination," which positions women as vulnerable and poor "in the Western gaze" and attributes their status almost exclusively to local patriarchal practices and norms, ignoring other causes of oppression, such as capitalist accumulation and resource extraction by global corporate actors, local elites, and states[35(,)36(,)37] . In this regard, it is worth mentioning that new studies show how countries that we consider progressive

[34] Alonso-Epelde, E., García-Muros, X., & González-Eguino, M. (2024). Climate action from a gender perspective: A systematic review of the impact of climate policies on inequality. *Energy Research & Social Science, 112,* 103511.

[35] Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender and climate change. *Global environmental change, 21*(2), 744-751.
[36] Resurrección, B. P. (2024). Colonial erasures in gender and climate change solutions. *Wiley Interdisciplinary Reviews: Climate Change, 15*(5), e890.
[37] Weatherill, C. K. (2024). Resisting climate change vulnerability: feminist and decolonial insights. *International Politics, 61*(4), 661-682.

in terms of macroeconomic indicators of gender policy also show gender inequalities in other contexts, as has recently been highlighted in the forestry sector[38] and in climate change policies[39] in countries such as Sweden.

As for the most studied socio-ecological contexts, the review shows that agricultural practices are by far the most studied (more than 60% of studies, Figure 5), leaving activities such as fishing, forest management, and hunting and gathering in anecdotal numbers.



[38] Ville, A., Wong, G., Aceituno, A. J., Downing, A., Karambiri, M., & Brockhaus, M. (2023). What is the 'problem' of gender inequality represented to be in the Swedish forest sector? *Environmental Science & Policy, 140,* 46-55.

[39] Arora-Jonsson, S., & Wahlström, N. (2023). Unraveling the production of ignorance in climate policymaking: The imperative of a decolonial feminist intervention for transformation. *Environmental Science & Policy, 149,* 103564.

Figure 5. Percentage of studies analyzing agricultural, livestock, fishing, forestry, or hunting and gathering practices.

Conceptual frameworks of the studies

We found that most of the case studies with a gender perspective had an adaptation framework (40% of the studies analyzed), followed by vulnerability (23%) or the interaction of both perspectives (23%) and, finally, resilience (5%) (Figure 6).

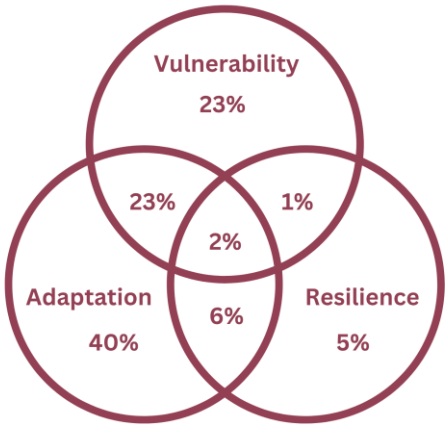


Figure 6. Percentage of studies on adaptation, vulnerability, and resilience with a gender perspective.

Although these three concepts and frameworks—resilience, vulnerability, and adaptation—are closely linked and recognized by the IPCC's sixth report[40] as "alternative, overlapping, and

[40] IPCC (2022): Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844.

complementary entry points that are widely used" in the climate change literature, a certain division persists between them, mainly due to conceptual constructs, scientific traditions, and a lack of interaction between the academic communities involved [41][42] . In fact, although there are significant advances in the literature on resilience and much greater engagement and reflection on the social dimensions of socioecological systems, the most frequent criticism of this framework is that there is still relatively little analysis of the role of human actors and agency; the interaction between diverse frameworks, discourses, and values; and issues of power, politics, social difference, and conflict in driving change and shaping complexity in coupled socioecological systems[43][44][45] .

Regarding how power relations, gender, and feminist frameworks are integrated, our review shows that a very low percentage (20%) of studies analyze power relations, and even fewer articles base their analysis on feminist theory (feminist political ecology, feminist science studies, poststructuralist feminism, critical feminist political economy) (Figure 7).

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[41] Turner Ii, B. L. (2010). Vulnerability and resilience: Coalescing or paralleling approaches for sustainability science?. *Global Environmental Change, 20*(4), 570-576.

[42] Miller, F., Osbahr, H., Boyd, E., Thomalla, F., Bharwani, S., Ziervogel, G., ... & Nelson, D. (2010). Resilience and vulnerability: complementary or conflicting concepts? *Ecology and Society, 15*(3).

[43] Beymer-Farris, B. A., Bassett, T. J., & Bryceson, I. (2010). Promises and pitfalls of adaptive management in resilience thinking: the lens of political ecology. In *Resilience and the cultural landscape: understanding and managing change in human-shaped environments* (pp. 283-300). Cambridge University Press.

[44] Stone-Jovicich, S. (2015). Probing the interfaces between the social sciences and social-ecological resilience: insights from integrative and hybrid perspectives in the social sciences. *Ecology and Society, 20*(2).

[45] Fabinyi, M., Evans, L., & Foale, S. J. (2014). Social-ecological systems, social diversity, and power: insights from anthropology and political ecology. *Ecology and society, 19*(4).

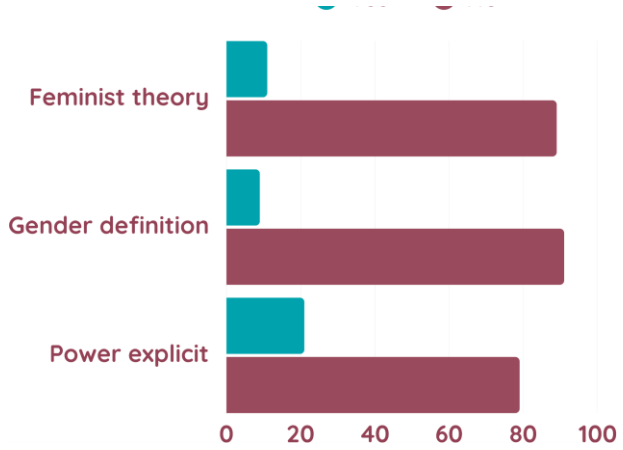


Figure 7. Percentage of studies that analyze power relations, define gender, or are based on feminist theory.

Our results are consistent with two recent reviews at the socio-environmental and gender interface. In the first systematic review of the existing literature on the impacts of climate policies on inequality from a gender perspective[46] , the authors find that 41% of the articles analyzed mention or recognize, implicitly or explicitly, the existence of power relations that place women at a disadvantage compared to men, but that none delve into the causes and consequences of gender inequality and that 48% have a low degree of gender mainstreaming. Another recent review of biocultural approaches to transformative adaptation[47] indicates that gender considerations in biocultural approaches are not based on feminist and gender theories.

Gender is a multidimensional construct that refers to the cultural, social, and psychological factors that shape people's experience

[46] Alonso-Epelde, E., García-Muros, X., & González-Eguino, M. (2024). Climate action from a gender perspective: A systematic review of the impact of climate policies on inequality. *Energy Research & Social Science, 112,* 103511.

[47] Díaz-Reviriego, I., Torralba, M., Vizuete, B., Ortiz-Przychodzka, S., Pearson, J., Heindorf, C., ... & Oteros-Rozas, E. (2024). Disentangling gender and social difference for just and transformative biocultural approaches. *People and Nature,* 6(4), 1394-1406.

and functioning in society, including relationships and power, roles and norms, and gender identities and expression[48] . The set of social roles and behaviors that are understood as expressions of gender within a particular society or community would be masculinities-femininities, and these are not fixed but are continually configured, recalibrated, and appropriated in specific contexts and, therefore, can also be contested[49] .

If we look at the dimensions of gender analyzed in the literature on vulnerability, adaptation, and resilience to climate change (Figure 8), gender roles, adaptations, and impacts are the most analyzed (in more than half of the studies), while the political dimensions of how policies and norms influence these are much less analyzed. In other words, **studies focus on how adaptations or vulnerability differ and are different in terms of gender impact, but do not place as much emphasis on how these roles, adaptations, and impacts have been influenced or can be modified by adaptation policies themselves.** A case study in the Gujarat region of India illustrates this well, where the prevailing institutional policy, which has supported buffalo or cattle dairy products over sheep or goat milk, has led to female pastoralists facing heavy workloads in caring for large numbers of livestock[50] .

[48] Barr, E., Popkin, R., Roodzant, E., Jaworski, B., & Temkin, S. M. (2024). Gender as a social and structural variable: research perspectives from the National Institutes of Health (NIH). *Translational Behavioral Medicine, 14(*1), 13-22.

[49] Brewis, A., DuBois, L. Z., Wutich, A., Adams, E. A., Dickin, S., Elliott, S. J., ... & Korzenevica, M. (2024). Gender identities, water insecurity, and risk: Re-theorizing the connections for a gender-inclusive toolkit for water insecurity research. *Wiley Interdisciplinary Reviews: Water, 11(*2), e1685.

[50] Venkatasubramanian, K., & Ramnarain, S. (2018). Gender and adaptation to climate change: Perspectives from a pastoral community in Gujarat, India. *Development and Change, 49(*6), 1580-1604.

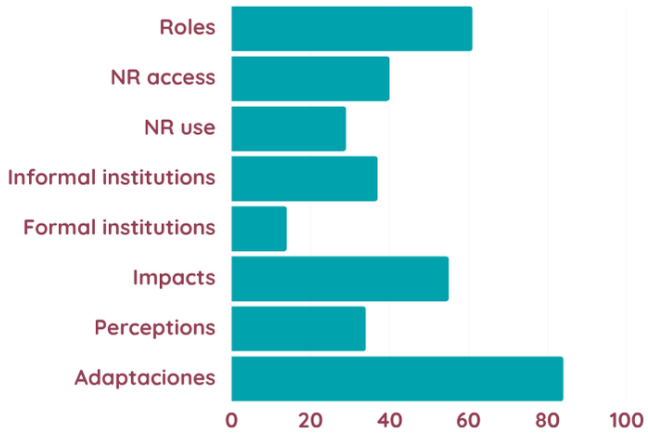


Figure 8. Gender dimensions analyzed in the literature on vulnerability, resilience, and adaptation to climate change.

Another consequence of studies not using feminist theory is that **they fail to deconstruct or question normative binary gender categories**[51] . Within feminist political ecology, it has been proposed to approach power relations from the theory of intersectionality[52] , which recognizes complex, horizontal (intercommunity) and vertical (national, regional, local) interactions and proposes a nuanced analysis of power relations. In Box 1, we illustrate with a case study from northern Mali how the intersectionality approach can visualize vulnerability and adaptation from a dynamic perspective that does not fix social groups according to their characteristics alone and challenges the binary categories of "men" and "women."

[51] Djoudi, H., Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Basnett Sijapati, B. (2016). Beyond dichotomies: Gender and intersecting inequalities in climate change studies. *Ambio, 45*(Suppl 3), 248-262.

[52] Mollett, S. (2017). Gender's critical edge: Feminist political ecology, postcolonial intersectionality, and the coupling of race and gender. In *Routledge handbook of gender and environment* (pp. 146-158). Routledge.

Box 1. Lessons on intersectionality in northern Mali

In 2008, Houria Djoudi and María Brockhaus conducted a case study in the Lake Faguibine area of northern Mali, where socio-environmental and political conditions have changed dramatically over the last three decades. With the drying up of Lake Faguibine, women have developed their own adaptation strategies based on new forest resources that have emerged in the former lake area, such as charcoal production.

The study observes that women from the former Iklan social class (lowest class) have greater capacity to diversify their livelihoods than Illelan women (highest class), as cultural and social barriers prevent women from Illelan communities from producing charcoal because this activity is perceived as "beneath them." Illelan women also experience greater restrictions on mobility and isolation than Iklan women.

The study concludes that adaptive capacity is not only determined by wealth, but also by the ability to take advantage of opportunities for livelihood diversification, and that this is limited by gender restrictions, norms and rules of labor division, and self-perceptions of class and ethnic groups. The authors show how vulnerability to climate change is dynamic and can change with social, ecological, economic, or political changes, and that linear assumptions and conclusions, such as that higher socioeconomic classes have more assets and therefore greater adaptive capacity, need to be reconsidered.

Djoudi, Houria, and Maria Brockhaus. "Is adaptation to climate change gender neutral? Lessons from communities dependent on livestock and forests in northern Mali." *International Forestry Review* 13.2 (2011): 123-135.

Furthermore, the literature on climate change adaptation, vulnerability, and resilience makes almost no reference to how masculinities influence, are modified, or are reaffirmed in this context. One of the few cases where this is the focus is discussed in Box 2.

Box 2. Rural masculinities and climate change adaptation in a case study from Nicaragua

This case study focuses on a climate change adaptation project implemented by an NGO in rural Nicaragua which, in line with the Nicaraguan government's 2013 climate change adaptation strategy, encouraged cattle ranchers to switch to cocoa production as a way of adapting to shorter rainy seasons and mitigating climate change by preventing deforestation.

The research showed that the men involved in the project did not give prominence to cocoa either on their farms or in the time they devoted to its production, not only because livestock farming still generated higher economic returns than cocoa production, but also because of the social status that livestock farming confers on men in the Nicaraguan social imagination. In this sense, the project challenged traditional gender roles by removing symbolic masculine power from men by encouraging them to produce cacao instead of livestock.

Gonda, Noémi. (2017):. "Rural Masculinities in Tension: Barriers to Climate Change Adaptation in Nicaragua." *RCC Perspectives*, no. 4: 69–76. https://www.jstor.org/stable/26241457.

Finally, as in other contexts such as the literature on water insecurity[53] , the climate change literature assumes binary cisgender and heterosexual identities and experiences. It does not consider or collect data on the lived gender experience of those whose gender expression, experiences, bodies, or identities fall outside these categories.

[53] Brewis, A., DuBois, L. Z., Wutich, A., Adams, E. A., Dickin, S., Elliott, S. J., ... & Korzenevica, M. (2024). Gender identities, water insecurity, and risk: Re-theorizing the connections for a gender-inclusive toolkit for water insecurity research. *Wiley Interdisciplinary Reviews: Water, 11*(2), e1685.

Box 3. Intersectional inequalities and adaptation to urban heat.

In a study conducted in two case studies in India and Australia, Tshackert and colleagues interviewed populations at risk from heat waves to see: 1) the dimensions of inequality that contribute to heat distress, 2) the intersectional dynamics in key groups, and 3) the lived experiences of the coexistence of privilege and deprivation.

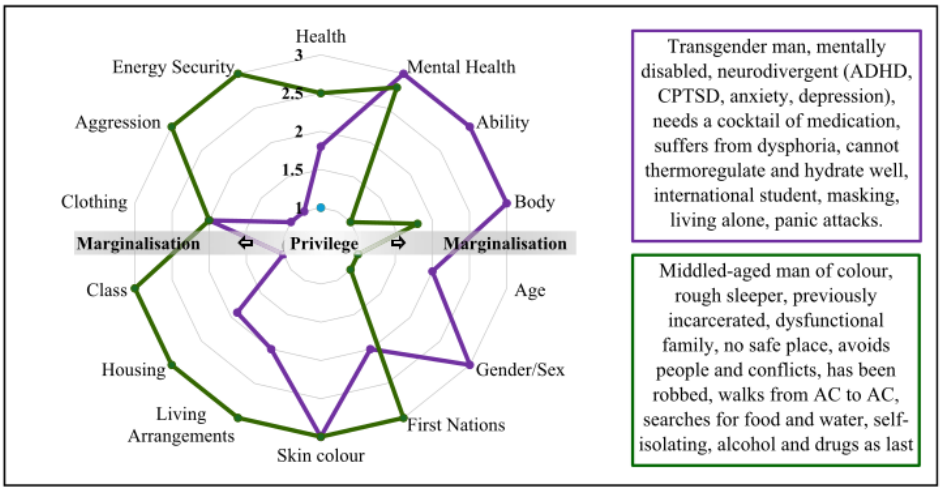


Figure showing characteristics related to power and marginalization.

Their study reveals several populations and situations that are not identified as vulnerable in official documents or academic literature. They also observe substantial heat distress in the middle category (some disadvantages/some power) in both locations. It also shows that the greater the cumulative marginalization and the less power (nodes in the outer rings of the figure, greater risk).

Their approach attempts to problematize the heat action plans of both cities, which are based on broad categories of vulnerable groups from a health perspective (e.g., children, the elderly, pregnant and lactating women, people with physical disabilities or cardiovascular and respiratory diseases) and divert attention from structural inequalities such as exclusionary planning patterns, unequal access to cooling services, and multidimensional discrimination that promote unequal risk. They also show how unequal capacity for action and resilience are not limited to Global South contexts but

also materialize, for example, among minority populations in colonial nations such as Australia.

Tschakert, P., Ogra, A., Sharma, U., Karthikeyan, K., Singh, A., & Bhowmik, A. (2025). Intersecting inequalities and urban heat adaptation. *Global Environmental Change*, *92*, 103003.

Conclusions

We see a clear increase in studies on resilience, adaptation, and vulnerability to climate change with a gender perspective, although the spatial distribution shows us that there is great inequality between studies conducted in the Global North and South. Therefore, although the number of studies has increased since Houria Djoudi's 2016 review, Sherilyn MacGregor's 2010 observation[54] of the near absence of studies in the Northern countries with the largest carbon footprints[55] remains prevalent, although recent studies such as the one shown in Box 3 are beginning to show this. As MacGregor points out, little research has been done on how gender division of labor will influence people's experiences of climate change in Global North societies, although there will be gender-differentiated implications for both formal employment and paid and unpaid reproductive work (e.g., the increase in the amount of care required by people affected by climate change).

Regarding the key vulnerability factors we raise in our objective, our review shows that aspects such as unequal access to

[54] MacGregor, S. (2010). 'Gender and climate change': from impacts to discourses. *Journal of the Indian Ocean Region,* 6*(*2), 223-238.

[55] Djoudi, H., Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Basnett Sijapati, B. (2016). Beyond dichotomies: Gender and intersecting inequalities in climate change studies. *Ambio, 45(*Suppl 3), 248-262.

resources, social norms, adaptation policies, gender roles, and unequal impacts are key to social vulnerability to climate change, although gender intersects with other aspects such as racialization, age, or class, and very few studies delve into how these characteristics intersect. We can also observe that the focus of studies in general is more on gender roles, the impacts of climate change, and different adaptations than on how these are affected by policies, except in those studies that are clearly anchored in feminist theories, such as feminist political ecology, which are in the minority.

Finally, the review shows us where there are gaps both in the context of the studies, most of which are agricultural, leaving forestry, fishing, hunting, gathering, and livestock contexts largely unexplored, and in the theoretical anchoring of the studies, with very few studies exploring masculinities, the intersection of gender with other aspects of social differentiation, and the political dimensions of vulnerability. Therefore, these case studies show the importance of understanding the gender and feminist perspective in all its complexity, adding intersectionality, and not from a simplistic or oversimplified perspective, which can ultimately even hinder adaptation measures.

How do we perceive the symptoms of climate change? Four case studies of food and agroforestry systems

Introduction

In this part of the project, we decided to explore some of the gaps revealed by the global systematic review on vulnerability, resilience, and adaptation to climate change: the contexts of the Global North, contexts beyond agricultural practices, and doing so from an anchoring in a concept of intersectional feminist social vulnerability.

To study perceptions of social vulnerability, adaptation, and drivers of change, we chose to conduct case studies. Case studies offer analytical, rather than statistical, generalization and, in this case, help us shed light on and highlight certain categories of vulnerability, explaining how they arise. This is crucial to understanding the phenomenon of vulnerability and adaptation itself and to helping define vulnerable communities[56] . In other

[56] We use the word "vulnerabilized" here to highlight the social process behind a group being considered vulnerable and to avoid criticism of the concept we present in the first section. In other words, vulnerability is socially constructed through processes of power loss or marginalization, not through a "natural" characteristic of a group. In the last section, we discuss how using the term "vulnerabilized" can be one of the alternative narratives for talking about vulnerability.

words, we aim to contribute relevant knowledge for both theory and practice. Regarding the dimensions of vulnerability we analyze, we use the definition of "lived experiences of social disadvantage that are individually, relationally, and structurally constituted, connected by agency, and take shape over time"[57] and located within a broader context, which is the "human condition of being affected"[58] . This definition, on the one hand, indicates the individual, relational, and structural aspects and also conceives vulnerability not as something opposed to agency or people's ability to adapt and take action, understanding also that vulnerability is inherent to the human condition, although it is unevenly distributed.

Despite the recognition of the need for quantitative and qualitative methods[59] to study interactions between humans and the environment, qualitative methods still play an underestimated role in climate change research[60] . One of the advantages of qualitative methods is that they can better capture the contradictions that interviewees may display, reflecting the tensions that people struggle with in their lives. This seems particularly relevant in our case, where we want to approach vulnerability in a way that is not exclusive to adaptation, allowing us to collect seemingly contradictory experiences as expressions

[57] Brown, K. (2024). Vulnerability and social control at the margins: A contribution to an interdisciplinary trialogue on vulnerability. Human studies, 47(2), 287-306.

[58] Gilson, E. (2024). Toward a pluralist approach to vulnerability: A contribution to an interdisciplinary trialogue on vulnerability. Human Studies, 47(2), 261-273

[59] Quantitative methods would include surveys or modeling, while qualitative methods consist of interviews, focus groups, workshops, among others.

[60] Bercht, A. L. (2021). How qualitative approaches matter in climate and ocean change research: Uncovering contradictions about climate concern. *Global Environmental Change, 70,* 102326.

of vulnerability and, at the same time, experiences of agency or adaptive capacity.

Design and methodology

Cases were selected according to several criteria: (1) territorial vulnerability to climate change, (2) long-term research in the areas, and (3) collaboration with other projects.

With regard to territorial vulnerability, we chose Galicia as one of the areas with the highest incidence of forest fires in Europe; Almería as an arid climate area at risk of desertification and with the largest organic almond-growing region in Europe; the Barcelona coast as representative of the vulnerability of Mediterranean fisheries in a context of touristification; and the Catalan Pyrenees as a high mountain area clearly vulnerable to snow cover variability and temperature changes.

With regard to the duration of the research, given that the VITAL project will last less than two years, we wanted its results to feed into future research and also to establish a minimum level of trust in the area, so that good relations between researchers and local actors are maintained.

With regard to collaboration with other active projects, VITAL has actively collaborated with the RERURP project (REsistencias RURales: crisis socio-ecológica, desarrollo territorial y futuros alternativos en los Pirineos) co-led by the UdG, with the SUSTAIN project (Leading Sustainability Transitions in Rural Spain), led by ICTA-UAB, and the project "Learning from forest fires: Analysing unequal impacts, well-being and local knowledge and action," a mobility grant funded by the Swedish Research Council for Environment FORMAS, at the Swedish University of Agricultural

Sciences (SLU). It was decided to conduct a minimum of 20 interviews per case study and then four focus groups, one in each territory, in order to validate, triangulate, and delve deeper into relevant issues that had emerged in the qualitative interviews. The groups had a minimum of three people and a maximum of five, and lasted a minimum of one hour and a maximum of two and a half hours. In livestock farming, the group focused on young female shepherds, who had been identified as the most vulnerable because they do not own land and are just starting out. In fishing, the aim was to gain a better understanding of perceptions of climate change, as this was the only case among all those studied where we found accounts that denied climate change. In agriculture, the focus was on identifying strategies to prevent greater vulnerability, as the stories revealed frustration at the inability to influence the territory. In forest management, the focus was on gaining a better understanding of the impacts of fires. In addition, in collaboration with the SUSTAIN project, another case study was carried out in a rural area in the interior of Catalonia, with a special focus on local migrant actors.

For the interviews, we chose to use life stories, based on previous work by Ravera, Oteros-Rozas, and Fernández-Giménez (2022)[61] , as they offer a more nuanced, reflective, and political understanding of environmental change from the perspective of experience[62] . The interview followed the following structure: (1) motivations, (2) affective and experiential dimensions, (3) structural dimensions (discrimination), (4) dimensions of agency

[61] Ravera, F., Oteros-Rozas, E., & Giménez, M. F. (2022). Embodied perceptions, everydayness, and simultaneity in climate governance by Spanish women pastoralists. In *Gender and the Social Dimensions of Climate Change* (pp. 119-144). Routledge.

[62] Williams, B., & Riley, M. (2020). The challenge of oral history to environmental history. *Environment and History, 26*(2), 207-231.

and adaptive capacity, (5) opportunities and barriers to adaptation, and (6) characterization of the exploitation and the interviewee.

This interview was conducted using a script that was adapted to the context and was carried out in five languages: Galician, Spanish, Catalan, Wolof, and French during the months of July 2024 to April 2025. They lasted a minimum of 30 minutes and a maximum of 2 hours. All interviews were recorded with the permission of the interviewees. The recordings were processed in accordance with current data protection regulations. They were transcribed for analysis and the voice files were subsequently deleted.

To select the interviewees, we used a typological matrix[63] with the two most relevant variables of social differentiation in each case. The intersection of the two variables in their various possibilities points to a profile of interviewee located in the case study area after mapping based on local knowledge of the area through long-term research in collaboration with other projects. In addition, where necessary, the snowball technique was used, asking interviewees for other profiles from the typological matrix. The framework is a tool that facilitates the selection of interviewees, while ensuring the heterogeneity of the sample in terms of the variables considered analytically relevant. In the agricultural case, gender and land tenure were chosen; in the livestock case, where only women were interviewed, social class (shepherdesses or livestock farmers) and neorurality were chosen; in the forestry case, the different forest management jobs

[63] Vallés, M. S. (2009). Qualitative interviews (2nd ed.). Madrid: Center for Sociological Research

and gender were chosen; and in the fishing case, nationality and the type of gear used were chosen.

Finally, the verbatim accounts are determined by the interviewees' own words and are coded to comply with the commitment to anonymity established with the interviewees and as part of the ethical considerations that this research has fulfilled. Thus, next to each literal sentence, the characteristics that determine the profile of the interviewee according to the typological grid are added in parentheses. For this reason, the codes are different in each case study, as can be seen in the results.

Results

Perceptions of climate change

All interviewees identified and described the changes caused by climate change based on their experiences, and we found different perceptions depending on the different territorial and ecosystem vulnerability.

For example, in the case of fishing, all users described the effects associated with rising temperatures:

> *"**Species that aren't native to this area** are being found. Like the fish I just gave you, the triggerfish. It's originally from tropical waters. But now we're starting to see 'globus' and 'trumpet' fish. Not here yet, because it's still cold, but if you go to Sardinia or Greece, you'll see lionfish... These fish come from Morocco. (Artisanal fisherman, local, 65 years old).*

*There are **many more jellyfish** here **than 10 years** ago because the water is much warmer and there are a few more than before. (Artisanal fisherman, local, 47 years old).*

In addition to the appearance of exotic, tropical, or other species from warmer areas, such as the white shrimp from Huelva, and the proliferation of jellyfish blooms that make artisanal fishing difficult, fishermen also reported changes in fishing schedules and in the size and reproduction of species.

In the case of forestry, obvious changes in the climate are described, with less rain and frost:

*"Fuel grows a lot in winter and dries out terribly in summer. Before, it didn't dry out as much, summers were milder. Everything stayed much greener. And now it dries out a lot more. Basically, **the interior of Galicia has become more Mediterranean**. And then it's all gasoline, a powder keg." (Forest brigade chief, 34 years old)*

In agriculture, changes in snowfall, wind, and cold weather are also clearly described, as well as the decrease in water availability that these changes generate:

***"In the last 10 years, it has snowed very little.** The last time it snowed properly here was in 2007, when a meter of snow fell. Since then, there have been snowfalls of two or three days. And now we haven't had any snow for three years. Right now, for example, **it can be hot in any month of the year**. Before, the cycles were more or less respected, because they vary a little bit, by a few weeks, but now... Now... Everything has changed a lot. For example, **the winds have** also **increased a lot in recent years. Minimum temperatures,** well... We've had at least one day*

without very low, very cold temperatures. (Farmer, <100 ha, 45 years old)

"There's a spring that brings water here, to the house, and we used to put the excess in a tank and water every day. I would empty it one day, and the next day I could water again because the raft was full again. Not now. ***Now all the water comes to the house because there isn't enough. So I'm telling you that the main problem here is the rain.*** *The rain and the fact that it doesn't snow in winter either." (Female farmer, >100 ha, 67 years old).*

The people interviewed reported that the drought has also affected wild flora, causing defoliation and death of oak groves and a decrease in springs and water sources in the mountains and plains.

Finally, in the case of livestock farming, prolonged droughts, a decrease in the quality and quantity of fodder, and an increase in animal diseases were reported: *"From 2015, even a little before,* ***I saw that there was less rain than before, less snow.*** *It was difficult to accept. This brings me back to climate change all the time.* ***The springs have dried up.*** *When there were big droughts, we didn't have to wait for the rain to come. We just waited..." (Cattle farmer, neo-rural, 47 years old)*

Women shepherds, who spend more time in direct contact with nature, are the most exposed to these changes. Often these effects begin to hinder the development of activities. For example, in the Pyrenees, changes in the livestock calendar caused by these effects are described:

"What's more, ***the vegetation isn't the same.*** *As it dries out much more quickly, we find it difficult... two years ago in*

*particular, **we found it hard to hold out until October** because the sheep couldn't eat anymore. Once the grass is too dry, they won't eat it." (Shepherdess, neo-rural, 27 years old)*

*"In fact, climate change causes more **health problems.** Because there is resistance. […] The principle of leaving a plot to rest for three weeks to eliminate parasites no longer works. The cold is not enough… There is not a long enough cold period." (Livestock farmer, neo-rural, 45 years old)*

In the fishing case study, we found conflict in recognizing the phenomenon of climate change:

*"No, **I don't see climate change.** I don't see it, because these are things of the Earth, they are changes in the earth, they are political excuses for us. There is pollution, there is pollution in the sea, we are collecting more and more rubbish, because of the sewage treatment plant, the sewage treatment plant dumps everything into the water, and sanitary towels go into the water, and we collect them." (Artisanal fisherman, local, 59 years old).*

The fishing case study, in this case, is also different because it comes from a clear ecosystem vulnerability that has led to a clear decline in fishing, which fishermen attribute to the 1990s and 2000s[64] , when there were various transformations in the territory: Barcelona experienced one of its most industrialized periods with

[64] Zelli, E., Legatelois, O., Calvet-Mir, L., Iniesta-Arandia, I., & Miñarro, S. (2025). Shifting baseline syndrome in the fishing community of Barcelona: insights from scientific and local ecological knowledge. *Ecology and Society, 30*(2), 40.

the 1992 Olympic Games, as well as port and airport expansion projects, which led to the diversion of the Llobregat River.

In some accounts, we also find confusion about how to name the phenomenon that is occurring:

> *"I don't know if it's climate change, I don't know if they're stopping it from raining, as some theories suggest, or I don't know if the desert is coming. So, it's one of those three things." (Farmer, landless, 30 years old)*

And again, in the case of the fishing study, we find an effect of climate change that trawl fishermen have been able to exploit positively, which is the harvesting and fishing of white shrimp in Huelva, although this is the only context where a benefit from these effects has been found.

Individual vulnerability

In the accounts of the people interviewed, the affective or emotional dimension of how people experience these effects of climate change often emerges. Often, there is sadness at seeing the effects of climate change directly or the general degradation of ecosystems:

> *"But after the 22nd, I realized how sad and how bad you can feel when you see everything that is being lost..." (Fire brigade chief, 39 years old)*

> *"It does change my mood because it's inevitable. When I go out and see how the countryside looks, just this morning I was in Roquéz and I came back feeling quite depressed because so many dry trees have fallen. The oak trees are*

drying up. They're shedding their leaves." (Farmer, landless, 46 years old)

There is also a sense of unease and concern in the face of uncertainty:

> *I think the most important thing here right now is time. If we keep going like this, we won't have any water, and that worries me. (Farmer, 67 years old, >100 ha)*

> *"I'm worried about my animals, about the cold, all of that. But I know it's going to be difficult. It's complicated in the sense that if they have nothing to eat, I ask myself, how are we going to make our hay? How are we going to feed them? Every summer, I worry now. Because I don't know how we're going to do it. What's going to happen to our animals?" (Livestock farmer, previously a shepherdess, neo-rural, 47 years old)*

And then there is the helplessness and frustration that comes from not being able to have any control over the processes that are directly affecting them:

> *"Given everything I've told you, the helplessness of not being able to do anything. Of not being the one in charge. If you're a farmer and you want to make a living from farming and you see so much injustice everywhere, in your field, in your sector, because in general everything is a mess, you can't do anything. The worst thing is that you can't do anything." (Farmer, 45 years old, >100 ha)*

> *"It's frustrating... we're fighting to save nature, which those at the top are managing with more and more eucalyptus and pine trees."*

(Brigade leader, 56 years old)

Despair is also mentioned:

> *"This relationship with subsidies, the increasing depredation, the weight of loneliness, climate change... we are telling ourselves that, in terms of hope and sustainability in the profession, it is complicated. We are always on the edge!" (Shepherdess, neo-rural, 27 years old)*

> *"Sometimes you lose hope, you know? You have to resist, you have to be strong."* (Trawler, migrant, 45 years old).

> *"It demotivates you, you want to quit." (Purse seine captain, local, 36 years old)*

All these feelings often coexist with stories of motivation to do work they enjoy and deeply value their connection with nature:

> *"I've been doing this job since I was a kid. And I really like it. I've made a career out of something I love. It's in my blood. What can I say? If I quit, I wouldn't feel motivated" (purse seine fisherman, local, 58 years old).*

Or with stories of motivation in the face of challenges:

> *"I'm always motivated. Well, precisely because it's a bit uncertain. So we still have the desire and the possibility to try. Being motivated is... I think you have to be." (Cattle farmer, local, 27 years old)*

Structural vulnerability

As we have seen in the previous accounts, this feeling of vulnerability and these emotional impacts are often caused by a

perceived lack of agency and control over the processes taking place in the territories. Therefore, the structural dimension of vulnerability is particularly key and intertwined with the individual dimension. One of the aspects on which all the case studies agree is related to existing rules and policies:

> *"The bureaucratic issue that has been driving us crazy in recent years. And if they want to make us use this digital notebook, where you have to say in the morning where you are going, where you are grazing the sheep, where you have been working, but anyway. You have to have an office worker."* (Farmer, >100 ha, 53 years old)

> *"If you're an industrialist or a farmer, you have the same standards."* (Livestock farmer, previously a shepherdess, neo-rural, 47 years old)

> *"The regulations. Yes, because they tell you that you have a business and you have to work 120 days. And what do you do the rest of the time?"* (Trawler, local, 66 years old).

> *"Pine and eucalyptus forests are now protected for decarbonization without considering the loss of biodiversity that this entails."* (Forest engineer, 32 years old)

Other frequently mentioned issues relate to the existence and distribution of aid and subsidies, which sometimes favor larger landowners or are insufficient to maintain employment:

> *"Three years ago, they changed the CAP, and they have done it, as I just told you, from their offices. Apparently, these people base their decisions on studies of erosion, environmental impact, etc., but they have introduced rules for the whole country without taking into account differences within each country and between countries. They have introduced aid models as if it were raining all year round." (Farmer, <100 ha, 44 years old.)*

"Because today, the problem with high mountain pastures is that it's like a cake that's cut into pieces according to the number of livestock farmers. And the pieces are proportional to the number of animals each farmer has. Nobody wants to reduce their share of the cake." (Livestock farmer, neo-rural, 45 years old)

"Here, the ban we have, they give us a pittance. We don't cover our expenses. We don't cover our expenses. We have to put money out of our own pockets. Because they give us very little. A thousand euros with a thousand euros, a thousand euros with a thousand euros. You can't support a family, a mortgage, with how expensive life has become." (Purse seine fisherman, local, 58 years old)

Another structural aspect that we find relevant, especially for people who have recently taken up these jobs in this context, is structural discrimination, particularly institutional sexism and racism. In the accounts of migrant fishermen, we find that, despite having been fishermen in their countries of origin, they are rarely able to carry out this activity upon arrival in Spain due to the existence of the Immigration Law. It is common in their accounts to find displacement within the territories as well as frequent job changes until they manage to find work as fishermen:

"I have been a fisherman all my life. When I arrived in Spain in June 2004, I was in the Canary Islands for 40 days. From there, they send you by plane, 20 people to Murcia, 20 people to Madrid. From there, on August 13, 2004, I went to Almería, to Roquetas de Mar, and I worked two or three times in the fields, then in Carboneras I boarded a boat with a skipper and two other people." (Purse seine fisherman, migrant, 50 years old).

In the case of forestry management, a highly male-dominated sector, we also find accounts that describe discrimination against women:

> *"From the time we study until we retire, we know that we are entering this sector, but the jobs are planned for men." (Female union representative, 49 years old)*

Finally, among the policies that affect the territories, we find stories denouncing touristification and its consequences for the fishing and livestock sectors:

> *"They want us to disappear, because the port is interested in yachts. If they could have all the space for themselves..." (Artisanal fisherman, local, 59 years old)*

And also the effect of conservation policies linked to protected areas, as in the case of livestock farming:

> *"I'm not very enthusiastic about seeing places turned into reserves... How do people live in an ecology like this, a political ecology like this? It worries me a lot. I can easily imagine a world under a bell jar, with windows at the entrances and blowholes to keep the sheep in and let the tourist money in..." (Shepherdess, neo-rural, 44 years old)*

Relational vulnerability

Finally, we observe that there is an important dimension of vulnerability, also intertwined with the previous two, which is relational, and has to do with how the relative security of some social groups is achieved through the production of insecurity in

others[65] . A central issue in this dimension is the relationship with larger companies, whether fishing, forestry, or agricultural, and the inequality that this causes among local actors:

> *"But I think there are also many companies that have been hired for fish 'import and export', which are very powerful, and so the less fish is caught here, because lately they have signed contracts and these are very powerful and I think they don't want us to go out fishing. And that, when we were dealing with all this issue of the days we went to the demonstration in Madrid and all that, they ended up signing a contract for I don't know how many years with Europe, which gave them the right to plunder the fish, and everything is the same. It's all about interests."* (Local trawler fisherman, 42 years old)

> *"The issue of large companies (...) there are companies that have plantations that need a lot of water, and on top of that, for example, they set up ultrasound cannons to break up the clouds." (Farmer, <100 ha, 37 years old)*

> *"Because what matters is the economy and quick money, and we are controlled. And large companies have a huge influence on everything, whether it be at the political level, in legislation... They have very good salespeople who manage the plantations for the owners. In other words, they give them the plants, the plantation, and in the first few years, they neglect the plants... and there is a monopoly*

[65] Taylor, M. (2013). Climate change, relational vulnerability and human security: rethinking sustainable adaptation in agrarian environments. *Climate and Development,* 5(4), 318-327.

and they no longer see any other point of view." (Forest agent, woman, 41 years old)

Another important issue is that of class relations in agri-food systems, between landowners and workers. This issue is expressed, for example, in livestock farming, by female shepherds:

> *"There is also a lot of violence in relation to our wages. 'In any case... You earn more than us.' They don't understand that you are a wage earner, that you don't own any property, that you don't have any real estate capital, economic capital."* (Shepherdess, neo-rural, 27 years old)

Finally, as in the structural dimension, there are reports of discrimination related to machismo and relationships:

> *"Well, why do the girls quit? There are ranchers who treat them very well. But there are others who are very annoying. I mean, they ask more of a girl. Or they are sexual aggressors. Some girls have told me about being groped. You see, things like that. So that also explains why they quit." (Rancher, formerly a shepherdess, 47 years old)*

> *"Discriminated against? I would say so, but... That's the way the world is. There's something that's not right... I think there's something we can't change overnight. They don't value you as they should." (Trawler, migrant, 45 years old)*

Adaptation strategies

The different dimensions of vulnerability of the people interviewed do not exclude the fact that everyday adaptation strategies were

also found in the stories, for example through mobility, especially in livestock farming and fishing:

> *"I've adapted with my flock. Well, I didn't have a water source anymore. I took them down to the stream more often. They went down on their own, actually. And if not, I've also adapted the route in terms of the grass." (Livestock farmer, previously a shepherd, neorural, 36 years old)*

> *"In winter especially, after the layoffs. We started fishing, but there aren't any fish. We had to go to Alicante. We spent two months away. We got by there, but of course, you're away from home." (Purse seine fisherman, local, 58 years old, purse seine fishing)*

Diversification in both types of crops and fishing gear:

> *"We, for example, my girlfriend has hybrids, she has hybrids that they planted, but now, for the last three years and this year too, we have planted free-standing plants. We have changed the planting method, which is supposed to be more suited to drought."* (Farmer, 37 years old, >100 ha)

> *"We have this boat, so we have two sonso boats, and then we take turns working so we can work every day, because otherwise it's a bit unfeasible, because in the end, with this boat, I could go out a hundred days a year. And then you have to do other things, or you have to reinvent yourself a bit. In this aspect of trying to do... Before they used to say that a man of many trades could go wrong, but now it's the opposite, I think." (Trawler and artisanal captain, local, 35 years old)*

Collective action, especially negotiation through unions, is also mentioned in the livestock and forestry sectors:

> *"I know that since I joined the union, above all, I have found very strong psychological and even emotional support. I really believe that beyond associations, fortunately there are unions because thanks to unions we can negotiate in joint committees and develop our collective agreements."* (Shepherdess, neo-rural, 27 years old)

However, it is pointed out that these adaptations sometimes also require larger-scale changes:

> *"There is a lot of camaraderie, and that is key to keeping going. But the problems are so huge that it is difficult to imagine solutions without structural change." (Forest firefighter, 54 years old)*

Conclusions

The case studies show that in all cases the effects of climate change are experienced with different impacts on the work of the people interviewed. In the case of agriculture, forestry, and livestock farming, climate change is perceived as one of the main drivers of change affecting people's well-being. In the case of fishing, although the effects are perceived, the concept itself is sometimes denied. This is the only case where we have also seen one of the effects being exploited, namely the appearance of the white shrimp in Huelva, a commercial species that is being harvested. In this case, there are also drivers of change such as pollution, changes in land use, and declining fish stocks, which have made ecosystems highly vulnerable and meant that climate change is not perceived as something that affects people's well-being.

In all cases, we have seen that this impact on well-being has emotional and mental health implications, with people often expressing sadness, anxiety, hopelessness, and frustration at not being able to intervene in what is happening.

Part of this frustration has to do with the effects of structural vulnerability generated by the existence of rules, policies, and subsidies that are perceived as unfair or discriminatory, and also with the existence of other drivers of change such as touristification or pollution, with relational vulnerability generated by benefits to large companies that make small businesses vulnerable, or by class relations that are established between owners and workers.

In all cases, these expressions of vulnerability coexist with expressions of motivation for the work they do, as well as with the development of everyday adaptations (what is often referred to in the literature as "bottom-up," referring to the fact that they emerge from local populations, in contrast to adaptation policies that are considered to come "top-down").

In summary, we see how environmental issues of vulnerability are linked to social issues such as discriminatory policies and regulations or class issues, which shows us that: (1) despite having interviewed groups from vulnerable territories, we see that these are crossed by differences of class, gender, and racialization that mean there are no homogeneous vulnerable groups; (2) in order to deal with vulnerability to climate change and promote adaptation policies, it is not enough to treat the symptoms of climate change; rather, it is necessary to transform the root causes that make certain people more vulnerable than others, within a climate vulnerability that is shared by all but is unequal due to the different power relations in society.

Promoting a change in narratives and policies through science-politics-society workshops

Introduction

As the final phase of the project, we wanted to reflect collectively on the results and the main issues that emerged as important in two science-politics-society workshops, in which we presented the results, contextualized the Spanish case through a presentation lasting approximately one hour in each workshop, and then spent another hour reflecting collectively on the results and the gaps in knowledge and action. The science-politics-society workshops are aimed at promoting a more active role for research by fostering exchange and promoting knowledge building among different groups involved in decision-making[66] . They are also crucial for different stages of the public policy cycle, such as problem definition, identification of research priorities, and implementation of agreed solutions.

In the second part, participants reflected collectively and built knowledge around two questions: (1) proposing a change of narratives and (2) designing policies that do not further undermine local actors. These two guiding questions were developed jointly with the Spanish Office for Climate Change, as

[66] López-Rodríguez, M. D., Castro, A. J., Castro, H., Jorreto, S., & Cabello, J. (2015). Science–policy interface for addressing environmental problems in arid Spain. *Environmental Science & Policy, 50,* 1-14.

there was a synergy between the final workshops of the VITAL project and the start of the process of developing the Second Work Program of the PNACC with a multisectoral and participatory seminar to work on the thematic areas of the PNACC. A seminar on groups vulnerable to climate change had also been held previously. The VITAL project saw these workshops as an opportunity to delve deeper into the cross-cutting aspects of the PNACC relating to gender and social vulnerability, so that we could provide useful information on these two cross-cutting aspects of the PNACC.

Design and methodology

Two workshops were designed to bring together a variety of social actors representing the administrative, academic, and civil society sectors.

In this way, on both days, the results obtained in the first two objectives of the project were used as a basis for reflection, so that they could serve as a foundation for the knowledge that was built.

The workshops took place on April 22 and May 21 at the Ateneo la Maliciosa in Madrid. They lasted four hours and were attended by a total of 20 people divided into two groups of 10.

On the first day, the objective was to reflect collectively on the dominant and alternative narratives in the discourse on vulnerability to climate change and gender. The results of the theoretical review and the global review of case studies corresponding to objective 1 were presented. The following were identified as dominant narratives:

1. Women as victims of climate change
2. Vulnerability as opposed to adaptation
3. Identification of vulnerable groups to see impacts

Subsequently, two inquiry exercises were proposed using the World Café methodology, each lasting 30 minutes: one in which participants reflected on these three questions by sector (administration, academia, civil society):

- Do you identify any of these narratives in your area of work?
- How do you think they influence it?
- What other narratives do you think could be proposed?
- What barriers do you identify to this happening?

After a discussion, a second space was proposed in three mixed groups, where the lines of action and proposals of the PNACC on gender and social vulnerability were reviewed.

On the second day, the objective was to reflect collectively on what public policies could be proposed to prevent climate vulnerability from increasing. The results of the state case studies corresponding to objective 2 were presented. During the presentation of each case, questions were answered and reflections were collected for each case to enrich the discussion in each sector.

This was followed by a 90-minute World Café discussion, where participants reflected on the guiding question for the day: what public policies can be proposed to prevent already vulnerable populations from becoming even more vulnerable? Reflections were gathered in three groups, some sectoral and others cross-cutting across all cases.

Results

New narratives of vulnerability, risks, and potential

The three dominant narratives were found in all three sectors. In the academic sector, it was identified that this generates negative feedback from the dominant narratives through what is researched, how research calls are designed, and how funds are distributed, as there is a difficulty in financing complex approaches, and ultimately in the design of the research itself, conditioning the scientific knowledge that is generated and, therefore, what is communicated from academia to journalists and from journalists to society. In the administration sector, it was commented that there is considerable or excessive simplification in quantitative data and in the generalism that this produces.

Civil society organizations emphasized the need to find other narratives from places other than this highly centralized West (from rural areas, from other identities). The need to break the dichotomy between vulnerability and agency or capacity for action and adaptation was highlighted, as well as the need to change the vocabulary and talk about "groups in situations of vulnerability" or use the term "vulnerabilized," which places a lot of weight on responsibilities within vulnerability, while at the same time analyzing the capacity for action that exists.

From academia, the need discussed in order to incorporate the approach to vulnerability as dynamics and processes into research was to have a broader time frame for research processes, in order to understand what is happening in a territory, to monitor and evaluate, or to understand the local adaptation processes themselves that generate counter-narratives. At the conceptual level, there was talk of being able to propose terms

other than vulnerability that do not have the connotation of weakness and of linking vulnerability to responses and/or action, as well as considering vulnerability as an inherent fact of living on this planet. Finally, in terms of context and methodological approach, the need to conduct research in urban areas and to advance in finding mixed approaches (qualitative and quantitative) for the study of vulnerability was discussed.

The administrations commented on the need to be able to carry out a series of interpretations, nuances, and analyses of quantitative data. It was noted that good practices and the possibility of learning from the application of certain policies or regulations could help when drafting new legislation that may be better suited to new realities, since often the legislation in force was drafted 15 or 20 years ago and administrations have to base their work on that. The need to include qualitative indicators in their work was also identified, for example, to find out what factors enable women to become entrepreneurs, how, etc.

As for the risks of implementing these narratives, it was identified that intersectionality, for example, runs the risk of being used as an afterthought, without any in-depth analysis, and also the risk of not being understood, especially if you are an organization that reaches a general audience because it may not be very attractive communicatively and also because there is a lack of research and disaggregated data with different approaches. A third risk identified was related to overcoming the vulnerability-agency dichotomy, which is that women are put under pressure to be "the saviors." In government agencies, the fear of change and criticism within the public administration was mentioned as a risk.

Policy proposals that do not undermine further vulnerable populations

There was discussion of the need to co-produce with local areas so that public services and projects do not arrive as saviors and as something imposed from above, but rather are produced in the areas that have long been dealing with the effects of climate change, even if they do not call it that. To this end, various measures are proposed: (1) Territorial Innovation Centers as a new regional figure for territorial mediation; (2) that there be a binding nature and that participatory processes be continuous and with adequate time frames, so that they do not reach the end of the processes or projects, but also exist before them; (3) mediation and facilitation as a key element in these processes. For example, prior consultation was discussed as an opportunity to bring together relevant groups and also provide a space for mediation; (4) recognition and appreciation of populations invisible to power (e.g., migrants, women, shepherds, etc.); (5) the presence of social technical staff in projects and in the formulation of public policy, such as specialists in social education, mediation, and gender; and (6) the emotional dimension, with a fundamental focus on analysis in relation to adaptation to climate change.

In support of this, there was talk of creating interdisciplinary teams that include local actors, groups, universities, public administration, and economic sectors to bridge the wide gap that exists between academic production, which knows the territory well (because it has carried out many methodologies in the territories but only communicates this to the academic world), and public policy, which does not know the territories so closely.

In this regard, the need for interdisciplinary teams to develop policies and, above all, to ensure policy coherence was also

mentioned. An example is given of the need for coherence between the three agreements that emerged from the 1992 Rio Summit (the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, and the United Nations Convention to Combat Desertification), particularly between climate change and biodiversity, where there is a major conflict. The need for livestock policies to be more closely linked to forestry and agriculture was also mentioned, for example through subsidies for grazing, which could prevent large amounts of public money being spent on major infrastructure. It was suggested that conservation policies and consumption policies should be linked to land use (such as consumption by public institutions, which could be linked to good practices).

The need to adapt policies to the territory and the scale of policies was made explicit, with policies coming from larger scales, such as the Common Agricultural Policy or the Common Fisheries Policy, sometimes causing problems in these ecosystems. The role and potential of small municipalities was explored in greater depth (for example, mention was made of a municipality in Galicia that has public shepherds and of the Barcelona Provincial Council, which has very good experience with the technical capacity of small municipalities).

Finally, the need for regulations that differentiate between sizes and class issues was explained so that priority is given to small-scale production, which is not necessarily more sustainable but is often more oriented towards local production and has a stronger link with the territory. Access to subsidies remains largely unregulated and is sometimes available to large companies. The need for aid to be conditional on labor rights and for environmental measures to be accompanied by well-established social policies (for example, housing and regularization problems

create problems in the livestock and fishing sectors) was also highlighted.

Finally, the need to promote collective land use and management models was identified, such as the revitalization of communal forests and collective models such as community-supported agriculture, which foster the associative fabric and community forestry policies.

Final conclusions

This project proposes a feminist perspective on social vulnerability to understand the experiences of those currently most affected by climate change. It does so in response to the current need to integrate social sciences into climate change adaptation research and policies and as a way of focusing greater attention on structural inequalities and power relations as key factors in persistent vulnerabilities and as an alternative to dominant discourses that label social groups as inherently vulnerable, attributing distinctive vulnerability properties to them.

A review of the current literature shows that despite a clear increase in studies on resilience, adaptation, and vulnerability to climate change from a gender perspective, the spatial distribution of these studies reveals significant inequality between studies conducted in the Global North and South, with the latter being the subject of most studies and replicating gender and North-South stereotypes.

However, our analysis of four case studies in the Spanish state, which is part of the Global North, shows that in all cases the effects of climate change are experienced with different impacts on the people interviewed from agri-food, fishing, and agroforestry systems. In the case of agriculture, forestry, and livestock, climate change is perceived as one of the main drivers of change affecting people's well-being.

In all cases, we have seen that this impact on well-being has emotional and mental health implications, with people often expressing sadness, anxiety, hopelessness, and frustration at not being able to intervene in what is happening.

We find that social vulnerability has a structural dimension generated by the existence of norms, policies, and other drivers of change, and a relational dimension generated by the benefits to large companies that make small farms vulnerable or by the class relations that are established between owners and workers.

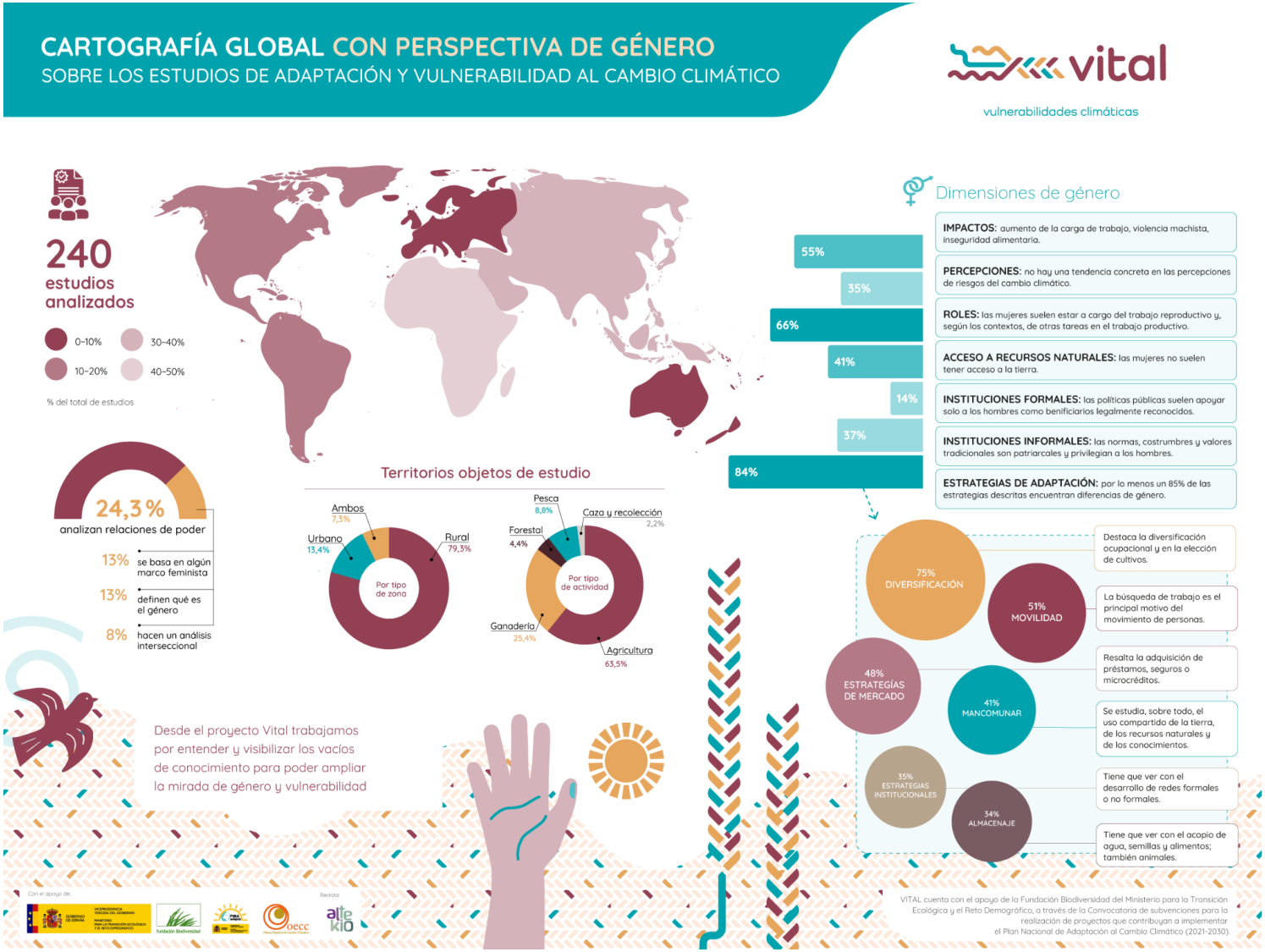
In all cases, these expressions of vulnerability coexist with expressions of motivation for the work they do, in some cases as a result of being able to enjoy their connection with nature, as well as the development of everyday adaptations.

Our results contradict the dominant narratives that women as a unitary group are victims of climate change or that there are vulnerable groups with homogeneous characteristics and, finally, the notion that vulnerability is mutually exclusive with adaptation. In other words, vulnerability and agency can both be present in lived experiences. This does not imply that there should not be greater responsibility at the structural level on the part of those who have the greatest impact, but rather that the framework of vulnerability and agency is shared.

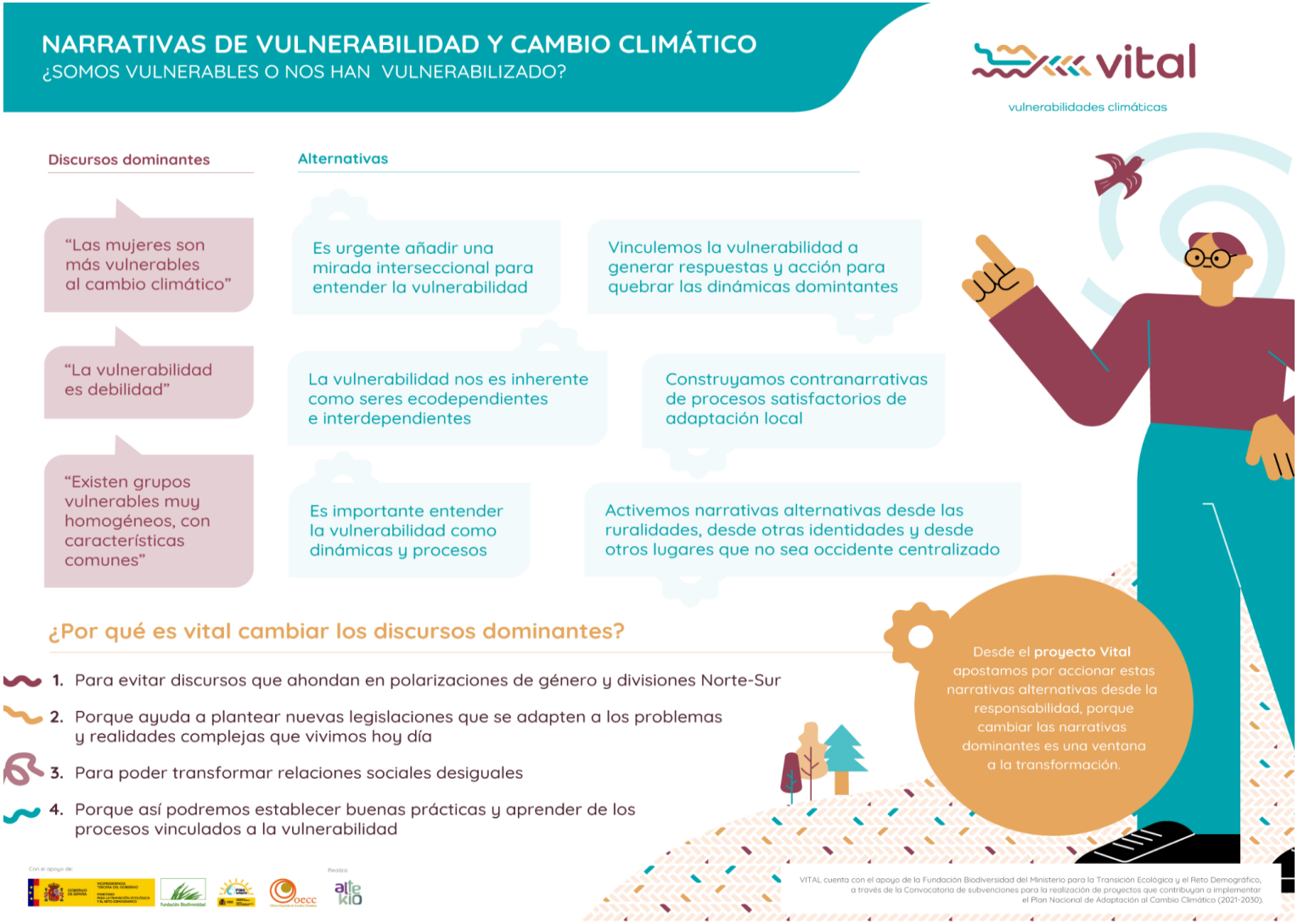
Finally, we conclude with recommendations on alternative narratives of vulnerability and policy proposals that promote adaptation to climate change.

Appendices

Appendix 1 Infographics


CARTOGRAFÍA GLOBAL CON PERSPECTIVA DE GÉNERO
SOBRE LOS ESTUDIOS DE ADAPTACIÓN Y VULNERABILIDAD AL CAMBIO CLIMÁTICO
vital
vulnerabilidades climáticas
240
estudios analizados
0–10%
10–20%
30–40%
40–50%
% del total de estudios
Territorios objetos de estudio
Ambos 7,3%
Urbano 13,4%
Rural 79,3%
Por tipo de zona
Pesca 8,8%
Caza y recolección 2,2%
Forestal 4,4%
Ganadería 25,4%
Agricultura 63,5%
Por tipo de actividad
24,3 %
analizan relaciones de poder
13% se basa en algún marco feminista
13% definen qué es el género
8% hacen un análisis interseccional
Dimensiones de género
55%
35%
66%
41%
14%
37%
84%
IMPACTOS: aumento de la carga de trabajo, violencia machista, inseguridad alimentaria.
PERCEPCIONES: no hay una tendencia concreta en las percepciones de riesgos del cambio climático.
ROLES: las mujeres suelen estar a cargo del trabajo reproductivo y, según los contextos, de otras tareas en el trabajo productivo.
ACCESO A RECURSOS NATURALES: las mujeres no suelen tener acceso a la tierra.
INSTITUCIONES FORMALES: las políticas públicas suelen apoyar solo a los hombres como beneficiarios legalmente reconocidos.
INSTITUCIONES INFORMALES: las normas, costrumbres y valores tradicionales son patriarcales y privilegian a los hombres.
ESTRATEGIAS DE ADAPTACIÓN: por lo menos un 85% de las estrategias descritas encuentran diferencias de género.
75% DIVERSIFICACIÓN
Destaca la diversificación ocupacional y en la elección de cultivos.
51% MOVILIDAD
La búsqueda de trabajo es el principal motivo del movimiento de personas.
48% ESTRATEGÍAS DE MERCADO
Resalta la adquisición de préstamos, seguros o microcréditos.
41% MANCOMUNAR
Se estudia, sobre todo, el uso compartido de la tierra, de los recursos naturales y de los conocimientos.
35% ESTRATEGIAS INSTITUCIONALES
Tiene que ver con el desarrollo de redes formales o no formales.
34% ALMACENAJE
Tiene que ver con el acopio de agua, semillas y alimentos; también animales.
Desde el proyecto Vital trabajamos por entender y visibilizar los vacíos de conocimiento para poder ampliar la mirada de género y vulnerabilidad
Con el apoyo de:
Realiza:
VITAL cuenta con el apoyo de la Fundación Biodiversidad del Ministerio para la Transición Ecológica y el Reto Demográfico, a través de la Convocatoria de subvenciones para la realización de proyectos que contribuyan a implementar el Plan Nacional de Adaptación al Cambio Climático (2021-2030).


¿CÓMO PERCIBIMOS LOS SÍNTOMAS DEL CAMBIO CLIMÁTICO?
Emociones que surgen en torno al cambio climático y algunos agravantes detectados en cuatro casos de estudio en sistemas alimentarios y agroforestales de diferentes territorios peninsulares especialmente vulnerables
vital
vulnerabilidades climáticas
Gestión forestal en Galicia: BOSQUES DE MONOCULTIVO FORESTAL
"Es frustrante... luchamos por salvar una naturaleza que los de arriba gestionan cada vez con más eucaliptos y pinares"
• Inestabilidad laboral y precariedad
• Abandono rural
• Poder desigual de empresas forestales
• Greenwashing
• Aumento de la intensidad de incendios
Pesca en Barcelona: COSTA URBANA
"Tienes que resistir, tienes que estar fuerte y a veces es muy difícil. Pero al final yo soy feliz con lo que hago; vas sobreviviendo todo el año"
• Contaminación
• Turistificación de la ciudad
• Desplazamiento de los puertos
• Políticas de pesca
• Bajos precios y disminución de capturas
Agricultura en Almería: CULTIVOS DE SECANO
"Claro que me hace sentir triste el cambio climático... ahora mismo el tema de la falta de lluvias, y que se están secando las chaparras... pero ¿sabes? Yo no quiero perder la esperanza y pienso que algún día mejorará!"
• Expansión del regadío intensivo
• Monocultivos
• Abandono rural
• Bajos precios del mercado
• Políticas agrarias PAC
Ganadería en Pirineo: ALTA MONTAÑA
"Yo creo que el cambio climático afecta a mi salud mental, a veces me da ansiedad pero es que todavía tenemos ganas y posibilidades para intentarlo. Estar motivado es importante... Sí, creo que hay que estarlo"
• Políticas de conservación
• Turistificación de la montaña
• Abandono agrícola
• Modernización tecnológica
• Falta de reconocimiento social del oficio
Con el apoyo de:
Realiza:
VITAL cuenta con el apoyo de la Fundación Biodiversidad del Ministerio para la Transición Ecológica y el Reto Demográfico, a través de la Convocatoria de subvenciones para la realización de proyectos que contribuyan a implementar el Plan Nacional de Adaptación al Cambio Climático (2021-2030).


NARRATIVAS DE VULNERABILIDAD Y CAMBIO CLIMÁTICO
¿SOMOS VULNERABLES O NOS HAN VULNERABILIZADO?
vital
vulnerabilidades climáticas
Discursos dominantes
Alternativas
"Las mujeres son más vulnerables al cambio climático"
Es urgente añadir una mirada interseccional para entender la vulnerabilidad
Vinculemos la vulnerabilidad a generar respuestas y acción para quebrar las dinámicas domintantes
"La vulnerabilidad es debilidad"
La vulnerabilidad nos es inherente como seres ecodependientes e interdependientes
Construyamos contranarrativas de procesos satisfactorios de adaptación local
"Existen grupos vulnerables muy homogéneos, con características comunes"
Es importante entender la vulnerabilidad como dinámicas y procesos
Activemos narrativas alternativas desde las ruralidades, desde otras identidades y desde otros lugares que no sea occidente centralizado
¿Por qué es vital cambiar los discursos dominantes?
1. Para evitar discursos que ahondan en polarizaciones de género y divisiones Norte-Sur
2. Porque ayuda a plantear nuevas legislaciones que se adapten a los problemas y realidades complejas que vivimos hoy día
3. Para poder transformar relaciones sociales desiguales
4. Porque así podremos establecer buenas prácticas y aprender de los procesos vinculados a la vulnerabilidad
Desde el proyecto Vital apostamos por accionar estas narrativas alternativas desde la responsabilidad, porque cambiar las narrativas dominantes es una ventana a la transformación.
VITAL cuenta con el apoyo de la Fundación Biodiversidad del Ministerio para la Transición Ecológica y el Reto Demográfico, a través de la Convocatoria de subvenciones para la realización de proyectos que contribuyan a implementar el Plan Nacional de Adaptación al Cambio Climático (2021-2030).

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Appendix 3. List of codes and themes used for the analysis of the interviews

Identified Themes Listings

The identified themes are detailed along with the interview narratives in the report section titled *"How do we perceive the symptoms of climate change? Four case studies of food and agroforestry systems"*, and are summarized here.
We grouped the themes into structural, relational, and individual vulnerability, based on the final definition of vulnerability used in the project: *"Vulnerability as lived experiences of social disadvantage constituted individually, relationally, and structurally, interconnected through human action, and shaped over time"* (Brown, 2024), which are situated within a broader context described as *"the human condition of being affected"* (Gilson, 2024).

In relation to structural vulnerability, themes included existing norms and policies, the distribution of aid and subsidies, structural discrimination in the form of sexism and racism, and other drivers of change such as tourism development and rural abandonment.

In relation to relational vulnerability, key issues included relationships with larger companies (in forestry, fisheries, or agriculture), existing class dynamics in agri-food systems, relationships between landowners and workers, and forms of discrimination such as sexism and racism.

In relation to individual vulnerability, we primarily gathered affective narratives related to:

1. Sadness, unease, and concern over ecosystem degradation

2. Frustration and helplessness due to lack of agency over territorial processes
3. Motivation to try to change things
4. Adaptive strategies

Identified Codes Listings

The codes used were divided into three main categories:

1. Perceived drivers of change, using the classification from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (Díaz et al., 2015) to distinguish between direct and indirect drivers
2. Vulnerability, identifying discrimination across different axes of social differentiation such as gender, age, origin, and the rural-urban divide, as well as perceived impacts
3. Adaptation strategies, using an adapted version of the strategies identified by Agarwal (2008) and in Gómez-Baggethun et al. (2012)

Drivers of Change

- Climate change
- Land-use change
- Pollution
- Technification
- Value shifts
- Political drivers

Vulnerability

- Gender axis
- Age axis
- Origin axis
- Rural-urban axis
- Emotional impact
- Physical impact
- Economic impact

Adaptation Strategies

- Mobility
- Diversification
- Commoning
- Institutional
- Market-based
- Resistance

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