

Climate-neutral cities with a gender perspective: assessing the interaction between gender and climate objectives in urban policies

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Abstract

Gender studies have highlighted how policies and actions that are not drafted and planned with a gender perspective tend to produce a gender bias. Climate policies are not an exception. Measures to mitigate and adapt cities to climate change might lead to undesired outcomes regarding gender equality or, in contrast, may help to improve equality. Ideally, cities should prioritise actions that aim to reduce their carbon footprint but also help promote gender equality. We propose a Multicriteria Decision-Making Method to assess urban policies and relate them to climate and gender criteria. We describe policies for urban decarbonisation that have a non-negative outcome from a gender perspective and compare their impact according to climate and gender criteria. To do so, we use a DEMATEL-ANP technique to determine how policies contribute to climate action and gender equality. Our results show which policies have a significant potential to reduce cities' carbon footprint and increase gender equality. Also, we were able to conclude that the inclusion of gender criteria contributes to more socially equitable decarbonisation.

Keywords:

Cities, renewable energy, positive energy districts, DEMATEL, ANP, Delphi

1. Introduction

Urban climate policies are cross-cutting issues and strategic for decarbonisation because they account for the majority of greenhouse gas (GHG) emissions. According to the European Environmental Agency [1], the main emission sectors worldwide are energy, industry, transport, residential/commercial, agriculture and waste. Furthermore, the IPCC 2022 report [2] cites energy, urban and other settlements, transport, buildings, industry, agriculture and other land use as sectors where mitigation should be addressed. According to the IPCC in Climate Change 2014: Impacts, Adaptation, and Vulnerability [3], the key adapting sectors at the urban scale are energy, transport, food, housing, and urban planning. This report also outlines the role of government, planning, and management in putting the urban environment in place.

When the gender representation of sectors is examined, it is noticeable that the sectors with the greatest carbon impact also have a low representation of women. The Nordic Council of Ministers analysed climate policies in the Nordic countries with a gender perspective, looking into high carbon-emitting sectors with gender implications:

mobility, energy, agriculture, food, construction and the built environment [4]. Energy, transport, housing and agriculture are also analysed as key sectors in other reports on climate change policies and gender, where women's inclusion in decision-making and other aspects of governance is also highlighted as decisive [5]–[7]. These previous studies emphasise the importance of including a gender perspective in climate change action [5]. However, the role that the gender perspective plays in climate action is limited [4], [8]. These studies do not quantify the effects of urban policies in both gender and climate spheres or assess the bias produced due to the expertise field of the decision-makers.

2. Study design and method

To determine which actions have an impact on both urban decarbonisation and gender gap closure, an integrated multicriteria decision-making approach based on a combination of DEMATEL and ANP (DANP) is used. To accomplish this, evaluation criteria for the two goals (urban decarbonisation and gender gap closure) are established. Actions are then categorised into five clusters (energy, food, governance, mobility and urban planning). A multicriteria analysis is used to evaluate the actions against the criteria, enabling us to rank the actions in relation to the two objectives together. On this basis, the evaluation framework suggested in this study is divided into four phases, as illustrated in Figure 1. Each step is described in detail below.



Figure 1: Summary of the methodology followed.

2.1. Definition of the model

The ranking model is based on a network of criteria and actions. Both the criteria and actions are derived from a literature review. The actions include measures to be implemented by city planners and all stakeholders involved at the city level or influencing it.

A set of criteria are selected to represent the achievement of both goals, climate change mitigation and adaptation and closing the gender gap. Four criteria represent each goal.

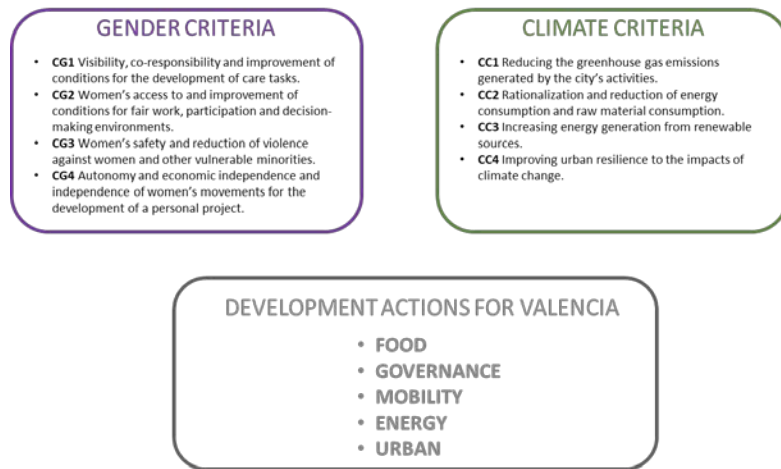


Figure 2. ANP model used for the prioritisation of actions

3. Results and discussion

3.1. Overall model

The DANP method prioritises the selected criteria and actions from the most to the least important for the decarbonisation of a city while closing the gender gap simultaneously, according to the participant experts.

The prioritisation of criteria for the aggregated group of experts is shown in Figure 3. Three climate criteria stand out slightly: rationalisation and reduction of energy consumption and raw material consumption (CC2), reduction of emissions associated with economic and social activity (CC1), and improving urban resilience to the impacts of climate change (CC4). The following criteria are autonomy and economic independence and independence of women's movements for the development of a personal project (CG4) and women's access to and improvement of conditions for fair work, participation and decision-making environments (CG2). The criteria with lower values are increasing energy generation from renewable sources (CC3), visibility, co-responsibility and improvement of conditions for the development of care tasks (CG1) and women's safety and reduction of violence against women and other vulnerable minorities (CG3).

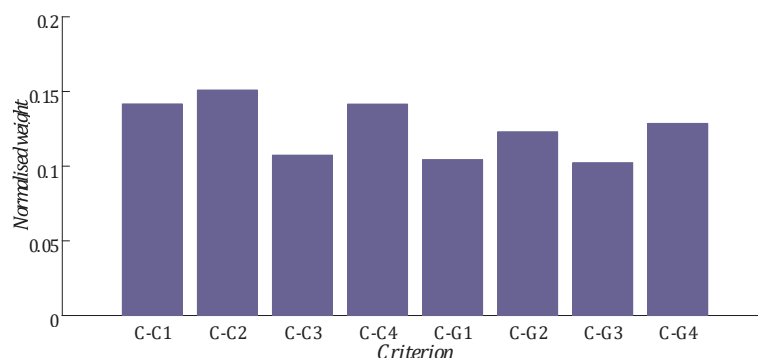


Figure 3: Aggregated weight of criteria

Figure 4 shows the final average priority of each action for the whole group of experts. According to them, the actions that better contribute to the two goals are: ensuring the presence and participation of women in jobs, decision-making and project management (G1), analysing and evaluating measures and actions from a gender perspective (G4) and adapting housing to new standards of quality, diversity and accessibility (U4). In contrast, reducing animal protein consumption (F2) is the lowest-scoring action. As can be seen, social aspects improve decision-making and living standards for all the main aspects that help to contribute to both groups of criteria.

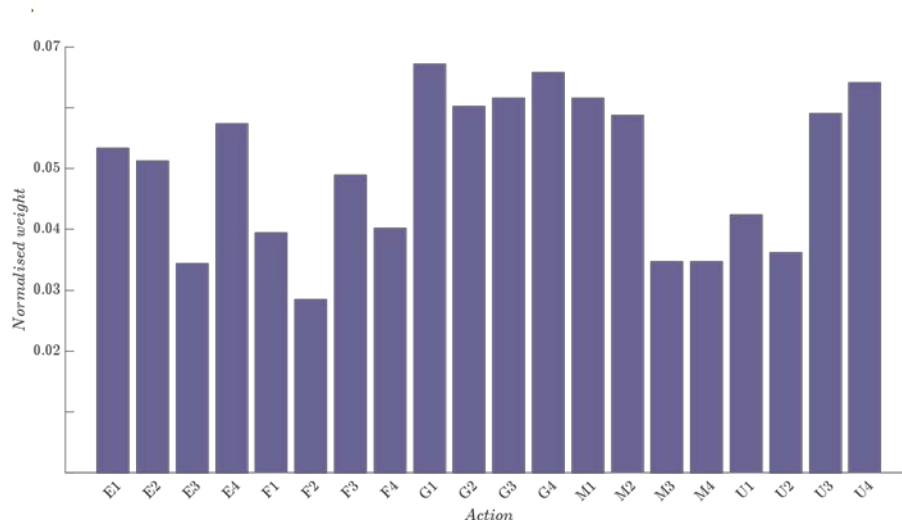


Figure 4: Aggregated weight of actions by expert type

3.2. Analysis by criteria type

When the model only considers climate or gender criteria, the outcome of action prioritisation varies, as shown in Figure 5. In this sense, what we aim to deliver in this analysis is what the prioritisation of actions will be if we only consider one group of criteria. To analyse this, one group of criteria is eliminated from the general DANP model so that the sequences studied are only those that refer to the criteria that remain in the model on the actions or alternatives for analysis. When only climate criteria are analysed (climate model) in the model, we can observe that governance actions lose priority while actions in the other clusters gain importance.

On the other hand, when only gender criteria are analysed (gender model), governance actions priorities tend to increase, mainly to the detriment of energy actions. Some observations that we can highlight depending on the model are as follows:

For the climate model, the importance of all energy cluster actions is increased with respect to the general model, except for the case of action E3. Direct Aid for Fuel Poverty, as it is a measure with more impact on social emergency than decarbonisation, as it involves economic aid to vulnerable socioeconomic groups, while for the gender model, consequently, this action rises.

For the gender model, governance actions become significantly more relevant with respect to the general model while becoming less relevant for the climate model. The food cluster is the least valued overall and even lower in the gender criteria model. Still, its value increases in the climate model due to the loss of importance of governance actions.

The actions of urban planning and mobility clusters do not follow a uniform trend within their own cluster when analysing the two different models. That is, some actions increase, and others decrease in importance when analysing each model separately. For example, while M1, M2, U1, and U4 remain consistent regardless of the criteria considered, M3, M4, U2, and U3 differ depending on the model considered. M3, M4, and U2 all increase for the climate model while decreasing for the gender model, while U3 decreases for both gender and climate models.

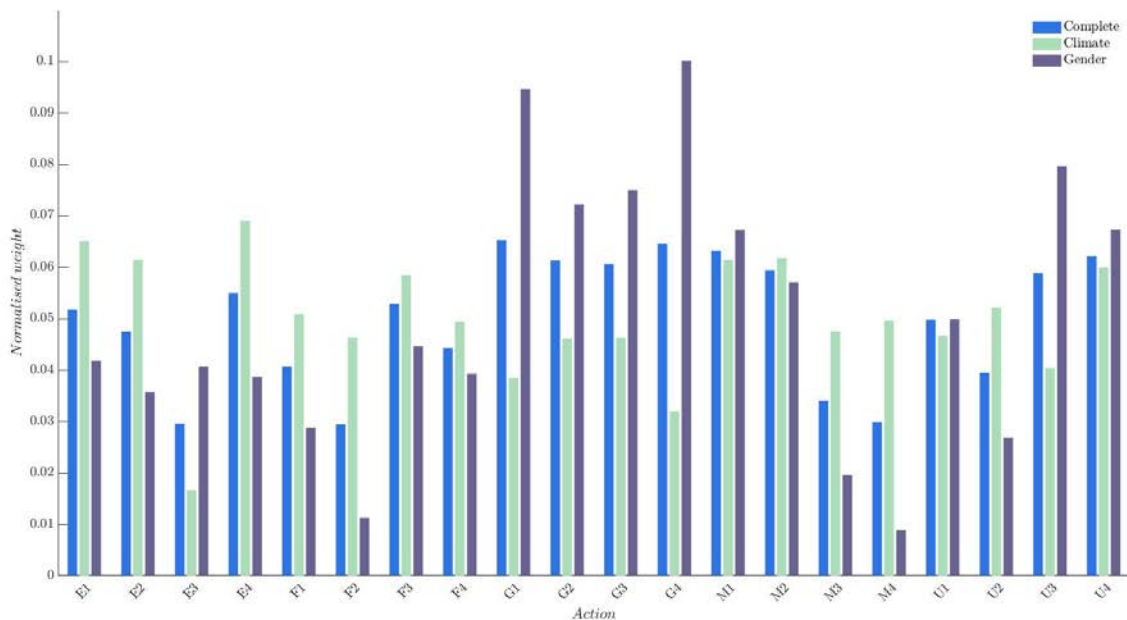


Figure 5: Aggregated weight of actions considering only Climate or Gender criteria

In sum, when only climate criteria are considered, there is a greater preference for technical actions, disregarding the social aspects of a just transition. In contrast, gender criteria prioritise efforts that have more significant social importance above technical elements. Both results show that if policymakers aim to promote equitable decarbonisation of cities, social factors should be broadly considered. Actions with significant social efforts will ensure a just transition as they would also catalyse and achieve the climate objectives needed.

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