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Posted Date: 11 February 2025

doi: [10.20944/preprints202502.0817.v1](https://doi.org/10.20944/preprints202502.0817.v1)

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Article

The Neglected Impact of the Livestock Sector on Climate Change: The Role of Intergovernmental Organizations

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Abstract: Climate change represents the major challenge facing humanity in the modern era. While countries and intergovernmental organizations (IGOs) have made some progress in addressing the climate crisis, there remains a flagrant blind spot in the global response: the significant greenhouse gas (GHG) emissions associated with livestock and animal-based food consumption. This Article critically explores how selected IGOs working directly or indirectly on climate change address the livestock industry and its GHG emissions. It employs a qualitative documentary and bibliographical methodology. More specifically, we analyze the following institutions: the United Nations Framework Convention on Climate Change Secretariat, the Intergovernmental Panel on Climate Change, the Food and Agriculture Organization, and the European Union. One of the conclusions is that three of the four IGOs have neglected the real impact of livestock on climate change. Even though the cultural, psychological, political, and economic obstacles to including the livestock sector in climate mitigation efforts are significant, IGOs could help overcome them if they fulfill their potential role in promoting the necessary global dietary shift.

Keywords: climate change; livestock industry; intergovernmental organizations; Paris agreement; diet change; meat consumption

1. Introduction

Billions of animals are slaughtered annually for meat production [1], and projections indicate significant growth in the following decades, as the world's current population of 8 billion is expected to reach 9.8 billion by the year 2050 [2] (p. 2). This population growth, rising incomes and the ongoing trend toward urbanization present unprecedented challenges for global food and agricultural systems, which emerge in a context where finite natural resources are not expanding in parallel [3]. Furthermore, the situation will likely worsen with an emerging middle class globally. As incomes rise, diets are anticipated to become more affluent and diverse, with a particularly robust increase in the consumption of animal-source foods. Projections indicate that by 2050, the demand for meat and milk is expected to surge by 73% and 58%, respectively, compared to their 2010 levels [3] (p. 1).

The significant environmental footprint of the livestock industry is well-established by science. Recent peer-reviewed studies have shown that the percentage contribution of animal agriculture to overall GHG emissions ranges between 16.5% and 28.1% [4] (p. 5). The sector is a large contributor to environmental degradation and global warming in several areas, of which we highlight two directly related to climate change: the release of methane and land use/deforestation. Approximately 30% of the documented global warming since the beginning of the Industrial Revolution can be attributed to methane [5]. Much of this methane stems from cattle's digestive processes and manure's decomposition, emitting more methane than the combined total of those generated by oil, gas, coal and bioenergy [6].

Agricultural expansion, which includes pasture and feed crops for humans and animals, is the primary driver of deforestation, accounting for almost 90% [7] (p. 47). Livestock grazing alone is responsible for 38.5% of the loss of carbo-absorbing forests [7] (pp. 18 and 47). In South America,

almost three-quarters of deforestation is due to livestock grazing [7] (p. 50). Farmed animals currently take up nearly 30% of the ice-free land on the planet [8]. A 2018 report highlighted that while meat and dairy contribute only 18% of the total consumed calories, they account for 83% of global farmland usage and 60% of the GHG emissions stemming from agricultural activities [9].

Several scientific studies show that changing our diet and reducing meat consumption is imperative to achieve the maximum global temperature rise of 1.5° C. An article addressing the topic concluded that Western countries must reduce beef consumption by 90% [10]. IPCC Special Report on Climate Change and Land also affirmed that the climate crisis cannot be prevented if we do not rapidly change the course of our food system [11]. The EAT-Lancet Commission on Food, Planet, Health, a report written by 37 scientists, says that a substantial shift in diet is necessary to achieve a sustainable food system [12]. Another article affirms that today, and likely in the future, dietary shifts can deliver environmental benefits beyond what producers can achieve. Moving from current diets to a diet that eliminates animal products holds transformative potential [9]. A recent study revealed discrepant environmental impacts of vegan, vegetarian, fish-eaters, and meat-eaters in the UK. It concluded that dietary shifts away from animal-based foods could substantially reduce the country's environmental footprint, including GHG emissions [13]. Another recent paper addresses how diet shifts can help reduce climate change impacts derived from the global food system [314]. CLARK et al. [15] affirm that global food system emissions could preclude achieving the Paris Agreement's climate change targets. A Report from Wageningen University [16], one of the world's top agricultural institutions, is clear about the need to reduce livestock numbers and shift to plant-rich diets in the context of climate change mitigation.

Despite the scientific evidence, many consumers are unaware that meat consumption has an adverse environmental impact, according to two different surveys. One revealed that across all the emissions sectors asked about, recognition of the livestock sector as a contributor to climate change was markedly the lowest [17]. For example, more than double the number of participants recognized direct transport emissions as a significant factor compared to those who recognized meat and dairy production, regardless of the nearly equivalent contribution of both sectors to overall emissions [17]. The other survey concluded that industrial meat is currently not regarded as a key contributor of global warming [18]. People from five different countries (France, United Kingdom, Germany, Brazil and United States.) considered that fossil fuels, deforestation, cars, overpopulation, overuse of plastic aviation, chemical manufacturing and overconsumption of goods contributed more than industrial meat to climate change. Furthermore, over 90% reported knowing very little or nothing about industrial meat production [18] (p. 14).

Against this backdrop, we will explore the subject through the lens of global politics. While national and international actions are vital to effectively addressing the problem, no article was found on the actions of international organizations regarding the intersection between climate change and industrial farming/global dietary shifts. There is a considerable amount of literature on the impact of diet/meat consumption on climate change, but none of it examines or focuses on international governance processes to tackle the problem.

This article's primary objective is to critically analyze how selected IGOs working directly or indirectly in climate change address the livestock industry and its GHG emissions, namely the United Nations Framework Convention on Climate Change Secretariat (UNFCCC), the Intergovernmental Panel on Climate Change (IPCC), the Food and Agriculture Organization (FAO) and the European Union. In this context, after concluding that three out of the four organizations examined have neglected the real impact of livestock on climate change, we will explore the potential reasons explaining why the livestock sector has been downplayed by global policymakers, as well as the potential roles IGOs can play in addressing the livestock industry's impact on climate change.

2. Materials and Methods

This article employs a qualitative documentary and bibliographical methodology. The introduction, with facts about livestock's contribution to climate change, relies on the analysis of peer-

reviewed articles and some grey literature. The latter includes primarily reports and studies published by IGOs and agencies, such as the United Nations (UN), the IPCC, the UNFCCC, the FAO, and the International Energy Agency (IEA).

For the empirical work, we selected four IGOs: the UNFCCC Secretariat, the IPCC, the European Union, and the FAO. A common criterion for choosing the first three IGOs is that they are among the most relevant for formulating international climate policies and are legally required (IPCC: its mandate is based on assessing the Science behind climate change; UNFCCC: Article 14(1) of the Paris Agreement; European Union: Articles 2(1), 4(1), 7(5) and 14(1) of the Paris Agreement.) to act according to the best available science. Meanwhile, the FAO has significantly influenced the development of global climate policies in the agricultural sector, including livestock, and continues to do so. Below are additional details regarding the criteria used to select these international organizations.

UNFCCC Secretariat: the international political body most directly involved in climate change. In addition to being responsible for supporting the global response to climate change, it must also organize and support the most important conference on the subject (COP). Its actions and inactions have great potential to shape climate policies worldwide.

IPCC: the UN body responsible for assessing the science concerning climate change. It exerts a significant influence on the climate change agenda, as its reports are used to inform national and international policies on climate change.

FAO: Although its mandate is not directly related to combating climate change, the organization has produced three reports about livestock's impact on climate change, which are widely cited and used to guide the global debate. Furthermore, the organization is very active at the COPs and influences how the livestock industry and dietary shifts are perceived in the context of climate change.

EUROPEAN UNION: The bloc's mandate is not related to climate change. Nevertheless, according to the best available science, reducing the consumption of animal-based foods is especially necessary in rich countries. Given European countries' meat consumption and the bloc's influence on the international climate change agenda, we understand it is pertinent to examine its policies on the topic.

The documentary analysis of the environmental bodies (UNFCCC and IPCC) comprises all the relevant actions – formal and informal – that they have carried out concerning livestock's GHG emissions: reports, studies, declarations, policies, decisions, agreements, toolkits, and social media activities. Regarding FAO, we have analyzed the three reports on livestock and climate change, as well as the participation and initiatives of the organization at the COPs. Concerning the European Union, we have analyzed its climate policies, which are available in various documents. Considering that climate change is not the central mandate of either FAO or the European Union, there was no expectation that livestock GHG emissions/dietary shifts – or any other major GHG emitter sector – would feature on their social media pages. We understand that the potential absence of the topic would not represent a bias and, thus, did not examine it.

The last section is divided into two parts and relies on scholarly publications and documents. The first part aims to explain why policymakers have overlooked the livestock sector and conduct a literature review in psychology, anthropology, and social and political sciences. Additionally, we utilized documents from IGOs, national governments, private institutions, and news articles to gather essential information and data. The topics derived from these sources included the following: the economic size of the livestock industry, gender representation in IGOs and leadership positions in general, civil society expectations and participation in COP28, allegations of censorship and harassment against FAO officials working with livestock policies, political lobbying at the IPCC, and the livestock industry's views on COP28's outcomes. The second part provides insights into the roles of IGOs in effectively incorporating livestock into mitigation actions.

Limitations

While this study focuses on four IGOs whose work has directly influenced global climate policies related to livestock, it acknowledges that other relevant IGOs in the environmental field were not included. The limited scope does not allow for generalized conclusions about the performance of non-analyzed IGOs. However, the roles and suggested changes discussed in this article may offer insights applicable to IGOs more broadly.

3. Results: The Performance of Selected Intergovernmental Organizations and Bodies Regarding the Livestock Sector

3.1. United Nations Framework Convention on Climate Change Secretariat

The UNFCCC Secretariat is the United Nations entity responsible for supporting the global response to climate change. It is tasked with supporting a complex architecture of bodies that advance the implementation of the Paris Agreement. One of its primary duties is organizing and supporting negotiating sessions each year, including the largest and most important: the Conference of the Parties (COP).

The fact that climate change has become the most significant environmental issue contemporarily has potentially turned the COPs and the UNFCCC Secretariat into the most relevant international political bodies in the environmental scene. The annual conferences attract attention from all over the world and are widely disseminated by all types of media, partly explaining the relevance of those bodies. Unlike many issues on the international agenda, the fight against climate change requires the direct involvement of the population. In the case of the livestock sector, public awareness and engagement are even more essential, given that most of the emissions reduction depends directly on a behavioral change, which is decreasing the consumption of animal-based foods. As these bodies receive a lot of media coverage at least once a year, they ultimately achieve greater visibility and outreach to the general public than other organizations addressing environmental or climate issues. This means that their actions - or inactions - also influence the degree of global awareness.

Regarding UNFCCC/COP's approach to the livestock industry, scant efforts have been made since the Paris Agreement entered into force. Every COP in the past years has failed to address the livestock sector when it comes to reducing the production and consumption of animal-sourced food. COP 27 was the first to pay relative attention to agriculture, but it overlooked the impact of livestock on climate change. The document drafted on the subject – “Food and Agriculture for Sustainable Transformation Initiative” – did not mention the issue [19].

Of all the conferences, COP 28 was the one that placed the most significant emphasis on the food system. For the first time, there was a day dedicated to food and agriculture, which gave the sector unprecedented publicity. This was useful in solidifying the topic on the political agenda for the climate, enhancing greater general awareness, and attracting the attention of people whose work relates to other emitting sectors [20]. Despite the more prominent spot, there were major omissions in dealing with the food system and its climate impacts.

By analyzing the most relevant documents drafted during the conference, we can identify the main problems. The Final Agreement generally addressed food systems throughout, did not mention the livestock industry or the need for global dietary shifts, and discussed the subject mainly in the adaptation section [21]. Although adaptation is essential, mitigating the sector's current emissions is vital and urgent, according to the best available science. The Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action also did not make any reference to the livestock sector or dietary changes [22]. A toolkit on agriculture and food was released, stating that “overwhelming scientific evidence indicates that nothing other than the widespread transformation of food and agriculture systems is required to achieve the global climate change goals outlined in the Paris Agreement” [23]. Yet, the toolkit did not discuss reducing animal-based food consumption. Lastly,

FAO released a report on livestock agrifood systems [24] that, despite mentioning global dietary shifts, has several limitations, as analyzed below in the FAO section (p. 9).

At COP29, the agenda for diet transition and reduction in the consumption of animal-based foods did not advance. Once again, there was a Food, Agriculture, and Water Day. However, no new initiatives in this area were launched. Existing initiatives, such as the Alliance of Champions for Food Systems Transformation, continued their advocacy efforts without achieving significant progress. Additionally, the initiatives addressing methane emissions primarily focused on reducing organic waste [25].

The COP has a legal duty to act according to the best available science (Article 14 of the Paris Agreement.) [26]. Overlooking the substantial emissions of the livestock sector could be interpreted as a neglect of solid scientific evidence. These annual gatherings are ideal for emphasizing critical aspects of the battle against climate change and pressuring countries to adopt policies on core areas. Yet, it has been a missed opportunity thus far concerning the livestock industry.

Awareness-raising activities regarding institutional initiatives aimed at the general public are also scarce when we analyze the UNFCCC Secretariat initiatives unrelated to the COPs. Nowadays, social media is one of the most popular tools for civil society engagement. Looking at the UN Climate Change (UNFCCC) Instagram account, it is possible to notice an omission concerning dietary change as a mitigation option.

An analysis of the organization's Instagram posts between January 2021 and September 2024 found that 14 out of 596 posts were about food systems/agriculture or mentioned the topic (Instagram page @unclimatechange, posts from 4 March 2021, 4 May 2021, 12 July 2021, 12 August 2021, 10 September 2021, 13 October 2021, 17 March 2023, 28 March 2023, 24 July 2023, 29 September 2023, 16 October 2023, 11 February 2024, 30 March 2024, and 11 July 2024). Food waste is the most addressed topic in the context of agriculture.). However, only five addressed the environmental impact of diets or shifts towards plant-rich diets (Instagram Page @unclimatechange, posts from 4 March 2021, 12 July 2021, 10 September 2021, 17 March 2023, and 11 February 2024.), representing less than 1% of the analyzed posts. None directly mentioned livestock as a significant contributor sector. If we compare it to the energy/fossil fuel sector, there were 39 posts. In addition to the quantitative disparity, we can also notice differences in the tone of the posts. While there seems to be considerable caution in associating industrial meat with climate change and recommending plant-rich diets, the posts on energy/fossil fuel, deforestation and transportation tend to be straightforward about the climatic impact of these sectors and the necessary mitigation efforts (There was one post about diets' environmental impact, but reducing animal-based foods was not among the five recommendations: consider the entire food system, support sustainable agriculture, buy locally, reduce food waste and avoid unnecessary packaging.).

Therefore, posts and references to the food system, agriculture, and food security exist on a small scale, and scarce attention has been devoted to dietary shifts. In addition, while topics concerning water, deforestation and biodiversity frequently take center stage in UNFCCC posts, the livestock industry is typically overlooked despite its significant and direct impact on these issues. While social networks often serve as a platform for education and awareness-raising for laypeople on various subjects, such as climate change, the UNFCCC has been neglecting a sector that may contribute up to a quarter of CO₂e emissions and whose mitigation actions depend on raising public awareness. In summary, the UNFCCC Secretariat has failed to address the livestock industry and the need for a global dietary shift in both the formal (COPs, decisions, document publications) and informal (social media) spheres.

3.2. Intergovernmental Panel on Climate Change (IPCC)

IPCC's main goal is to provide governments with scientific information that they can use to develop climate policies, which is done by publishing comprehensive assessment reports about the state of scientific, technical, and socioeconomic knowledge on climate change. The IPCC does not produce science; it only evaluates the existing science on subjects relevant to climate change. Apart

from political internal bodies, the IPCC also has internal organs composed of scientists and counts on the work of hundreds of leading experts responsible for the IPCC reports. Therefore, it can be considered a hybrid body – scientific and political.

Of all the intergovernmental institutions analyzed in this section, the IPCC is the only one that, since 2019, has been approaching the impact of GHG emissions from the livestock sector in a straightforward manner and has not shied away from addressing the need for changes in the global diet to reduce GHG emissions. The most relevant document produced by the IPCC concerning the subject was the Special Report on Climate Change and Land (SRCCL). Afterward, no specific reports on land, agriculture or any other related topic were published. However, general IPCC reports usually mention the impact of agriculture/livestock and how dietary shifts are effective mitigation actions, such as the AR6 WGIII Report [27] (p. 111). One of its reports affirms that demand-side measures (shifting to sustainable healthy diets and reducing food loss/waste) and sustainable agricultural intensification can reduce CH₄ and N₂O emissions [28] (p. 106). Dietary changes could provide a technical mitigation potential of 0.7 to 8.0 GtCO₂eq yr by 2025 [11].

An analysis of IPCC's Instagram posts since 2023 revealed that the institution has a different approach than the UNFCCC's page. While UNFCCC's account has predominantly informative posts about various aspects of climate change, most of IPCC's posts relate to institutional matters – calls for authors, event/report promotions, and job openings. Out of 345 posts, 192 were institutional and 153 had information about climate change. The latter usually featured general climate topics, and many posts have been replicated several times between January 2023 and November 2024. The minority of them addressed specific emitting sectors. Concerning the livestock industry, one post addressing major sectors mentioned dietary change as a mitigating action (There was one post about diets' environmental impact, but reducing animal-based foods was not among the five recommendations: consider the entire food system, support sustainable agriculture, buy locally, reduce food waste and avoid unnecessary packaging.), and there was another post about the positive impact of sustainable healthy diets that include plant-based foods (Instagram page @ipcc, post from 1 March 2023.). While there have been only two posts on the subject in almost two years, there is no significant disparity in the number of posts exclusively dedicated to major emitting industries, as identified on UNFCCC's Instagram page.

Even though the IPCC has addressed livestock's impact on climate change several times, the organization is not exempt from the political pressure of state parties, as discussed below (p. 13). This allegedly prompted the organization to remove a phrase from a report recommending shifting to plant-based diets. Indeed, the general recommendation to adopt "sustainable healthy diets" is more common in IPCC reports than direct mentions of reducing the consumption of animal-based foods or shifting to plant-based diets. We cannot have an objective dimension of how much this could have influenced policies on the topic. Yet, in conclusion, it should be safe to affirm that the IPCC has not avoided directly addressing livestock emissions and the need for dietary shifts, probably because this body heavily relies on science.

3.3. Food and Agriculture Organization (FAO)

FAO is a specialized agency of the U.N. whose main goals are to achieve global food security and defeat hunger. Although its mandate is not directly related to combating global warming, world food production directly affects and is affected by climate change. On the one hand, the global food system is responsible for a third of GHG emissions [29]. On the other hand, climate change is already turning fertile lands into deserts, causing increasingly frequent flooding and altering the freshwater ecosystem, which seriously compromises food production worldwide. In this context, the organization frequently publishes studies whose themes are at the intersection of food production/security and climate change.

FAO published three reports exclusively dedicated to livestock's impact on climate change. The first – Livestock's Long Shadow (2006) [30] – affirmed that the sector was responsible for 18% of CO₂e emissions. The second – Tackling Climate Change through Livestock (2013) [3] – revised the figure

down to 14.5%. The third report - Pathways towards Lower Emissions: A Global Assessment of the Greenhouse Gas Emissions and Mitigation Options from Livestock and Agrifood Systems (2023)[24] – once again revised the sector's contribution downward to 12%.

FAO's most widely publicized report was "Tackling Climate Change through Livestock," and it has several limitations. Firstly, it has methodological problems demonstrated by peer-reviewed articles, which reveal that the sector's contribution has been underestimated. According to a peer-reviewed paper that revised the FAO report and used many other peer-reviewed studies on the impact of animal agriculture, the sector's emissions are between 16.5% and 28.1% [4]. Twine affirms that due to the limitations of the second FAO report, the figure may not be as low as 16.5%, which should be considered as a new minimum estimate [4] (p. 5). According to the author, even slight increases in the percentage figure can significantly influence the social and political framing of emissions from animal agriculture [4].

Secondly, although the technical staff of IGOs are usually qualified professionals, the report was not peer-reviewed, which is essential to make studies scientifically credible. Lastly, it presents increased efficiency and sustainability in the livestock industry as the solution without mentioning the need to reduce the production and consumption of animal-sourced products. Despite the implementation of diverse technological initiatives to enhance productivity, FAO itself admits that emissions from the industry persistently escalate [31] (p. 1). The first report [30] also did not advocate reducing the consumption of animal-based foods and focused on efficiency improvements in production. While advancements in technology on the supply side are essential and welcome, they alone will not suffice to reduce emissions to the necessary extent [32].

Considering the shortcomings of the second report, it contributed to the livestock sector being downplayed for a decade in the fight against climate change. The report was widely cited – 4.740 times (Checked on February 3rd, 2025.) only in academic papers identified by Google Scholar, in addition to unaccountable citations in news articles, blogs and other online texts. Percentage figures hold social and political significance, influencing policy and highlighting the importance of societal reflection on the narratives that develop around them [4].

Regarding the third report, despite all the robust scientific data produced between 2014 and 2023 on livestock's CO₂e emissions and its impact on climate change, it decreased the sector's estimated emissions from 14.5% to 12%. While the report addressed dietary shifts as a mitigation measure, it predominantly emphasized the potential challenges and limitations associated with implementing such a solution, affirming that it would represent only a 2% to 5% reduction in emissions associated with the entire global food system [24] (pp. 17 and 18).

In the third report, the misuse of research data was so evident that two academics whose studies were cited in the report wrote a letter to the organization requesting an urgent retraction based on numerous methodological, framing, and data errors. The misuse of the authors' works allegedly resulted in the FAO estimating an emission reduction of dietary change between 6 and 40 times lower than the scientific consensus, seriously distorting their studies' findings [33].

In addition to the reports, FAO is engaged in discussions about climate change in other forums. As mentioned, COP 27 was the first to devote some attention to the agricultural industry, and FAO was directly involved in many initiatives. The Organization co-hosted a Food and Agriculture Pavilion for the first time, set up again during COP 28. The most relevant informative documents drafted on the topic were either from FAO or co-authored by some of the organization's staff. Yet, they continued to overlook the impact of livestock on climate change and the need for a shift in the global diet.

Although no FAO report, recommendation, or document is legally binding to state parties of the organization or the COP – as they are in the realm of soft law – these non-binding initiatives are vital to informing the creation of domestic policies and raising awareness and engagement in the causes they address [34]. Therefore, IGOs such as FAO have the potential to play a key role in creating obstacles or enhancing awareness and the adoption of effective mitigation actions, depending on the accuracy of the information they publish and their initiatives in major international events.

3.4. European Union

The EU aims to become the first climate-neutral continent by 2050; thus, the state parties must drastically cut their GHG emissions. Another target is to reduce emissions by at least 55% compared to 1990 by 2030 [35]. The bloc's climate objectives are undeniably bold, and it will take a remarkable effort to accomplish them. Therefore, no major emitting sector can refrain from contributing. The EU's livestock sector accounts for 81-86% of total agricultural GHG emissions [36]. Notwithstanding these facts, EU policies and laws have not adequately addressed the livestock sector thus far. Although many documents refer to livestock emissions [37], this sector's treatment is much milder than other highly polluting industries. In the transportation industry, for example, the banning of combustion engine cars is set to take place in 2035. While various sectors undergo regulation and are subject to mandatory rules/targets, there are no concrete initiatives aiming at reducing the emissions of the agriculture sector, let alone the consumption of animal-based foods. The EU's Nationally Determined Contributions (NDCs) have not mentioned the livestock sector [38].

Concerning the EU's specific policies on livestock, the European Commission published a study conducted by scientists on sustainable food consumption, which was clear about the need for dietary shifts towards reducing the consumption of animal-sourced foods [39]. Nevertheless, the report's recommendations have not been transformed into political actions. Regarding climate policy, agriculture in the EU is predominantly governed by differentiated national reduction goals, which has led to generally inadequate climate regulations within Member States [40]. Unlike other major emitting sectors, agriculture is exempt from applying the "polluter pays principle," meaning that "those responsible for environmental damage should pay to cover the costs" [41]. In this regard, adopting an emissions trading system is a common practice. It already applies to many other industries and could be introduced in agriculture.

Nevertheless, in its 2040 climate roadmap, presented in 2024, the EU Executive withdrew reference to applying carbon pricing to agriculture [42]. The roadmap allegedly represented a setback in the cut of agricultural emissions, as it dropped many bold targets and references to the agriculture sector, comparing the preliminary and final versions of the document [42]. According to KORTLEVE [43], more than 80% of the European Union's Common Agricultural Policy funding is directed toward emission-intensive animal products.

In addition, through the analysis of lobbying, subsidies and regulations in the US and the EU, a study has revealed that animal farming receives most of the public financial support for food producers and still heavily relies on public subsidies [44]. One of the study's conclusions is that the public policies benefiting the meat industry obstruct the establishment and diffusion of plant-based products as viable substitutes for animal products [44] (p. 1220). In the EU, animal farmers got 1200 times more public funding than the meat alternative industry. Therefore, livestock/agriculture currently is not subject to stricter climate regulations and is directly stimulated through subsidies. Scientific studies show that shifts in diet are especially needed in rich countries; thus, the EU should have been playing a leading role, considering its overconsumption of meat and its legal duty to act according to the best available science.

While the EU has implemented and significantly improved agricultural productivity, GHG emissions from the sector have barely decreased. An analysis from the European Environment Agency projects that the emissions will decrease by only 1.5% between 2020 and 2040 if current policies and measures remain the same [45]. The European Scientific Advisory Board on Climate Change found that emissions in agriculture are not decreasing [46]. Considering the EU emission goals, excluding the livestock sector from mitigation initiatives would lead to failure in meeting their own targets and potential breaches of the Paris Agreement's objectives.

4. Discussion

4.1. The Main Reasons Why the Livestock Industry Has Been Ignored

Climate policymakers neglect the livestock sector for multiple reasons, including psychological and cultural factors, the industry's enormous financial power, and domestic politics. These elements are intertwined and contribute to shaping national and international policies on the topic.

Although there is evidence of meat consumption by humans since prehistoric times, the industrial production of meat has transformed the consumption pattern, with a clear inflection at the end of the Second World War. In 50 years (1961 - 2011), world consumption of meat and dairy products almost doubled, from 23.1 kg per person per year to 42.2 kg [47]. How meat consumption has developed throughout recent human history has added elements that complicate the necessary diet shift in the current context of climate emergency. Meat consumption is frequently regarded as "natural, normal, necessary and nice" (4 Ns) [48], and myths about the irreplaceability of animal protein for human health are still firmly established in the popular consciousness.

In psychology and anthropology, there are research areas dedicated to meat consumption, and the findings of numerous studies add several layers to the already complex relationship that people and societies generally have with meat. For instance, there is strong evidence that meat consumption is correlated to personality characteristics such as power, social dominance orientation, support for hierarchical structures and inequality [49]. Numerous studies in the field of social psychology show that eating meat is directly connected with the perception of masculinity [50]. Marketing has also perpetuated this association for a long time [51].

This means that people may subconsciously resist reducing their meat consumption because it may entail a perception of less wealth and power, which generally have a positive connotation in the world's societies. This may also explain the tendency for meat consumption to increase as societies become wealthier, as shown in the estimate presented in the introduction [3]. In addition, for up to half of the population—men—the perception of masculinity can also be compromised, which can be a sensitive issue.

The correlations above are just a fraction of research topics that show the intricate relationship between humans/societies and meat consumption. This gives us a glimpse of the significant psychological/cultural obstacle in the path of the needed global dietary shift to tackle climate change. Furthermore, this factor is deeply intertwined with another factor: domestic politics. In democracies, politicians depend on constituents to be elected, and policies targeting the reduction of meat consumption are potentially among the most unpopular in most countries (In France, a meatless school menu sparked a political row (Henley, 2021,

The third factor is the livestock sector's enormous political and economic power. The sector's economic size is estimated at USD 487.46 billion in 2024 [52], and its political power is also immense. Several relevant countries for the production and consumption of meat, such as Brazil and the USA, have agricultural/livestock Congressional caucuses. The sector's lobby is usually quite powerful and effective. As mentioned before, a study examining lobbying, subsidies, and regulations in the US and the EU revealed that the meat industry restrains the development of sustainable alternatives [44]. The paper noted a glaring contrast: US farmers received 800 times more public funding than plant-based meat groups, while animal farmers received 1200 times more public funding in the EU [44].

All these factors are also relevant at the international level, contributing to the insufficient performance of IGOs concerning the livestock sector. The psychological and cultural aspects

influence domestic and international policymakers alike. When we take into consideration the deep association between meat and masculinity/power, we can infer that adopting policies aiming at meat reduction is generally more challenging for men than for women; however, leadership positions in IGOs are predominantly held by men. Women have always been and still are underrepresented at all levels of decision-making worldwide, both in national and international spheres [53].

Gender disparity is also a reality in the area of climate change. At UNFCCC, female representation in constituted bodies averaged 38% in 2022 [54]. At COP 28, 15 out of 133 leaders were women [55], and only 34% of Party delegates were females, the same percentage as ten years ago [56]. Although it should be safe to assume that the prevailing tendency toward male passivity regarding policymaking on livestock occurs predominantly subconsciously, the need for prompt action to comprehensively integrate livestock into mitigation efforts remains the same.

Concerning political influence, even though IGOs are theoretically independent and autonomous concerning the state parties that created them, in practice, state interests often strongly influence international decisions. Such influence is easier to identify in the context of documents and policies adopted through the individual votes of the member countries. Nevertheless, it also occurs in circumstances in which the direct involvement of the countries is not supposed to happen.

There are serious allegations from ex-officials and officials of FAO claiming that the work on livestock methane emissions has been censured since 2006 [57]. The pressure comes allegedly from farm-friendly funding states, and officials working on the project said they were censured, sabotaged, undermined and victimized [58]. The head of the livestock policy branch at FAO affirmed that a senior official once told him that “even if livestock contributes 18% to climate change, the FAO shall not say that. It’s not in the interest of the FAO to highlight environmental impacts” [58]. Concerning the IPCC, according to THOMAS [59] and DUTKIEWICZ/ROBERTS [60], Brazil and Argentina’s delegates allegedly made the IPCC remove a phrase from a report recommending shifting to plant-based diets. The final version of the synthesis report recommended a “balanced, sustainable healthy diets acknowledging nutritional needs.” Therefore, the heightened political sensitivity that the issue engenders domestically in countries ultimately affects the policies carried out by IGOs.

Regarding lobbying, the livestock industry also exercises its political and economic power internationally. At COP 28, big meat and dairy lobbyists attended in record numbers, and over one-third of them participated in the conference as part of country delegations, which granted privileged access to diplomatic negotiations [61]. While it was expected that COP 28 would be a “Food Cop” [62], this was not the perception of many involved in the conference. For instance, the US meat lobby considered the outcome of COP 28 positive. The livestock sector’s representatives are said to feel enthusiastic and excited about the industry’s prospects [63]. At COP 29, once again, hundreds of industrial farming lobbyists attended the summit [64].

4.2. The Potential Role of Intergovernmental Organizations

If scientific predictions are correct and dietary shifts are vital to tackling climate change, humanity will need to overcome the abovementioned obstacles, however significant they may be. In this context, IGOs can play an important role. Nevertheless, before addressing the possible contributions of IGOs, we shall make some remarks about the abovementioned obstacles.

Although the economic and political power of the livestock sector is indisputable, other major emitting sectors are equally or more powerful, such as fossil fuels and transport. Despite this, there are several international and domestic initiatives, many of them legally binding, aimed at regulating these sectors and reducing their GHG emissions. Generally, IGOs demonstrate no reluctance to unequivocally label these industries as emitters and launch advocacy campaigns to engage them in practical mitigation efforts. Therefore, the fact that the livestock sector is powerful should not be a reason for international society to remain inert.

Concerning the need for behavioral change, it is known that collective changes in behavior are challenging, but they are achievable. This has already been done concerning the prevalence of smoking [65] and the seat belt use rate [66], for instance. Nevertheless, any behavioral change requires

raising awareness among the population as a basilar step, and it will be challenging to achieve a global dietary change if a considerable percentage of the population continues to ignore the facts that directly link the consumption of animal-based foods and climate change.

The reduction of emissions in all sectors benefits from greater public awareness. Yet, in the case of livestock farming, awareness is one of the main factors that can lead to reduced emissions. While many of the initiatives in other industries do not depend on the general population, such as the development of new technologies in renewable energies and clean transportation, in the case of livestock farming, reducing the demand for animal products is the measure with the most significant possible impact on achieving the necessary decrease in emissions [9] (p. 991). Although awareness alone does not suffice for individuals to engage in sustainable behavior, initial awareness is paramount for achieving behavioral change [67].

Addressing the potential contributions of IGOs, one of the most remarkable capacities of these organizations is to act in the realm of soft law by formulating declarations, recommendations and technical studies that are not legally binding on their member states but generate awareness and engagement in the causes they address. Soft law is recognized as especially effective in international environmental law [68]. While IGOs have frequently failed to address and effectively contribute to solving international security problems, they can play a decisive role in transforming systems that grand non-military international challenges require. On the one hand, IGOs operate with high political support. They are, thus, able to set priorities and develop norms through the definition of collective problems and solutions. On the other hand, IGOs have the unique capability to enhance the implementation and protection of novel practices involving public and private actors [69].

From a practical standpoint, the adoption of specific measures is essential. IGOs need to acknowledge the impact of livestock on climate change unequivocally. In addition, those organizations working directly on climate issues should pay particular attention to gender representation, which is essential not only for effective general climate governance [70] but also for the promotion of mitigation actions involving dietary shifts, given that men tend to be less prone than women to adopt policies to reduce meat consumption. Institutions must also back up their actions with solid scientific data. The publication of inaccurate information may inform the debate on the subject, as in the case of the FAO reports, which, instead of collaborating, generates setbacks that can have a high cost in the context of climate change. Finally, while it is unrealistic to expect that IGOs will be completely exempt from political pressure, employee harassment and distortion of studies in an attempt to suppress scientific facts shall not be regarded as a standard or acceptable practice. Notwithstanding the political pressure, IGOs must do their best to keep their independence and integrity.

In line with these measures, IGOs' actions can take various forms: awareness campaigns, publication of reports, recommendations, statements by senior leaders, and adoption of declarations, among others. Community-based social marketing (CBSM) campaigns are particularly efficient in engaging individuals in sustainable behavior [66], and there are examples of IGOs that successfully integrated elements of CBSM in their initiatives (UNICEF (<https://www.sbcguidance.org/do/social-marketing>) and World Food Program (<https://www.juzaor.org/projects/1884.html>) are examples of organizations using CBSM in their initiatives.). It should be noted that even IGOs whose mandates are not related to environmental causes can take action with a significant impact. For example, the adoption by the World Health Organization of a dietary guideline that promotes healthy eating habits and is compatible with environmental/climatic demands has great mitigation potential [44]. All this would potentially promote awareness among the world population, engage other major actors, such as NGOs and media outlets, and exert political pressure on countries, enhancing the adoption of domestic policies.

5. Conclusions

Climate change is imposing radical changes on the planet's functioning. Reviewing, rethinking, and reconfiguring long-standing systems and behaviors is arduous. Yet, in a scenario where some

studies affirm that the 1.5°C threshold is no longer achievable [71], all major emitting sectors and all stakeholders in the fight against climate change must act.

Global efforts can most effectively tackle a global challenge that requires targets to be met by the entire world. While national initiatives are necessary and welcome, there isn't enough time to wait for over 200 countries and 8 billion people to conclude—at their own pace—that reducing the consumption of animal-based foods is essential. Achieving the ambitious goals to address the climate crisis will be difficult without coordinated international action. Although IGOs alone cannot resolve the issue, they might be the most capable of mobilizing all other stakeholders, both directly and indirectly, including countries, NGOs, media outlets, and individuals.

This article revealed that three of the four analyzed IGOs are not playing the role they could in stimulating the reduction of emissions from the livestock sector. Changing their initiatives and policies is vital to tackling the world's climate crisis.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Acknowledgments: Not applicable.

Conflicts of Interest: The author declares no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

MDPI	Multidisciplinary Digital Publishing Institute
DOAJ	Directory of open access journals
TLA	Three letter acronym
LD	Linear dichroism

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