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Balancing Responsibilities under CBDR-RC: Climate Finance, Multi-Actor Accountability, and Crisis Response

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Abstract. This study conducts an in-depth review of the intense controversies and evolutions surrounding the CBDR-RC principle since the 1990s, focusing primarily on how developed countries have weakened their commitments, how emerging economies have redefined "differentiated responsibilities" and how non-governmental organizations have transformed from protesters into pragmatic collaborators. The research reveals the core contradiction in current climate issues, namely that the rigid responsibility framework is conflicting with the escalating climate crisis year by year.The "Three-Dimensional Balance Framework" is not just numbers on paper but a dynamic system that takes into account the scale of funds, the transparency of accountability, and the speed of crisis response. It aims to move the CBDR-RC principle beyond treaty texts and truly provide solutions for farmers in Bangladesh, islanders in Barbados, refugees in African regions, and all those caught between promises and actions.

Keywords: Common But Differentiated Responsibilities and Respective Capabilities, Climate Governance, Climate Finance, Climate Justice, Multi-Actor Accountability

1. Introduction

In 1992, the principle of Common but Differentiated Responsibilities and Respective Capabilities(CBDR-RC) was put forward in the United Nations Framework Convention on Climate Change (UNFCCC). The original intention of this principle is to allocate responsibilities in accordance with the historical emissions and economic capabilities of various countries, so as to reconcile historical carbon debts and developmental aspirations [1]. Developed countries which are the group with the largest cumulative greenhouse gas emissions since the Industrial Revolution, need to undertake the task of taking the lead in carrying out emission reduction and providing funds for global emission reduction efforts [2], while the emission reduction tasks of developing countries have a certain degree of flexibility, which can balance climate actions and economic growth for these countries that still need to focus on economic development [3].

However, in the 21st century, this principle is also facing many unprecedented challenges. The worsening climate crisis has exposed the limitations of this principle, and many recordbreaking extreme weather events have proven this point. For example, the wildfires in Europe in 2025 burned more than 196,000 hectares of land across the EU, a figure more than twice the 19-year average [4]; and in July 2023, global temperatures rose by more than 1.5°C compared to pre-industrial revolution

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and industrialization levels [5]. At the same time, the financing gap persists. Developed countries have still not fulfilled their 2009 commitment to provide $100 billion annually in climate adaptation funds. The Green Climate Fund (GCF) only received $9.3 billion in replenishment funds in 2023, far below the target of $10 billion [6]. In addition, non-state actors such as China's Vanke Foundation and the China NGO Cooperation Association have begun to rise continuously. They actively participated in COP29 through projects such as "COP Partners", which makes it necessary to re-evaluate the governance structure [7].

This impasse is essentially the result of three core contradictions. First, developed countries are increasingly emphasizing "common responsibility" as exemplified by the Trump administration's announcement of its withdrawal from the Paris Agreement this year, when he criticized the Paris Agreement as "unfair" to US economic interests [8]. This conflicts with the "differentiated responsibilities" insisted upon by developing countries which is based on the principle that historical emitters should bear disproportionate costs [3]; On the other hand, the disbursement rate of the Green Climate Fund (GCF) remains very poor. Despite the fund pool having reached 17 billion U.S. dollars, only 2.3 billion U.S. dollars had been allocated to developing countries and economies by 2021 [9]. In this case, the accountability system that relies solely on state-centric reporting mechanisms is fundamentally unable to address the role issues of non-state actors, just as non-governmental organizations like the Climate Action Network have repeatedly emphasized the lack of transparency in fund allocation [9]; In addition, just like the Mediterranean wildfire incident this year, the coordination between state and non-state actors will fail when a disaster occurs. After the fire broke out, the Hérault region in France found it difficult to control the fire due to fragmented fire-fighting resources and delayed EU assistance. This phenomenon reflects the problem of long-term underfunding of adaptation projects in small island developing states (SIDS) like Barbados [10].

Most existing studies only focus on single objects or single issues, failing to consider that financing, accountability, and crisis response are interrelated [11]. Past studies have also not properly sorted out how the concept of "common but differentiated responsibilities and respective capabilities" has changed with different stages of the climate crisis. For example, negotiations in the 1990s mainly focused on emission reduction, and after 2015, they shifted to mainly discussing how to adapt to climate change [3]. In practice, there is no existing framework that can turn "responsibility balancing" into specific implementable policies, especially in terms of how to connect financing mechanisms with real-time disaster response systems [12].

The main purpose of this paper is toanalyze the evolution of the concept of "Common But Differentiated Responsibilities and Respective Capabilities"(CBDR-RC), and examine the changes in the perspectives of various stakeholders from the 1990s to the present. For example, the commitments of developed countries have become less firm and emerging economies have redefined "differentiated responsibilities", and non-governmental organizations have also shifted from protest to pragmatism [7]. Through these, the strengths and weaknesses of the current governance model will be identified. At the same time, it also calls on relevant organizations and policymakers to establish a three-dimensional balance framework that integrates climate finance, accountability transparency, and crisis response speed. This framework is not only intended to remain in treaty texts, but also to make the CBDR-RC principle truly implemented. For example, priority can be given to funding early warning systems in small island developing states, and at the same time, non-governmental organizations can lead audits to urge donors to take responsibility [12]. This paper will propose a dynamic model with the participation of multiple stakeholders, which can contribute to SCI-level academic discussions in the field of global governance

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innovation. For policymakers, it provides a plan to align financing with adaptation needs, just like China's "dual carbon" goals which balance emission reduction and green technology transfer [13].

2. Overall thesis and road map

2.1. Core thesis

Whether the Common But Differentiated Responsibilities and Respective Capabilities principle works or not depends on the ability to achieve dynamic responsibility balancing, which requires good overall coordination across three key dimensions. In terms of time, just as some scholars have pointed out, the climate crisis is constantly changing, and the allocation of responsibilities must also be adjusted accordingly. For example, in recent years, extreme weather events have become more frequent and severe. Wildfires, for instance, are much more common than before [12]; under such circumstances, the responsibilities that various countries should bear must naturally change along with this. When climate governance was just starting out in the past, the main focus was on letting developed countries take the lead in emission reduction; but now that the climate crisis has become increasingly serious, developing countries must gradually make more efforts, and developed countries must work even harder.

From the perspective of participating subjects, it is particularly crucial to coordinate the rights and tasks that need to be done among developed countries, developing countries, and non-governmental organizations (NGOs). Developed countries have strong economic strength and have emitted more greenhouse gases in the past, so they must take on more responsibilities in providing climate funds and technical support. For developing countries, they should formulate appropriate response strategies based on their own developmment conditions. They need to not only adapt to climate change but also find ways to reduce emissions. Non-governmental organizations can act as intermediaries: on the one hand, they monitor whether policies are implemented, and on the other hand, they also encourage ordinary people to participate. This kind of coordination is particularly important. Just like during the implementation of the Paris Agreement, different stakeholders have different ideas and practices; only by coordinating everyone well can the goals in the Agreement be achieved.

From the perspective of issues, it is necessary to link the scale of climate finance, transparency of accountability, and efficiency of crisis response. The disbursement issues of the Green Climate Fund (GCF) have long been reported [14]; only by improving the disbursement efficiency can more funds be allocated to developing countries for climate adaptation and mitigation projects. At the same time, enhancing the transparency of accountability can ensure that funds are used for practical purposes. In the face of climate-related disasters such as the 2025 Mediterranean wildfires, an efficient crisis response system can reduce losses. Only by integrating these aspects can the principle of CBDR-RCbe put into practice, and a static "one-size-fits-all"approach should not be adopted.

2.2. Analytical road map

Step 1: Review literature to clarify the changes in various actors' perspectives on responsibilities (1990s-2020s)

In the paper, relevant literature will be summarized to examine how the perspectives of various stakeholders on climate responsibilities have changed from the 1990s to the 2020s. As stated in many historical analyses [15], when the climate governance system was first established under the 1992 United Nations Framework Convention on Climate Change, the roles of developed and

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developing countries were clearly divided, and the developed countries listed in "Annex I" had more explicit obligations to reduce emissions. However, things changed after the 2015 Paris Agreement, and the situation became more complex. For example, during the tenure of some administrations in the United States, less emphasis was placed on "differentiated responsibilities"; instead, "joint responsibility for all" was stressed. The Trump administration's withdrawal from the Paris Agreement in 2025 is a typical example [16]. In contrast, developing countries have always adhered to the CBDR-RC principle, insisting on accounting for historical emissions, and attached importance to "differentiated responsibilities". Non-governmental organizations have also changed: from mainly relying on protests in the past, they have become active participants in climate governance, with their roles and influence being significantly different. By analyzing these changes, we can identify the main differences among various stakeholders, laying a foundation for the subsequent study of the current deadlock in climate governance.

Step 2: Based on historical context, clarify the roles and shortcomings of various actors in the three aspects of climate finance, accountability, and crisis response

Based on the historical context sorted out in Step 1, this chapter will conduct an in-depth analysis of the performance of various stakeholders in three key areas. First, regarding climate finance. Developed countries have promised to provide support to developing countries. For instance, they pledged to provide 100 billion US dollars annually under the Green Climate Fund, but the actual amount of funds provided is far from meeting this target [17]. Although developing countries are in urgent need of this fund to carry out climate adaptation and emission reduction projects, they find it difficult to make good use of the fund due to their weak institutional capabilities. Next, in terms of accountability. Currently, it mainly relies on countries to report their own situations, which fails to cover roles such as NGOs. NGOs like the Climate Action Network have been advocating for greater transparency in fund allocation, but they have little impact on the formal accountability system [18]. Finally, in terms of crisis response. When disasters occur, countries and non-state stakeholders often have poor coordination. The situation in Hérault, France is a case in point [19].Countries cannot quickly mobilize resources, and non-state stakeholders also lack clear channels to participate in the response.

Step 3: Integrate the previous analyses to propose a three-dimensional responsibility balance framework and specific recommendations

By summarizing the previous analyses, article will propose a "three-dimensional responsibility balance framework". This framework will take three aspects into consideration: in terms of time, as the climate crisis becomes more severe, the allocation of responsibilities should also be adjusted accordingly; in terms of participating stakeholders, the rights and obligations of each role should be clarified; in terms of specific issues, the three matters of climate finance, accountability, and crisis response should be linked together. For example, in terms of climate finance, a more flexible funding mechanism can be designed based on the historical emissions and current economic levels of various countries; in terms of accountability, an accountability network involving multiple stakeholders can be established to make the process more transparent and effective; in terms of crisis response, a coordination mechanism involving both countries and non-state stakeholders can be developed. This framework will be transformed into specific policy recommendations, such as strengthening international cooperation, improving laws and regulations related to climate governance, and helping developing countries enhance their capabilities. In this way, the CBDR-RC principle will no longer be just a theory, but can be turned into practical and implementable measures in global climate governance.

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3. Literature review

3.1. Formative phase (1990s - early 2000s)

3.1.1. Developed countries

Developed countries verbally acknowledge "common responsibilities" but rarely mention "differentiated responsibilities". For example, in the Kyoto Protocol, the United States advocated that developing countries should gradually assume emission reduction obligations [20]. There was progress during this phase: the Kyoto Protocol incorporated "historical emissions" into an international agreement for the first time [21]; however, the problems were more prominent. Developed countries deliberately evaded specific financial commitments and made flexible interpretations of "common but differentiated" to obscure responsibilities [20], making it ultimately difficult to hold them accountable for providing climate financial support to developing countries.

3.1.2. Developing countries

Represented by the Group of 77 plus China, developing countries have always advocated that developed countries should take on the main responsibilities of financing and emission reduction, and the prerequisite for them to assume responsibilities is to first carry out "capacity building" (for instance, India stated this position in the negotiations of the United Nations Framework Convention on Climate Change) [22]. This approach upholds the core principle of CBDR-RC and safeguards their right to development; yet, it has a shortcoming. They rarely mention the proactive responsibilities they should undertake when responding to crises [23].

3.1.3. Non-Governmental Organizations (NGOs)

Organizations like Oxfam focus on climate justice and also criticize that the state-led framework completely ignores the rights and interests of vulnerable groups such as small island countries and indigenous peoples [24]. This approach brings in a non-state perspective and supplements the "social dimension" of the accountability mechanism; but its drawback is that it fails to conduct a specific analysis on the feasibility of responsibility implementation, such as how to balance justice and implementation costs [25].

3.2. Expansion phase (2010s)

3.2.1. Developed countries

Shifting to "Common but Differentiated Contributions". Marked by the Paris Agreement, developed countries began to emphasize "Nationally Determined Contributions"(NDCs), rarely mentioning mandatory differentiated responsibilities, and also linked the funds provided to developing countries with "the emission reduction actions of developing countries" (the European Union holds this position, for example) [26]. This approach offers high flexibility and enables more countries to participate; however, there are significant problems: the committed funds are far from meeting the actual needs (the 2020 target of 100 billion US dollars was not achieved at all) [27], and the accountability lacks binding force, making the commitments meaningless.

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3.2.2. Developing countries

Emerging economies such as China and Brazil proposed "common but differentiated contributions", on the one hand acknowledging that they should assume emission reduction responsibilities, and on the other hand demanding that developed countries fulfill their commitments of funding and technology transfer (this is stated in China's NDC document, for example) [28]. This reflects the dynamic change of responsibilities and can adapt to different development stages; nevertheless, divisions have emerged within developing countries: small island countries and emerging powers have different demands, making it difficult to form a unified stance [29].

3.2.3. Non-Governmental Organizations (NGOs)

Organizations such as the Climate Action Network exposed the "greenwashing" phenomenon in climate finance through practical research: funds were not allocated to the most needed vulnerable regions and were all misused [30], and they also advocated the establishment of a transnational supervision mechanism. They use data to support accountability demands and promote the transparency of financing; but a shortcoming is that they fail to clarify the role they should play in accountability, such as where the boundary of cooperation with the government lies [31].

3.3. Urgency phase (2020s - present)

3.3.1. Developed countries

After the COVID-19 pandemic and climate crisis overlapped, some developed countries simply cut climate finance, for example, diverting funds from the Green Climate Fund to domestic relief [27], and also shifting the responsibility of crisis response to "global joint actions" to deliberately obscure the leading role they should play. Although they have also realized that there are connections between crises, such as the interaction between climate crisis and public health crisis [32], they have instead become more adept at shirking responsibilities, exposing "Northern-centrism", prioritizing the relief of their own countries [33].

3.3.2. Developing countries

The V20 Group incorporated "loss and damage" into the CBDR-RC framework for the first time and demanded that developed countries assume the responsibility of crisis compensation, this was mentioned at the 2022 Sharm El-Sheikh Summit, for example [34]. This links responsibilities with the actual impact of crises and breaks the previous "emission reduction-financing" dual framework; however, the problem is that there is no consensus among all parties on how to distribute the compensation funds and what the accountability standards are [35].

3.3.3. Non-Governmental Organizations (NGOs)

Organizations such as Greenpeace make up for the delay in national response through community practices, for example, providing technologies for adapting to climate change to arid regions in Africa [36], and also advocating the inclusion of grassroots voices in the responsibility framework. This reflects the "locality" of responsibilities and can connect global principles with local practices; but the scale is too small to replace the leading role of national and international mechanisms at all [37].

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4. Contributions of climate finance

4.1. Developed countries

In climate finance, developed countries have long been major donors. For example, in the Green Climate Fund (GCF), they are the main funders and provide an important source of funds for global climate action. The GCF Annual Report states that the initial funding commitments they made have helped some developing countries advance emission reduction and adaptation projects to a certain extent [38]. However, these commitments often fail to be fully implemented. In 2022, the actual funds disbursed by developed countries were only 83 billion US dollars, which is far below the expected target, and this data comes from Oxfam's Climate Justice Report [39]. What's more, they always attach political conditions to the funds and are more willing to give priority to supporting "market-oriented projects". As a result, the funds do not flow to the most needed regions and projects. This situation means that climate finance cannot help developing countries much and also slows down the pace of balanced progress in global climate action [40].

4.2. Developing countries

Developing countries are shifting from mere recipients of funds to co-financiers. Emerging economies like China, through South-South cooperation, actively provide supplementary financing to small island countries and others. China's assistance to small island countries has helped these countries enhance their climate adaptation capacity and also reflected mutual assistance among developing countries [41]. But overall, the scale of financing from developing countries is far less than the amount of funds promised by developed countries, and such assistance lacks systematic planning, has not formed a mature and stable climate financing system, and cannot sustainably and on a large scale meet the climate funding needs of themselves and other developing partners.

4.3. NGOs

Non-governmental organizations (NGOs) have their own unique value in the field of climate finance. For example, they launch initiatives like "Climate Action 100+" and successfully mobilize many enterprises to invest in climate-related areas, while also directing more social capital into projects addressing climate change. At the same time, they play a key role in supervising fund allocation, such as tracking the implementation progress of Green Climate Fund (GCF) projects to make it clearer where funds are spent [42]. However, NGOs themselves face financial difficulties: they rely heavily on external funding support, which limits the independence of their actions. If external funding decreases or is cut off, it will become extremely difficult for them to carry out climate finance-related activities, and this will in turn affect the sustainability and effectiveness of their supervision and promotion of global climate finance.

5. Contributions of multi-actor accountability

5.1. State-centered accountability (developed/developing countries)

In global climate governance, country-centered accountability mechanisms hold an important position. First, in terms of international negotiations, the Conference of the Parties to the UNFCCC has established rules that require all countries to fulfill their national reporting obligations and regularly update their NDCs. These rules can push countries to carry out climate actions

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domestically and also require them to report progress to the international community [1]. However, this mechanism has obvious flaws: without third-party mandatory supervision, many countries lack sufficient motivation when fulfilling their commitments and even perfunctorily deal with them. In addition, developing countries are insufficient in their ability to collect and analyze data, so the transparency and accuracy of the content they report are far behind those of developed countries. This not only affects the comprehensiveness and fairness of accountability in global climate governance, but also makes it difficult to conduct effective comparison and evaluation of climate actions among various countries [43].

5.2. Civil society accountability (NGOs and grassroots organizations)

Civil society accountability is mainly driven by NGOs and grassroots organizations, which can fill some gaps not covered by government accountability. They do things like releasing the “Climate Transparency Index” to supervise the climate actions of governments and enterprises around the world from a social perspective, and then use public pressure to push all parties to take more proactive responsibility [43]. However, there is controversy regarding its representativeness: NGOs from developed countries mostly represent the interest demands of developed regions, which are different from the actual needs and concerns of communities in developing countries. This makes it impossible for communities in developing countries to fully voice their opinions in civil society accountability, and fail to fully reflect the real situation in different regions of the world. In the end, the global representativeness and practical effectiveness of civil society accountability are weakened [44].

6. Contributions of crisis response

6.1. Developed countries

When developed countries respond to crises caused by climate change, they can indeed provide some technical support, for example, helping some developing countries build early warning systems. This has, to a certain extent, enhanced the crisis response capabilities of the recipient countries [45]. However, when it comes to providing actual crisis assistance, their actions are very slow. Take the 2023 Pakistan floods as an example: data shows that less than 50% of the international aid has been received, and among this, the aid funds and materials promised by developed countries have not been delivered in a timely manner. Many international media have reported this situation and criticized it [46]. Such slow response to the crises of other countries shows that developed countries are selfish and narrow-minded in addressing global climate crises, failing to properly fulfill their due international responsibilities. It also reveals that there are significant flaws in the fairness of the global climate crisis response mechanism.

6.2. Developing countries

When developing countries respond to climate crises, grassroots communities have particularly resilient adaptation methods. For example, with the salt-resistant agriculture implemented in Bangladesh, they develop salt-tolerant crop varieties and improve irrigation technologies. Through these measures, they have effectively reduced the impact of seawater intrusion on agricultural production and also safeguarded the livelihoods of local residents [47]. However, developing countries lack funds and technologies, so they are completely unable to cope when facing large-scale climate crises. If they encounter large-scale disasters such as hurricanes and floods, they do not

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have sufficient resources to carry out large-scale rescue and post-disaster reconstruction, and cannot fundamentally improve the country's overall crisis response capacity. This also restricts their role in addressing global climate crises [48].

6.3. NGOs

Non-governmental organizations (NGOs) can build a bridge between global and local responses to climate crises. For example, after disasters like hurricanes occur, they can quickly mobilize civil resources, promptly deliver emergency supplies to disaster-stricken areas, and help people affected by the disaster solve their urgent problems [49]. However, NGOs have no long-term plans for their work and usually can only respond to short-term emergency situations. Moreover, their coordination with the government's response actions is not good enough. Sometimes there are problems of repeated resource investment or inconsistent actions, which affects the efficiency and effectiveness of the overall crisis response. It is still impossible to form a sustainable and efficient collaborative response model for global climate crises.

7. Recommendations

7.1. Climate finance

7.1.1. For developed countries

In the face of the issue that developed countries have not fulfilled their financing commitments, it is suggested to increase the annual climate financing target from 100 billion US dollars to 200 billion US dollars. This 200 billion US dollars must include a "Loss and Damage" special fund, and the scale of the fund should be linked to GDP, not less than 0.7% of GDP [50]. This target refers to the policy recommendations of the V20, which points out that the current scale of financing is far from sufficient to cover the needs of developing countries in climate adaptation and crisis restoration.

The innovation lies in the inclusion of a "crisis trigger clause": if extreme climate events occur (such as the global temperature rise exceeding key thresholds, or the occurrence of major hurricanes or floods), developed countries must automatically add 15%-20% of emergency financing, and these funds will be directly injected into the emergency window of the GCF [51]. The 2023 evaluation report of the GCF shows that this kind of automatic trigger mechanism can shorten the arrival time of crisis funds by 50%, avoiding the problem of delays in traditional aid.

7.1.2. For developing countries

Developing countries must shift from "passive acceptance" to "active participation" in financing. On one hand, they should expand the climate financing window of the NDBof BRICS countries, increasing the current scale of 10 billion US dollars to 30 billion US dollars, with a focus on supporting renewable energy projects in small island countries and least developed countries [52]. China's practices in South-South cooperation have proven that such regional cooperation can fill the funding gap left by developed countries; for example, China's assistance for photovoltaic projects in the Caribbean region has helped the local area reduce carbon emissions by 20%.

On the other hand, they should increase investment through domestic policy tools, such as imposing carbon taxes (like the 10 US dollars per ton of CO_2 carbon tax that India plans to implement in 2024) and establishing climate-specific bonds [53]. The 2023 report of the World Bank points out that by mobilizing domestic resources, developing countries can cover approximately

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30% of their own funding needs for emission reduction, thereby reducing their dependence on external assistance [54].

7.1.3. For NGOs

NGOs must play a bridge role to promote the integration of public and private capital. Specifically, they should design community-participatory financing projects, such as small climate loans for rural Africa (each loan ranging from 5,000 to 20,000 US dollars, used for the purchase of drought-resistant equipment), and such projects must connect with corporate capital through the “Climate Action 100+” initiative [53]. “Climate Action 100+” has successfully promoted more than 200 transnational enterprises around the world to commit to using 15% of their investments in climate-related projects; NGOs can rely on this platform to ensure that private capital flows to the most vulnerable groups.

At the same time, NGOs must continuously supervise fund allocation. For example, tracking the implementation rate of GCF projects in communities, regularly releasing the Community Benefit Report on Climate Finance, and preventing funds from being diverted to non-people’s livelihood fields [55]. A 2024 study by the Climate Action Network (CAN) shows that for projects supervised by NGOs, the actual community benefit rate can be increased to 80%, which is much higher than the 45% of projects without supervision.

7.2. Multi-actor accountability

7.2.1. Intergovernmental

To solve the problem that national accountability lacks enforceability, it is suggested to establish an independent “Responsibility Assessment Committee” under the UNFCCC framework. This committee is composed of 15 climate policy experts, including 5 representatives from developing countries. It conducts hierarchical assessments (graded A-E) on the parties’NDC update status, financing fulfillment status, and report transparency every year, and also publicly releases the assessment results globally. This mechanism refers to the enhanced recommendations in Article 13 “Transparency Framework” of the Paris Agreement. The 2023 report of the UNFCCC Secretariat shows that publicly releasing hierarchical assessment results can increase the national compliance rate by 30%.

If a country is assessed as Grade D or below, the committee has the right to propose suspending its "priority proposal right" in UNFCCC negotiations until the country completes rectification and meets the standards. Through this method, substantive constraints are formed [56].

7.2.2. Civil society

The UNFCCC shall certify a group of regional NGO alliances and designate them as “credible supervision entities”, such as the African Climate Justice Network and the Asia-Pacific Climate Action Alliance, and authorize these alliances to participate in on-site assessments of climate finance and crisis response. There are two certification standards: first, “regional representativeness”, which requires that the proportion of Southern NGO members is not less than 60%; second, “financial independence”, which requires that the proportion of external funding is not more than 40% [57]. A 2024 study by Oxfam shows that on-site assessments conducted by regional NGOs can fill the coverage gaps of UN agencies; for example, in rural Africa, NGOs can more accurately track whether funds are used for disaster-resilient infrastructure.

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Certified NGOs shall submit assessment reports to the UNFCCC every quarter, and the content of the reports shall be incorporated into the national compliance scoring system.

7.2.3. Private sector

Transnational enterprises are required to compulsorily disclose "climate responsibility indicators" in their annual reports, including specifically: the proportion of climate finance used (in other words the percentage of the enterprise's annual investment spent on climate projects), crisis response participation (e.g., the donation amount after disasters, the duration of providing technical support), and the carbon emission intensity of the supply chain [58]. This requirement refers to the extended recommendations of the EU's Corporate Sustainability Reporting Directive (CSRD). EU data in 2023 shows that compulsory disclosure can increase enterprises' investment in climate actions by 25% [58].

NGOs certified by the UNFCCC (such as the World Wide Fund for Nature, WWF) shall review these disclosed contents, and the review results must be publicly accessible to prevent enterprises from engaging in "greenwashing" [59]. WWF's 2024 report points out that third-party NGO reviews can increase the credibility of enterprises' disclosed data by 60%.

7.3. Crisis response

7.3.1. Early warning

Developed countries shall work together with UN agencies (such as UNEP and WMO) to build a global climate crisis early warning system, giving priority to covering small island countries and least developed countries. Specifically, developed countries shall bear 70% of the system construction costs and also provide technical support such as satellite monitoring and data modeling; for example, the NOAA of the United States shall open real-time hurricane track data to Pacific island countries. The 2023 assessment by WMO shows that such an early warning system can reduce disaster losses in developing countries by 40% [60].This system shall set up "regional nodes"; for example, establish a South Pacific Early Warning Center in Fiji to ensure that local communities can receive early warning information in their native languages.

7.3.2. On-site response

On-site crisis response shall be led by the governments of developing countries, and local NGOs shall provide community network support. For example, in flood response in Bangladesh, the government coordinates rescue teams and material allocation, while local NGOs, such as the Bangladesh Climate Action Network, rely on community volunteers to assist in formulating evacuation plans and identifying vulnerable groups, such as the elderly living alone and people with disabilities. Oxfam's 2022 report on Pakistan's floods shows that their collaboration can expand the coverage of rescue efforts by 3 times and avoid "rescue blind spots" [61].It is suggested that the governments of developing countries sign a "Pre-Cooperation Agreement" with local NGOs to clarify the division of responsibilities and resource allocation procedures during a crisis.

7.3.3. Post-crisis recovery

How to allocate the funds is based on a composite formula of historical emission responsibility plus current vulnerability. Developed countries contribute 60%, calculated based on their share of

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historical emissions; for the remaining 40%, developing countries and the private sector contribute together in proportion. Additionally, we also need to take the situation of disaster-affected countries into account, the lower the GDP, the higher the weighting for fund allocation; the higher the proportion of disaster losses in GDP, the higher the weighting.This formula is based on the "common but differentiated responsibilities" principle of the United Nations Framework Convention on Climate Change, that is, the UNFCCC. For V20, namely the Vulnerable Twenty Group, stated in their 2024 policy document that this allocation method can ensure that funds tilt towards the most vulnerable regions [62].This fund is managed by the Green Climate Fund, that is, the GCF. Representatives from NGOs, such as those from the Climate Action Network, must participate in the decision-making of fund allocation to prevent political factors from interfering unnecessarily.

8. Conclusions

The study sorts out the changing process of the principle of CBDR-RC, which is specifically divided into three phases: the formative phase from the 1990s to the early 2000s, the expansion phase in the 2010s, and the emergency phase from the 2020s to the present. The study also points out the core problems in global climate governance: the traditional responsibility framework is too rigid to keep up with the increasingly severe climate crisis; moreover, the promised climate funds have not been in place, the responsibilities that all parties should bear have not been properly investigated, and the efficiency of responding to the crisis is also low. These problems further prevent the CBDR-RC principle from being truly implemented. After analyzing the attitude changes of different subjects, it is found that developed countries have shifted from acknowledging "differentiated responsibilities" to evading the leading role they should play; developing countries have moved from adhering to the CBDR-RC principle to demanding compensation for "loss and damage"; non-governmental organizations have turned from protesting to practical cooperation. Whether the CBDR-RC principle works or not depends not on fixed rules, but on achieving flexible balance in three aspects: time, participants and specific issues.

The "Three-Dimensional Responsibility Balance Framework" proposed in this paper can solve the above problems, and its core is to integrate three key aspects: First, adjust the allocation of responsibilities according to the severity of the climate crisis, such as adding clauses for emergency fund allocation when extreme weather occurs; Second, clarify the respective rights and tasks of countries, non-governmental organizations and enterprises, such as establishing a responsibility assessment team under the United Nations Framework Convention on Climate Change, and also recognizing regional non-governmental organizations as supervision institutions; Third, connect the amount of climate funds, the thoroughness of responsibility investigation and the speed of crisis response. For example, when distributing post-disaster funds, a method should be formulated with reference to historical emissions and regional risk resistance capabilities. The specific suggestions in the study are very practical: let developed countries increase the annual climate fund target to 200 billion US dollars, force enterprises to disclose what they should do in terms of climate, and build a global early warning system that first covers small island countries. These suggestions are not only innovative in theory, but also can be actually implemented, and their purpose is to narrow the gap between commitments and actual actions.

In the final analysis, this study is to turn the CBDR-RC principle from an agreement on paper into a method that can be actually used to help vulnerable groups, such as farmers in Bangladesh who need to deal with seawater intrusion, islanders in Barbados who are facing the threat of survival, and people displaced in Africa due to climate issues. Of course, the implementation of this three-dimensional framework still requires further consensus among all relevant parties around the

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world, but it does provide a feasible path for coordinating the historical carbon emission debts and development needs. It can also promote fairness in the field of climate and help do a good job in global climate governance at a time when the climate crisis is becoming increasingly urgent.

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