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Rethinking and reshaping the climate policy: Literature review and proposed guidelines

Qiang Wang [a,b,*], Xi Chen [a]

[a] Western Research Center for Energy and Eco-Environmental Policy, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Urumchi 830011, PR China
[b] Ecological Complexity and Modeling Laboratory, Department of Botany and Plant Sciences, University of California, Riverside, CA 92521-0124, USA

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ABSTRACT

Addressing climate change represents a governing the climate commons on a global scale. The "tragedy of the commons" might better be described as the "failure of governing the commons". Hardin's solutions were "centralized government" and "private property", which have long been criticized as oversimplified. However, governing the unprecedented climate commons, there is only a "global federalism of climate policy"—the Kyoto Protocol. The Kyoto cannot keep atmospheric CO_2 level below 450 ppm (rising 2 °C). Some key evidences of the Kyoto failures are identified. The Kyoto failures do not indicate that the Kyoto is a wrong tool of "centralized government". Instead, the Kyoto failures are derived from the fact that the only "centralized government" cannot effectively govern the commons, which have been proven by the efforts of governing the commons last four decades. Here we propose a wide diversity of governance systems for climate common to addressing global warming. The multi-level and multi-scale governing system includes but is not limited to: (i) starting at home, (ii) emphasizing the local approach, (iii) efforts of global-level focusing these top emitters, (iv) improved information sharing, (v) privatizing the property of climate to avoid "free riders", (vi) combination mitigation with adaptive, (vii) improved ecology services to expand carbon sinks. We argue that the Kyoto failures indicate again that reliance on a single "solution" may result in more of a problem than a solution in governing the common. Therefore, continuing to wait for another global federalism of climate policy may lead to missing the chance to make significant mitigations and adaptations in time to battling the climate change. Post-2012, multi-level and multi-scale approaches could make a difference in collective action for governing the climate commons to meet climate challenge.

Contents

* Corresponding author at: 818 South Beijing Road, Urumqi, 830011 P.R. China. Tel./fax: +86 899 917 885420.
E-mail addresses: wang_q@ms.xjb.ac.cn, qiangwang7@gmail.com (Q. Wang).

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1. Introduction

"The tragedy of the commons" [1] has also beset the climate change [2–6]. Climate is shared by all, it is in each individual actor's short-term interest to greenhouse gas (GHG) emission, rather than GHG reduction, so individual rational behavior driven by narrow short-term self-interest would lead to above 2 °C temperature rises (450 ppm CO_2e), and ultimately harm oneself [2–4].

The "tragedy of the commons" might better be described as the "failure of governing the commons" [6–8]. Hardin's solution were two institutional arrangements – "centralized government" and "private property" [9,10] – which have long been criticized as oversimplified [6,8,10]. However, governing the climate commons – unprecedented complexity and uncertainly commons, there is only a "global federalism of climate policy", i.e., the Kyoto Protocol – cutting GHG emissions through an international binding treaty under the United Nations Framework Convention on Climate Change [3,11]. Given that the Kyoto Protocol set to expire in 2012, countries have tried to set another globe federalism of climate policy – post-Kyoto pact – since 2008. However, the Climate Change Conference of 2009 Copenhagen, the 2010 Cancun and 2011 Durban have highlighted that a post-Kyoto binding agreement will not be reached before 2012.

To avoid the climate common become unprecedented "the tragedy of the common", it is time to deeply rethink and radically reshape our climate policy for fighting global warming. To this end, the present article is intended to identify key failures of the Kyoto Protocol so as to break the illusion of waiting for a "panacea" to emerge from global federalism of climate policy, and propose multi-scale and multi-level approaches to govern the climate commons and to avoid the tragedy of the climate commons.

2. Two key evidences of the Kyoto failures

2.1. The Kyoto system incompetence to lower carbon emission

The Kyoto Protocol can neither effectively curb GHG emission, nor keep atmospheric GHG level below 450 ppm CO_2e [12–17]. Global GHG emission continued to track the most carbon-intensive scenario of IPCC [12–14] (see Fig. 1). Even worse, growth rate of global fossil-fuel CO_2 emissions has increased from 1.0% yr^{-1} for 1990–1999 to 3.4% yr^{-1} for 2000–2008 [12,13,15]. Global carbon dioxide emissions from fossil-fuel combustion and cement production grew 5.9% in 2010, surpassed 9 Pg of carbon (Pg C) for the first time [16]. Since 1960s, only major economic crises have led to important changes in the trajectory of global CO_2 from fossil fuel combustion and cement production. As shown in Fig. 2, only economic recession has lowered the global fossil fuel and industrial CO_2 emission in the long term.

2.2. Annex-B countries outsourcing their carbon emission

Article 3 of the United Nations Framework Convention on Climate Change (UNFCCC) states that "the Parties should protect the climate system… on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities" [19]. Under the principle of "common but differentiated responsibilities", the heart of the Kyoto Protocol lies in setting stringent target for Annex-B countries (37 developed countries excluding the United States) for reducing GHG emissions, whereas non-Annex B countries (developing countries) are not subjected to emission reduction commitments [20–24]. However, economic performance and job creation, rather than GHG in atmosphere remain main criterion for choosing government leaders in the most developed countries (Annex-B). We have to confess that there is still lacking of sustainable and substantial force to drive national government – the signer and endorser of the Kyoto – cutting GHG emission. If the Annex-B countries appear lowering GHG emission, this is partly because they have exported the GHG emission to non-Annex B countries.

The Kyoto protocol has defined the accounting framework for GHG emissions on production-based inventory, rather than consumer-based inventory. The producer-based inventory includes all carbon emissions from the production within a country wherever these are consumed, and does not take into account emissions generated in import goods. Compared to this, the consumer-based inventory is refereed as the emissions from

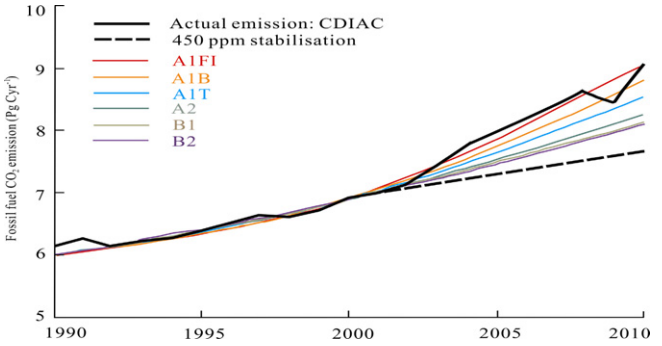

Fig. 1. actual global CO_2 emissions, compared with emissions scenarios and stabilisation trajectories.
Source: [12,16–18].

Fig. 2. The change in the trajectory of global fossil fuel and industrial CO_2 emission responds to the economic recession .
Source: [16].