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EDITED BY

Kun Fai Yuen,
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Tsungh Han Tai,
Shandong University, China
Wan-Chun Ho,
Soochow University, Taiwan

*CORRESPONDENCE

Shih-Ming Kao

✉ kaosm@mail.nsysu.edu.tw

Huan-Sheng Tseng

✉ hstseng@mail.ntou.edu.tw

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Rationalizing Taiwan's climate action based on oceans: ineffective governance, aspiring international participation, unrealized universal values, and a new window of blue carbon ecosystem measure

Hui-Yi Katherine Tseng¹, Shih-Ming Kao^{1*}
and Huan-Sheng Tseng^{2*}

¹Graduate Institute of Marine Affairs, National Sun Yat-sen University, Kaohsiung, Taiwan,

²Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University, Keelung, Taiwan

Characterized by unique practices of self-imposed voluntary commitment, the formulation of Taiwan's climate action has been informed by the logic of appropriateness, which is norm-guided without regard to consequences. However, ineffective governance exhibited in the gap between governance incapability and overcommitted contribution, aspiring international participation, and realization of universal values hindered by a developmentalism mindset altogether reify that Taiwan's climate action has turned out to be an unrealistic ideal. It requires due consideration of socially constructed roles and matching obligations (the appropriateness concern) on the one hand, and promulgation of actions made upon rational choice along with well-defined interests (calculation of consequences) on the other hand, to deliver Taiwan's voluntary commitments while living up the name and substance of an earth citizen. Taiwan's effort at developing the blue carbon ecosystem (BCE) measure may open a new window of opportunity, whereby a paradigm shift in transforming the appropriateness logic to the appropriateness-consequence compound is discernible. The key lies in integrating the developmentalist drive for growth and the rising environmentalist demand while engaging, substantially and extensively, members of those affected communities with more accessible and sustainable financing mechanisms.

KEYWORDS

the appropriateness logic, effective governance, international participation, universal values, blue carbon ecosystem (BCE) measure, the appropriateness-consequence compound logic

1 Introduction

1.1 The imminent climate change crisis

Threats from anthropogenic climate change have been clearly felt in world capitals in recent years. Billions of people are suffering from extreme weather, like heat waves, drought, wildfires, and floods. The United Nations Intergovernmental Panel on Climate Change (IPCC) in 2018 has issued a stern warning of a 2°C rise and the disastrous outcome of the loss of virtually all coral reefs, extreme heat waves for a third of the planet, and more (IPCC, 2018a). In order to avoid these disastrous consequences, global temperature rise needs to be limited to no more than 1.5°C above pre-industrial levels with net-zero greenhouse gas emissions by 2050. More than 150 countries have made corresponding commitments (Net zero tracker, 2023) to echo the international consensus achieved in IPCC 2018. Despite the recognition widely upheld by a majority of states that make their intended nationally determined contributions (INDCs), individual and collective actions as such cannot effectively address the rapidly deteriorating climate situation. The terrifying reality is that progress to a 3°C rise is ongoing, even if all pledged commitments for 2030 are met (IPCC, 2022a). In this context, the IPCC sends another alarming message in its February 2022 press release launching the Climate Change 2022: Impacts, Adaptation, and Vulnerability report (IPCC, 2022b). Multiple climate hazards over the next two decades have seemed unavoidable, with global temperature rising over 1.5°C and additional severe impacts, including irreversible and increasing risks for infrastructure and low-lying coastal settlements.

Against this doomed picture, all are required to take action in fighting this climate change crisis. The international community had been geared up swiftly to tackle the climate change issue, as witnessed in the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, after only 1.5 years of negotiations. The UNFCCC quickly entered into force in 1994, while an innovative and flexible enforcement mechanism had been established in the Kyoto Protocol adopted in 1997 (Andresen, 2015). Nevertheless, the negotiation process had been stalled, while progress remained painstakingly slow, with the outcome barely fruitful in the Marrakesh Accord (2001), the 2005 Protocol, the Bali Action Plan in 2007, and the 2009 COP in Copenhagen. At the beginning of the 2010s, the negotiation process had limped along, while new action plans and platforms produced only limited progress. Nevertheless, the breakthrough came in 2016, as 195 countries made commitments to reducing greenhouse gas emissions and mitigating harmful climate risks under the framework of the Paris Agreement (U.N. 2015) on climate change. The agreement has been celebrated as a testament to the effectiveness of collective action and a landmark achievement in the history of international environmental politics (Dimitrov, 2016; Rowell and Zeben, 2016).

1.2 The research question: rationalizing Taiwan's climate action

Treading a unique path in the quest for formal recognition and international participation for decades, Taiwan voluntarily joins this collective action to fight against the quickly deteriorating climate change crisis. Given Taiwan's unique practice of voluntary compliance, rationalizing Taiwan's climate action is worth the effort. Inter alia, the development of the blue carbon ecosystem (BCE) measure merits attention, due to its potential to generate a paradigm shift in the decision-making of incumbent Taiwan's climate action.

The formulation of Taiwan's climate action has been informed with a behavioral logic of appropriateness, which is norm-guided without regard to consequences. This action logic of appropriateness is reflected in Taiwan's incumbent practices in three aspects, namely, effective governance in Taiwan's climate action, international participation, and realization of universal values. Therefore, the rationalization goes on as follows: first, effective governance in Taiwan's climate action not only tackles climate impact for domestic needs but also enables the delivery of global public goods, upon which universal values can be realized, like a human right to a healthy environment and a quest for social justice. Second, once fulfilled, effective governance can bring along opportunities for meaningful international participation in Taiwan.

However, ineffective governance in Taiwan's climate action embodied in the gap between governance incapability and overcommitted contribution, yet-to-be-acquired/aspiring international participation due to intervening political forces, and realization of universal values hindered by a developmentalism mindset altogether reify that Taiwan's climate action has turned out to be an unrealistic ideal, which attends more to the socially constructed roles and matching obligations (the appropriateness concern) while disregarding actions made upon rational choice along with well-defined interests (calculation of consequences). Nevertheless, the development of the BCE measure may open a new window of opportunity, whereby a paradigm shift is discernible, from the appropriateness logic to the appropriateness-consequence compound, in the prospect of Taiwan's climate action. The key lies in integrating the developmentalist drive for growth and the rising environmentalist demand while engaging, substantially and extensively, members of those affected communities with more accessible and sustainable financing mechanisms.

That said, after this introduction, the rest of the discussion will proceed in the following order. In Section 2, Taiwan's climate action will be rationalized under the logic of appropriateness through three aspects: effective governance, international participation, and universal values. Section 3 addresses Taiwan's incumbent effort at developing the BCE measure and the entailing paradigm shift from the appropriateness logic to the appropriateness-consequence compound. Section 5 concludes with some observations.

2 Assessment of Taiwan's climate action: a methodology of an institutionalist perspective

Taiwan has been shut from international participation in past decades due to the loss of a UN seat and lack of formal recognition, which has been exacerbated by China's increasing hefts and growing economic powers in international affairs. In the scenario of international environmental politics, Taipei is not legally bound by any major international agreement to reduce its greenhouse gas emissions (Shih, 2002). Nevertheless, Taiwan has made voluntary commitments while going further to codify these commitments into its domestic law, in the Greenhouse Gas Management Act promulgated in 2015, which was later amended to the Climate Change Response Act in February 2023 (Environmental Protection Administration (EPA), 2023a). The 2050 net-zero emission target is also codified in this new Act, together with a carbon levy scheme, an enhanced adaptation policy framework, and an amount of NTD 900 billion climate investment for decarbonization in this decade (Chao and Yang, 2023). Given the wariness and resistance of sovereign states against compulsory international obligation, it is intriguing for Taiwan to adopt this practice of self-imposing voluntary compliance.

Nevertheless, it should be noted that Taiwan has adopted similar practices in other scenarios, like human rights and public health. Some recent examples are as follows: Taiwan had adopted voluntary compliance to international human rights obligations prescribed in the International Covenant on Civil and Political Rights (ICCPR), (1966) and the International Covenant on Economic, Social and Cultural Rights (ICESCR), (1966) (see subsequent discussion in Section 3.2) and managed to steer through the COVID-19 epidemic while providing medical assistance to other countries whenever possible. That said, rationalizing the action logic of Taiwan's effort at fighting the climate change crisis is worth the effort so that a clearer picture of how Taiwan's climate action is determined and put into implementation can help prescribe its status quo while providing an objective evaluation of its future development. Furthermore, a reasonable explanation of the gap between Taiwan's governing incapability and overcommitted contribution can be provided.

In this vein, the theoretical aspect of the action logic of Taiwan's incumbent climate action is analyzed in this section, which will be recast through Taiwan's practices in three aspects in Section 3, namely, effective governance, international participation, and universal values.

2.1 The institution of the state and its dual characteristic of regulatedness and contestedness

The institution has always been an object of study in social sciences. Institutions are inclined to bring social relations to an orderly manner by regulating flexibility and reducing variability while preventing the one-sided pursuit incentivized by involving actors' self-interested calculations or egoistic drives (Weber, 1978). From the institutionalist perspective, institutions are thus premised

on the basic logic of action of rule-following, namely, the logic of appropriateness premised upon identity and membership in a political community, with a sense of rights and obligations that filters through the ethos, practices, and expectations of its practice. In other words, this appropriateness logic predicts that members follow rules because they are seen as natural, rightful, expected, and legitimate, whereby members are not only rule-takers but also need to take up the responsibility of the guardians of the community's constitutive principles and standards (March and Olsen, 1989; March and Olsen, 2006).

However, because institutions are reinforced via the consolidation effort of insiders' and outsiders' validation and because their histories are encoded into rules and routines, their internal structures and rules cannot be changed arbitrarily (March and Olsen, 1989; Offe, 2001). In this vein, changes that occurred to reflect local adaptation to indigenous customs and experiences are likely to become relatively myopic, meandering, and even inefficient in the sense that they may not achieve a uniquely optimal institutional arrangement (March, 1981). Even when institutional actions that occurred in due course of institutional development are relatively efficient, it would be a common scenario that the rate of adaptation could not match that of change in a given environment wherein the institutional adaptation occurred. In this sense, the institution remains a concept, vigorously contended and ill-defined (Scharpf, 1997), which adds to the complexity of the state as an institution in terms of what it is and what it actually entails.

Through the lens of the institutionalist approach that integrates the traditional institutional view and behavioralist insights, states are taken as both an ontological object of inquiry in political science works and an arena wherein the bureaucratic capability and operation are recalibrated and reinvented under the influx of historical processes and events. The wrestling thus inherited can be instantiated in states' organizational routine practices and the development of administrative capacities. Furthermore, a state can be deemed a setting comprised of multi-layered institutions with varying objectives and regulatory capabilities and the arena wherein contestations from multiple actors that carry pluralized, sometimes conflicting, cultural categories and political logic are conglomerated and interacted (Streck and Thelen, 2005; Mahoney and Thelen, 2010). Therefore, the state is one among the various types of institutions, which is not only an amalgamation of administrative organs and bureaucratic mechanisms but also a set of rules and norms, both formal and informal, that create, modify, and restrain political actors' behaviors and preferences.

2.2 The behavioral logic of Taiwan's climate action: the logic of appropriateness and consequences

To interpret how human behavior, including policy-making, has been driven, a few theses lend constructive help, for example, the logic of appropriateness, consequences, or exemplary behavior organized into institutions (March and Olsen, 1996; March and Olsen, 1998; March and Olsen, 2009; Bernstein and Cashore, 2012; Christensen and Lægveid, 2021). Meanwhile, as a state can be analogized to a human

being, the action of which can therefore be analyzed by referencing the behavioral logic of human action. In this vein, the behavioral logic of the subject actor's action can be recast in the following descriptive question, which logic can serve as the explanatory basis of the subject actor's action. That said, the logic of appropriateness and the logic of consequences merit attention.

The logic of appropriateness is premised on identities, rules, and institutions, so it dictates that actions are rule-based. Actors are therefore expected to follow while duly adjusting according to particular identities in particular contexts. Guided by evaluation between various possible identities and selection of matching obligations, actions are therefore pursued by being associated with identities more than with interests, while selection of appropriate rules is preferred to individual rational expectations (March and Olsen, 1989; March and Olsen, 1995). Consequences are generally disregarded in the appropriateness logic, while cognitive factors related to self and ethical concerns of being virtuous are not. Therefore, individual or state behavior is shaped by a selection of due identities and corresponding matching obligations, whereby the appropriateness thereof is reified in the selected position in a particular situation. In this sense, the appropriateness logic attends to mainly the socially constructed role and matching obligations.

In the logic of consequences, actors are presumed to act according to the most consequential among many alternatives by accounting for personal and collective objectives and possible costs. Therefore, political order is seen as an outcome of negotiations among multiple rational actors pursuing personal preferences and interests, wherein coordination between them is deemed mutually beneficial. Political integration is therefore built upon a collection of contracts, reached by negotiations that engage actors with conflicting interests and varying resources. In this vein, politics is seen as aggregating individual preferences into collective actions through procedures of bargaining, negotiation, coalition formation, and exchange (Hechter and Kanazawa, 1997). Therefore, individual or state behavior is shaped by consequential incentives and determined upon rational expectations, while it is justified by the outcome and polished by the entailed interpretation. In this sense, the logic of consequences attends to mainly actions made upon rational choice along with well-defined interests.

While both types of logic are individualistic in structure, they differ in their perceptions of how the premises of action and society interact with each other. For the consequentialist logic, political order is constructed by interactions among autonomous, egoistic, self-interested maximizers. Preferences are largely assumed, and projected consequences are deemed the outcome, which have been jointly shaped by states' determination and individual biases. In this vein, the interest of political actors would be prioritized over the interest of nation-states so that changes in international institutions have been driven by local adaptation, practiced by political actors along with well-defined interests (March and Olsen, 1998). For the appropriateness logic, actions are pursued in accordance with rules and practices that are socially constructed, publicly known, anticipated, and accepted (Cerulo, 1997). Therefore, it is rule followers and role players, acting with distinctive sociocultural ties,

cultural connections, intersubjective understandings, and sense of belonging, who contribute to the development of international order (March and Olsen, 1998). Identities and rules are constitutive as well as regulative and molded by social interaction and experience.

Nevertheless, here thus arises a question regarding the persistence of certain logic of given actors. Put succinctly, will actors persistently stick to certain logic in due course of their actions? In other words, will actors shift their logic of action, under what conditions? A shift of action logic is indeed not uncommon in human action, which would nevertheless occur only after the passage of time. In other words, only after this given action is being consistently practiced can there be room for deliberation of shifts of action logic of given actors, along with fallout implication of given shifts. That said, the issue of a shift in action logic would need to be postponed to a later stage when there accumulate sufficient cases along with the fulfillment of other relevant conditions.

3 Assessment of Taiwan's climate action: the case of rationalization under the logic of appropriateness

In this section, rationalization of Taiwan's climate action logic continues by recasting Taiwan's incumbent practices through three aspects, namely, effective governance, international participation, and universal values, which reaffirm that the appropriateness logic has so far dominated Taiwan's climate action. It is contended that policy-making of Taiwan's climate action has been hinged upon the logic of appropriateness, which has been characterized by insufficient consideration of policy consequences and, collaterally, ineffective policy implementation. What is implied is that complementing the main decision-making logic in climate policy-making with insights from other strands will enhance the understanding of institutional drivers of given climate actions. This can help evaluate policy implementation in a more realistic manner. Therefore, this leads to our suggestion of a paradigm shift from the appropriateness logic to the appropriateness-consequence compound exhibited in the development of BCE measure in Taiwan's climate change policy, which will be analyzed in Section 4.

3.1 Effective governance: Taiwan's climate action seeking for effectiveness or esteem?

Taiwan contributes 0.8% to global carbon emissions every year. Nevertheless, Taiwan's per capita emission is higher than that of G7 countries, like Japan and Germany, owing to its heavy reliance on fossil fuels for energy and a manufacturing-dominated industry structure (Monforti Ferrario et al., 2021). For decades, Taiwan has been held as a democratic giant and a dwarf in fighting climate change while being rated a country with "very poor" performance on climate change by Germanwatch since 2012 (Climate Change Performance Index, 2023) and ranked 21st for total fossil fuel CO₂

emissions and 22nd for CO₂ emissions per capita worldwide (Monforti Ferrario et al., 2021).

Echoing the international consensus reached in the 20th Convention of the Parties to the UNFCCC COP20, Taiwan announced its intended INDCs on September 17, 2015 (Environmental Protection Administration (EPA), 2023b), whereby the Environmental Protection Agency (EPA) has set to reduce carbon emission to a 50% level from the expected business as usual standard by 2030, which would proceed as an initial phase of emission reduction by 20%, followed by a future direction toward 50% lower than the 2005 level (Environmental Protection Administration (EPA), 2023c). Furthermore, Taiwan has codified its INDCs into black letter law, the Greenhouse Gas Emission Reduction and Management Act in 2015, later amended to the Climate Change Response Act in 2023. Nevertheless, Taiwan's performance of reduction commitment is far from satisfactory.

Taiwan's energy authority admitted in 2019 that it was unlikely to achieve the goal set in the 2015 INDCs, not to mention making a meaningful contribution to the long-term climate goal of limiting global warming to 1.5°C to 2°C above pre-industrial levels as agreed upon under the Paris Agreement (Ngerng, 2020). The authority also rejected further escalation of electricity prices, which thus alluded to the increasing possibility of failure in achieving the goal set in 2015 INDCs, given that increasing electricity prices as a form of carbon pricing served to curb the use of higher-polluting energy sources (Ngerng, 2020).

In a report issued by the Environmental Justice Foundation in 2022, Taiwan's ambitious plan to net-zero emissions by 2050 is being plagued by issues of insufficient transparency, unclear distribution of responsibilities among government departments, and inappropriate reviewing processes for policy plans (Environmental Justice Foundation (EJF), 2022), which collaterally leads to a doubtful conclusion regarding the goal and its insufficient ability to meet given commitment. In Table 1, major gaps in Taiwan's incumbent climate actions are identified. Nevertheless, Taiwan announced its amended INDCs in January 2023, aiming to enhance the reduction target further to 23%–25% by 2030, with reference to Article 3 of the Paris Agreement (common but differentiated responsibilities) (Environmental Protection Administration (EPA), 2023c).

While it remains to be seen if the Taiwanese government could successfully deliver these amended INDCs, the gap between

ineffective incumbent action and the ostensibly ambitious commitment is more than apparent, which raises questions about whether Taiwan's climate action has meant for effective governance or more for winning esteem from the international community. What comes with these two goals is the appropriateness logic that stresses international norms and its behavior-shaping effect of involving actors, and the consequence logic premised on utilitarian calculation and its consolidating effect of rational choice. Judging the gap between governance incapability and overcommitted contribution, it can be convincingly argued that the appropriateness logic has prevailed and fundamentally shaped Taiwan's climate action. That said, ineffective governance embodied in the gap between governance incapability and overcommitted contribution not only reifies the dominating theme of the appropriateness logic in Taiwan's incumbent climate action but also alludes to a doomed prospect of the long-aspired international participation, which would have entailed Taiwan's effective climate governance.

3.2 International participation: legitimacy, international recognition, and appropriateness

In theory, effective climate governance not only serves domestic needs in tackling climate change impacts but also enables the delivery of global public goods, from which universal values thus inherited can be realized so as to cultivate meaningful international participation for Taiwan. Taiwan's self-imposing voluntary commitment, as a part essential to the sophistication of Taiwan's climate action that echoes international effort, is projected to lead to more fruitful international participation, so to speak. However, whatever the benign intention underlying Taiwan's self-imposing voluntary commitment, the reality is that failure to deliver commitments in the stage of domestic implementation would compromise the goodwill exhibited in Taiwan's voluntary commitment to international climate obligation while discrediting Taiwan's future effort to earn international recognition in the climate change regime. Put sharply, failing the delivery of climate governance, further opportunities for international participation are likely to be aborted.

In other words, only after Taiwan makes a substantial contribution to the international community, in whatever subject field, will it obtain future opportunities for international participation. However, the harsh reality is that there is no guarantee for this formula—"effective governance, then opportunities of future international participation"—to work in every attempt. Nevertheless, this is the only way for Taiwan to open up the door and secure further engagement with the international community. This reifies how a political entity, lacking recognition, can survive in the international community, which also explains the reality that most countries would accept a Taiwanese economic and cultural office to handle de facto exchange therewith, but not a formal embassy and consulate division.

In this vein, Taiwan's ineffective climate governance so far raises questions about the due delivery of global public goods and the

TABLE 1 Major gaps identified in current actions (Environmental Justice Foundation (EJF), 2022, p. 3).

Area	Major gaps
Governance	<ul style="list-style-type: none"> • A lack of the "whole of government" approach • Insufficient mitigation targets
Finance	<ul style="list-style-type: none"> • Insufficient climate budget • Opaque government fund portfolios • Heavy fossil fuels subsidies
Human rights	<ul style="list-style-type: none"> • No regular climate-related human rights assessment • Lack of meaningful citizen participation
Nature	<ul style="list-style-type: none"> • Nature-based solutions are marginalized • Ocean ecosystems are neglected

realization of universal values while casting doubts upon the long-aspired international participation. In this vein, Taiwan's international participation is analyzed in this section, with the issue of the realization of universal value relegated to the next section.

That said, Taiwan's self-imposing voluntary compliance in the subject field of human rights protection is worth referring to (Tai, 2017; Chen, 2018).

Beginning in Chen Shui-bian administration, Taiwan started to actively embrace obligations prescribed in international human rights treaties, the activeness of which has distinguished itself from other "territorial non-state actors" that often evade the imposition of such obligations (Ronen, 2013). This policy shift also foretells the transition of the Taiwanese government from pursuing international recognition through formal UN membership to a pragmatic stance based upon its non-recognized status by seeking legitimacy credits through the implementation of UN human rights standards (Chang and Lim, 1996; Chen, 1998; Caspersen, 2015). In 2009, Taiwan ratified two fundamental human rights covenants, the ICCPR and the ICESCR, while it then incorporated these covenants into domestic laws (Ministry of Justice (ROC), 2009) and implemented an expert review process that is modeled on the UN treaty bodies.

Nevertheless, the country's prospect of participation in the international human rights regime has been overshadowed by the review outcome of the implementation of two covenants. The first two reviews held in 2013 and 2017 drew different pictures of the Taiwanese government, as a patriarchal one carrying genuine political will to fully implement covenant obligations and a giant wall to further implementation and promotion of human rights obligations in Taiwan (Kuo, 2013; Shi, 2017). In the third independent review held in May 2022, despite Taiwan's effort to comply with international human rights standards being acknowledged, Taiwan's continuous struggles with several major outstanding issues in its still-incomplete processes of democratic transition and transitional justice are highlighted, with an inherent relatedness to the persistent legacies of abuses under the authoritarian, one-party rule of Chiang Kai-Shek and Nationalist Party (KMT) successors in Taiwan between 1949 and 2000 (Pérez-Bustillo, 2022).

Drawing lessons from Taiwan's human rights commitment, what has consistently plagued Taiwan's voluntary commitment to international climate obligations is the gap between Taiwan's self-projection as an earth citizen, being aware of and dedicated to climate action, and its realistic posture informed by enduring authoritarian mindsets, institutional constraints, and a prospect of national development replete with conflict views wrought by inter-group differences in their view of guiding norms and principal values. This gap between Taiwan's governance incapability and overcommitted contribution is a reification that Taiwan's climate action, at the helm of the appropriateness logic, has turned out to be an unrealistic ideal, which is guided by international norm (the appropriateness concern) and the entailed normative behavioral expectation, with few attentions paid to real consequences (calculation of consequences) inflicted upon local actors in the national environment.

This dominating theme of appropriateness logic also leads Shyu to view Taiwan's climate action as a "product of following the outcomes of the international climate agreements and negotiations" (Shyu, 2014), while Yeh and Lin characterized such a gesture policy meant for meaningful participation in the collective action at the global level (Yeh and Lin, 2018). In this vein, it can be argued that Taiwan's climate action has been driven more by international norms, its direct and indirect normative impact in shaping all sovereign and non-sovereign actors' behaviors, while less addressed to realistic climate change threats and consequential outcomes.

However, goodwill demonstrated in a voluntary commitment to emission reduction is not an all-time panacea. While it is difficult to justify excluding Taiwan from the Paris Agreement, held as a major triumph by getting all players onboard, it is equivalently unlikely for the UNFCCC to risk upsetting the delicate balance reached through exhausting international negotiation to alienate the world's largest emitter, China, and include Taiwan. Put sharply, it is extremely difficult to channel Taiwan's goodwill embodied in the self-imposing voluntary commitment to real leverages but to reap nominal benefits, like reputation and respect from peer countries. So far, what comes with Taiwan's self-imposing voluntary commitment is reputational interest, namely, every nominal but the UNFCCC membership.

3.3 Universal values: developmentalism and the appropriateness logic

The end of the Cold War was marked by the victory of liberal international order, the advancement of which has been characterized by a value system that honors inter-state cooperation, supranational integration, the sophistication of global governance through the legalization of international affairs, and judicialization of international dispute settlement. To name a few, human rights protection, a quest for social justice as the repercussion of development-oriented globalization, a sustainable environment, and the rule of law, are categorical universal values widely upheld in the international community.

3.3.1 Developmentalism: an anchoring concept that conflicts with the appropriateness logic

Taiwan's climate action, with its significance registered in its unique practice of voluntary compliance to international climate obligation, has suggested a hidden agenda tailored for a long-term aspiration. That is, effective climate governance tackles climate change impacts to serve domestic needs, while it collaterally enables the delivery of global public goods, particularly in subject fields characterized by transnationality and collegial inter-state cooperation. As a result, universal values thus inherited can be realized, for example, a human right to a healthy environment and a quest for social justice. This could lead to long-aspired international participation and, eventually, formal recognition for Taiwan. However, the reality is that delivering global public goods and realizing universal values via routinized and quality domestic governance can, at best, secure nominal interests and reputational gains for Taiwan. Furthermore, Taiwan's ineffective climate

governance, exhibited in the gap between governance incapability and overcommitted contributions, has substantially impeded the delivery of global public goods and collaterally aborted the realization of universal values. However, in the context when Taiwan's incumbent climate action is norm-guided and designed for esteem-seeking with little regard directed to consequences, this issue of realization of universal values merits further attention. That said, ineffective climate governance aside, another critical factor that catalyzes the failure to realize universal value is the developmentalism mindset that permeated Taiwan's overall national development for decades.

The developmentalism mindset has prioritized economic development over social justice concerns, for example, environmental protection and labor rights. In a developmental state shaped by this developmentalism mindset, such as Taiwan, the state wields a "brown economic package", whereby low energy price is purposively maintained with government-sponsored economic planning and miscellaneous fossil fuel subsidies (Liu and Chao, 2023). By privileging the carbon-intensive petrochemical industry, the main goal is to spur industrial development, at the cost of laggard climate actions with constrained mobility to a low-carbon economy transition, and a hindered prospect of the electronics industry (Chou et al., 2019). Till the present day, the deeply embedded developmentalism mindset has nurtured consistent practices of a patron-client relationship between Taiwan's energy authorities and these carbon-intensive incumbents, which logically explains the stalled climate actions and lack of incentives of neither ruling nor opposition parties to challenge this development-centric paradigm. Therefore, despite the relatively active unofficial and business actors (Biedermann, 2017), such as non-governmental organizations (NGOs) and industries, the ineffectiveness of official climate actions in Taiwan is essentially an outcome of interactions among an enduring developmentalism mindset, a conventional top-down approach in climate policy-making, and a deep-seated perception viewing the government as a patriarchal figure with corresponding commanding authority in all aspects of national development. Furthermore, this developmentalism negates the realization of universal values inhered in the practice of effective climate governance because national economic development has been prioritized to all other social justice concerns and at all costs, which would collaterally hinder the delivery of global public goods.

That said, not only the ineffective climate governance was exhibited in the widening gap between governance incapability and overcommitted contributions but also the developmentalism mindset, both of which have jointly impeded the delivery of global public goods while collaterally aborting the realization of universal values. Altogether, the unrealistic-ness of Taiwan's climate action has been reified. Having said that, the reality is the identity and social expectation (the appropriateness concern) aside, effective climate governance (out of a refocus on the calculation of consequences and rectification of the developmentalism mindset) has remained one, if not solely, of the opportune means through which the Taiwanese can secure survival with dignity, having its contribution to humanity's wellbeing concretely registered while balancing against the suppression wrought by the lack of sovereign

status and formal recognition. This collaterally sends an alarming message: both the appropriateness concern (socially constructed roles and matching obligations) and calculation of consequences (actions made upon rational choice along with well-defined interests) are required to live up to the name and substance of an earth citizen making a substantial contribution to humanity's wellbeing.

4 Discussion and actionable recommendation: the blue carbon ecosystem measure and a paradigm shift from the appropriateness logic to the appropriateness-consequence compound logic

4.1 Carbon dioxide removal mechanism and the blue carbon ecosystem measure

In most of the 90 scenarios developed by the IPCC 2018 Special Report on Global Warming of 1.5°C (SR1.5) (IPCC, 2018a) to limit warming scale to 1.5 with limited overshoot, these scenarios require CDR "in the order of 100–1000 GtCO₂" by 2100 (IPCC, 2018b). The use of carbon dioxide removal (CDR) technologies, based on large-scale deployment of such from 2020 onward (van Vuuren et al., 2017), is crucial. As one focal point in the Paris Agreement, CDR and mitigation have drawn heavy attention from policy-makers and seasonal observers.

In reality, despite uncertainties in the reliability of CDR technologies, there is a growing trend to include such in emissions modeling and national target-setting, including that informing the Paris Agreement (Fajardy et al., 2019). CDR technologies are expected to remove carbon dioxide from the atmosphere. In such cases, scenarios will be set at a 40%–60% reduction relative to 2010 levels, compared to a much larger reduction of greenhouse gas emissions by 2050, namely, a 60%–75% reduction in other occasions (van Vuuren et al., 2017). Therefore, these scenarios suggest the demand for a CDR industry of a comparable magnitude to the current oil industry. In a similar vein, the United Nations Environment Program's analysis of cost-optimal scenarios with a 50% probability of limiting warming in 2100 to 1.5°C also suggests that net emissions of 788 GtCO₂ prior to 2050 must be offset by net removal of 552 GtCO₂ between 2050 and 2100 (UNEP, 2016).

This heavy reliance aside, CDR technologies have remained marginalized in IPCC reports. In the IPCC Fifth Assessment Report (AR5), only afforestation (IPCC, 2014) and bio-energy carbon capture and storage (BECCS) (IPCC, 2014) are included in global mitigation scenarios. However, amidst the trend of including a variety of CDR technologies in national emission modeling and their respectively determined contribution, the 1.5°C special report in 2018 started to rectify this inattention (IPCC, 2018b). Meanwhile, the IPCC has provided accounting guidance for afforestation, soil carbon, and bioenergy (irrespective of whether it includes CCS), but not for direct air carbon capture and storage

(DACs), ocean fertilization, or accelerated weathering (Mace et al., 2021).

Marine ecosystems serve as critical means in the security of the health and wellbeing of humanity. Nevertheless, they have received disproportionate attention despite their substantial contributions to climate change mitigation, largely by sequestering excess carbon from the atmosphere. Known as the BCE, the IPCC defines blue carbon as “All biologically-driven carbon fluxes and storage in marine systems that are amenable to management” (IPCC, 2019). To date, the focus is on rooted vegetation in the coastal zone, as tidal marshes, mangroves, and seagrasses are some most exemplary cases.

The BCE measure is valued because of the significant carbon sequestration capacity of marine ecosystems whereby the inextricable link between the protection of biodiversity and climate mitigation is embodied. Being praised for high carbon burial rates on a per unit area basis, these ecosystems accumulate carbons in their soils and sediments, so the climatic and non-climatic benefits they provide have been multiple, enormous, and enduring. Nevertheless, carbon storage is likely to be released once these coastal blue carbon ecosystems are degraded. This thus leads to contentious debates if the blue carbon concept could be applied to other non-coastal processes and ecosystems, including the open ocean (IPCC, 2019). Due to variability in ecosystem impacts, uncertain carbon fluxes and trajectories, valuation methods, and governance strategies, inattention and incorporation of these blue carbon concepts uniformly into climate strategies on local, national, and global scales, are therefore not surprising (Hilmi et al., 2021).

4.2 The blue carbon ecosystem measure in Taiwan

To deliver Taiwan’s reduction commitment to greenhouse gas emissions, attention has been drawn to the BCE in Taiwan’s coastal area, with the Ocean Conservation Administration (OCA) conducting monitoring surveys, and conservation and restoration of marine ecosystems of seagrass beds, mangroves, salt marshes, and coral reefs in recent years. Taiwan is an island country with a resourceful marine ecosystem in its surrounding waters, in which the area of mangroves in Taiwan is approximately 680.7 hectares, seagrass beds approximately 25.3 hectares, and salt marshes approximately 187.39 hectares (Ocean Conservation Administration (OCA ROC), 2022). According to monitoring surveys conducted in 2021, there were 33 healthy or stable sites of coral reef in Taiwan, with coral colonies in the eastern coast and Kenting area the healthiest, and seven other dysfunctional sites that needed enhanced maintenance.

In due course, local organizations are also engaged in this process to conduct civic science and remove coral reef mulching and coral restoration through the “Ocean Conservation Protection Program”. In this way, community participation can be facilitated, while indigenous people and local residents can help practice ocean conservation actions with their traditional knowledge. The authority also pledges to conduct coral monitoring surveys to keep track of the annual status and long-term changes of corals in Taiwan’s surrounding waters. Furthermore, inter-agency

cooperation is pursued among the OCA, Fisheries Research Institute, Council of Agriculture, and Executive Yuan to conduct a 50-m² pilot trial of planting salt grass, single-vein dicotyledonous grass, and licorice in the sandy waters around the coral reefs of Chixiwan, Pescadores, which had been planted and rehabilitated in 2021. The BCE measure is also included in the blueprint issued in March 2022, “Taiwan’s Pathway to Net-Zero Emissions in 2050 (National Development Council, 2023a)” while being listed in its “12 Key Strategies (National Development Council, 2023b)” regarding the establishment and restoration of marine carbon sink.

In addition, economic benefit serves as another catalytic factor, which is inductive to subsequent governmental action in developing the BCE measure and critical to its further sophistication.

According to the Taiwanese government, the estimation of a total of NTD 900 billion public investment by 2030 to fulfill the net-zero emission has driven business sectors to view the development of renewable energy and relevant industries as a crucial factor for boosting the economy. Furthermore, the push toward net-zero emission will spur approximately NT\$4 trillion in investment and generate a production value of NT\$5.9 trillion, while creating 551,000 jobs (Pan et al., 2022). Government-sponsored incentive measures, including subsidies and tax breaks, are currently being studied for future implementation. Meanwhile, the government has been considering issues related to carbon pricing such as emissions trading systems and carbon taxes that reflect the true cost of polluting greenhouse gas emissions.

Other governmental promotion actions are on the way, for example, international exhibitions and seminars organized annually to promote the development of domestic supply chains in renewable energy while aiming at creating further business cooperation with foreign suppliers. Furthermore, by gradually extending international cooperation in the commercial and research-development sector, more funding and resources in both public and private domains can be brought into the picture of Taiwan’s advocacy to develop the BCE measures in its climate change policy.

4.3 A paradigm shift from the appropriateness logic to the appropriateness-consequence compound logic

Against this backdrop, Taiwan’s advocacy for the BCE measure opens a new window of opportunity, whereby rectifying the unrealism embodied in Taiwan’s incumbent climate action is possible. The key lies in whether the BCE measures can be effectively implemented. Should it be so, the gap between governance incapability and overcommitted contribution as demonstrated in Taiwan’s incumbent climate action can be redressed so as to avoid the dominating appropriateness concern that emphasizes identity, collateral social expectation, and esteem-seeking. Only with effective governance of the BCE measures can Taiwan facilitate the delivery of global public goods and the realization of universal values where meaningful international participation would logically entail and formal recognition is eventually obtained.

That said, the successful implementation of the BCE measures has hinged upon the substantial transformation of the relations between the developmentalist drive for growth and the rising environmentalist demand, which needs to be not only mutually exclusive but also interacting, inclusive, and integrative. This can be reified in a shift from a view holding the essence of climate action as the fulfillment of responsibility to one having green growth opportunities situated at the core while supplemented by the enhancement of Taiwan's industrial competitiveness (Hu et al., 2016; Hu et al., 2017; Feng et al., 2022; Liu and Chao, 2023), which can help facilitate the integration between the appropriateness concern (the socially constructed role and matching obligations) and calculation of consequence (actions made upon rational choice along with well-defined interests), whereby forming the appropriateness-consequence compound logic. The development of the BCE measures, therefore, serves not only to fulfill Taiwan's responsibility in fighting climate change but also to reap the benefit of a sustainable environment and an economist interest in the growth of relevant industries.

In practice, successful implementation of the BCE measure requires meticulous consideration of the following issues in policy planning: first, incorporation of livelihood aspects as a part of the restoration planning (Convention on Biological Diversity, 2018) and, collaterally, involvement of local community members in all stage of planning and implementation. Furthermore, effective engagement of community members, in a reasonable manner at a comprehensive scale, would help prevent the zero-sum mindset that may permeate different communities bound by closed interconnectedness in biological and non-biological aspects, which would consequently damage the overall restoration effort. An exemplary case is the Mikoko Pamoja project in Kenya, in which the community has worked to avoid leakage by planting pine trees outside of the mangrove project site; therefore, the community has an alternative source of wood when dedicating most of the available resources to prevent mangrove deforestation (Wylie et al., 2016). In addition, financing mechanisms would be the key to successful BCE measures, so more flexibility should be granted in due course of planning and implementation to include both UN-originated mechanisms and the voluntary carbon market.

Therefore, the development of the BCE measure is shaped by consequential incentives of developing CDR mechanism while determined upon a reasonable evaluation of Taiwan's natural resources and rational expectation of the BCE's carbon storage potential. Preferences for the BCE measure have been formed and consolidated upon the IPCC recommendation, while the risk of a zero-sum mindset permeating the closely interconnected local communities that may sabotage the restoration effort can be mitigated by necessary local adaptation. Therefore, the interest of political actors and certain communities would not be prioritized to the interest of the whole of affected communities. In this vein, by incorporating the BCE measures and entailing local adaptation, recalibrated against well-defined interests of combating the increasing climate change risks on the foothold of all those affected, reconfiguration of Taiwan's climate action can be more effectively facilitated, with corresponding policy actions, practically advanced. Furthermore, the success of the BCE measure can be enhanced by substantial and extensive engagement of members of

those affected communities and the provision of a more accessible and sustainable financing mechanism, whereby the practicality of these issues can better integrate or achieve a reasonable balance between the appropriateness concern (the socially constructed role and matching obligations) and calculation of consequences (actions made upon rational choice along with well-defined interests).

5 Conclusion

In this research, Taiwan's climate action is recast through the lens of the appropriateness logic. On the one hand, Taiwan's climate action is extraordinary because it has been characterized by persistent conflict between spontaneous dedication as an earth citizen to collective climate action and preference of a sovereignty country to no further binding international obligations. On the other hand, what Taiwan's climate action has aimed for is unrealistic and self-deceptive due to the dominating appropriateness logic (that attends more to socially constructed roles and matching obligations) and an enduring developmentalism mindset. The appropriateness logic has led to ineffective climate governance and yet-to-be-acquired/aspiring international participation, while the developmentalism mindset has further impeded the realization of universal values.

That said, the development of the BCE measure serves to open a new window of opportunity to integrate appropriateness concern (the socially constructed role and matching obligations) and calculation of consequences (actions made upon rational choice along with well-defined interests) whereby reconfiguring Taiwan's climate action along with the appropriateness-consequence compound logic. In this vein, Taiwan's advocacy to develop BCE measure is a step to tackle domestic needs for coping with climate change impacts, while sophistication thereof also demonstrates the fulfillment of Taiwan's responsibility as an earth citizen, in both name and substance, by making a substantial contribution at a global scale.

Overall, strengthening Taiwan's capability to deliver effective climate action, with steady advancement of BCE measures, can help reify the "whole of human being" approach as the sole and only legitimate means to handle the climate change crisis, regardless of conditions like the acquired statehood or political calculation in international negotiation forum. A fair corollary that thus follows is the cooperation and economic opportunities in relevant industries within and across national borders and collateral boosting impacts on the economic and politico-social context. In this sense, whether a reformulated type of green developmentalism has taken root and nourished upon the appropriateness-consequence compound logic deserves further observation and so does if this newly formed green developmentalism could overthrow Taiwan's developmentalism mindset, challenge the entrenched high-carbon regime, and deliver what has been committed in Taiwan's climate action.

Author contributions

H-YT: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Writing – original draft. S-MK: Investigation, Project administration, Supervision, Validation,

Writing – review & editing. H-ST: Funding acquisition, Project administration, Resources, Writing – review & editing.

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