

27 Colum. J. Asian L. 81

Columbia Journal of Asian Law
Fall, 2013

Article

PROPERTY RIGHTS ARRANGEMENT IN EMERGING NATURAL RESOURCES: A CASE STUDY OF CHINA'S
NATIONALIZATION OF WIND AND SUNLIGHT

Jianlin Chen^{*1} Jiongzhe Cui^{*2}

Copyright © 2013 by the Columbia Journal of Asian Law; Jianlin Chen, Jiongzhe Cui

Abstract

The passage of the Heilongjiang Province Regulation on Climate Resources Survey and Protection (the “Regulation”) that regulates wind and solar energy generation sparked a public furor because it contains a provision that stipulates, “climate resources are owned by the state.” As a case study of this regulatory attempt to manage emerging natural resources, this Article makes the following three arguments. First, the “nationalization” provision in the Regulation is legally compatible with Chinese law that conceives of public property as state-owned property and not as property that requires public access. Second, a clear designation of the state as the manager of resources on behalf of the otherwise amorphous notion of the public is preferable to the “tragedy of the commons” that might arise from the free public access to such natural resources that is advocated by certain Chinese scholars. Third, this controversy is largely irrelevant because the state is always able to address redistribution and externality concerns related to resource use through taxation and various regulatory powers, regardless of whether natural resources are publicly or privately owned. On a broader note, this Article cautions against the pitfall of instinctively rejecting all state intervention - even when there is legitimate distrust regarding state governance - and highlights how the issue of governance remains central regardless of the property rights arrangement for emerging natural resources.

INTRODUCTION	83
I. NATIONALIZATION IN CONTEXT	86
A. Regulatory Framework for Climate Resources	86
B. The Regulation	89
C. Comparison with Other Provincial Regulations on Climate Resources	90
D. The Public Reaction	92
II. NATIONALIZATION IS LEGAL	94
A. Climate Resources Can Be the Subject Matter of Property	94

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

	B. Public Property is State-Owned Property Under Chinese Law	95
	1. Public Property Under Civil Law	96
	2. The “Privatized” Right to Wind and Sunlight Under Civil Law	98
	3. Public Property Under Chinese Law	99
III.	NATIONALIZATION IS PREFERABLE TO STATE OWNERSHIP	103
	A. Uncertainty in Ownership and the Tragedy of the Commons	103
	B. The Problem of Externalities	105
	C. The Disparate Accessibility of Free Public Access	106
	D. The Greater Evil?	107
	E. Summary: Throwing the Baby out with the Bath Water	110
IV.	NATIONALIZATION IS IRRELEVANT	111
	A. Regulatory Powers to Manage Externality and Redistribution	111
	B. Limited Distinctions between State Ownership and Regulation	115
	C. The Inquiry that Should Have Been	119
V.	GENERAL IMPLICATIONS	121
	A. Improvement Rather than Rejection: Reflection from Reich’s “New Property”	121
	B. Sensitivity to Background Regulatory Powers	125
	CONCLUSION	127

***83 INTRODUCTION**

The specter of climate change has prompted increased policy emphasis on generating wind and solar energy to help reduce greenhouse gas emissions. This has in turn brought legal issues on the rights regarding wind and sunlight to the forefront. Such legal issues can manifest in several forms. For example, can wind rights be “severed” from ownership rights to underlying land to facilitate market transactions and investment in wind energy generation?¹ Should access to sunlight and wind be legally recognized as a form of easement that will prohibit neighboring landowners from interfering with wind and solar energy generation?² Do neighbors have the right under nuisance laws to enjoin wind and solar energy generation

because of the negative externalities associated with the otherwise clean energy?³ Is the right to harness wind and sunlight for energy generation subject to the public trust doctrine and the consequential limitations based on public rights in the environment?⁴

Then, there is the nationalization of wind and sunlight.

The passage of the Heilongjiang Province Regulation on Climate Resources Survey and Protection (the “Regulation”) that regulates the use of wind and solar energy in China’s Heilongjiang province sparked a public furor. The controversy centered on Article 7 of the Regulation, which stipulates that “climate resources,” defined as “wind energy, solar energy, precipitation and any component of the atmosphere that is capable of being used by human activities,”⁵ are owned by the state and require regulatory approval by the provincial meteorological bureau before being utilized or even surveyed.

***84** This perceived assertion of state ownership over wind and sunlight was widely criticized by Chinese commentators. One popular jib is whether citizens must now pay to enjoy the breeze on a sunny afternoon,⁶ and another asks whether the state “owner” of wind and sunlight is liable for damages with respect to civil claims for injuries caused by wind and sunlight.⁷ Amidst the popular uproar, certain Chinese academics have also challenged the legality of the Regulation. In addition to the issues of whether climate resources are a form of national “basic economic institutions” that cannot be regulated by the Heilongjiang provisional legislative body⁸ and whether climate resources can even be the subject matter of ownership rights,⁹ a central theme of the criticism revolves around the ownership of climate resources. Echoing public sentiment, academics argue that wind and sunlight are resources that belong to the entire population and not the state¹⁰ and that the state is not permitted to impede or otherwise impose charges on the use of such resources by the people.¹¹

***85** This Article critically examines the “nationalization” of climate resources under the Regulation and makes three arguments. The first is that the “nationalization” provision is legally compatible with current Chinese law. Unlike the civil law tradition that recognizes public property as property from which public access cannot be excluded, public property under the socialist influence on Chinese law is based solely on state ownership. If climate resources are publicly owned - and no Chinese commentator is suggesting that these resources should be private property - then such resources can only be state-owned property under Chinese law.

Second, the clear designation of the state to represent the otherwise amorphous notion of public in the management of publicly owned natural resources is preferable to the free access of the public advocated by Chinese scholars. Although skepticism regarding the state’s ability to fairly and efficiently manage state-owned property is legitimate - particularly in China, where scandals abound that are linked to the mismanagement of state-owned property¹² - free public access is a poor alternative allocation method to address the negative externalities associated with resource exploitation and the redistributive concerns of genuine public resource exploitation. Having no restrictions on public access to natural resources will only result in the “tragedy of the commons,” in which the negative externalities of over-exploitation are imposed on society, and use of the resource is allocated only to those segments of the population that are poised to exploit it.

Third, once the misleadingly attractive notion of public access is rejected, the question of state ownership becomes irrelevant. State ownership is neither a necessary nor a sufficient prerequisite for effectively addressing externalities and redistribution considerations. State ownership through nationalization is only one form of state intervention that regulates the use of natural resources. Even if the rights and entitlement to the natural resources remained vested in private entities, the state can easily impose regulatory restrictions to manage the negative externalities associated with resource exploitation and can levy taxes to achieve the de facto transfer of the economic value of the natural resources back to the public coffers. Conversely, the corruption and rent-seeking that plagues the state management of state-owned property remains a real concern for the state exercise of regulatory powers, particularly in an authoritarian state - such as China - that does not have separation of powers. Thus, improving governance - such as through a critical discussion regarding the operation of the regulatory regime set up by the Regulation to manage the use of climate resources - should be the subject of critical inquiry.

***86** In essence, this Article argues that the public furor over the “nationalization” of climate resources represents a legitimate and understandable distrust of Chinese state governance that is, however, wrongly directed at state ownership.

Two takeaway lessons emerge on the broader question regarding the management of emerging natural resources. First, the remedy for grievances about governance should be to strengthen governance provisions rather than a rejection thereof; this reasoning applies not only for our case study of climate resources management in China but also equally for other emerging natural resources and in other jurisdictions. Echoing the jurisprudential development of Reich's "New Property,"¹³ this Article cautions against the pitfall of instinctively rejecting all state intervention that is likely to introduce a greater evil in the form of the tragedy of the commons. Second, the discourse regarding the appropriate property rights arrangement for the emerging categories of natural resources should also be sensitive to how far-reaching the extent to which regulatory power over the use of resources can directly or indirectly turn the tables on whatever ostensible property rights arrangement is arrived at. This Article argues that the quality of the governing institution will determine the efficacy of the exercise of regulatory powers and should be given equal attention - even if the institution of private property rights is adopted for the particular emerging natural resources.

This Article is organized into seven Parts. Part II presents the Regulation and the underlying regulatory framework on climate resources in China. Part III addresses the legality of the Regulation's nationalization provision. Part IV explains why nationalization is preferable to the public free access advocated by Chinese commentators. Part V analyzes the irrelevancy of state-ownership and highlights that the real issue at stake is governance. Part VI discusses implications on the contemporaneous property right discourse over climate resources and other emerging natural resources. Part VII concludes.

I. NATIONALIZATION IN CONTEXT

This Part presents the "nationalization" controversy in China by examining the overall regulatory framework, the text of the Regulation, a comparison with other provincial regulations and the resulting public reaction.

A. Regulatory Framework for Climate Resources

The conceptualization of climate and weather as an economically valuable resource is a relatively recent development under Chinese law. The prevalence of severe natural weather disasters (e.g., flood, drought, typhoon, hail) *87 throughout the history of Chinese civilization¹⁴ has inevitably led to laws and policies that emphasized forecasting and preventing weather disasters. For example, weather forecasting and disaster prevention is the central theme of a pioneering 1959 State Council document on weather-related government tasks.¹⁵ This document set the tone for subsequent regulations that govern the provision of weather services¹⁶ and safeguard meteorological observation facilities.¹⁷ There is no mention of climate as a resource, even in the relatively recent 1992 State Council document on proposed government tasks and actions on weather-related matters.¹⁸

The major jurisprudential breakthrough came in 1994 when the use of climate resources was provided for expressly in written law. The Regulations on Meteorological Services,¹⁹ an important national-level regulation, consolidates the various regulations and rules relating to weather management. In addition to the chapters on meteorological observation, weather forecasting and disaster prevention, a chapter was dedicated to "meteorological services and exploitation of climate resources."²⁰ The term "climate resources" was defined as "climate conditions such as solar, thermal, hydraulic and wind energy which can be used in human economic activities."²¹ *88 The chapter indicated that the rational development, exploitation and protection of climate resources is encouraged by the state²² and set out the relevant governmental bodies responsible for the various spheres of climate resources.²³ In particular, managing climate resources is delegated to various levels of local people's government and advised by local meteorological agencies. The role of the central meteorological agency is limited to the consolidation and provision of meteorological data.²⁴

The legal status of climate resources was further elevated in 1999 when the Meteorological Law - a national law that is above a national-level regulation in the Chinese legal hierarchy²⁵ - was passed to replace the Regulations on Meteorological Services.²⁶ In addition to strengthening the regulatory authority of the meteorological departments,²⁷ the provisions relating to climate resources remained largely similar²⁸ except for two notable changes. First, climate feasibility studies are now required

for large-scale climate resource exploitation projects.²⁹ Second, the definition of climate resources was removed entirely.³⁰ The first change is understandable in light of the recognition that the unregulated exploitation of climate resources has resulted in damage to both the environment and climate resources.³¹ However, the second change is curious. The legislative history and the legislative explanation of the Meteorological Law are both surprisingly silent about removing the definition of climate resources.³² One reason might have been to preserve the flexibility to expand the scope of the definition whenever *89 technological advances facilitate the exploitation of new forms of climate resources.³³

B. The Regulation

Heilongjiang province is one of the top five provinces in China in terms of wind energy resources.³⁴ The Regulation was enacted by the Standing Committee of the Heilongjiang People's Congress in June 2012 in response to the rapidly increasing exploitation of wind and solar energy in the province.³⁵ The basic thrust of the Regulation designates a regulatory authority for climate resource management and the regulatory framework for climate resource surveying. For example, Article 4 of the Regulation indicates that the provincial weather bureau is the supervisory body that oversees the execution of climate resource surveying and protection by the local weather bureaus in their respective administrative regions. Article 8 sets forth technical competency standards for surveying climate resources, and Article 12 governs *90 climate feasibility studies. These provisions largely reflect the regulatory framework envisaged under the Meteorological Law.³⁶

The main controversy centered on Article 7 of the Regulation, which stipulates, "climate resources are owned by the state" and requires approval by the provincial meteorological bureau before surveying and using climate resources.³⁷ Climate resources are defined to include wind, sunlight, precipitation and any component of the atmosphere that is capable of being used for human activities.³⁸ The sanctions for failing to obtain the necessary permits are a fine between RMB 50,000 and RMB 100,000 and the confiscation of illegal gains.³⁹ The stated legislative purpose is "promoting harmonized development between economic society and the natural environment."⁴⁰ Another purported justification is to prevent enterprises from staking their claims to these climate resources through preemptive investment,⁴¹ a practice that has occurred in other provinces.⁴²

C. Comparison with Other Provincial Regulations on Climate Resources

The perceived outrageous boldness of the Heilongjiang provincial government in stipulating the state ownership of climate resources and in imposing the requirement of regulatory permits for resource use has been heavily criticized by commentators. However, it is worth bearing in mind that the Meteorological Law does delegate the management of climate resources to the local people's government.⁴³ This delegation is a surprisingly decentralized regulatory structure for the Chinese government, which typically prefers direct *91 regulatory supervision by the central government.⁴⁴ One possible explanation is that the conceptualization of climate resource remains at a relatively formative stage in China, [supra cite II.A] and the central government is thus prepared to allow some experimentation at the local provincial level on the management of these emerging natural resources.

A comparison with other provincial regulations on climate resources dampens the controversial uniqueness of the Regulation. Explicitly mentioning "state ownership" is a novelty; no other regulation from Shanxi province,⁴⁵ Guizhou province,⁴⁶ the Tibet Autonomous Region,⁴⁷ and the Guangxi Zhuang Autonomous Regions⁴⁸ makes such a proclamation. However, the real meat of the Regulation - requiring regulatory permits for climate resource use - is not entirely unusual. All the other provincial regulations contain regulatory controls on climate resource usage in the form of climate feasibility studies. The regulations typically require climate feasibility studies to be conducted by the relevant meteorological departments for any large-scale wind- or solar-energy project.⁴⁹

There is a qualitative difference between climate feasibility studies and regulatory permits under the Regulation. The requirement of climate feasibility studies originates from the Meteorological Law⁵⁰ and is generally a less stringent regulatory burden. In the majority of the provincial regulations, a fine is typically imposed for failure to conduct the required climate

feasibility studies, but there is typically no mention of the consequences of an unfavorable climate feasibility study⁵¹ or the confiscation of gains under the Regulation. Nevertheless, it is possible to elevate the feasibility studies into a significant and potent form of regulatory control. For example, the Tibet *92 Autonomous Region requires a favorable result of climate feasibility studies as a precondition for the planning/building permits for a climate resource usage project.⁵²

D. The Public Reaction

In any event, the perceived “nationalization” of wind and sunlight was widely criticized by Chinese commentators. One popular jib is whether citizens must now pay to enjoy a breeze on a sunny afternoon,⁵³ another asks whether the state “owner” of wind and sunlight is liable for damages with respect to any civil claims for injuries caused by wind and sunlight.⁵⁴ Other critics have expressed skepticism regarding the purported legislative purpose of “promoting coordinating development between economic society and natural environment”⁵⁵ and regard the legislation as a typical example of either a power grab by the regulatory department⁵⁶ or revenue generation by the government.⁵⁷ Although the deputy director of the Heilongjiang provincial Meteorological Bureau has emphasized that the regulatory permission does not come with any additional monetary charges,⁵⁸ this emphasis did not quell skepticism about hidden fees⁵⁹ or concerns about rent seeking in the administrative approval process.⁶⁰ Opponents also noted that such measures add unnecessary bureaucratic red tape and administrative costs to enterprises and are contrary to the national policy of promoting clean energy.⁶¹

The public endorsement of the Regulation by the director of the National Meteorological Bureau as compliant with national laws and as a useful reference model for other provinces⁶² has also done little to deflect concerns *93 regarding the Regulation’s legality. The main critique has focused on the purported “nationalization” of climate resources and the implications of government restrictions. Jie Dai has indicated that climate resources belong to the entire population and are distinct from state ownership.⁶³ Professor Gangzhi Zhou argued that in light of the public-interest nature of climate resource usage, the state is not permitted to impose charges on the use of these resources in the guise of nationalization.⁶⁴

There are two other notable legal critiques of the Regulation. The first is procedural in nature. Certain commentators have argued that the legislative authority that allows the legislature to alter “basic economic institutions” is vested only in the national legislative body and not in any provincial legislative body.⁶⁵ The other legal argument notes that wind and sunlight cannot be regarded as the subject matter of property. Eminent Chinese climate resources scholar Lu Zhang highlights the inappropriateness of property rights in relation to a subject matter that cannot be readily and precisely quantified.⁶⁶ This point is echoed by Wujun Liu, editor-in-chief of the official legal magazine for China’s judiciary, who emphasizes that property in the legal sense must be controllable and have sufficient scarcity and that both characteristics are absent from climate resources.⁶⁷

Amidst the chorus of criticism, there are some lonely voices of qualified support. Lin Li suggests that the popular criticism of paying for sunshine and wind is completely misconceived because the Regulation is only targeted at the commercial use of climate resources.⁶⁸ Yongqiang Li supports the Regulation, citing the increasing scarcity of climate resources because of increased exploitation, but nevertheless opines that administrative permits should be allocated without any charges.⁶⁹ Professor Jinghua Zhuang supports the state ownership of climate resources with the caveat of the obligation to tolerate free use by the public.⁷⁰

*94 II. NATIONALIZATION IS LEGAL

The nationalization of climate resources by the Regulation has certainly touched a raw nerve. This Part critically examines the central legal issue of whether the nationalization of climate resources is compatible with current Chinese law by addressing two related objections. First, does the intangible and uncontainable nature of climate resources render these resources incapable of being the subject matter of property rights? Second, are climate resources publicly owned resources that are not susceptible to the ownership of any entity, including the state? Although the administrative procedural aspect of the Regulation is not the focus of this Article, it is worth noting that the objection based on legislative overreach would be

largely negated if, as this Part shall argue, climate resources are legally subject to state ownership under Chinese law and the Regulation's "nationalization" provision is simply a restatement of current law.

A. Climate Resources Can Be the Subject Matter of Property

One preliminary objection against nationalization is that the intangible and abundant nature of climate resources presents significant jurisprudential obstacles with recognizing climate resources as property that can be owned by an entity.

This critique reflects the general hesitation under Chinese jurisprudence toward the recognition of property rights with regard to intangible property. The prevailing view in China is that intangible property is not covered by the Property Law, the otherwise monumental legal milestone in the recognition and protection of property rights.⁷¹ A recent interpretative book from the official law publisher for the State Council legal office emphasized the distinction between intangible property and tangible property and opined that specific legislation is necessary to regulate matters relating to the latter.⁷² Prominent Chinese property rights scholar Wang Limin has also advanced a similar conceptual distinction between tangible property and intangible property.⁷³ Although recognizing the international trend to increasingly emphasize the economic value of property as the defining characteristic of property rights,⁷⁴ Yihua Zhang and Xiaojing Luo nevertheless retained the *95 view that intangible property is, as a matter of principle, not generally covered by the Property Law.⁷⁵

This conceptual distinction between tangible property and intangible property is the result of confusing terminology, particularly when applied in the context of climate resources. "Property rights" in Chinese can be either "wuquan" or "caichan quan." "Wuquan" is the main subject matter covered in the Property Law and generally refers to tangible property. "Caichan quan" encompasses a broader concept and is an essentially an economic definition for rights to certain economic interests⁷⁶ Although the two phrases have different meanings, the interchangeable use of the concepts is unfortunately commonplace.⁷⁷

This terminology explains and also negates the critiques against the proprietary nature of climate resources that are based on an assessment of climate resources against the incorrect benchmark of "wuquan".⁷⁸ The constitutional provision of property is framed as "caichan" and not limited to "wuquan".⁷⁹ The law will recognize and protect "caichan" that is owned by both private entities and the state. The argument that "ownership rights" are peculiar to "wuquan"⁸⁰ also does not hold because the Property Law ("wuquan fa") itself contains a special chapter on ownership that addresses various state-owned properties ("guoyou caichan") extensively in the broader economic sense.⁸¹ That chapter affirms that for state-owned property at least, the satisfaction of "caichan" would have sufficed for legal recognition. As long as sunlight and wind can be conceived as subject matter to which economic rights can attach - and the international experience does confirm this possibility⁸² - then it can be the subject matter of state-owned property.

B. Public Property is State-Owned Property Under Chinese Law

The other criticism of the state ownership of climate resources is based on the notion that climate resources are a form of public property owned by the entire population and should be able to be enjoyed and used by everyone. This *96 section explains the civil-law origin of this notion of public property and argues that the concept is inapplicable in modern Chinese law.

1. Public Property Under Civil Law

Roman law, the bedrock of modern civil law,⁸³ typically recognizes public property based on public use.⁸⁴ Air, running water and the sea are classic examples of such *res communes* that cannot be legally owned; however, the law also recognizes that everyone has the right to enjoy the use of such public property.⁸⁵ A similar concept, *res publicae*, involves property such as public roads, rivers and harbors that are typically owned by the state but in which private property interests can exist.

However, regardless of ownership, the public cannot be excluded from accessing and enjoying of this type of property.⁸⁶

This understanding continues to be reflected in modern civil jurisdictions such as France and Germany in which the classification of public property depends on use rather than on ownership.⁸⁷ In Germany, property that is subject to public ownership cannot prima facie be the subject matter of private transactions.⁸⁸ Known as “public property proper,” these public properties are *97 deemed to be property that has a beneficial function to the public.⁸⁹ The objective of the public beneficial use of public property is regulated by administrative law orders of dominion and use.⁹⁰ Public property can be designated pursuant to legislation or administrative act, as in the case of groundwater systems under private land.⁹¹ “Public property proper” can be contrasted with “public financial assets” that are property owned in a private capacity by a public authority.⁹²

Under French law, public property is differentiated into “state public property” (or “public domain”) and “state-owned private property,” with the former relating to property that is directly used by the public or modified for public use.⁹³ Public roads, navigable rivers, beaches, ports and other property that is not susceptible to private ownership are considered “public domain.”⁹⁴ There are also other things that belong to no one but whose usage is common to all (including air, light, the sea, rivers and solar heat⁹⁵); the use of these things is regulated by public order statutes.⁹⁶ The rules governing the management of these public properties are in the realm of public law and enforced by administrative courts.⁹⁷ In particular, any property that is considered to be the “public domain” must undergo special procedures with regard to reclassification before the property can be transferred to a private person.⁹⁸

***98 2. The “Privatized” Right to Wind and Sunlight Under Civil Law**

This seemingly attractive idea of public property in which the entitlement and the right of use are vested in the public and not excludable by discrete entities underpins the objections toward the “nationalization” of climate resources in China. As noted above, Chinese commentators frequently characterize the nationalization provision and the requirement of regulatory permit as an impediment by the state to the inherent rights of the public to access and use the resources.⁹⁹ Even scholars who support state ownership and/or regulatory control advocate for the imperative of free public access to resources.¹⁰⁰ Although this conceptualization of public property based on civil law has not been expressly debated in the controversy over the Regulation, Chinese academics in recent years have pushed for a civil-law concept of public property.

For example, in his case study of the Chinese courts’ treatment of religious property, Professor Jianwen Zhang identifies the subtle judicial recognition of public access as a limiting characteristic on the use of publicly owned religious property and argues for a systematic reworking of the current Chinese approach to incorporate the normatively superior civil-law concept of public property.¹⁰¹ Zhang argues that the requirement of public access to public property would ensure a better appreciation of the public entitlement in using the property and prevent the possible mismanagement of the property for improper private gains.¹⁰² In a similar vein, Professor Zechang Xiao strongly criticizes the common practice of charging steep entry fees for Chinese natural, cultural and historic tourist attractions and suggests that such tourist attractions are “social public property” to which public access cannot be denied.¹⁰³ In particular, the government is prohibited from using market mechanisms (i.e., charging market rates) in allocating property that should be freely accessible to the public.¹⁰⁴

The ironic aspect of this push for civilian conceptualization of public property is that other facets of civil law prescriptions for property entitlement are actually antithetical to the normative concerns of the “nationalization” objectors. “Nationalization” is rejected because of the desire to preserve the public entitlement and access to climate resources. However, the right to harness climate resources is typically allocated by civil law jurisdictions in accordance with ownership of the underlying land. Under the German civil code, for instance, the right of the owner of land extends to the space above the surface and to the terrestrial areas below the surface, subject to *99 interferences at such heights or depths that the owner has no interest in their exclusion.¹⁰⁵ Similarly, the French civil code posits that ownership of land includes the ownership of what is above and below the ground,¹⁰⁶ although this conceptualization is often limited in practice by various regulations, such as land-use planning rules, telecommunications law and aviation law.¹⁰⁷ This principle echoes the basic common law principle that vests title to natural resources above and below the surface of a plot of land in accordance with title to the land itself.¹⁰⁸ The principle, also known as the *ad coelum* rule, uses boundary lines to determine the rights to natural resources.¹⁰⁹

For the objectors of “nationalization,” this “privatization” of climate resources would be worse than state ownership in terms of unrestricted public access.

Moreover, in the particular context of China, this line of thought would ironically strengthen the legal case for nationalization. Under Chinese law, the ownership of all land is vested either with the state or with the collectives. Private ownership of land is prohibited and private entities may only acquire land use rights.¹¹⁰ Given that the usufructuary rights acquirable by private entities under land use rights¹¹¹ do not prima facie include the right to use natural resources,¹¹² the right to harness climate resources remains vested in the state.

3. Public Property Under Chinese Law

In any event, the legal concept of public property is different in China. Notwithstanding an ostensibly civilian tradition,¹¹³ Chinese laws and policies *100 are heavily influenced by the communist and socialist tradition¹¹⁴ as the result of Chinese Communist Party rule since 1949.¹¹⁵ One distinct manifestation of this ideology is its emphasis on protecting public property.¹¹⁶ A major platform of the Chinese Communist Party is the institution of a socialist state whereby public ownership is the dominant form of ownership in the country.¹¹⁷ Public ownership of property is deemed crucial for the survival and prosperity of the socialist state.¹¹⁸ This perspective remains the official stance of the country, notwithstanding the transition into a “socialist market economy” and the increased recognition of the economic contributions from privately owned entities.¹¹⁹

Thus, it is not surprising that public property is given “inviolable” status under the Chinese Constitution.¹²⁰ This status is in sharp contrast to private *101 property, which has been recognized only since the 2004 constitutional amendment.¹²¹ Article 53 of the Chinese Constitution also expressly includes the protection of public property as the duty of the Chinese citizen.¹²² The “sacred and inviolable” nature of state property and its collective ownership by “the whole people” is reiterated in Article 73 of the Principles of Civil Law.¹²³

Notably for our inquiry, public property under Chinese law does not include any requirement of public access. Instead, ownership is the sole criterion in determining the status of property. Public property under Chinese law primarily consists of state property and collective property.¹²⁴ Although not specifically defined in the Constitution, Article 12 provides that “socialist public property is inviolable. The state protects socialist public property. Appropriation or damaging of state or collective property by any organization or individual by whatever means is prohibited.”¹²⁵ The article discusses only state and collective property without any definition of “other public property” or any “such as” list. This is unlike the other constitutional provisions where a non-definitive list is typically provided, such as those in relation to the state ownership of natural resources¹²⁶ or the setting up of people’s courts.¹²⁷ Thus, by necessary implication, public property under existing Chinese constitutional framework can only be manifested in the form of state property or collective property.

This understanding of public property is echoed in other legislation. For example, Property Law only recognizes state owned and collectively owned as *102 the two forms of non-private ownership rights of property.¹²⁸ Notably, public property is given a broader definition under the Criminal Law. In addition to state property and collective property, Article 91 of the Criminal Law recognizes a third form of public property - namely, “public donations to be used for aiding the poor and other public services, or property of special funds.”¹²⁹ This recognition, however, must be considered in light of the purpose of criminal law. The recognition of this third category of public property is to facilitate a more comprehensive criminalization of corruption and other abuses of power by state employees and personnel¹³⁰ rather than to alter the general understanding of public property as a property rights arrangement.

Thus, if climate resources are indeed public property, these resources can only be state-owned property under current Chinese law. Aside from collective property managed by collectives, no other forms of public property are legally recognized in China. Indeed, the “nationalization” of natural resources such as climate resources conforms to Article 9 of the Constitution, which stipulates that “[a]ll mineral resources, waters, forests, mountains, grasslands, unreclaimed land, beaches and other natural resources are owned by the state,” and to Article 48 of the Property Law, which indicates that “[n]atural resources

such as forests, mountains, grasslands, waste lands and tidal flats shall be owned by the state.” Although the absence of an explicit reference to “climate resources” is commonly relied on by critics of nationalization and the Regulation,¹³¹ the authoritative legislative interpretation by the Civil Law Department of the NPC Legal Committee expressly confirms that climate resources are a form of natural resources covered under Article 48’s state *103 ownership provision of the Property Law.¹³² The “nationalization” of climate resources under the Regulation merely reflects current Chinese law.

III. NATIONALIZATION IS PREFERABLE TO STATE OWNERSHIP

The legality of “nationalization” under the Regulation does not necessarily mean that nationalization is desirable, particularly when the legality depends on the strong socialist influence on Chinese law. The question remains as to whether the free access of the public that is advocated by Chinese commentators is preferable to state ownership. This Part argues that free access to the public will introduce the greater evil of the tragedy of the commons.

A. Uncertainty in Ownership and the Tragedy of the Commons

Advocating for free public access is based on the notion that climate resources belong to the general public. Yet as an amorphous entity, the “public” by itself is unable to actively manage these natural resources. Individual members of the general public lack both the capacity and incentive to effectively ensure the proper usage of publicly owned resources. The information costs necessary to track the usage of natural resources across the entire jurisdiction are far beyond the means of any individual members of the population.¹³³ The management of public resources is also confronted by the free-rider problem, in which individual members may simply rely on others to expend resources and undertake the management because any benefits from effective management are enjoyed by the public as a whole.¹³⁴ Thus, as the representative of the public, the state is the natural candidate for enforcing the rights of the public to use and enjoy these resources. In fact, the formation of the state is in part a response to the collective action problem that otherwise *104 plagues decisions and actions that are purported to be on behalf of the general public.¹³⁵

The absence of an entity with the capacity and incentive that is necessary to manage the resources can result in the greater evil of the tragedy of the commons. The tragedy of the commons occurs when individuals, in pursuit of their self-interest, overexploit communally shared resources with little regard to the costs of their actions because they are borne by other individuals and society in general.¹³⁶ Garrett Hardin, in his seminal article introducing the concept, used the example of a public-access pasture in which a herdsman calculates that he will retain all the benefits of adding a herd, but bear only a tiny fraction of the negative costs arising from overgrazing because such costs are shared by all the herdsmen.¹³⁷ The typical modern example of tragedy of the commons is fishing in international waters, in which the lack of effective management of the natural resource has led to the depletion of fish stocks and the collapse of major fisheries.¹³⁸ Such overexploitation is not restricted to circumstances in which public access is legally guaranteed but will similarly occur when private rights to the resources are insecure.¹³⁹

*105 B. The Problem of Externalities

At first glance, free public access to climate resources, particularly sunlight and wind, would not seem subject to the tragedy of the commons scenario because the resources are renewable, abundant and non-exhaustible. Indeed, the abundance of climate resources is a point frequently raised in objection to the Regulation.¹⁴⁰ However, the tragedy of the commons can occur even when the resources are readily renewable. The depletion of resources is an important social cost that is ignored by individuals pursuing their own self-interest during resource exploitation. Nonetheless, the use of resources may generate other social costs even if the particular characteristic of the resource renders the risk of depletion negligible. For example, the tragedy of the commons is amply manifest in public roads,¹⁴¹ the otherwise classic public property to which public access is normatively required under Roman law¹⁴² and contemporary discourse.¹⁴³ Although public roads are a renewable resource in the sense that current usage will not deprive future use, the absence of management over public roads has led to

uncoordinated road overuse, as demonstrated by major traffic congestions in urban areas.¹⁴⁴ These traffic congestions impose not only substantial time and fuel costs on motorists but also general environmental damages on the public.¹⁴⁵

***106** There is a similar pattern of negative externalities under a regime of free public access to the use of climate resources. Wind and solar energy are often considered green energy because of their renewable nature and low carbon emissions.¹⁴⁶ However, the generation of wind and solar energy does impose significant negative externalities. Harnessing wind through wind turbines may impose externalities on neighboring land, such as noise, safety hazards, aesthetic harm, flicker effects, and a general decrease in property value.¹⁴⁷ More importantly, the turbulence caused by a wind turbine can diminish wind flow to wind turbines located downwind, which reduces their electrical generation.¹⁴⁸ The land-intensive nature of large-scale solar energy also threatens biodiversity and adversely affects the landscape aesthetically.¹⁴⁹ The high usage of water by solar energy projects can also adversely affect current water resources, particularly because solar energy projects tend to be located in desert regions in which water is already scarce.¹⁵⁰ Any exploitation of climate resources must balance these negative externalities with the direct and indirect benefits of renewable energy generation.¹⁵¹ However, private entities harnessing these climate resources under a regime of free public access have little incentive to take these costs into account, which by definition are borne by others.

C. The Disparate Accessibility of Free Public Access

Moreover, the problem with free public access to climate resources is not simply the excessive negative externalities that arise from overexploitation by self-interested entities. Unrestricted access to a resource does not guarantee actual and equal access by all members of the public. Instead, unrestricted access merely allocates the resource to segments of the population that are poised to exploit the resources. For example, the free access of ocean fisheries has benefited large corporations with capital and expertise depleting the fish ***107** at the expense of local small-scale fishermen.¹⁵² Similar usage patterns may be observed with greenhouse gas emissions--nature's absorption capacity for greenhouse gases has been used to saturation by the industrialized north.¹⁵³ Gerd Winter observes that free and unrestricted access to resources "implies that the more ancient and the more powerful users have often won priority over newcomers or less powerful ones."¹⁵⁴

In the case of wind and solar energy generation, land ownership and capital investment become the de facto allocation mechanisms in the absence of an express *ad coelum* legal rule. Various solar and wind energy enterprises in China have made a concerted effort to claim these climate resources for themselves through preemptive investment.¹⁵⁵ The disturbing practice of acquiring large tracts of lands and erecting wind turbines and solar panels merely for the sake of staking out the right to future exploitation--the current electrical grid infrastructure is not yet ready to fully use the electricity generated from these renewable resources--is in fact the purported justification for the Regulation.¹⁵⁶ The alternative to regulatory intervention is not true public enjoyment but private entities capturing and hoarding the resources.

D. The Greater Evil?

In this regard, the state ownership of natural resources is a possible response to the tragedy of the commons problem. The state can exercise its ownership rights to exclude undesirable usage methods while coordinating access by legitimate users. Similarly, the "nationalization" of climate resources can be understood as an alternative approach to the externalities problem. The issue of externalities is theoretically negated under "nationalization" because the benefits and harms related to climate resource usage that occur within the jurisdiction of the state are now "internalized" by the state as owner. The state thus has the legal right and the proper incentive to ensure that the total benefits arising from the use of the climate resources are greater than the total harm. In terms of redistribution, the state as the manager of the resources can also levy fees on the use of the resources by private entities and use the collected fees to engage in publicly beneficial projects or otherwise redistribute the wealth to needy sections of the community.

***108** This utopian view of the state management of natural resources is, of course, unrealistic. Rent-seeking, corruption, and transaction costs can easily derail effective redistribution and externalities management. The corrupt exercise of state

ownership over natural resources produces numerous inefficiencies and inequalities. When the rights to natural resources are allocated based on the ability to bribe the government rather than the ability to make the best use of the resources, the natural resources are likely to be exploited by less efficient producers.¹⁵⁷ Corruption may also lead government decision makers to manage resource usage inefficiently. Instead of considering overall social welfare, corrupt government officials are likely to make resource management decisions that either promote the private benefits of the bribing entity or extract the maximum bribes from competing entities.¹⁵⁸ In terms of redistribution concerns, the general population suffers when the gains from natural resource usage are captured by corrupt government officials and the bribing entities.¹⁵⁹ This inefficiency and inequality is present even in the absence of explicit bribery. The state may be indifferent towards the benefits and harm suffered by private entities, particularly when those entities lack political influence.¹⁶⁰ Information costs may also prevent an accurate assessment of the benefits and harms of the usage activities.

In the context of China, the Chinese Constitution equates the state ownership of natural resources with ownership by the entire population.¹⁶¹ However, even Chinese academics are not shy to note the bureaucratic, rent-seeking power grab in China's regulatory allocation of natural resources or the profit-hungry usage of market allocation mechanisms.¹⁶² The authoritarian *109 and undemocratic nature of the Chinese communist regime also calls into question its legitimacy as a true representative of the public.¹⁶³

The question thus is, which is the greater evil? This Article concedes that there is insufficient evidence to conclusively prove that free public access is inferior to the corrupt exercise of state ownership. The question is also largely dependent on context - the severity of the corruption certainly matters, as do the particular characteristics of the natural resources involved.¹⁶⁴ Nevertheless, this Article makes three arguments in favor of China's nationalization of climate resources. First, it is notable that the efficiency arguments against public management are premised on comparing public management with private property rights.¹⁶⁵ The efficiency argument against the corrupt public management of resources is premised on private entities with the proper incentive to properly balance resource use and conservation under a regime of the private ownership of natural resources. The literature certainly does not suggest that a "free-for-all" scenario under free public access is preferable. Similarly, neither free public access nor a system of private ownership based on the *ad coelum* rule will advance genuine public enjoyment of the benefits of natural resource usage.¹⁶⁶ In these circumstances, the corrupt exercise of state ownership is--at its worst--no worse than the tragedy of the commons in terms of efficiency and redistribution considerations.

Second, governance in China is not in such a deteriorated state that public management of natural resources is a mere façade for corrupt transactions without any due considerations of social welfare. In international ranking, *110 China ranks reasonably respectably with regards to governance as compared to other developing nations.¹⁶⁷ Despite continued governance problems in China, commentators have acknowledged that Chinese governance has improved significantly in managing public resources with respect to climate change, renewable energy¹⁶⁸ and state-owned enterprises.¹⁶⁹ Externalities and redistributive considerations are likely to be at least partially addressed by Chinese government regulation and policy.

Third, historical experiences demonstrate the greater perils introduced by the withdrawal of state control over communal resources. Joshua Muldavin's case study of resource management in reform-era China observed that villages with a complete breakdown of public property management institutions fare worse in environmental degradation and economic output compared to villages that retained at least some form of collective governance mechanisms and that managed to prevent a resource free-for-all.¹⁷⁰ Tellingly, although the retention of public management control of the resources was far from perfect and was plagued with problems of corruption and misaligned incentives, Muldavin considered the alternative scenario of free-for-all to be inferior.¹⁷¹ In a similar vein, Shitong Qiao highlighted the severe problems that arose from the retreat of the state in the management of ostensibly publicly owned rivers during the post-socialist transition era. In particular, the de facto commons were plagued by environmental disasters caused by indiscriminate pollution and overfishing and the inequitable claim to resources based on superior power.¹⁷²

E. Summary: Throwing the Baby out with the Bath Water

Free public access is neither free nor public. The seemingly absent costs to individuals using the resources mask the

substantial social costs borne by the general public. The seemingly open-to-the-public nature of unrestricted access *111 in reality allocates the resources only to those selected segments of the population in a position to exploit the resources. In the context of wind and solar energy, free public access will result in massive wealth transfers from the general public (who bears the costs) to large, land-possessing enterprises (who enjoy the benefits of resource exploitation).¹⁷³ Given the concerns about inefficiencies and inequalities arising from the corrupt exercise of state ownership over natural resources, it is difficult to consider this scenario is preferable. Although opposition is motivated by legitimate grievances concerning the state of governance in China, the near-instinctive rejection of state intervention and the advocacy of free public access by Chinese commentators has overlooked the real and arguably greater dangers of inefficiencies and inequalities that would likely ensue under the tragedy of the commons.

IV. NATIONALIZATION IS IRRELEVANT

The previous Part argues that a clear designation of state ownership is preferable to the tragedy of the commons under free public access. However, state ownership is certainly not the only mechanism to address the externalities and redistributive issues arising from the usage of natural resources. This Part explains how the state, regardless of the identity of the rights holder to natural resources, is able to use its current array of regulatory powers to achieve the exact same outcome of resource management as if the state were exercising state-ownership rights. In both forms of resource management, the key determination of whether the outcome is good or bad is ultimately dependent on issues of governance. Thus, this Part argues that whether a natural resource is state-owned is fundamentally less important than whether the governance institution institutions in relation to resource management is sound. In this regard, the problem with the enthusiastic debate concerning state ownership in China's nationalization controversy is not simply about incorrect legal interpretations or the advocacy of normatively undesirable solutions. Instead, the dominance of the state-ownership issue precludes a critical examination of the regulatory scheme that the Regulation imposes to manage the usage of climate resources. This issue of governance improvement should be the focus of inquiry.

A. Regulatory Powers to Manage Externality and Redistribution

The externalities and redistribution problems that arise from free public access renders it a poor mechanism for resource management. The clear designation of the state as owner is one possible solution to resolve the *112 externalities and redistribution issues. However, state ownership is not a prerequisite for state intervention in externalities and redistribution.

Externalities concerns feature prominently in both common and civil law jurisprudence on property rights in climate resources. Whereas the *ad coelum* rule is a basic starting point for allocating the right to harness climate resources,¹⁷⁴ actual usage is subject to various legal restrictions. Under common law, the most obvious land-use restriction is the doctrine of nuisance. Nuisance may be broadly classified as either private or public. Private nuisance involves activities that cause a substantial and unreasonable interference with a claimant's land or with a claimant's use of that land.¹⁷⁵ Public nuisance is typically a publicly enforced claim for activities that harm the community at large, although private claimants may obtain compensation if the claimants can show particular damage.¹⁷⁶ In both types of nuisance, the courts essentially serve in the role of land-use regulator and must grapple with the unenviable task of balancing the rights of the landowner to use the land with the negative externalities arising from such use.¹⁷⁷ The negative externalities caused by wind and solar energy generations have prompted litigation by neighboring landowners alleging nuisance with varying degrees of success.¹⁷⁸

The civil law tradition also has a legal concept akin to the common law doctrine of nuisance. Sometimes known as neighbor law, the concept operates to protect property owners from interference by private or public parties and in practice exhibits little difference from its common law counterpart.¹⁷⁹ In Germany, a landowner can claim compensation for interferences that negatively impact the customary use or income from land beyond an expected degree.¹⁸⁰ In Denmark, the decisive criterion for a successful claim is whether *113 the effects exceed the "limit of tolerance" expected under normal circumstances in the area in question.¹⁸¹ In Norway, the Neighbor Act¹⁸² prohibits activities that "unreasonably or unnecessarily" negatively affect neighboring property. This is assessed according to several factors, including the expectations of the neighborhood, the

severity of the nuisance on a limited group of people and the technical and economic feasibility of avoiding the nuisance.¹⁸³ Neighbor law claims against wind turbine operators have been brought in Scandinavian courts, and compensation has been awarded by Norwegian courts.¹⁸⁴

In addition to these private law claims to govern the negative externalities inflicted on neighboring land owners, the exercise of the private rights to climate resources is also subject to various legislative and regulatory frameworks that regulate those activities. These frameworks might take the form of land-use regulations that depend on the nature and intensity of the activities¹⁸⁵ or general environmental laws that restrict activities which may harm the environment.¹⁸⁶ Public trust, a common law doctrine in the U.S. that has its origin in Roman law, is available to constrain both private and public entities. Based on the idea that some resources are forever to be held on trust for present and future generations, the public trust doctrine imposes restrictions on activities and usage that either compromise public access to the resources or the public interests inherent in those lands.¹⁸⁷ Environmental ***114** groups and other opponents of large-scale climate energy projects have relied on the public trust doctrine to thwart the potential destruction of important wildlife habitats.¹⁸⁸

Taxation, one of the important regulatory powers of the government, is also a versatile tool to tackle both efficiency and redistributive concerns. A Pigovian tax may be imposed to ensure that the extractors of the natural resources bear the full costs of resource usage.¹⁸⁹ In terms of redistributive concerns, whereas the parceling of climate resources in accordance with land ownership appears to concentrate the entitlement to climate resources into small groups of wealthy land owners, the economic value arising from these climate resources can be channeled back to the public coffer via taxes - whether the tax is a general tax on the profit arising from climate-resource harnessing¹⁹⁰ or a specific tax for the operation of climate resource usage activities.¹⁹¹ Redistributive and efficiency issues are arguably less of a concern now for climate resources. Indeed, the current practice is geared toward state-provided subsidies to promote the use of renewable energy and reduce greenhouse gas emission.¹⁹² Nevertheless, the option of taxes is readily available once the technological and socio-economic circumstances of climate resource usage change.

***115 B. Limited Distinctions between State Ownership and Regulation**

There is no principled distinction between state ownership and state regulatory intervention in terms of their effects. Both modes of state intervention can address the redistributive and externalities problems arising from natural resource usage. Although at first glance the state enjoys greater flexibility and power in the exercise of state ownership compared to regulatory powers, the limitations on the exercise of regulatory powers are only marginally more onerous than the limitations of state ownership. Judicial checks tend to be more stringent for regulations than property disposition by the executive branch, which is often treated as an exercise of private law powers and excluded from judicial review.¹⁹³ However, the checks are rather limited even for the former. Regulations and administrative decisions are reviewed primarily on the process by which the decisions are formulated, which typically is not a problem if the underlying law is worded with sufficient specificity and provided with sufficient procedural safeguards for affected entities.¹⁹⁴ The legislative branch is also given a large amount of leeway in the formulation of tax policy,¹⁹⁵ including taxes specifically targeting the exploitation of natural resources.¹⁹⁶ Regulatory takings claims are available but only in limited circumstances that typically involve the near extinguishing of all economically viable activities on the land.¹⁹⁷

***116** Similarly, both modes of state intervention are subject to the inherent risks of governance failure that can easily thwart the ideal of state intervention and that frequently do occur in practice. If properly executed, the judicial and legislative initiatives discussed immediately in the previous section can effectively manage the externalities and redistribution goals. However, as with the problems of governance that can thwart the proper exercise of ownership rights by the state, transaction costs are again a critical concern with respect to proper execution in practice. Environmental regulations and other regulatory frameworks that might manage climate resource exploitation may be subject to rent seeking by affected interest groups and to the inevitable bureaucratic costs of implementing the regulations.¹⁹⁸ There may also be regulatory lacuna in which there are competing potential regulators and “a mismatch between the regulators’ jurisdictions and the injurious activity’s causes and effects” that can lead to under-regulation¹⁹⁹ Judicial administration involves costly litigation expenses that can outweigh the value of the rights litigation.²⁰⁰ The uncertainty associated with the ad hoc nature of litigations further limits the efficacy of

judicial administration as a means of managing externalities.²⁰¹ At the end of the day, a government that allocates state-owned assets to politically influential minority interest groups is just as likely to enact regulations to benefit those same interest groups.

It is true that depending on the socio-legal context, the mode of state intervention can affect the effectiveness and risks of governance failure. For example, in the three-branch separation of powers system in the U.S., there are arguably more procedural checks inherent in the legislative enactment of laws and authorized regulations than in the executive branch's disposal of state property.²⁰² Conversely, the distinction between regulation and the *117 disposal of property is most likely less significant in the Westminster parliamentary system in the U.K. and other former English colonies in which the executive branches and the legislative branches are largely of the same political composition.²⁰³ Increasing public awareness and acceptance of the takings nature of regulation may also serve as de facto constraints over the exercise of regulatory powers.²⁰⁴

In the particular context of the current Chinese socio-legal framework, however, the irrelevance is particularly pronounced. First, the concentration of power in the Communist Party in China's authoritarian regime renders the nuances concerning the risks of governance failure among the different government branches mute. The close institutional ties of the judiciary with the provincial government in China make the lack of judicial independence a problematic issue.²⁰⁵ It is also difficult to imagine any real intra-government tension between the government leaders and the largely "rubber-stamp" legislative branch of the National People's Congress.²⁰⁶ The efficacy and shortfalls of governance in China are materially indistinguishable for both the management of state-owned assets and the exercise of regulatory power.

Second, the mode of state intervention with respect to the use of climate resources will be identical whichever property rights conceptualization of climate resources is adopted. Regardless of whether climate resources are state-owned, the right to use these resources will be both restricted and allocated via administrative permits under the Administrative Permit Law,²⁰⁷ which was enacted in 2003 to enhance administrative accountability and governance in China.²⁰⁸ Article 12 explains the five main categories of circumstances in which administrative permits may be instituted, two of *118 which are relevant.²⁰⁹ Given the negative externalities associated with large-scale solar and wind energy generation, administrative permits for climate resource use can be justified under the broadly worded Article 12(1) provisions for "public safety ... [and] environment protection."²¹⁰ As demonstrated in the Regulation, the right to use the purportedly state-owned climate resources is allocated via the administrative permits. Similarly, even if *ad coelum* rights theory is adopted in China to wed climate resource rights to the underlying land, the exact same regulatory restrictions can continue to be placed on use because of Article 12(1).

In addition, Article 12(2) also expressly allows for administrative permits to regulate the "exploitation of limited natural resources."²¹¹ This allowance is important for both externalities and redistributive concerns because, read together with Article 53, the system of administrative permits can include a limitation on the number of permits issued and the default allocation of those permits via "tender, auction and other fair competitive measures." This measure authorizes the charging of market fees for the use of climate resources.²¹² Again, neither the operation of Article 12(2) nor Article 53 is premised on the resources being state-owned. The state can continue to limit administrative permits on climate resources because of negative externalities and essentially can capture the economic value of the climate resources regardless of the ownership of the resources. Although the use of "limited" may suggest the non-applicability of auctions to climate resources, it is worth noting that the Shanghai municipal government has been using monetary auctions to allocate the limited number of vehicle licenses.²¹³ The fact that *119 roads are a readily renewable resource has not prevented this use of market mechanisms to allocate what are essentially administrative permits to use the roads.²¹⁴ In any event, general taxes or special taxes²¹⁵ can be levied to effectively transfer the economic value of the climate resources back into public coffers and/or achieve the desire redistributive effect.²¹⁶

C. The Inquiry that Should Have Been

The insight into how the state ownership of climate resources is immaterial to the resource management mechanisms employed by the Chinese state not only renders the vigorous public debate on the issue irrelevant but also distracts from the

pertinent issue at hand - how the regulatory regime instituted by the Regulation actually operates. For all the voluminous newspaper reports and academic journals that have excitedly discussed, critiqued and debated the “nationalization” of wind and sunlight, little ink has been expended to explain the issue of governance. A cursory glance at the wording of the Regulation itself reveals aspects of it that deserved greater scrutiny.

For starters, one may enquire whether the criteria for regulatory approval under the permit system closely relate to the stated policy objectives and are defined with sufficient specificity to avoid abuse of regulatory discretion by the government agency. Article 8 of the Regulation describes the following three conditions for regulatory permits: 1) the applicant must have independent status as a legal person; 2) the survey equipment must conform *120 to the technical specifications set forth by the National Meteorological Bureau; and 3) the surveying personnel must meet the qualification specifications set forth by the provincial meteorological bureaus. Although little public attention has been directed at these seemingly non-onerous and technical criteria, close examination reveals several potential problems.

First, the requirement of separate legal status inexplicably excludes applications by natural persons and business associations without separate legal personality (such as partnerships and sole proprietorships), which is to the possible detriment of small and medium-size enterprises that disproportionately use such business vehicles.²¹⁷ Second, the difference in the source of technical specifications for equipment (national level) and personal (provincial level) is curious and may suggest a protectionist regulatory maneuver with respect to the latter. Third, and perhaps most critically, these criteria do not appear to bear any relation to the purported legislative objective to prevent enterprises from staking their claims in climate resources by making preemptive investments.²¹⁸ Regulatory assessment based on the requirements of separate legal personhood status, proper equipment and qualified personnel will not stop an enterprise from entrenching its claim to climate resources.²¹⁹ This scenario renders the introduced permit system a curious combination of harmlessness (because of the limited regulatory burden imposed) and uselessness (because of the incoherency of the approval criteria and legislative objective).

In addition, the procedural aspects of the newly instituted regulatory permit system merit closer examination. The Regulation is silent with respect to any mechanism of appeal by private entities whose application for permit is denied. Although the current Administrative Litigation Law may fill the gap,²²⁰ it may be prudent to follow other regulations and expressly provide for *121 procedures that better meet the circumstances of a particular permit system.²²¹ Given the negative externalities of wind and solar energy generation imposed on neighboring lands and on the general public, there should also be a discussion as to whether some form of public consultation should be incorporated into the process as there is with other jurisdictions.²²²

Although these considerations may be less eye-catching to the public, these are the issues that materially affect the fair and efficient use of natural resources. In its current state, the regulatory scheme suffers from both an incoherency vis-à-vis the legislative objective and a deficiency in procedural safeguards. More importantly and unfortunately, these issues are overlooked in the enthusiastic debate over state ownership.

V. GENERAL IMPLICATIONS

In addition to the legality issue whose relevancy is more confined to the study of Chinese law, socialist law and/or comparative law, two broader takeaway lessons emerge from this case study of the nationalization of climate resources in China. First, notwithstanding any legitimate distrust or grievance regarding the governance of a particular jurisdiction, any instinctive rejection of state intervention over natural resource usage is likely to introduce greater externalities and redistributive problems under the tragedy of the commons. Second, regardless of the proposed property rights arrangement for emerging natural resources, it is imperative to appreciate that the strengths and weaknesses of any property rights arrangement can be reversed or enhanced by current regulatory powers typically available to the state.

A. Improvement Rather than Rejection: Reflection from Reich’s “New Property”

This Article is sympathetic to the distrust of China’s government that underpins the strong objections to the “nationalization”

of climate resources under the Regulation. However, there is also danger in instinctively rejecting all state intervention because it introduces the tragedy of the commons that guarantees neither equitable nor efficient allocation of resources.

***122** At this juncture, it is worth taking a leaf from the jurisprudential development concerning “new property” in the U.S. pioneered by the aptly titled article “The New Property” by Charles A. Reich.²²³ Reich discusses various forms of government-created wealth, ranging from government benefits and subsidies to regulatory actions such as occupational licenses and franchises.²²⁴ Other scholars have since developed and refined this concept of “regulatory property” as a new form of property that is distinct from traditional property.²²⁵ Reich and others have highlighted the danger of how the magnification of the government’s power and dominion over private individuals can threaten the constitutional rights and liberties of the affected individuals.²²⁶ This recognition of the new forms of property created by the expansion of government power run parallel to state intervention via ownership rights regarding resources that were previously subject to no ostensible legal control, i.e., the assertion of state ownership over climate resources and the establishment of a regulatory permit scheme under the Regulation. The regulatory restrictions on the exploitation of climate resources inevitably reduce the freedom of private entities to use the resources.

However, what is notable is that Reich’s proposed solution to this risk of government abuse is not a smaller government either in size or scope. Reich aptly observes that the modern socio-economic realities render such a move merely a transfer of power back to the private cooperation (“private governments”) that the public-interest state was originally designed to replace.²²⁷ Thus, rather than a rejection of the state, Reich and others focus on a more robust check on the government’s discretion in allocating and recalling this wealth.²²⁸ Likewise, in this case study of climate resource, state intervention is a necessary evil to manage the redistribution and externalities ***123** considerations of resource usage.²²⁹ In such circumstances, the focus of inquiry should be on improving government rather than its complete rejection.

To a certain extent, this problem of complete rejection is less pronounced in American jurisprudential discourse. The affinity toward private property in the legal culture²³⁰ indicates that any distrust of government resources will typically dictate a proposal for private property rights that minimize state involvement in the allocation and management of natural resource usage. For example, Andrew P. Morriss et al. highlight the shortcomings of public management inherent in various possible resource management mechanisms over mineral resources in federal land (e.g., auction, leasing and public ownership) and support a mechanism that creates clear and strong private property rights to the mineral resources with minimal state intervention.²³¹ Similarly, Erika Weinthal & Pauline Jones Luong challenge the prevailing international proposals for strengthening governance institutions to manage the state’s natural resources and argue instead for domestic private ownership in light of the inherent and inevitable governance deficiencies in resource-rich developing countries.²³² Private property is in fact a form of state institution that reduces the effect of state mismanagement and also avoids the problem of the tragedy of the commons.²³³

This preference for private property over public management can be contrasted in China. The prevailing advocacy of free public access in China is a response to both the distrust regarding state governance and to market mechanisms. As discussed above, the argument for public access by Professor Xiao is a reaction to the charging of market rates by the state for admission to natural, cultural and historic tourist attractions.²³⁴ The basic consensus among critics of the Regulation’s nationalization is also that climate resources belong to the entire population. Converting these currently publicly owned resources into private property held by select private entities would be the antithesis of the redistribution concerns that drive the skepticism against state governance.

***124** Tellingly, these reservations about market mechanisms and private property are rather common in developing countries. For example, in India, the recognition of private property in the Indian constitution is fraught with public and political resistance because of concerns about wealth redistribution.²³⁵ The aversion to private property is also prevalent in the management of natural resources, in which “resource nationalism” has been on the rise in several developing countries, such as Brazil’s emphasis on public ownership of hydrocarbon resources and the corresponding flexibility to foster national policy goals that can be contrasted with the American legal culture of limited government intervention in property rights.²³⁶ On a more extreme level is the case of Venezuela, in which restrictions on the majority private ownership of oil resources were elevated to an outright conversion of private property to state-owned property over the past few years.²³⁷ Such hostility toward

private property and market mechanisms is understandable given the prevailing populist political forces in these jurisdictions.²³⁸

Moreover, free public access has an inherently attractive quality such that it can thwart the adoption of market and private property mechanisms - even in the U.S. One telling example is public roads. Despite the widely recognized severe traffic congestion resulting from the tragedy of the commons amid unrestricted public access,²³⁹ any attempts to impose congestion pricing or other restrictions on road travel is met with strong public resistance based on the premise that roads are a form of public property that the public is entitled to access.²⁴⁰ From a public perspective, it is not difficult to see why any alteration of free public access (particularly through monetary fees) is perceived to increase the general burden on the population.²⁴¹ In addition, such alterations may also be perceived as introducing inequities by posing ***125** barriers to travel for those with less income,²⁴² particularly given the lack of sufficient trust in the government's ability to equitably and efficiently distribute the increased revenue.²⁴³

Thus, although the danger of rejecting all state intervention is greater for developing countries such as China because of unease regarding both state governance and private property, it is important not to lose sight of the fact that free public access has an alluring, if misleading, public appeal that can galvanize popular sentiment against a more efficient and fairer allocation of natural resources. The takeaway implication of not throwing the baby (i.e., necessary governance) out with the bath water (i.e., bad governance) also remains applicable to other jurisdictions.

B. Sensitivity to Background Regulatory Powers

The second takeaway implication relates to the property rights discourse regarding emerging natural resources. Technological advances and socio-economic changes have introduced a new type of resource exploitation concerning naturally occurring substances that were not previously regarded as a form of valuable natural resources. The debate concerning the appropriate property right arrangement of sunlight and wind is a direct consequence of the increasing emphasis on renewable energy caused by the depletion of fossil fuels and concerns about climate change.²⁴⁴ Other examples of emerging natural resources have spurred debates over how the rights to these emerging natural resources should be defined and allocated. The technological innovation of carbon sequestration and heat mining has prompted renewed attention to the property rights of the space beneath the land surface.²⁴⁵ Water vapor in the atmosphere is another emerging frontier that is likely to prompt novel legal and policy discussions about improvements in weather modification technologies.²⁴⁶

***126** These various discourses about appropriate property rights arrangement are typically premised on the notion that clearly defined property rights is a necessary - even if not sufficient - prerequisite to a solution.²⁴⁷ Given the tragedy of the commons that is created by the absence of a clearly designated entity with the ability and incentive to properly manage a resource, this Article certainly agrees with the underlying objectives of these discourses. However, the discussion regarding the irrelevancy of state ownership in Part V highlights how the strengths and weaknesses of any particular proposed property rights arrangement can be undermined/mitigated by the state exercise of regulatory power. For example, the popular choice of private property rights is associated with the advantages of having given the private owner the incentive and accompanying freedom to choose the most appropriate form of resource use.²⁴⁸ However, this freedom can be substantially curtailed by various forms of legislative and judicial pronouncements that might mandate the scope and manner of the resource use.²⁴⁹ Similarly, the choice and extent of taxes can substantially distort the incentives for optimal resource use. For example, excessive premature exploitation may be induced by a property tax regime that imposes a higher rate of property tax because of the increased value of land containing natural resources.²⁵⁰ Conversely, higher profit tax rates may deter exploitation, particularly when the resource use involves substantial risk and capital investments.²⁵¹

On the flip side, these regulatory measures can be conceptualized as mitigating the disadvantages of private property. Nuisance, neighbor laws, and environmental regulations can help solve the externalities problem of private owners ignoring the costs of their activities if those costs occurs beyond their property boundary. Redistributive taxation can also address the inequality of granting windfalls to those private property owners who benefit when private property is created.²⁵²

Thus, although the discourse regarding the appropriate property rights arrangement is important, the mere designation/clarification of the identity of the rights holder and the content of those rights is in itself only half of the picture. It is imperative to appreciate the manner in which the background ^{*127} regulatory powers can step in to materially alter the practical consequences of the property rights arrangement. Whether such alterations are normatively desirable depends on the quality of governance that exercises those regulatory powers. Governance remains the critical issue that cannot be ignored, particularly in developing countries that lack robust, transparent and accountable governing institutions. In this context, a close examination of the technical specifics regarding how decisions on natural resource usage are actually managed is as important as the broader and often more exciting question concerning property rights.

CONCLUSION

The controversy over the “nationalization” of climate resources in China provides an illustrative case study to highlight the actual issues at stake in natural resource management. State ownership, notwithstanding its legality under Chinese law, is merely a red herring. The state is amply endowed with general regulatory and taxing powers to address the negative externalities and redistribution concerns arising from natural resource usage even when the natural resources are privately owned. The distrust over China’s government underpinning the objections to “nationalization” is equally important with respect to such exercises of the state’s regulatory and taxing powers. The vehement opposition to nationalization in China is objectionable not only because of the tragedy of the commons that would be introduced under the free public access that is advocated but also because this opposition obscures the more important and practically relevant issues regarding the regulatory permit regime embodied in the Regulation.

These insights are particularly relevant to the management of emerging natural resources. Technological advancements and changes in socio-economic circumstances have increasingly generated debates about the appropriate property rights arrangement to manage resources that might seem inexhaustible and abundant. Yet the typical default absence of state intervention in the management of such resources aggravates the inertia against transition to more suitable allocation mechanism. In this regard, it is worth bearing in mind that the solution to poor governance in the modern world is typically not the absence of governance but an improvement in governance. In addition, this newfound attention on the property right issue of these emerging natural resources should not lose sight of how the current array of available regulatory powers can fundamentally alter the efficiency and redistributive outcomes of the initial allocation and definition of property rights.

Footnotes

^{a1} Jianlin Chen is an Assistant Law Professor (University of Hong Kong), JSD Candidate (University of Chicago), LLM (University of Chicago), LLB (University of Singapore). Admitted to the bar in New York and Singapore.

^{a2} Jiongze Cui is a Trainee Solicitor (Leung & Lau), PCLL (City University of Hong Kong), JD (City University of Hong Kong), LLB (Fudan University). Admitted to the bar in China.

¹ For a discussion of the current U.S. laws on and the normative desirability of severable wind estate, see Alan J. Alexander, *The Texas Wind Estate: Wind as a Natural Resource and a Severable Property Interest*, 44 U. MICH. J.L. REFORM 429, 451-456 (2011); K.K. DuVivier, *Animal, Vegetable, Mineral - Wind? The Severed Wind Power Rights Conundrum*, 49 WASHBURN L.J. 69 (2009).

² For a discussion of the policy considerations and proposed statutes relating to this “right” to sunlight and wind, see Troy A. Rule, *Property Rights and Modern Energy*, 20 GEO. MASON L. REV. 803, 823-826 (2013); David E. Missirian, *Let the Sun Shine In: An Examination of Solar Easements and a Proposed Statute*, 41 REAL EST. L.J. 303 (2012); Sara C. Bronin, *Solar Rights*, 89 B.U. L. REV. 1217, 1222-1225 & 1237-1250 (2009); FRED BOSSELMAN, JIM ROSSI & JACQUELINE LANG WEAVER, ENERGY, ECONOMICS AND THE ENVIRONMENT, 36-40 (FOUNDATION PRESS, 36-40 (2000)).

- ³ See *infra* V.A. See also Tyler Marandola, *Promoting Wind Energy Development Through Antinuisance Legislation*, 84 TEMP. L. REV. 955 (2012).
- ⁴ For a discussion of the interplay between renewable energy and the public trust doctrine, including litigations on wind and solar energy generation that involve public trust doctrines, see Alexandra B. Klass, *Renewable Energy and the Public Trust Doctrine*, 45 U.C. DAVIS L. REV. 1021 (2012); Richard J. Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine*, 71 IOWA L. REV. 631, 633-656 (1986).
- ⁵ [Heilongjiang Province Regulation on Climate Resources Survey and Protection] (promulgated by the Standing Comm. Heilongjiang People's Cong., June 14, 2012, effective Aug. 1, 2012) art.2, (2012) (China(P)).
- ⁶ Ding Wang, [Classifying Wind and Sunlight as State-Owned], HONG KONG ECONOMIC JOURNAL, Oct. 10, 2012, at A18; Shen Bin, [Must Prevent Climate Resources from Capture by Regulatory Department], [EASTERN DAILY], Aug. 21, 2012, at A22; Liu Wujun, [“Wind and Sunlight Law” Highlight Trend of Legalizing Department's Interest], [The PEOPLE'S COURT DAILY], June 30, 2012, at 2.
- ⁷ Feng Changliang & Zhang Qian, [No Legal Basis for “Wind Energy and Solar Energy Belongs to State”], [DEMOCRACY & RULE OF LAW TIMES], June 25, 2012, at A08; Li Kejie, [“Nationalizing Wind Energy” Expose Arrogance of Power], [PROCURATORIAL DAILY], June 20, 2012, at 6.
- ⁸ Shen, *supra* note 6; Liu, *supra* note 6; Feng & Zhang, *supra* note 7.
- ⁹ Li, *supra* note 7.
- ¹⁰ Dai Jie, [Legislative Emphasis and Regulation Integration of Climate Resources], 26 [JOURNAL OF SHANDONG INSTITUTE OF BUSINESS AND TECHNOLOGY], 112 (2012).
- ¹¹ Zhuang Jinghua, [State Ownership of Climate Resources is not Pioneered by China], 2012(6) JOURNAL OF CHINA UNIVERSITY OF POLITICAL SCIENCE AND LAW 33 (2012); Zhou Gangzhi, Ziran Ziyuan “Guoyou” [Proper Understanding is Required for “Nationalization” of Climate Resources], 2012(8) [LAND & RESOURCES HERALD] 18 (2012).
- ¹² Wang Jining & Huang Lan, [EVOLUTION AND CHANGES IN TRANSACTIONS OF CHINA'S STATE-OWNED PROPERTY RIGHTS] 1-2, ECONOMY & MANAGEMENT PUBLISHING 2009); YANG WEN, [LEGAL AND ECONOMIC ANALYSIS OF STATE-OWNED ASSETS] 154-155 (c Chanquan5).
- ¹³ Charles A. Reich, *The New Property*, 73 YALE L.J. 733 (1964). See *Infra* VI.A.
- ¹⁴ Ge Quansheng, [CHINA'S CLIMATE RESOURCES AND SUSTAINABLE DEVELOPMENT], SCIENCE PUBLISHING, 269-271 (2007).
- ¹⁵ [Notice on Strengthening Weather-Related Tasks] (promulgated by St. Council, July 31, 1959, effective July 31, 1959),(China)

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

- ¹⁶ See, e.g., [Temporary Regulations on Weather Services] (promulgated by Weather Bureau, Nov. 1, 1987, effective Nov. 1, 1987) (China); [Notice on Strengthening Weather Forecast Report for Ocean Fishing] (promulgated by St. Council, Jan. 16, 1975, effective Jan. 16, 1975) (China).
- ¹⁷ [Notice on Protecting the Metrological Observation Environment] (promulgated by St. Council, Apr. 15, 1980, effective Apr. 15, 1980) (China).
- ¹⁸ [Notice on Further Strengthening Weather-Related Tasks] (promulgated by St. Council, May 2, 1992, effective May 2, 1992) (P.R.C.). Climate as resource was mentioned in the subsequent 2006 opinion by the State Council: [Opinion on Accelerating the Development of Weather Enterprise] (promulgated by St. Council, Jan. 12, 2006, effective Jan. 12, 2006) (China).
- ¹⁹ [Regulations on Meteorological Services] (promulgated by St. Council, Aug. 18, 1994, effective Aug. 18, 1994, ineffective Jan. 1, 2000) (China).
- ²⁰ *Id.*, Chapter 5.
- ²¹ *Id.*, art. 38(5).
- ²² *Id.*, art. 23.
- ²³ *Id.*, art. 24-5.
- ²⁴ *Id.*
- ²⁵ ALBERT CHEN, *AN INTRODUCTION TO THE LEGAL SYSTEM OF THE PEOPLE'S REPUBLIC OF CHINA*, 144-150 (LEXISNEXIS 4TH ED. 2011).
- ²⁶ [Meteorological Law] (promulgated by the Standing Comm. Nat'l People's Cong., Oct. 31, 1999, effective Jan. 1, 2000) (China).
- ²⁷ The meteorological department is now tasked with supervision of other regulatory agencies involved in climate management: art. 5, *id.* Previously, the meteorological departments only exercise "professional control": art. 3, Regulations on Meteorological Services, *supra* note 19. The affected regulatory agencies (Ministry of Water Resources and Ocean Bureau) did voiced objections about being "supervised" by the meteorological departments, though the objections were ultimately rejected: [Explanation of Meteorological Law] 12 & 183-184, LAW PRESS, 2001.
- ²⁸ Meteorological Law, art. 32-4, *supra* note 26.
- ²⁹ *Id.*, art. 34.
- ³⁰ *Id.*, art. 41(5).

³¹ Bian et al., *supra* note 27, at 174-175.

³² *See id.*

³³ One example of such new forms of climate resources exploitation is artificial weather modification. The Meteorological Law introduced new provisions to govern artificial weather modifications: art. 30, Meteorological Law, *supra* note 26. The most significant legal effect is the prohibition of artificial weather modification by unauthorized public or private entities: art. 39, Meteorological Law, *supra* note 26. This addressed the concern about inefficiency and unintended consequences arising from uncoordinated weather modification: Bian et al., *supra* note 27, at 174. The legislative explanation also envisaged artificial weather modification to both reduce weather disasters and the utilization of climate resources: Bian et al., *supra* note 27, at 92. Indeed, the definitions of climate resources in subsequent provincial regulations on meteorological matters include “cloud water”: art. 2, [Shanxi Province Climate Resources Development, Utilization and Protection Regulations] (promulgated by Shanxi Province People’s Cong., Sep. 28, 2012, effective Dec. 1, 2012) (China); art. 3, Xizang Zizhiqu Qihou Ziyuan Tiaoli [Tibet Autonomous Region Climate Resources Regulations] (promulgated by Tibet Autonomous Region People’s Cong., Sep. 27, 2012, effective Jan. 1, 2013) (China); art. 2, [Guangxi Zhuang Autonomous Region Climate Resources Development, Utilization and Protection Regulations] (promulgated by Standing Comm. Guangxi Zhuang Autonomous Region People’s Cong., Feb. 14, 2011, effective May. 1, 2011) (China); art. 3, [Guizhou Province Climate Resources Development, Utilization and Protection Regulations] (promulgated by Guizhou Province People’s Cong., Nov. 29, 2012, effective Jan. 1, 2013) (China).

³⁴ Yan Kai, [Review of “Wind and Sunlight” Nationalization], The ECONOMIC OBSERVER, July 2, 2012, at 27. For a general overview on climate resources utilization in China, *see* CHINA’S CLIMATE RESOURCES AND SUSTAINABLE DEVELOPMENT, *supra* note 14, at 312-314.

³⁵ Yan, *supra* note 34.

³⁶ *See* Section II.A.

³⁷ Art. 7, Heilong Jiang Province Regulation on Climate Resources Survey and Protection, *supra* note 5. The actual provision only expressly mentions “surveying” as the activity that is subjected to regulatory control. Nonetheless, all the public discourse on the matter, including by the government officials, assumes that “usage” of climate resources is covered by the provision. This is likely due to the fact that the most common forms of climate resources usage - harnessing wind and sunlight for electricity generation - will inevitably provide data about the intensity and duration of the wind and sunlight and thus necessarily involve “surveying.”

³⁸ *Id.*, art. 2.

³⁹ *Id.*, art. 16.

⁴⁰ Art. 1, *id.*

⁴¹ Yan, *supra* note 34; Li Yuanqiang, [Avoid Increasing Burden on Enterprise Through Administrative Permit], [CHINA ENERGY NEWS], June 25, 2012, at 1.

⁴² Yan, *supra* note 34.

- ⁴³ See Section II.A.
- ⁴⁴ [Constitution], Art. 3 (2004) (China); CHEN, *supra* note 25, at 66-67.
- ⁴⁵ Shanxi Province Climate Resources Development, Utilization and Protection Regulations, *supra* note 33.
- ⁴⁶ Guizhou Province Climate Resources Development, Utilization and Protection Regulations, *supra* note 33.
- ⁴⁷ Tibet Autonomous Region Climate Resources Regulations, *supra* note 33.
- ⁴⁸ Guangxi Zhuang Autonomous Region Climate Resources Development, Utilization and Protection Regulations, *supra* note 33.
- ⁴⁹ Shanxi Province Climate Resources Development, Utilization and Protection Regulations, art. 20, *supra* note 33; Guizhou Province Climate Resources Development, Utilization and Protection Regulations, art. 20, *supra* note 33; Tibet Autonomous Region Climate Resources Regulations, art. 32, *supra* note 33; Guangxi Zhuang Autonomous Region Climate Resources Development, Utilization and Protection Regulations, art. 21, *supra* note 33.
- ⁵⁰ Meteorological Law, art. 34, *supra* note 26.
- ⁵¹ See Shanxi Province Climate Resources Development, Utilization and Protection Regulations, art. 24, *supra* note 33; Guizhou Province Climate Resources Development, Utilization and Protection Regulations, art. 24, *supra* note 33; Guangxi Zhuang Autonomous Region Climate Resources Development, Utilization and Protection Regulations, art. 24, *supra* note 33.
- ⁵² Tibet Autonomous Region Climate Resources Regulations, art. 37 & 39, *supra* note 33.
- ⁵³ Ding, *supra* note 6; Shen, *supra* note 6; Liu, *supra* note 6.
- ⁵⁴ Feng & Zhang, *supra* note 7; Li, *supra* note 7.
- ⁵⁵ Heilong Jiang Province Regulation on Climate Resources Survey and Protection, art. 1, *supra* note 5.
- ⁵⁶ Shen, *supra* note 6; Liu, *supra* note 6.
- ⁵⁷ Feng & Zhang, *supra* note 7.
- ⁵⁸ Yan, *supra* note 34; Liu, *supra* note 6.
- ⁵⁹ Lu Yu, [Climate Bureau Now Businessman of “Wind and Light”], [CHINA POWER NEWS], Aug. 29, 2012.

⁶⁰ Liu, *supra* note 6.

⁶¹ Zhao Minwang, [What is the Intention Behind Law Nationalizing Wind and Solar Energy], [CHINA BUSINESS TIMES], June 20, 2012 at 1.

⁶² Climate Bureau Now Businessman of “Wind and Light”, *supra* note 59.

⁶³ Dai, *supra* note 10.

⁶⁴ Zhou, *supra* note 11.

⁶⁵ Shen, *supra* note 6; Liu, *supra* note 6; Feng & Zhang, *supra* note 7.

⁶⁶ Zhang Lu, [On the Nationalization of Climate Resources], [LEGAL STUDIES] no. 7, 2012 at 12, 15.).

⁶⁷ Liu, *supra* note 6. For a similar argument, *see also* Li, *supra* note 7.

⁶⁸ Li Lin, [“Nationalization of Wind and Sunlight”? Don’t Let Jib Obscure Real Issue], WORKER DAILY, June 21, 2012, at 3.

⁶⁹ Li, *supra* note 41.

⁷⁰ Zhuang, *supra* note 11.

⁷¹ Liang Huixing & Chen Huabin, [PROPERTY RIGHT LAW] 36-37 (2008).

⁷² [NEW INTERPRETATION OF PROPERTY RIGHTS LAW] 4-5 (2010).

⁷³ Wang Liming, [PROPERTY LAW] 13-15 (2008).

⁷⁴ Zhang Yihua & Luo Xiaojing, [PROPERTY RIGHTS JURISPRUDENCE] 17 (2010).

⁷⁵ *Id.* at 31-32.

⁷⁶ *Id.* at 31.

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

- ⁷⁷ See, e.g., Liang & Chen, *supra* note 71, at 39-41 (equating the two in their discussion on the relationship between the constitutional protection of property (“caichan”) and the Property Law provisions against property infringement (“wuquan”)).
- ⁷⁸ Zhang, *supra* note 66, at 15; Liu, *supra* note 6; Li, *supra* note 7.
- ⁷⁹ XIANFA, *supra* note 44, art 12 & 13.
- ⁸⁰ Zhang, *supra* note 66, at 14-16; Li, *supra* note 7.
- ⁸¹ [Property Law] (promulgated by Nat’l People’s Cong., Mar. 16, 2007, effective Oct. 1, 2007) 3 STANDING COMM.NAT’L PEOPLE’S CONG. GAZ. 291
- ⁸² See notes 1-4 and accompanying materials.
- ⁸³ For a discussion on the relationship between Roman law and modern Civilian jurisdictions, see generally Reinhard Zimmermann, ROMAN LAW, CONTEMPORARY LAW, EUROPEAN LAW: THE CIVILIAN TRADITION TODAY (2001).
- ⁸⁴ Carol M. Rose, *Romans, Roads, and Romantic Creators: Traditions of Public Property in the Information Age*, 66 LAW & CONTEMP. PROBS. 89, 92-105 (2003); Zhang Jianwen, [Classification Criteria of Public Property], [Journal of China Youth College for Political Sciences], no. 2, 2012 at 114, 115; Xiao Zesheng, [Distinction Between Society, Public Property and State-owned Private Property], [Zhejiang Academic Journal], no. 6, 2007, at 32, 35.
- ⁸⁵ Rose, *supra* note 84, at 93-94; Andrew Borkowski, TEXTBOOK ON ROMAN LAW 143 (1st ed. 1994).
- ⁸⁶ Rose, *supra* note 84, at 96-97; Borkowski, *supra* note 85, at 143; Fritz Schulz, CLASSICAL ROMAN LAW 340-341 (1951).
- ⁸⁷ Zhang, *supra* note 84, at 115-116; Xiao, *supra* note 84, at 35-36. For a critical comparative discussion about the distinction in the conceptualization of public property under common law and civil law, see Giacinto della Cananea, *From (Public) Ownership to Use: A Comparative Analysis*, in THE PUBLIC-PRIVATE LAW DIVIDE: POTENTIAL FOR TRANSFORMATION? 297 (Matthias Ruffert ed., 2009).
- ⁸⁸ MURRAY RAFF, PRIVATE PROPERTY AND ENVIRONMENTAL RESPONSIBILITY: A COMPARATIVE STUDY OF GERMAN REAL PROPERTY LAW 161 (2003) (discussing the German Passport Case, [AG Heilbronn] [Local Court] July 17, 1974, NEUE JURISTISCHE WOCHENSCHRIFT [NJW] 2182, 1974, that voided the act of a German citizen transferring his passport as security for the unpaid balance of the purchase price of a car).
- ⁸⁹ *Id.*, at 161-162.
- ⁹⁰ *Id.*, at 161.
- ⁹¹ *Id.* (discussing the German Gravel Extraction Case Bundesverfassungsgericht [BVERFG] [Federal Constitutional Court] July 15, 1981, 58 ENTSCHEIDUNGEN DES BUNDESVERFASSUNGSGERICHTS [BVERFGE] 300 (344), 1982).

- ⁹² *Id.* (for example, a state-owned office building leased to private tenant to generate income).
- ⁹³ Laurent Aynès, *Property Law*, in INTRODUCTION TO FRENCH LAW 147, 157 (George A. Bermann & Etienne Picard eds., 2008); PRINCIPLES OF FRENCH LAW 282 (John Bell et. al. eds., 1st ed. 1998); Zhang, *supra* note 84, at 116.
- ⁹⁴ Code Civil [C.Civ.] art. 538 (Fr.).
- ⁹⁵ Aynès, *supra* note 93, at 157.
- ⁹⁶ Code Civil [C.Civ.] art. 714 (Fr.).
- ⁹⁷ Aynès, *supra* note 93, at 157. For a critical critique about this distinction and a discussion of the limited reform in France, see Patrice Chrétien, *The Property of Public Bodies*, in THE PUBLIC-PRIVATE LAW DIVIDE: POTENTIAL FOR TRANSFORMATION? 311, 316-325 (Matthias Ruffert ed., 2009).
- ⁹⁸ Bell et al., *supra* note 93, at 282.
- ⁹⁹ See Section II.D.
- ¹⁰⁰ Li, *supra* note 41; Zhuang, *supra* note 11.
- ¹⁰¹ See Zhang, *supra* note 84.
- ¹⁰² *Id.* at 118.
- ¹⁰³ Xiao, *supra* note 84.
- ¹⁰⁴ Zhang, *supra* note 84, at 118; Xiao, *supra* note 84, at 37-38.
- ¹⁰⁵ Bürgerliches Gesetzbuch [BGB] [Civil Code], Jan. 2, 2002, Bundesgesetzblatt [BGBI.] BGBI. I 2002, 53, 2909, §905.25, 2013).
- ¹⁰⁶ Code Civil [C.Civ.] art. 552 (Fr.). The right is subject to statutory limitations and regulations on mines.
- ¹⁰⁷ Aynès, *supra* note 93, at 154.
- ¹⁰⁸ Rule, *supra* note 2, at 806; DuVivier, *supra* note 1, at 75-77; John G. Sprankling, *Owning the Center of the Earth*, 55 UCLA L. REV. 979, 982-985 (2007-2008).

- ¹⁰⁹ Rule, *supra* note 2, at 806; DuVivier, *supra* note 1, at 76.
- ¹¹⁰ XIAN FA, *supra* note 44, art. 10.
- ¹¹¹ Usufructuary right is included in the right to use land for construction purpose, but is absent for the right to use lands for building houses: Property Law, *supra* note 81, art. 135, 152. The right to use land for construction purposes and right to use lands for building houses are the two most important land use rights commercially, although the right to the contracted management of land is important in rural areas, *see* PROPERTY RIGHTS JURISPRUDENCE, *supra* note 74, at 206-255.
- ¹¹² The right to use natural resources is subjected to fee-based allocation unless otherwise stated: Property Law, *supra* note 81, art. 118.
- ¹¹³ CHEN, *supra* note 25, at 27-47.
- ¹¹⁴ *See, e.g.,* Wuquan Fa, *supra* note 81, art. 3 (“In the primary stage of socialism, the state upholds the basic economic system under which the public ownership shall play a dominant role and diversified forms of ownership may develop side by side.”). *See* XIANFA, *supra* note 44, Preamble. *See also* [THE HISTORY, THEORY AND IMPLEMENTATION OF SOCIALIST ECONOMY] 207-357 (Zhang Guanyi ed., 2007) (discussing the ideological evolution of China’s socio-economic model since 1949).
- ¹¹⁵ Mo Zhang, *From Public to Private: the Newly Enacted Chinese Property Law and the Protection of Property Rights in China*, 5 BERKELEY BUS. L.J. 317, 324-325 (2008).
- ¹¹⁶ Public ownership is essential in a socialist economy, though progressive socialist thinkers argue that it encompasses more than state-ownership: Ge Yang, [EVOLUTION AND EXPLANATION OF PUBLIC-OWNED PROPERTY SYSTEM DURING ECONOMIC TRANSITION] 40-61 (2009); Jing Weiming, *et al.*, [SOCIALIST MARKETS IN ECONOMIC TRANSITION: ANALYSIS AND PRACTICAL EXAMINATION FROM FOREIGN MARXISTS] 38-42 (2009). After wiping out private economic entities during the period of 1960s and 1970s, private entities were gradually allowed after the 1978 market reform. Nonetheless, official policies until 2000 envisaged private economic activities as merely supplementary of state-owned economic activities: [30 YEARS OF ECONOMIC REFORM IN CHINA: REFLECTING AND LOOKING AHEAD] 36-42 (Wei Liqun ed., 2008); [RESEARCH ON THE 30 YEARS OF CHINA’S ECONOMIC SYSTEM REFORM] 59-64 (Liu Shucheng & Wu Taichang eds., 2008).
- ¹¹⁷ XIANFA, *supra* note 44, art. 6.
- ¹¹⁸ 30 YEARS OF ECONOMIC REFORM IN CHINA: REFLECTING AND LOOKING AHEAD, *supra* note 116, at 36-41; GE YANG, *supra* note 116, at 40-61 (discussing the evolution of China’s property ownership regime).
- ¹¹⁹ Property Law, *supra* note 81, art. 3; 30 YEARS OF ECONOMIC REFORM IN CHINA: REFLECTING AND LOOKING AHEAD, *supra* note 116, at 42.
- ¹²⁰ “Socialist public property is inviolable. The state protects socialist public property. Appropriation or damaging of state or collective property by any organization or individual by whatever means is prohibited.”: XIANFA, *supra* note 44, art. 12. This

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

protection has been enshrined since the second version of constitution: XIANFA art. 8 (1975) (China.).

- ¹²¹ “The lawful private property of citizens may not be encroached upon. The state protects by law the right of citizens to own private property and the right to inherit private property. The state may, for the public interest, expropriate or take over private property of citizens for public use, and pay compensation in accordance with the law.”: XIANFA, *supra* note 44, art. 13. Earlier mention of private property has been at best lukewarm: *e.g.*, XIANFA art. 13 (1982) (China) (“The state protects the right of citizens to own lawfully earned income, savings, houses and other lawful property. The state protects according to law the right of citizens to inherit private property.”).
- ¹²² XIANFA, *supra* note 44, art. 53.
- ¹²³ [General Principles of the Civil Law] (promulgated by Nat’l People’s Cong., Apr. 12, 1986, effective Jan. 1, 1987) 2 SUP. PEOPLE’S CT. GAZ., Apr. 1, 1986, at 15.
- ¹²⁴ Collective property is property that is owned by collectives, a political-legal institution akin to a village or town municipal government and is peculiar to Chinese socialist tradition: PROPERTY RIGHTS JURISPRUDENCE, *supra* note 74, at 105-107; Liang & Chen, *supra* note 71, at 129-130.
- ¹²⁵ XIAN FA, *supra* note 44.
- ¹²⁶ “... and other natural resources ...”: *id.*, art. 9.
- ¹²⁷ “... and other special people’s courts”: *id.*, art. 124
- ¹²⁸ WUQUAN FA, *supra* note 81, art. 45-69.
- ¹²⁹ This third form is not found in the initial Criminal Law, and is only added in the 1997 amendments: [Criminal Law] (promulgated by Nat’l People’s Cong., July 6, 1979, effective Jan. 1, 1980, amended Oct. 1, 1997) 3 SUP. PEOPLE’S CT. GAZ., Sept. 20, 1997, at 75 (China), art. 81. An additional nuance from the amendment history of the Criminal Law is that “state property” was actually expressed as “property owned by the whole people” in the initial version: *id.* This arguably confirms the interchange between state ownership and public ownership under Chinese jurisprudence. For a detailed historical analysis on the evolution of the definition of property in Criminal Law, see [Articles 91 and 92 “Property” Provision of the Criminal Law Should be Abolished], [LEGAL STUDIES], no. 3, 2012 111.
- ¹³⁰ [Criminal Law], art. 397 & 403 (promulgated by Nat’l People’s Cong., Mar. 14, 1997, effective Oct. 1, 1997, amended Feb. 25, 2011) (China).
- ¹³¹ Dong Lixin, [The Analysis on the Constitutionality of Nationalizing Wind and Solar Energy], 34(7) [JOURNAL OF YICHUN COLLEGE] 27, 28 (2012); Liu, *supra* note 6; Shen, *supra* note 6; [The Absurdity and Harm of Climate Resources Nationalization], [CHINA MANAGEMENT TIMES], July 2, 2012, at B13.
- ¹³² CIVIL LAW DEPARTMENT OF NPC LEGAL COMMITTEE, [ARTICLES EXPLANATION, LEGISLATIVE REASONS AND OTHER RELATED REGULATIONS ON PROPERTY LAW] 74-75 (2007).

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

- ¹³³ Hope Babcock, *Can Vermont Put the Nuclear Genie Back in the Bottle?: A Test of Congressional Preemptive Power*, 39 *ECOLOGY L.Q.* 691, 739-741 (2012); Michael Faure & Jing Liu, *New Models for the Compensation of Natural Resources Damage*, 4 *KY. J. EQUINE, AGRIC. & NAT. RESOURCES L.* 261, 312-313 (2012); Amy R. Poteete & David Welch, *Institutional Development in the Face of Complexity: Developing Rules for Managing Forest Resources*, 32(3) *HUMAN ECOLOGY* 279, 285-286 (2004).
- ¹³⁴ For a leading discussion on the collective action problem, see generally MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS* (Harvard University Press 1971). For application in other fields, see Lindsay F. Wiley, *Rethinking the New Public Health*, 69 *WASH. & LEE L. REV.* 207, 269-270 (2012) (public health); Amy R. Poteete & David Welch, *supra* note 132, at 281 (2004) (forest resources).
- ¹³⁵ Blake Hudson & Jonathan Rosenbloom, *Uncommon Approaches to Commons Problems: Nested Governance Commons and Climate Change*, 64 *HASTINGS L.J.* 1273, 1283-1284 (2013); Sheila R. Foster, *Collective Action and the Urban Commons*, 87 *NOTRE DAME L. REV.* 57, 109-111 (2011) (discussing innovative governance arrangements in the context of urban commons). *C.f.*, Richard L. Hasen, *Lobbying, Rent-Seeking, and the Constitution*, 64 *STAN. L. REV.* 191, 226-228 (2012) (highlighting the danger of rent-seeking by well-organized narrow interest groups which take advantages of the collective actions problem of the general public).
- ¹³⁶ Garrett Hardin, *The Tragedy of the Commons*, 162 *SCIENCE* 1243 (1968). For more recent exposition and application, see MOORE MCDOWELL ET AL., *PRINCIPLES OF ECONOMICS* 337-343 (McGraw-Hill Education 2nd European ed. 2009); ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 147-150 (Pearson 4th ed. 2004).
- ¹³⁷ Hardin, *supra* note 135, at 1244.
- ¹³⁸ Gerd Winter, *Rationing the Use of Common Resources: Problems of Design and Constitutionality*, in *THE REGULATORY STATE: CONSTITUTIONAL IMPLICATIONS* 129, 137 (Dawn Oliver, Tony Prosser & Richard Rawlings eds., Oxford University Press 2010); Hope M. Babcock, *Grotius, Ocean Fish Ranching, and the Public Trust Doctrine: Ride 'Em Charlie Tuna*, 26 *STAN. ENVTL. L.J.* 3, 7-11 (2007); Fikret Berkes, *Native Subsistence Fisheries: A Synthesis of Harvest Studies in Canada*, 43(1) *ARCTIC* 35, 40-41 (1990); O. Hertz & F. O. Kapel, *Commercial and Subsistence Hunting of Marine Mammals*, 15(3) *AMBIO* 144, 146 (1986).
- ¹³⁹ Andrew P. Morriss, Roger E. Meiners & Andrew Dorchak, *Homesteading Rock: A Defense of Free Access Under the General Mining Law of 1872*, 34 *ENVTL. L.* 745, 781 (2004) (explaining that insecure property rights create incentives for over-use through examples of pasture grazing and mineral extraction).
- ¹⁴⁰ See e.g., Zhang, *supra* note 66, at 15-16; Shen, *supra* note 6; Li, *supra* note 7.
- ¹⁴¹ Christian Iaione, *The Tragedy of Urban Roads: Saving Cities from Choking, Calling on Citizens to Combat Climate Change*, 37 *FORDHAM URB. L.J.* 889, 891 (2010); Jonathan Remy Nash, *Economic Efficiency versus Public Choice: the Case of Property Rights in Road Traffic Management*, 49 *B.C. L. REV.* 673, 683-687 (2008).
- ¹⁴² Rose, *supra* note 84, at 96-97.
- ¹⁴³ See e.g., Dan Janison, *Spin Cycle: A New Spin on Traffic Plan?*, *NEWSDAY* (New York), Dec. 7, 2007, at A16; Wes Smith, *Minneapolis Drivers Will be Able to Buy Way into Fast Lane*, *CHICAGO TRIBUNE*, Oct. 12, 1997, at C4; John Stackhouse, *Indian Economy in Desperate Need of a New Foundation Infrastructure*, *THE GLOBE AND MAIL* (Canada), Feb. 28, 1997, at

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

B10. See also Carlos Sun, *The Toll Road Not Taken: Could the One Option Less Used Make a Difference*, 21 KAN. J.L. & PUB. POL'Y. 280, 284 (2012) (noting the common argument "that travelling is a right and that roads are public goods, and as such they should be 'free.'" And observing that the argument "confuse[s] the right to free transportation with the constitutional rights that guarantee citizens to move freely between states, to visit another state, or to enjoy state benefits after relocation.").

¹⁴⁴ Michael H. Schuitema, *Road Pricing as a Solution to the Harms of Traffic Congestion*, 34 TRANSP. L.J. 81, 85 (2007); ARTHUR O'SULLIVAN, URBAN ECONOMICS 258 (McGraw-Hill 5th ed. 2003); Kenneth A. Small, *Urban Traffic Congestion: A New Approach to the Gordian Knot*, in READINGS IN URBAN ECONOMICS: ISSUES AND PUBLIC POLICY 409, 409-410 (Robert W. Wassmer ed., Wiley-Blackwell 2000).

¹⁴⁵ Iaione, *supra* note 140, at 894-896; Nash, *supra* note 140, at 684-694; Schuitema, *supra* note 143, at 84-92. See Govinda R. Timilsina & Hari B. Dulal, *Urban Road Transportation Externalities: Costs and Choice of Policy Instruments*, 26 THE WORLD BANK RESEARCH OBSERVER 162, 164-166 (2011) (discussing the various external costs of urban transportation).

¹⁴⁶ Klass, *supra* note 4, at 1023; CHINA'S CLIMATE RESOURCES AND SUSTAINABLE DEVELOPMENT, *supra* note 14, at 372 & 376.

¹⁴⁷ Matthew K. McCasland, *Windy City Heat: How Wind Energy Can Help Power Illinois Into the Future*, 2012 U. ILL. J.L. TECH. & POL'Y. 167, 182-185 (2012) (noting nuisance claims brought in relation to wind turbines); Troy A. Rule, *Renewable Energy and the Neighbors*, 2010 UTAH L. REV. 1223, 1238-1239 (2010).

¹⁴⁸ Alexander, *supra* note 1, at 438; Yael Lifshitz-Goldberg, *Gone with the Wind? The Potential Tragedy of the Common Wind*, 28 UCLA J. ENVTL. L. & POL'Y 435, 455-460 (2010).

¹⁴⁹ John Copeland Nagle, *Green Harms of Green Projects*, 27 NOTRE DAME J.L. ETHICS & PUB. POL'Y 59, 66-69 (2013).

¹⁵⁰ *Id.*, at 70 (2013).

¹⁵¹ *Id.*, at 98-103 (2013); Klass, *supra* note 4, at 1063-1065.

¹⁵² Winter, *supra* note 137, at 137; Babcock, *supra* note 137, at 7-12; Berkes, *supra* note 137, at 40-41; Hertz & Kapel, *supra* note 137, at 146.

¹⁵³ Winter, *supra* note 137, at 137; Jeremy Baskin, *The Impossible Necessity of Climate Justice?*, 10 MELB. J. INT'L L. 424, 430 (2009) (highlighting that an disproportionate amount of carbon emissions in India is attributed to a small number of wealthy middle-class families).

¹⁵⁴ Winter, *supra* note 137, at 137.

¹⁵⁵ Yan, *supra* note 34; Li, *supra* note 41.

¹⁵⁶ Yan, *supra* note 34; Li, *supra* note 41.

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

- ¹⁵⁷ Morriss, Meiners & Dorchak, *supra* note 138, at 774.
- ¹⁵⁸ Patrick Wieland, *Going Beyond Panaceas: Escaping Mining Conflicts in Resource-Rich Countries Through Middle-Ground Policies*, 20 N.Y.U. ENVTL. L.J. 199, 252-253 (2013); Susan Rose-Ackerman & Sin  ad Hunt, *Transparency and Business Advantage: the Impact of International Anti-Corruption Policies on the United States National Interest*, 67 N.Y.U. ANN. SURV. AM. L. 433, 462 (2012). For a discussion of the corruption in China land management, see Jianlin Chen, *China's Ding Zi Hu, The United State's Kelo, and Singapore's En-bloc Process: A New Model for Economic Development Eminent Domain from a Givings Perspective*, 24 J. LAND USE & ENVTL. L. 107, 114-119 (2008).
- ¹⁵⁹ Rose-Ackerman & Hunt, *supra* note 157, at 459. (discussing with reference to mineral extraction industry).
- ¹⁶⁰ The raise of community awareness of environmental pollution in China has at times been successful to compel the government to relocate high-pollution industry, but usually and unfortunately to communities with limited capacity for mobilization: Sara Imperiale & Wang Pian Pian, *Waste Incineration, Community Participation, and Environmental Justice: A Comparative Study of China and the United States*, 14 VT. J. ENVTL. L. 435, 455-456 (2013); Srini Sitaraman, *Regulating the Belching Dragon: Rule of Law, Politics of Enforcement, and Pollution Prevention in Post-Mao Industrial China*, 18 COLO. J. INT'L ENVTL. L. & POL'Y 267, 304 (2007) (noting the increasing attention paid to environmental and health impacts of pollution in China).
- ¹⁶¹ Constitution (P.R.C.), art. 9, *supra* note 44.
- ¹⁶² See Section II.D.
- ¹⁶³ For a critical evaluation of the absence of democracy in the Chinese Communist state's claim for legitimacy, see Man Yee Karen Lee, *The Chinese People's Struggle for Democracy and China's Long Quest for Dignity*, 27 CONN. J. INT'L L. 207, 233-235 (2011-2012); Bradley Klein, *Democracy Optional: China and the Developing World's Challenge to the Washington Consensus*, 22 UCLA PAC. BASIN L.J. 89, 121-134 (2004). See also Larry Cat   Backer, *Party, People, Government and the State: On Constitutional Values and the Legitimacy of the Chinese State-Party Rule of Law System*, 30 B.U. INT'L L.J. 331, 344-345 (2012) (arguing that the lack of democracy in China does not preclude the legitimacy of its constitutional system that to the extent that there is rule of law, accountability, and limited government.).
- ¹⁶⁴ See e.g., Poteete & Welch, *supra* note 132 (discussing how management of different forest resources is affected by the various characteristics of identification risk, resilience, scarcity and abundance, variability and predictability, the viability of storage, and the availability of substitute).
- ¹⁶⁵ Wieland, *supra* note 157, at 253-255; Morriss, Meiners & Dorchak, *supra* note 138, at 764-789 (the use of the term "free access" is a misleading because the authors are in fact referring to a regime of secure private property rights in mineral resources on federal land allocated free-of-charge to private entities that have successful prospect for the minerals). See also Erika Weinthal & Pauline Jones Luong, *Combating the Resource Curse: An Alternative Solution to Managing Mineral Wealth*, 4(1) PERSPECTIVES ON POLITICS 35, 38-46 (2006) (arguing that domestic private property rights is categorically superior to the various proposed reforms on public management of state-owned natural resources).
- ¹⁶⁶ Wieland, *supra* note 157, at 251-252.
- ¹⁶⁷ In a worldwide survey of 176 countries by the international non-profit organization Transparency International, China came in 80th with a score of 39 (score range from 100 being highly clean and 0 being highly corrupt), above Thailand (37), India (36), Greece (36) and Mexico (34), among others: TRANSPARENCY INTERNATIONAL, CORRUPTION PERCEPTION INDEX 2012,

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

available at <http://cpi.transparency.org/cpi2012> (last visited, Sep. 25, 2013)

- ¹⁶⁸ Richard Balme, *China's Climate Change Policy: Governing at the Core of Globalization*, CARBON & CLIMATE L. REV. 44, 51-53 (2011).
- ¹⁶⁹ Li-Wen Lin & Curtis J. Milhaupt, *We are the (National) Champions: Understanding the Mechanisms of State Capitalism in China*, 65 STAN. L. REV. 697, 734-746 (2013).
- ¹⁷⁰ Joshua Muldavin, *The Paradoxes of Environmental Policy and Resource Management in Reform-Era China*, 76(3) ECONOMIC GEOGRAPHY 244, 262-265 (2000).
- ¹⁷¹ *Id.*, at 265.
- ¹⁷² Shitong Qiao, *Governing the Post-Socialist Transitional Commons: A Case from Rural China*, 24(1) COLO. J. INT'L ENVTL. L. & POL'Y 117, 132-138 (2013).
- ¹⁷³ Severin Borenstein, *The Private and Public Economies of Renewable Electricity Generation*, 26(1) THE JOURNAL OF ECONOMIC PERSPECTIVES 67, 81 (2012).
- ¹⁷⁴ See Section III.B.2.
- ¹⁷⁵ JOHN MURPHY, THE LAW OF NUISANCE 5-7 (Oxford University Press 2010); Bent Ole Gram Mortensen et al., *Environmental Protection Law*, in LEGAL SYSTEMS AND WIND ENERGY: A COMPARATIVE PERSPECTIVE 207, 223 (Helle Tegner Anker, Birgitte Egelund Olsen & Anita Rønne eds., Djøf Publishing 2008).
- ¹⁷⁶ MURPHY, *supra* note 174, at 137-147; Mortensen et al., *supra* note 174, at 224.
- ¹⁷⁷ Mortensen et al., *supra* note 174, at 223 ("In part because of the required balance of competing interests, the doctrine of nuisance has suffered from 'confusions, contingencies and lack of principle.'").
- ¹⁷⁸ E.g., *Sowers v. Forest Hills Subdivision*, 294 P.3d 427 (Nev. 2013) (permanent injunction granted against installation of a wind turbine); *Rankin v. FPL Energy, LLC*, 266 S. W.3d 506 (Tex. App. 2008) (presence of wind farms not considered private or public nuisance). See generally Mortensen et al., *supra* note 174, at 224-226 & 232-234 (discussing nuisance litigations in U.S. and New Zealand).
- ¹⁷⁹ Helle Tegner Anker, Birgitte Egelund Olsen & Anita Rønne, *Wind Energy and the Law: A Comparative Analysis*, 27(2) J. ENERGY & NAT. RESOURCES L. 145, 159 (2009).
- ¹⁸⁰ §906, German Civil Code, *supra* note 105. The provision sets out an interesting dichotomy in liability rule (compensation) and property rule (injunction) protection. In terms of property rule protection, the focus is on the use of the offending land - no prohibition would be granted if the use conforms to local custom or statutory standards. In terms of liability rule, it protection is on the affected land - any harm above what is expected receives compensation even if the action cannot be constrained. See also Sun Xianzhong, [Modern German Property Law] 193-198 (1997) (discussing the German approach in balancing rights of neighboring land).

- ¹⁸¹ Helle Tegner Anker, Sanford Gaines & Brigitte Egelund Olsen, *Jurisdiction, Fundamental Rights and the Market*, in LEGAL SYSTEMS AND WIND ENERGY: A COMPARATIVE PERSPECTIVE 93, 106 (Helle Tegner Anker, Brigitte Egelund Olsen & Anita Rønne eds., Djøf Publishing 2008); Mortensen et al., *supra* note 174, at 212-214.
- ¹⁸² Act No 15 of 16 June 1961.
- ¹⁸³ Anker, Gaines & Olsen, *supra* note 180, at 106; Mortensen et al., *supra* note 174, at 218-219.
- ¹⁸⁴ Anker, Olsen & Rønne, *supra* note 178, at 168-169.
- ¹⁸⁵ Patricia Salkin, *The Key to Unlocking the Power of Small Scale Renewable Energy: Local Land Use Regulation*, 27 J. LAND USE & ENVT. L. 339, 354-360 (2012) (discussing the effectiveness of zonal regulation of wind turbines by local state governments in the US); Rule, *supra* note 146, at 1226-1228.
- ¹⁸⁶ For a discussion of environmental litigations against renewable energy projects that involved the various environmental laws such as the National Environmental Policy Act, the Endangered Species Act, Clean Water Act, National Historic Preservation Act etc., see Nagle, *supra* note 148, at 73-88. For a comparative discussion of regulatory approaches in other countries, see Mortensen et al., *supra* note 174.
- ¹⁸⁷ Klass, *supra* note 4, at 1027-1032; Lazarus, *supra* note 4, at 633-656. For a detailed historical deconstruction of the circumstances surrounding the landmark case of *Illinois Central Railroad Company v. Illinois* that laylaylaid out the judicial precedent for the public trust doctrine in American law, see generally Joseph D. Kearney & Thomas W. Merrill, *The Origins of American Public Trust Doctrine: What Really Happened in Illinois Central*, 71 U. CHI. L. REV. 799 (2004).
- ¹⁸⁸ E.g., *Alliance to Protect Nantucket Sound, Inc. v. Energy facilities Siting Bd.*, 932 N.E.2d 787 (Mass. 2010); *Center for Biological Diversity v. FPL Group*, 83 Cal. Rptr. 3d 588 (Cal. App. 2008). For a good concise summary of the litigation attempts, see Klass, *supra* note 4, at 1046-1063.
- ¹⁸⁹ STEPHEN J. SPURR, *ECONOMIC FOUNDATIONS OF LAW* 74-75 (Routledge 2nd ed. 2010).
- ¹⁹⁰ Morriss, Meiners & Dorchak, *supra* note 138, at 757.
- ¹⁹¹ The U.S. state of Wyoming became the first U.S. state to impose a tax on wind energy production, purportedly for “the privilege of producing electricity from wind resources”: Walter Wang, *Challenging State Taxation of Renewable Energy: Will Wyoming be the Battleground*, 15 LEWIS & CLARK L. REV. 451, 455-456 (2011). See Keith J. Brewer, Stephen E. Hamilton & Richard A. Westin, *Economic Approaches to Nonrenewable Resource Taxation*, 11 J. NAT. RESOURCES & ENVT. L. 175, 188-193 (1995) (discussing from an economic perspective the various possible models of taxation for use of natural resources); Walter Hellerstein, *Political Perspectives on State on Local Taxation of Natural Resources*, 19 GA. L. REV. 31, 32-35 (1984) (discussing the political impact of natural resources tax regimes implemented in the US states of North Dakota, Minnesota, and Georgia).
- ¹⁹² These can be in the form of tax abatements, grants, low-interest loan programs: Salkin, *supra* note 184, at 340-344; Wang, *supra* note 190, at 453-454. For a discussion of state subsidies for renewable energy in Europe, see Anker, Olsen & Rønne, *supra* note 178, at 173-174.

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

- ¹⁹³ Timothy Zick, *Property As/And Constitutional Settlement*, 104 NW. U. L. REV. 1361, 1362-1364 (2010). For the U.K. position, there is an even stronger public-private dichotomy, see A W BRADLEY & K D EWING, CONSTITUTIONAL AND ADMINISTRATIVE LAW 712 (Pearson Education 15th ed. 2011); ALEX CARROLL, CONSTITUTIONAL AND ADMINISTRATIVE LAW 311 (Pearson Longman 5th ed. 2009).
- ¹⁹⁴ See GEOFFREY R. STONE ET AL., CONSTITUTIONAL LAW 967-988 (Aspen Publishers 5th ed., 2005); Philip Harter, *Administrative Law in the United States*, in ADMINISTRATIVE LAW OF THE EUROPEAN UNION, ITS MEMBER STATES AND THE UNITED STATES 307, 333-341 (Intersentia 2002); BOSSELMAN, ROSSI & WEAVER, *supra* note 2, at 165-175; DAVID H. ROSENBLOOM & ROSEMARY O'LEARY, PUBLIC ADMINISTRATION AND LAW 51-86 (Marcel Dekker 2nd ed. 1997). In the U.K. and other English common law jurisdictions, the grounds for judicial review are illegality, irrationality and procedural irrationality: see generally PETER LEYLAND & GORDON ANTHONY, ADMINISTRATIVE LAW (Oxford University Press 7th ed. 2013); CARROLL, *supra* note 192, at 309-357.
- ¹⁹⁵ In the U.K., the main judicial assessment is on whether the tax is properly authorized by the Parliament, with negligible rules on the rates and activities that can be taxed: see BRADLEY & EWING, *supra* note 192, at 347-348; CARROLL, *supra* note 192, at 374. In the U.S., the main concern with the exercise of the federal taxing power is whether the taxes are regulation in disguise, but outright redistribution and/or revenue generating taxes are never an issue: see STONE ET AL., *supra* note 193, at 280-283.
- ¹⁹⁶ Wang, *supra* note 190, at 463-465; Hellerstein, *supra* note 190, at 36.
- ¹⁹⁷ STEVEN J. EAGLE, REGULATORY TAKINGS 178-212 (Lexis Nexis 3rd ed. 2005). In the context of land use and environmental protection, see generally ROBERT MELTZ, DWIGHT H. MERRIAM & RICHARD M. FRANK, THE TAKINGS ISSUE: CONSTITUTIONAL LIMITS ON LAND-USE CONTROL AND ENVIRONMENTAL REGULATION (Island Press 1999). Around the world, most countries typically have a similar or higher threshold before actionable regulatory takings is established: see Matthew C. Porterfield, *State Practice and the (Purported) Obligation Under Customary International Law to Provide Compensation for Regulatory Expropriations*, 37 N.C. J. INT'L L. & COM. REG. 159, 171-186 (2011) (surveying the domestic laws on selected countries regulatory takings); Michael Wilkinson, *Land*, in LAW OF THE HONG KONG CONSTITUTION 359, 392-394 (Johannes Chan & C.L. Lim eds., Sweet & Maxwell 2011) (discussing the U.S. style standard adopted in Hong Kong); Jianlin Chen, *Curbing Rent-Seeking and Inefficiency with Board Takings Powers and Undercompensation: the Case of Singapore from a Givings Perspective*, 19 PAC. RIM L. & POL'Y J. 1, 12 (2010) (No regulatory takings claims in Singapore). C.f., Rachelle Alterman, *When the Right to Compensation for "Regulatory Takings" Goes to the Extreme: The Case of Israel*, 6 WASH. U. GLOBAL STUD. L. REV. 121, 152 (2007) (discussion of the substantial more generous regulatory takings doctrine in Israel).
- ¹⁹⁸ Steven J. Eagle, *A Prospective Look at Property Rights and Environmental Regulation*, 20 GEO. MASON L. REV. 725, 769-775 (2013); Bronin, *supra* note 2, at 1237-1250; EAGLE, *supra* note 196, at 25.
- ¹⁹⁹ Babcock, *supra* note 137, at 69-70.
- ²⁰⁰ Bronin, *supra* note 2, at 1250-1265.
- ²⁰¹ *Id.*, at 1265.
- ²⁰² Legislatures may however enact general laws governing the manner in which the executive dispose of property, such as requirements that fair market value has to be obtained: Frederick E. Ellrod III & Nicholas P. Miller, *Property Rights, Federalism, and the Public Rights-of-Way*, 26 SEATTLE U. L. REV. 475, 485 n.30 (2003).

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

- ²⁰³ LEYLAND & ANTHONY, *supra* note 193, at 20-26; BRADLEY & EWING, *supra* note 192, at 84-85; CARROLL, *supra* note 192, at 5-39.
- ²⁰⁴ For example, the distinction is likely to be less stark in the numerous countries that have limited or no recognition of regulatory takings claims: *supra* note 196.
- ²⁰⁵ QIANFAN ZHANG, THE CONSTITUTION OF CHINA: A CONTEXTUAL ANALYSIS 184-194 (Hart Publishing 2012); Weixia Gu, *Judicial Review over Arbitration in China: Assessing the Extent of the Latest Pro-Arbitration Move by the Supreme People's Court in the People's Republic of China*, 27 WIS. INT'L L.J. 221, 257-262 (2009).
- ²⁰⁶ ZHANG, *supra* note 204, at 121-124; CHEN, *supra* note 25, at 75-94 & 118-121.
- ²⁰⁷ [Administrative Permit Law] (promulgated by Standing Comm. Nat'l People's Cong., Aug. 27, 2003, effective July 1, 2004) 5 STANDING COMM. NAT'L PEOPLE'S CONG. 439.
- ²⁰⁸ Zhang Chunsheng & Li Fei ed., [EXPLANATION OF THE ADMINISTRATIVE PERMIT LAW] 2-7 (2003); [UNDERSTANDING AND APPLICATION OF JUDICIAL INTERPRETATION ON ADMINISTRATIVE PERMIT] 32-40 (2010).
- ²⁰⁹ The other three are "vocations and trades that provide public services and directly relate to the public interests," "important equipment, facilities, products, articles that directly concern public security, human health, the safety of life and property" and "The establishment of the enterprises or other institutions, which need to determine the subject qualification." In addition, there is a catch-all category for "other matters, for which administrative licenses may be established in accordance with the laws and regulations."
- ²¹⁰ Administrative Permit Law, *supra* note 206. See EXPLANATION OF THE ADMINISTRATIVE PERMIT LAW, art. 12(1), *supra* note 207, at 50-57.
- ²¹¹ Art. 12(2), Administrative Permit Law, *supra* note 206. See EXPLANATION OF THE ADMINISTRATIVE PERMIT LAW, art. 12(2), *supra* note 207, at 57-58.
- ²¹² Interestingly, the official legislative explanation of the Administrative Permit Law conceived of the allocation of administrative permits relating to the use of public or natural resources as analogous to a transfer of property rights and interests ("caichan quanli") by the country to the permit holders: EXPLANATION OF THE ADMINISTRATIVE PERMIT LAW, *supra* note 207, at 191.
- ²¹³ The vehicle license quota is implemented in 1994 to combat traffic congestion in the city. Auction prices for the mere right to register a vehicle in Shanghai has reached Renminbi (RMB) 80,000 in 2013 (approximately U.S. Dollar (USD) 13,000, which is more than the price of some new cars): [Shanghai Private Vehicle License Price Exceed Eighty Thousand for the First Time], LIANHE ZAOBAO, Feb. 24, 2013. For a general discussion of the scheme, see Luo Wei & Wang Jintao(), [Theoretical Research and Empirical Analysis of Vehicle License Auction], 9(6) SCIENCE TECHNOLOGY & ENGINEERING (CHINA) 1466 (2009); Hu Xiyin, Shanghai: 4 wanyuan yikuai Chepai neng jie jue wenti ma? [Theoretical Research and Empirical Analysis of Vehicle License Auction], 2004(3) CHINA SOCIETY PERIODICAL 51 (2004).

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

- ²¹⁴ For discussion on the legality issue, including justification based on the Administrative Permit Law, see Hu Lvyin, [*Legal Analysis of Basis of Shanghai Municipal Government Vehicle Licenses Auction*], 2011(5) [LEGAL STUDIES]3, 7 (2011); Yang Xiaojun & Huang Quan, [*Recognizing the Legality of Motor Vehicle License Auction: Interpreting Article 12 & 15 of the Administrative Permit Law*], 2005(4) ADMINISTRATIVE LAW RESEARCH (CHINA) 109 (2005).
- ²¹⁵ China has specific regulations imposing taxation on the exploitation and utilization of natural resources since 1993: [FINANCIAL AND TAX LAW OF CHINA] 186-189 (Law Press 2nd ed. 2010).
- ²¹⁶ For a discussion of the legal authority and procedural for enacting tax laws in China, see Liu Jianwen, [TAX LAW] 104-135 (2007). For a critical analysis of the problem arising from the lack of legal authorization and control over the imposition of taxes in practice, see Wang Hongmao & Chen Shoucan [ON THE TAX LAW PROBLEM] 94-101 (2004).
- ²¹⁷ While this may suggest discrimination of small and medium enterprises, the actual utilization of these business vehicles is very low in China as compared to U.S. and Europe. This is due to China's peculiar tax policy which, by subjecting the owners of these business associations to the double taxation of personal and corporate tax, is very unfriendly to these forms of business vehicles: He Changjian & He Yi, [STUDY ON THE SYSTEMATIC OBSTACLES AND COMPREHENSIVE REFORM OF SMALL BUSINESS DEVELOPMENT IN CHINA] 62-63 (2007).
- ²¹⁸ Yan, *supra* note 34; Li, *supra* note 41.
- ²¹⁹ One possible explanation is that the protection of general environment is the role of the weather feasibility study and not this new regulatory permit. However, if this is the case, then the entire controversy is rather misguided since the weather feasibility study is already a requirement imposed by the national law (i.e., Meteorological Law).
- ²²⁰ For a discussion of the scope and operation of the administrative litigation laws in China, see Zhongguo Dalu Xingzheng Susong: [ADMINISTRATIVE LITIGATION IN MAINLAND: SYSTEM, LEGISLATION AND CASES] 24-30 (Hu Jianmiao et al. eds., 2011).
- ²²¹ For example, relatively detailed provisions on challenge procedure is provided in the context of administrative permit relating to traffic: Li Yanxia & Liu Pengfei, [RESEARCH ON TRAFFIC ADMINISTRATIVE PERMITS] 121-123 & 222 (2006).
- ²²² For example, a proposed legislation to create solar rights (right to receive sunlight for solar generation) includes provisions for the notice and opportunity to object by neighboring landowners: Missirian, *supra* note 2. For a proposal of localized decision-making on a community level as to whether wind and solar energy generation should be allowed, see Rule, *supra* note 146.
- ²²³ Reich, *supra* note 13.
- ²²⁴ *Id.*, at 734-737.
- ²²⁵ See e.g., Steven J. Eagle, *The Really New Property: A Skeptical Appraisal*, 43 IND. L. REV. 1229, 1239 (2010); Shi-Ling Hsu, *A Two-Dimensional Framework for Analyzing Property Rights Regimes*, 36 U.C. DAVIS L. REV. 813, 879 (2003); Bruce Yandle & Andrew P. Morriss, *The Technologies of Property Rights: Choice Among Alternative Solutions to Tragedies of Commons*, 28 ECOLOGY L.Q. 123, 129 (2001). See also Michael L. Wells & Alice E. Snedeker, *State-Created Property and Due Process of Law: Filling the Void Left by Enguist v. Oregon Department of Agriculture*, 44 GA. L. REV. 161, 207 (2009) (a similar concept of "state-created property").

- ²²⁶ Reich, *supra* note 13, at 756-764; Charles A. Reich, *The Liberty Impact of the New Property*, 31 WM. & MARY L. REV. 295, 303 (1990). See also Eleanor Marie Lawrence Brown, *Visa as Property, Visa as Collateral*, 64 VAND. L. REV. 1047, 1085 (2011); Eagle, *supra* note 224, at 1255; Kevin Gray, *Regulatory Property and the Jurisprudence of Quasi-Public Trust*, 32 SYDNEY L. REV. 221, 222 (2010); Wells & Snedeker, *supra* note 224, at 188-189.
- ²²⁷ Reich, *supra* note 13, at 778. Reich is skeptical of large corporations, recognizing the equal coercive potential of large private corporations and the need for similar public obligations on the corporations: Reich, *supra* note 225, at 300.
- ²²⁸ Reich, *supra* note 13, at 778-785; Wells & Snedeker, *supra* note 224, at 188-189.
- ²²⁹ See Section IV.A.
- ²³⁰ Gabriela Engler Pinto, *Upstream Oil and Gas Legal Frameworks: Brazil and the United States Compared*, 115 W. VA. L. REV. 975, 998 (2013); Katina Miriam Wyman, *Why Regulators Turn to Tradeable Permits: A Canadian Case Study*, 52 U. TORONTO L.J. 419, 420-421 & n.6 (2002); Amy Sinden *The Tragedy of the Commons and the Myth of a Private Property Solution*, 78 U. COLO. L. REV. 533, 534-538 (2007) (noting but skeptical of US's society unquestioning preference for market solutions)
- ²³¹ Morriss, Meiners & Dorchak, *supra* note 138, at 764-789.
- ²³² Weinthal & Luong, *supra* note 164, at 38-46.
- ²³³ Hudson & Rosenbloom, *supra* note 134, at 1284; Thomas W. Merrill, *The Property Strategy*, 160 U. PA. L. REV. 2061, 2085-2086 (2012); Foster, *supra* note 134, at 61; Babcock, *supra* note 137, at 33-36; COOTER & ULEN, *supra* note 135, at 143-151; Yandle & Morriss, *supra* note 224, at 124-125.
- ²³⁴ Zhang, *supra* note 84, at 118; Xiao, *supra* note 84, at 37-38.
- ²³⁵ GREGORY S. ALEXANDER, *THE GLOBAL DEBATE OVER CONSTITUTIONAL PROPERTY: LESSONS FOR AMERICAN TAKINGS JURISPRUDENCE* 49-57 (University of Chicago Press 2006).
- ²³⁶ Pinto, *supra* note 229, at 997.
- ²³⁷ A. F. M. Maniruzzaman, *The Issue of Resource Nationalism: Risk Engineering and Dispute Management in the Oil and Gas Industry*, 15 TEX. J. OIL GAS & ENERGY L. 79, 84-85 (2010); Elisabeth Eljuri & Clovis Treviño, *Political Risk Management in Light of Venezuela's Partial Nationalisation of the Oilfield Services Sector*, 28(3) J. ENERGY & NAT. RESOURCES L. 375, 375 (2010).
- ²³⁸ Maniruzzaman, *supra* note 236, at 81-86.
- ²³⁹ Iaione, *supra* note 140, at 891; Nash, *supra* note 140, at 683-687.

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

- ²⁴⁰ Carlos Sun observed that “[s]ome believe that travelling is a right and that roads are public goods, and as such they should be ‘free.’”: Sun, *supra* note 142, at 284. Joseph D. Kearney & Thomas W. Merrill observed “[w]e tend to think of public property as something open to all members of the public on equal terms”: Joseph D. Kearney & Thomas W. Merrill, *Private Rights in Public Lands: the Chicago Lakefront, Montgomery Ward, and the Public Dedication Doctrine*, 105 NW. U. L. REV. 1417, 1521 (2011). For public discourse over the objection of any government restrictions on roads, *see also* Janison, *supra* note 142; Stackhouse, *supra* note 142.
- ²⁴¹ Nash, *supra* note 140, at 728; Schuitema, *supra* note 143, at 109-110.
- ²⁴² Sun, *supra* note 142, at 284; Nash, *supra* note 140, at 726-727; Schuitema, *supra* note 143, at 107-109.
- ²⁴³ Iaione, *supra* note 140, at 911.
- ²⁴⁴ *See* notes 1-4.
- ²⁴⁵ Owen L. Anderson, *Geologic CO₂ Sequestration: Who Owns the Pores Space?*, 9 WYO. L. REV. 97, 99-109 (2009); Spranking, *supra* note 108, at 1030-1031; BOSSELMAN, ROSSI & WEAVER, *supra* note 2, at 48-58. Carbon sequestration is the removal of carbon dioxide from the air and storing it in deep subsurface layers to reduce greenhouse gas in the atmosphere: Anderson, *supra* note 244, at 97-98. Heat mining involves injecting water deep underground where it is converted to steam by the natural underground heat. The steam can then be used to propel electricity generating turbines: Spranking, *supra* note 108, at 1030-1031; BOSSELMAN, ROSSI & WEAVER, *supra* note 2, at 48-50.
- ²⁴⁶ *See e.g.*, Virginia Simms, *Making the Rain: Cloud Seeding, the Imminent Freshwater Crisis, and International Law*, 44 INT’L LAW 915, 928-930 (2010); BOSSELMAN, ROSSI & WEAVER, *supra* note 2, at 61-68; *Who Owns the Clouds?*, 1 STAN. L. REV. 43 (1948).
- ²⁴⁷ *See* Rule, *supra* note 2, at 812-814 (arguing that clarity of property arrangement is not always sufficient and that law stipulating property arrangement should adapt to the specific and changing usage characteristics of the nature resources in question).
- ²⁴⁸ Merrill, *supra* note 232, at 2081-2089; Morriss, Meiners & Dorchak, *supra* note 138, at 764-773.
- ²⁴⁹ *Supra* V.A.
- ²⁵⁰ Brewer, Hamilton & Westin, *supra* note 190, at 188-189; Robert D. Cairns, *Reform of Exhaustible Resource Taxation*, 11 CANADIAN PUBLIC POLICY 649, 653 (1985).
- ²⁵¹ Lei Zhang, *Neutrality and Efficiency of Petroleum Revenue Tax: A Theoretical Assessment*, 107 THE ECONOMICAL J. 1106, 1106 (1997). *C.f.* Cairns, *supra* note 249, at 651 (skeptical about the riskiness and capital intensiveness arguments for favorable tax treatment of resource industries).
- ²⁵² Brewer, Hamilton & Westin, *supra* note 190, at 192-193.

PROPERTY RIGHTS ARRANGEMENT IN EMERGING..., 27 Colum. J. Asian L. 81

27 CLMJAL 81

End of Document

© 2014 Thomson Reuters. No claim to original U.S. Government Works.