

RECONCILING PROPERTY RIGHTS
AND THE ENVIRONMENT: A REVIEW
OF THE CHINESE PROPERTY LAW

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ABSTRACT

The Property Law of the People's Republic of China, adopted in the fifth session of the Tenth National People's Congress on March 16, 2007, made a useful exploration into integrating environmental protection into property law. The Property Law established the principle of comprehensive decision-making, integrating environment and development, enlarging the definition and scope of property by accepting as new forms of property rights the right to spaces and the right to use resources exclusively owned by the State, defining the obligation to protect public interests when acquiring and exercising property rights, and providing the adjoining owner's right to environmental protection. These rules are very important for the sustainable development of China. However, the provision of the Property Law regarding the right of use of resources exclusively owned by the State as a usufructuary right failed to distinguish different impacts on the environment through different ways of exploiting resources and also failed to provide better protection for the environment and resources. Therefore, it is necessary to reconcile the environmental law and property law with new methods on the basis of a sound understanding of the economic aspect and the ecological aspect of the environment and resources.

INTRODUCTION

Environmental problems and sustainable development are major issues in the current world. Chinese legislators have to answer the question of how property law should react to such issues. The Property Law of the People's Republic of China ("Property Law") adopted by the

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fifth session of the Tenth National People's Congress on March 16, 2007, gave a clear answer: it is advisable to integrate environmental protection considerations into the values and rules of property law by means of integrating environmental protection and development into decision-making under the guidance of sustainable development. However, from the perspective of environmental protection, the Property Law still has some drawbacks to be improved, especially those provisions related to resources. We still need to discuss these issues and find the best solution.

I. GREENING CHINESE PROPERTY LAW

The integration of environment and development in decision-making is regarded as an important means of achieving sustainable development. The essential idea is that environmental goals should be a new factor in the definition of development. We need a way to integrate environment and development. This integrated decision-making emphasizes that environment is not necessarily a secondary factor when the central government makes political decisions.¹ The key to integrating environment and economic factors is at the decision-making level; the main theme of achieving sustainable development is thus to integrate economy with ecology during decision-making. It is necessary to exert the co-effort of many disciplines; the discipline of law is a necessary basic safeguard. Just as the Twenty-First Century Agenda pointed out, the laws and rules of a state are the most important instruments in transforming environmental and development policies into actions. They are not only implemented through command-and-control mechanisms. They are also a framework of economic planning and market tools.² In fact, the making and implementing of law should itself be regarded as a decision-making process. According to the requirements on strategies and major actions for sustainable development in the Chinese Twenty-First Century Agenda, making an overall evaluation of the current policies and rules, along with establishing a new system of laws and

1. XIA GUANG ET AL., *INTEGRATING ENVIRONMENT AND DEVELOPMENT IN DECISION-MAKING: THEORIES AND MECHANISMS 1* (China Environmental Science Press 2000).

2. WAN YICHENG & WAN YAN, *LANDMARKS FOR NEW CIVILIZATION—CLASSIC LITERATURES OF HUMAN GREEN MOVEMENT 2* (Jilin People's Press 2000).

policies, is a major legislative step towards the achievement of sustainable development.³

We admit that solving environmental problems is not a customary task for property law, a field typically dominated by private concerns. The reason to integrate property law into the decision-making process is because of the failure of public law. In a modern society, whether in developed countries such as Great Britain and the United States or in underdeveloped countries such as India and China, public law is the first choice for solving environmental problems. Measures for addressing environmental problems usually have a tone of command and control. The deteriorating environmental condition, however, declares the bankruptcy of public law and demonstrates the necessity of seeking solutions in private law. It is thus natural to solve environmental problems by the co-effort of public and private law. As an essential part of private law, property law should be taken into the integrated decision-making process.

Another reason for taking property law into the integrated decision-making process is the comprehensiveness of environmental problems. Environmental problems in modern society are comprehensive, resulting from all aspects of the social life. Although environmental problems are not mainly caused by the insufficiency of property law, they nevertheless have some relation to property law. Property law, which is steeped in the modern agricultural society, exacerbated environmental problems. We will address this topic in the following aspects.

A. Environment and Resources Are Beyond the Range of Things Regulated by the Property Law

In property law, people are the opposite of things. Persons are the subjects and things are objects. What exactly is a thing? According to general understanding, the following conditions should be met by a thing under property law⁴: a thing should be corporeal, separate,⁵ independent in the sense of economy and law, capable of being controlled, able to meet the needs of people, and both particular and specific.⁶ The object of a property law must be particular and specific,

3. XIA GUANG ET AL., *supra* note 1, at 6–7.

4. LIANG HUIXING & CHEN HUABIN, PROPERTY LAW 22–24 (Law Press 2003).

5. QIAN MINGXING, PRINCIPLES OF PROPERTY LAW 27 (Peking University Press 1994).

6. 1 WANG ZEJIAN, PROPERTY RIGHT OF CIVIL LAW 43 (Taipei Sanmin Press 1992).

because if a thing cannot be individually identified, it is not a thing under property law.⁷ A specified thing is a thing that can be regarded as a thing separated from other things.⁸

In contrast, environmental resources refer to anything that can be used or potentially used by the people. Environmental resources include those currently being used by mankind, such as minerals, water, and forests. They also include those resources not currently being used, but having the potential for future use, such as icebergs in the Arctic Ocean and snowy mountains on the Antarctic. Although environmental resources can meet our needs, be controlled by people, and are corporeal, they cannot be specified, and so are not things under property law. Generally speaking, therefore, environmental resources are not objects of property law. The ownership and utilization of environmental resources cannot be solved within the framework of environmental law, but can be addressed through the framework of property law.

For this reason, the tragedy of the commons cannot be avoided regarding environmental resources. The failure of property law to regulate environmental resources leads to disorder in the utilization of environmental resources. This is an important cause behind the disruption of environmental resources. Although property law has provisions governing the ownership and utilization of forests and land, such forests and land are simply a part of the environmental resources. Such partial provisions cannot solve the problem as a whole. Furthermore, even such partial provisions are not in line with sustainable development.

B. Neglect the Non-Economic Values of Things

Everybody knows that things not only have economic values but also ecological, aesthetic, and other values. The thing regulated by property law is not the thing as a whole, but only the economic aspect of the thing. As the regulation of things is limited to its economic aspect, the non-economic aspects are neglected, and property law does not give due attention to the conflicts between a thing's different values. The neglect of ecological and other non-economic

7. LIANG HUIXING, RESEARCH INTO CHINESE PROPERTY LAW 36 (Law Press 1998).

8. *Id.*

values by property law is a source of environmental problems in modern society.

C. Legalize Actions Disrupting the Environment Under Ownership

The rule of ownership is partially responsible for environmental problems. Although the notion of absolute ownership has to some extent loosened in modern society along with the wave of socialized property rights, its content has not been greatly changed. Ownership is still an almost omnipotent right, the owner in fact has an unfettered right to sue and to dispose of his property, including misuse. A person has the right to construct fences along the border of his property, no matter how high the fence may be or how much sunshine it blocks.⁹ Actions polluting the environment and disrupting resources may be sheltered under the notion of absolute ownership. This makes property law a shelter for environmental pollution and resource disruption.¹⁰

In one sense, property law as it developed in modern agricultural society also exacerbated environmental problems. The problems caused by property law should be solved by property law. Therefore, property law must be integrated into the decision-making process.

Of course, as the most typical private law, property law takes the protection of private rights as its principal task. The nature of property law in safeguarding rights and freedoms shall not change, no matter how obvious the trend towards socialization and no matter how serious social problems may be. This does not mean, however, that property law cannot be part of the integrated decision-making process. Property law can be interpreted in light of the current social situation, maintaining flexibility and without changing its inherent nature.

1. Establishment of the Legislative Principles of Decision-Making by Integrating Environment and Development

Legislative guiding principles of the property law have direct impact on provisions of this law. Scientific development and the promotion of harmonious society are both specifically listed as legislative

9. BERNARD SCHWARTZ, *THE LAW IN AMERICA: A HISTORY* 204 (McGraw Hill, China University of Politics and Law 1989).

10. LÜ ZHONGMEI, *NEW PERSPECTIVES OF ENVIRONMENTAL LAW* 67 (China University of Politics and Law 2000).

guiding principles of the Property Law. This indicates that the Property Law takes full consideration of environmental protection and the harmonious development of human beings and nature. The legislators clearly declared that guiding principle include the theories of Deng Xiaoping, the three-representative theory developed by Jiang Zemin, overall implementation of scientific developments, adherence to socialist institutions, meeting the urgent needs of actual social life, coordinating all sorts of interests, and promoting social harmony.¹¹

2. Defining the Property Law and Its Scope of Regulation

The scope of regulation and the types of property rights directly reflect the essence of property law. Article 2(2) of the Property Law provides that “the things under this law include real property and personal property. If a law provides that a right can be regarded as the object of property right, that rule shall be followed.” In the part governing ownership of condominiums, the Property Law considers the ownership of space as a type of property right. In the usufructuary rights provision, the rights to contract land, use construction land, use dwelling land, and use natural resources are all listed as property rights. The Property Law does not follow the traditional definition of a “thing” and goes beyond the scope of corporeal things by including the right to space and the right to use resources as property rights. This embodies the shift from focusing on ownership towards paying more attention to actual use. This also provides a rights basis for the rational utilization of natural resources and for the coordination of property law with other related laws and regulations on natural resources. After the nature of the right to use resources is determined by the Property Law, the right holders have rights under the Property Law. This defines the scope within which governmental authorities can exercise their powers to regulate resources. At the same time, the right holders also have obligations under the Property Law. They must follow requirements imposed by governmental authorities on environmental protection and the realization of environmental public interests.

11. Wang Zhaoguo, Explanation on the Draft of the Property Law of the People's Republic of China (Mar. 8, 2007), http://www.npc.gov.cn/englishnpc/Speeches/2007-03/08/content_360345.htm (last visited August 20, 2012).

3. The Obligation of Property Right Holders to Protect Public Interests

Article 7 of the Property Law provides that the acquisition and exercise of property rights shall abide by the law, respect the social moral standards, and should not injure public interests and the legitimate rights and interests of other persons. This provision directly embodies the socialization of property rights and restricts the absoluteness of ownership. In contemporary society, environmental protection is obviously a social and moral requirement and a public interest. The Property Law confirms that the right holders shall have the obligation to protect the environment when they acquire or exercise property rights. It clearly declares its intent to restrict the absoluteness of the ownership interest with this general provision and also provides a legal basis for environmental protection in the exercise of property rights. Without the change of the traditional notion of ownership, and without the restriction of absolute ownership, it is impossible to achieve environmental protection.

4. Establishment of the Neighbor Right

In the chapter on neighbors' rights, the Property Law, after making provisions about the principles of regulating right holders of property bordering on each other, specifically provides rules on reasonable use, environmental protection, and pollution prevention. These provisions not only specify requirements in the General Provisions that the acquisition and exercise of property rights should respect the public social standards and should not injure public social interests but also incorporate environmental protection in the determination of public social standards and public interests. Without fresh air and sunshine, a house is not a healthy dwelling. It is a basic right of any human being to have fresh air and sunshine, and it is a basic environmental protection obligation for any human being not to litter by discharging solid wastes and other pollutants into the environment. Provisions of the Property Law on the one hand protect the property right holders, and on the other hand provide a legal basis for legislation governing environmental rights and the revision of environment law. Provisions on access to fresh air and sunshine

will greatly promote the recognition and protection of such rights in environmental legislation.

II. PROBLEMS WITH CHINESE PROPERTY LAW

It is a sign of progress that the Property Law made some achievements in reconciling property rights with environment protection, but its provisions on the property rights governing resources still have much room for improvement.

As aforementioned, the Property Law takes into its scope of regulation the right to use natural resources exclusively owned by the State. It also states provisions on property rights concerning natural resources held by collective units and individuals. However, from the perspective of reconciling property rights with the environment, there are still two problems not to be neglected. The first problem is that the Property Law failed to take into its scope of regulation some important natural resources, such as environmental capacity and the weight or limits of ecological and other non-economic values. The second problem is that it is inappropriate to treat all rights to use natural resources as usufructuary rights. Such a provision is against the environmental protection goals and may lead to negative impacts. I will mainly discuss the second problem here.

When drafting the Property Law, scholars proposed different ways to address this problem. Generally speaking, these proposals were of three types. The first type regards the right to use state-owned natural resources as usufructuary rights, the second possession, and the third quasi-property rights. All these proposals recognize the exclusive state ownership of natural resources.¹² The Property Law adopted the first proposal. Although all these proposals are reasonable in one sense, they all have problems if we open our eyes and examine this issue from a natural and ecological perspective according to the principle of sustainable development.

In China, the state ownership of natural resources is based on a declaration in the Constitution. Its basis is the socialist public ownership. However, I do not understand the statement in civil law

12. Although the socialist public ownership includes both state ownership and collective ownership, natural resources are owned by the State. Accordingly, this article does not discuss collective ownership.

textbooks that the State is the independent, exclusive, and only owner of natural resources, although this is the most accepted statement in all civil textbooks. Is the constitutional ownership based on socialist public ownership an ownership in civil law? First, in terms of the objects, are natural resources things under property law? If so, how to specify such natural resources and make them qualified as objects of the property rights, as the air moves, water flows, forests grow and die, and wild animals migrate? Second, why does the Property Law use the term “permit” instead of “entrustment” or “agency” to describe how the State authorizes other subjects to use natural resources? Why does the Property Law provide that natural resources should be used with compensation instead of providing that the users should pay consideration? Third, from the perspective of safeguard and remedies, why does the law not provide for tort liabilities but directly provide for criminal liability for damages to state-owned natural resources? Is it a loss of the state-owned property when the rivers reach the sea, the fish swims away, the birds fly away, or when the forest and grasslands burn themselves? Can the Property Law answer these questions? If not, what should we do?

A. The Usufructuary Rights Failed to Distinguish Different Ways to Use Natural Resources

Why does the Property Law provide that use of state-owned natural resources is a usufructuary right? The basic logic is that no individuals or organizations own state-owned natural resources because there is only one owner of the state-owned natural resources. It is a principle of property law that there is only one owner for one thing. Therefore, the rights of all other parties in natural resources are not ownership but usufructuary rights, though they can possess, use, make profit with, or dispose of natural resources.¹³ This may be logical reasoning, but it may lead to many problems in practice. For example, as to the mining right, when the State confers the mining right to a company or an individual, such companies or individuals have the right to mine mineral resources in a specific area. The actual

13. Cui Jianyuan & Wang Weiguo, *Developments of Hot Topics in the Legislations of Property Rights*, http://article.chinalawinfo.com/Article_Detail.asp?ArticleID=2349&Type=mod (last visited August 20, 2012).

result is that the mining companies or individuals do not use what they take out of the land but sell it to others. The buyers will consume (for example, coal) or process (such as iron ores) what they buy. However they consume or process what they buy, they completely change the things they buy and the original things no longer exist. We all know that mineral resources cannot be returned to the original owner once they are taken out of the land. Can we treat this kind of use as the exercise of a usufructuary right? Who exercises such rights and who benefits from such use? Why can the holder of a usufructuary right freely dispose of mining products, even though they do not have the ownership of mineral resources? Are mining products the same as mineral resources? After the expiration of usufructuary rights, how can the right holder return what they used? Is the payment for the use of natural resources the benefit the state gets as the owner?

Here, we just take the mining right as an example. The situation of a logging right, hunting right, fishing right, or water right is similar. In fact, the use of resources can be classified as non-consuming use and consuming use, each having a different impact on the ownership. If the non-consuming use meets the features of a usufructuary right, it is not convincing to treat consuming use as the exercise of a usufructuary right. Furthermore, to treat consuming use as an exercise of a usufructuary right will promote excessive use and waste of resources. This is against the goals of resources conservation and environmental protection. Because the Property Law has some significant problems, this article takes the view that the Property Law makes some declarative provisions but fails to make complete and perfect rules on natural resources.

B. The Right of Possession Cannot Incorporate Environmental Protection Obligations into Property Law

Some scholars proposed that property law should use the right of possession to solve the problem caused by the separation of ownership and use of natural resources.¹⁴ The basic logic of this idea is to

14. MENG QINGUO, DOUBLE STRUCTURE OF PROPERTY RIGHTS (3d ed., People's Court Press 2008).

discard the notion of one right for one thing and establish both ownership rights and rights of possession for natural resources. This idea recognizes serious problems in the usufructuary rights regime. We praise its innovativeness but doubt its usefulness. Can possession be an independent right? If so, what conditions should be met to be such a right? What is the relationship between ownership and possession? If possession derives from ownership, what is the difference between possession and other non-ownership rights? If ownership and possession are parallel, what is the content of ownership and what is the content of a possession right? Can a possession right be established on all public goods? Even disregarding the obvious conflict between the notion of possession and other notions of the civil law of the continental law family, if possession is parallel with ownership, it will be detrimental to the conservation of resources, rather than improving it. Many environmental problems are caused by situations where resources are public and multi-functional on the one hand, while not subject to ownership and instead subject to the principle of first capture on the other. For this reason, the possession right goes against the goal of incorporating environmental protection obligations into the civil law.

C. A Quasi-Property Right Is Reasonable, but There Is Still Much to Study

Some scholars propose that China should learn from the notion of accessory (permit) property rights in other continental law countries, especially Germany.¹⁵ The basic logic of this proposal is that natural resources should be freely used by the public but that this freedom should be restricted for the benefit of public interests because natural resources are limited and multi-functional. For this reason, the scope and content of such rights should reflect the nature of public law. We call it permit property right because it has the features of private law as well as public law. It is not a typical property right and is not a complete property right in the private law. The notion of permit property right is generally recognized by continental law countries. Compared with other proposals, it is more

15. SUN XIANZHONG, PROPERTY RIGHTS (Law Press 2001).

appropriate for incorporating public law obligations into civil law rights and meeting the needs of sustainable development. A careful analysis of this proposal indicates that there are still many problems to be solved for this proposal to work under the state ownership of natural resources in China. The establishment of quasi-property takes the permits of public law as a prerequisite, no matter whether in civil code or in special laws on natural resources. Since it is a private right with the features of public law, can the public nature of natural resources be completely achieved with state ownership? What is the nature of the permit? Does it confer a private right? In what role does the state grant this permit? What is permitted? According to the principles of administrative law, a permit does not confer rights but rather imposes requirements on the exercise of rights. Under the condition of state-owned natural resources, which rights of private persons should be regulated and how should this regulation function? In fact, permit is a measure to reconcile the conflict between the economic aspect and ecological aspect of natural resources and serves to reconcile freedom and fairness through the introduction or intervention of public law. Therefore, clarification of the ecological and economic nature of natural resources is a prerequisite for designing property law.

III. SOME IDEAS ON HOW TO RECONCILE PROPERTY LAW AND ENVIRONMENTAL LAW

My doubts are all based on my questioning of relevant rules. It is in fact my reflection from the perspective of environmental law or the notion of sustainable development. The traditional civil law is insufficient. I think the challenge of property law by environmental problems is because of the conflict between freedom and fairness caused by the economic and ecological values of natural resources. If we cannot find the causes of the conflicts between different values, cannot find ways to coordinate and balance conflicts between values, then we cannot completely solve the problem. Therefore, we must incorporate ecological rationality and overcome the insufficiency of economic rationality on the basis of a thorough review of the economic rationality of the traditional civil law.

A. The Two Aspects of Things

Things under property law mainly refer to things with economic value. Many things fall into the category of natural resources. In one sense, the object of environmental law and property law are identical. However, the same object has different meanings in property law and environmental law. The environment and natural resources have ecological values in environmental law but economic values in property law. The Property Law provides rules on ownership and use of natural resources for the purpose of making use of their economic values. For this reason, environmental function is not under its consideration. However, rights provided in property law will undoubtedly affect environmental values when such rights are exercised. If we hope to reconcile these two values and incorporate the ecological values of things into the scope and regulation of property law, we need to solve the conflict between the economic values and ecological values.

The first value to be considered is that of the thing in its economic form. Generally speaking, we call those environmental elements that are useful to our economic development natural resources. They are things in the form of resources. These things are objects of human labor. Our understanding of natural resources has economic meaning: forests can provide wood, water flow supports navigation, and mineral resources can be mined. In this sense, resources are scarce and useful, which leads to conflicts among different interests. The law should provide rules on ownership to prevent conflicts. Such rules are rules of property law.¹⁶

The second value to be discussed is that of the natural resource as an ecological thing. From the perspective of ecology, environmental resources are necessary conditions for the existence and development of human beings. These resources combine with human beings to form the ecological system through the flow of energy, recycling of matter, and transference of information. From the perspective of ecology, forests, water flows, and mineral resources are all necessary components of the biological circle. As ecological things, natural resources form an integrated whole and have self-adjusting capacity. Environmental resources are critical to human beings, so we have to consider this ecological aspect and establish rules to protect it.

16. SHI SHANGKUAN, PROPERTY RIGHTS 1 (China University of Politics and Law 2000).

Otherwise, the existence of human beings will be directly endangered. This system of rules protecting the integrity and self-adjusting function of natural resources is environmental law.

The two aspects of natural resources as things lead to the variations in values placed on natural resources. Property law and environmental law recognize and provide protection for different parts and values of these resources. Because of the past neglect of the ecological values of environmental resources, property law did not protect the ecological values of environmental resources; environmental law later developed to make up for this deficiency. The classification of ecological and economic values of environmental resources, however, is only in theory because these two values are inseparable in reality. The traditional civil law only cared about economic value, neglecting ecological values. This is one of the direct causes of environmental problems. Although we now have environmental legislation that protects the ecological functions of environmental resources, the achievement of this goal relies on two prerequisites. The first is to recognize the two aspects of environmental resources, while the second is to establish mechanisms to coordinate their conflicts. Therefore, environmental law alone is not enough. There must be a way for environmental and civil law to communicate and coordinate. Property law must recognize the ecological values of environmental resources. Currently, property law has established some channels for the recognition of ecological values and established some rules conducive to protection of ecological values. But these rules are far from perfect. I think China should establish more active rules for recognition and protection of ecological values.

B. Establishment of Environmental Property Rights

The understanding of the economic and ecological aspects of things provides a basis for protection, but we still need to identify a way to break through.

1. Redefining Property Rights

The definition of a legal term is based on the value given by a subject, along with a legal description of its inherent nature. We

currently use values to define legal terms. This value embodies how the object satisfies certain needs of the subjects. The needs of human beings for certain purposes form the value criteria. Among all values, the existence of human beings is the most important.

To classify things into corporeal things, specific things, and controlled things is similar. Things in property law are different from matters in physics because things, as objects of legal relations, must meet the value judgment of subjects and meet certain needs of subjects. According to the basic theories of civil law, the subjects are presumed to be rational economic persons. The maximization of interests is the inner impetus and the maximization of property is the highest goal for a human being. For a human being, the purpose of a right is to advance the acquisition of economic value. Only those things actually controlled by a human being can be possessed and used in one way or another; all other things are not things under property law. In this way, there is only one standard to determine whether something is a thing under property law: whether it can create economic value for human beings. Therefore, although all human beings need air, water, and other things, they are not things under property law because they cannot be controlled and bring direct economic interests to any human being.

The needs of human beings can, however, change over time. Being subjective, value orientations also change over time. When the environment deteriorates, human beings gain a deeper and deeper understanding of the environment and understand that the seeking of purely economic interests will bring destruction to humanity. Now, human beings have not only economic rationality but also ecological rationality. They think that the continuing existence of human beings is the most important goal and that the pursuit of economic benefits should yield to the need to maintain human existence.

Against this background, we can still use values as a way to define legal terms, but we can change the nature of things to make them meet the needs of subjects. This method will, however, bring confusion. The first problem is that we have to explain the values and the definition used. The second problem is that it will be difficult to apply legal norms if we change the criteria for value judgments. The legal norms of the past are based on economic rationality, while the current understanding is based on ecological rationality. These

two premises should not be changed randomly, for then the application of legal norms would have no premise. Furthermore, the existence of property law is itself reasonable., Property law also regulates many other things besides things of environmental value. If we abandon property law because of some deficiencies, property law will lose its function and this will lead to new problems and social disorder.

It is necessary, therefore, to consider a new way to define legal terms. We can define things according their economic or ecological functions. I call this way of defining terms functional definition. As an objective definition, the definitions can be expanded as we gain more understanding of the term to be defined. Different functions can coexist and be separately defined by different laws and can also be integrated.

Following this line of thinking, things have economic and ecological functions and these functions can coexist in one value. Now suppose a person with economic rationality is seeking the maximization of his interests through the possession and control of things. His rationality will tell him that he will not only jeopardize his own interests but will also endanger his living condition and harm himself if he uses his things without limits. Now he must take ecological functions into account. When he considers the ecological function, he has ecological rationality. In this way, ecological consideration can be incorporated into the definition of things.

In fact, this way of defining terms already exists in property law, as exemplified in the rights relating to condominiums. Additionally, more and more countries separate water right from the right to land. This is in fact an embodiment of this way of defining terms. The concept of accessory property rights in Germany is a typical example of integrating economic and ecological functions into property law.

2. Specification of Environmental Resources

Functional definition can provide us a way to have a multi-aspect and multi-dimensional understanding of things, and provide us with conditions to support the integration of ecological functions into property rights. The remaining question is what ecological functions can be integrated into property law. Things in the sense of property law are not things in the sense of physics. According to the interpretation

of German civil law, things are not only corporeal but also capable of being felt and controlled.¹⁷ Being corporeal means things have forms, either liquid, solid, or gaseous. No matter what form it has, a thing must be capable of being controlled by human beings.¹⁸ According to these requirements, it is still difficult to integrate environmental resources with ecological functions into property law. How can things without an owner and price can be objects of property law?

Environmental resource is a broad term. We still cannot control its scope and function. However, what is not controllable is the entirety of the environment. We can still control parts of the environment and some of its functions. Just as aforementioned, environmental resources have forms and content. The ecological function is the content, while the physical existence is the form. As to its economic function, the physical existence is both the form and the content. Now the question is whether incorporeal ecological functions or values are capable of being integrated into property law. This depends on whether such functions can be felt, made independent, and be specified.

The first issue is whether they can be felt. Environmental resources are the entirety of the basic conditions for human existence. The environment is a complete ecological system with different functions, structure, and features, such as renewability, recoverability, and recyclability. All values are embedded in these functions. All physical things are only embodiments of such functions, not the values themselves. However, ecological values are indeed capable of being felt. Clean air, fresh water, suitable climate, and beautiful sceneries can be actually enjoyed by the people.

The second issue is the controllability of environmental resources. Objectively, the ecological function as an entirety is not controllable by human beings. Humanity can only control part of it. Human beings have understood some basic laws of ecology and possess ways to find more. To a certain extent, the lack of prices for environmental resources is because they have no owner. Once prices are determined, environmental resources can be allotted through market mechanisms. Therefore, a simple and convenient way to solve the problem of controllability is to set prices for environmental resources and

17. SUN XIANZHONG, *MODERN GERMAN PROPERTY LAW 2* (Law Press 1997).

18. LIANG HUIXING & CHEN HUABIN, *PROPERTY LAW 31* (Law Press 2003).

make them exchangeable in the market.¹⁹ Theoretically speaking, it is feasible to monetize environmental resources. For example, some Japanese scholars determined the prices of forests by calculating the alternative costs to provide functions of water source conservation, prevention of desertification, prevention of soil erosion, provision of entertainment and health care functions, protection of wildlife, and provision of oxygen. There are also many other ways to value ecological functions. It is feasible to integrate ecological functions quantifiable with technical measures.

The above analysis indicates that ecological property rights are in fact a new type of property rights developed by integrating the economic and ecological functions of things by functional definitions. It is essentially the addition of the ecological function of things into the traditional economic functionality. I call it ecological property rights. This type of property right has features different from those of traditional property rights. There are two ways to materialize such ecological property rights, either by interpretation of traditional property rights in light of ecological requirements or by the establishment of new property right systems. The establishment of ecological property rights needs the co-effort of property law and environmental law.

19. WANG LIMIN, PROPERTY RIGHTS 36 (China University of Politics and Law 1998).