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Unprotected Areas, Protected Areas, and Sustainability Under Green Development Policies: Which Are the Expected Impacts?

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Introduction

Traditionally, development theories have been made to support and validate dominant forms of development and their practices or to create the need for inducing the shift from one paradigm to another. External conflicts, arguments, and disagreements are searched, and used against opposing paradigms while internal paradigm shortcomings are ignored or assumed minimal. For example, eco-economic development programs point out how win-win eco-economic opportunities can be found and implemented to achieve better development outcomes, but they rarely provide a link to the win/lose social impacts that they generate. This missing link is hard to see in paradigm structures that are additive by design. The difficulty arises basically due to the unsystematic nature under which traditional development theories are based. Hence, traditional development theories are not very helpful in the search for systematic understanding of and solutions to development problems, which are systematic by nature.

One of the goals of this paper is to describe a non-traditional way to look at development processes in a systematic fashion, and which can be used to trace the evolution of development from the original fully unprotected area based development to the current partially protected area based development, and its political implications.

Full unprotected area based development

Officially, unprotected area based development has existed since the beginning of time. No land area protection was necessary when humans did not exist for environmental development to take place, and no land area protection was thought necessary for economic development to be sustained officially until 1987 when the Bruntland Report was published(WCED 1987).

During this period, environmental and social externalities were assumed to be zero or minimal, and the value of factors of production such as mountainous terrain or so called primitive societies were seen as zero or negative because they were considered barriers to economic development. Hence, mountains and primitive cultures had to be transformed into new commodities through processes such as deforestation and cultural assimilation in order to create value for them. The increasing recognition of the existence of environmental and social values has led to the need to shift to a development system that recognizes those values as well as the traditional economic values. The result of this change in development thinking is that critical areas are placed under a

management system based on protected area development principles while non-critical areas are left open to traditional economic development systems.

Partially protected area based development

This type of development has two principal venues in theory, protected critical deforested areas and protected critical forest areas. However, it appears that in practice, protected critical forest area based development has priority over protected critical deforested area based development. This is because reforestation practices and social forestry exercises appear to make the management of protected deforested areas more expensive and it appears to have a far less biodiversity impact than the management of critical forest areas.

Managing for sustainable development

Sustainable development programs are designed to manage both unprotected area based development and protected area based development in ways that are environmentally friendly. However, budgetary and institutional constraints have led in practice to focusing sustainable development programs on the management of protected area based development leaving the management of unprotected areas as the last priority. This is because it appears that funding for supporting protected area programs, specially international funding, is easier to find than funding for the management of unprotected areas. On the other hand, within protection programs, funding for the protection of remaining forest areas appears to be more likely to be found than funding for the management of protected deforested areas.

The sustainability problem

Both, the focus of development only on the management of protected areas, and the focus on only the management of forested areas leads to a dual plus sustainability problem. The first problem is that as investment in protected areas increases because there is a market for them, the pressures, social, economic, and ecological, on unprotected areas outside the market increases too, which may lead to a system failure. The second problem is that as investment in forested areas increases because there is an environmental market for them, the deterioration of deforested areas outside this market continues as they are more prone to natural and non-natural disturbance. And the third problem is that if the environmental incentives channeled to protected area programs or forested area programs are high enough, there is a potential for inducing a fully protected area development program or a fully forested area development model. All these issues can be better understood from a systematic point of view.

The goals of this paper

The first goal is to present a qualitative comparative framework that can be used to derive a regional partially unprotected development model. The second goal is to use this framework to point out the most likely impacts that green development issues such as climate change, the Kyoto market mechanism, and green marketing strategies may have on regional development when stated this way. And the third goal is to point out the need for systematic interventions as

unsystematic approaches to regional development may lead to the creation of unsustainable development situations, which may back-fire in the long run.

Methodology

First, a fully unprotected model of development is defined to represent the development conditions preceding the time of environmental concerns. Then, a partially unprotected development model is derived by means of incorporating regional protected area concerns. Now, this framework is used to see the impacts that green policies may have on regional system and subsystem conditions. From here, some implications related to the sustainability situations that may be induced when using green programs at the regional level are pointed out.

Terminology

Table 1 Qualitative terminology used

DFA	=	Protected deforested area
FA	=	Protected forested area
dfa	=	Unprotected deforested area
fa	=	Unprotected forested area
R1	=	Fully unprotected model
R2	=	Partially protected model
P	=	Protected area
U	=	Unprotected area
W	=	Climate change
E	=	Kyoto environmental market
G	=	Green marketing policies

The regionally fully unprotected development model

A regional development model(R1) based on full unprotection can be stated as follows:

1) $R1 = dfa.fa$

The above regional development model(R1) indicates that the necessary and sufficient condition for a fully unprotected development model to exist is that all deforested areas(dfa) and all forested areas(fa) within the region must be in an unprotected state at the same time. Notice that this was the situation of most development regions before the Bruntland Report was released in 1987(WCED 1987).

The regional partially protected development model

When protection policies were implemented to mitigate the environmental impacts of traditional economic development the internal structure of the regional development model was changed from a fully unprotected to a partially protected, which can be expressed as follows:

2) $R2 = DFA.dfa.FA.fa$

The partially protected development model above($R2$) points out that the necessary and sufficient condition for this regional model to exist is the presence of protected and unprotected forested and deforested areas at the same time. Some forested areas and some deforested areas are now protected. Notice that since today all regions have some degree of protection, the internal structure of their regional development models is similar to the one stated above, and they just may vary in the degree of protection only.

By reorganizing terms to place them as two interacting subsystems, protected deforested areas and protected forested areas($DFA.FA$) and unprotected deforested areas and unprotected forested areas($dfa.fa$), we get the following:

3) $R2 = DFA.FA.dfa.fa$

4) $R2 = P.U$; where $P = DFA.FA$ and $U = dfa.fa$

Hence, the interaction of protected area concerns(P) and unprotected area concerns(U) are the drivers of the partially protected regional model($R2$).

Main implications

Three implications of the partially protected regional development model($R2$) can be listed. The first implication is that focusing development policies on protected areas(P) only would lead to unsustainable outcomes unless we assume that unprotected areas do not matter($U = 1$); The second implication is that focusing development policies on unprotected areas(U) only would also lead to unsustainable outcomes unless again we assume that protected areas do not matter ($P = 1$); and the third implication is that for partially protected regional development to be sustainable we have to be able to balance protected area based development(P) with unprotected area based development(U).

Expected green development policy impacts

The structure of formula 4 can be used to identify the potential impacts that green development issues such as climate change, the kyoto market mechanisms, and green marketing programs may have on regional systems and subsystems, which is described below.

Expected system impacts

Following is a short description of the potential impacts that green development issues may have at the regional system level.

i) The impact of climate change

Climate change(W) is expected to affect the over all regional development model(R2), and the climate change's impact on protected areas(W1) is expected to be different or equal to the climate change's impact on unprotected areas(W2), which is stated below:

$$5) \quad W(R2) = W(P.U) = W1P.W2U$$

If all the critical deforested areas and forested areas in the region were protected, then we should consider the climate change's impact on protected areas to be the one that should be minimized by preventive or mitigating action in the short term because its negative impact is expected to be higher($W1 > W2$). However, if not all critical deforested areas and forested areas are protected, we have to be concerned about the climate change's impact on both critical protected areas(W1) and on critical unprotected areas(W2).

ii) The impact of the Kyoto environmental market

The Kyoto market(E) is expected to affect the over all regional development model(R2) too and the Kyoto market's impact on protected areas(E1) is expected to be different or equal to the Kyoto market's impact on unprotected areas(E2), which is indicated below.

$$6) \quad E(R2) = E(P.U) = E1P.E2U$$

Again, if all the critical deforested areas and forested areas in the region were protected, then we should consider the Kyoto market as an excellent mechanism to maximize the preventive and mitigating impacts of green policies in the short term if it is targeted to critical protected areas alone. We should expect the marketization of protected areas(E1) within the Kyoto framework to be easier than the marketization of unprotected areas(E2) because the stakeholders in protected areas are more likely to be supportive of such a framework. However, if not all critical deforested areas and forested areas are protected, we have to be concerned about the Kyoto market's impact on both protected critical areas(E1) and unprotected critical areas(E2) as environmental incentives may induced not only the conversion of unprotected critical deforested areas and forested areas to protected areas, but also the conversion of non-critical deforested area and non-critical forested areas to environmental uses.

iii) The impact of green marketing programs such as green oil

The collection of environmental funds to support green marketing programs(G), such as funds coming from green oil or pollution programs, is expected to affect the over all regional development model(R2) and the green marketing program's impact on protected areas(G1) is

expected to be different or equal to the green marketing program's impact on unprotected areas(G2), which is summarized below:

$$7) \quad G(R2) = G(P.U) = G1P.G2U$$

Again, if all the critical deforested areas and forested areas in the region were protected, then we should consider the green marketing program too as an excellent mechanism to maximize the preventive and mitigating impacts of green policies in the short term if it is targeted to protected critical areas alone. We should expect that the greening of protected areas(G1) within the green marketing framework to be easier than the marketization of unprotected areas(G2) again because the stakeholders in protected areas are more likely to be supportive of such a framework. However, if not all critical deforested areas and forested areas are protected, we have to be concerned about the green marketing program's impact on both protected critical areas(G1) and unprotected critical areas(G2). Again environmental incentives may induced not only the conversion of unprotected critical deforested areas and forested areas to protected areas, but also the conversion of non-critical deforested areas and non-critical forested areas to environmental uses too.

Internal impacts in protected areas

Below is a short description of expected impacts that green development issues may have at the regional subsystem protected area level.

i) The impact of climate change

The impact of climate change(W) on the protected area development model(P) can be expressed as follows:

$$8) \quad W(P) = W1DFA.W2FA$$

Notice that again, climate change's impacts for both component of the system may be different or equal. Also notice that here the most vulnerable areas to climate change, whether too much rain or little rain appear to be critical protected deforested areas(DFA) as impact W1 is expected to be higher than impact W2 as critical deforested areas are usually more prone to extreme natural conditions.

ii) The impact of the Kyoto environmental market

The impact of the Kyoto market(E) on the protected area development model(P) can be expressed as follows:

$$9) \quad E(P) = E1DFA.E2FA$$

Notice that the conversion of protected area uses from critical deforested areas(DFA) to critical protected forested areas(FA) depends on the values of E1 and E2. If only critical protected

forested area(FA) is brought into the Kyoto market, then $E2 > E1$, which implies a process of reversion from non-forested uses(DFA) to forest uses(FA). Under these conditions, again one of the issues would be whether or not it is Socially acceptable to have a fully forested protected area system.

Internal impacts in unprotected areas

Below there is a brief description of the expected impacts that green development issues may have on the regional subsystem unprotected area.

i) The impact of climate change

The impact of climate change(W) on the unprotected development model(U) can be expressed as follows:

$$10) W(U) = W1dfa.W2fa$$

Here, climate change will affect both unprotected deforested areas(dfa) and unprotected forested areas(fa). The impact on critical unprotected deforested area and critical unprotected forested areas is to be more negative than the impact on non critical areas. The impact of climate change on unprotected deforested areas(W1) may be a reduction in the quality and quantity of deforested area production while the impact of climate change on unprotected forested areas(W2) may be a reduction in the quality and quantity of forest cover production. Climate change also has a direct impact on the levels and quality of biodiversity within unprotected forested and deforested areas. Hence, measures have to be taken to minimize the reduction in deforested area and forested area production as well as in biodiversity levels. Notice that the impact of climate change(W) on all unprotected areas is important, and hence the solution to minimizing climate change's impacts must be a systematic one to be effective.

ii) The impact of the Kyoto environmental market

The impact of the Kyoto market(E) on the unprotected development model(U) can be expressed as follows:

$$11) E(U) = E1dfa.E2fa$$

Now the driving forces of the process of conversion or reversion of unprotected land uses depend on which environmental incentive is higher, environmental incentive in unprotected deforested areas(E1) or environmental incentives in unprotected forested areas(E2). If we have a situation where $E2 > E1$, there will be a strong incentive for the reversion of unprotected deforested areas(dfa) to unprotected forested areas(fa), and if the environmental incentive is high enough, it may lead to a fully unprotected forested area model. On the other hand, if $E1 > E2$, then there is a strong incentive to convert unprotected forested areas(fa) to unprotected non-forest area uses(dfa), and again, if the incentive is high enough, it may lead to a full unprotected deforested

area model. Notice that if the situation is $E1 = E2$, we would be indifferent to the type of unprotected land use that we have in the region.

iii) The impact of green marketing programs such as green oil

The impact of green marketing programs(G) on the unprotected development model(U) can be expressed as follows:

12) $G(U) = G1dfa.G2fa$

In this case, the dynamics of the unprotected model(U) depend on where the green marketing money is invested. If the green marketing money is invested only on unprotected forested areas, then $G2 > G1$, which again suggests a process of reversion from unprotected deforested uses(dfa) to unprotected forested uses(fa), with the potential of full reversion. If the green marketing money is invested only on unprotected deforested areas, then $G1 > G2$, which suggests a process of conversion from unprotected forested uses(fa) to unprotected non-forest uses(dfa), again with the potential of full conversion. Under these conditions, one of the issues would be to decide whether or not it is socially acceptable to have a fully forested unprotected area system or a fully deforested unprotected area system or a combination of both; and the green money should be spent accordingly.

Conclusions

The discussion above can be used to highlight some specific conclusions and a general conclusion. The most important specific conclusions are the following three. First, green policies have a systematic impact that can have sustainability implications for both regional system and subsystem development models. Second, if green policies are geared to benefit one component of the system only or one component of the subsystem only, the other components of the system or subsystem left out will be subjected to more intensive pressures underlined either by a process of conversion or reversion, which may lead to unintended, but increasing environmental deterioration. If all element of the system and of the subsystems are targeted by green policies at the same time, the uses that have the higher environmental value will prevail in the market leading to a process of conversion or reversion from low value uses to more valuable ones. Third, without intervention, green policies targeted to protected uses only have the potential to induce a fully protected development model which could maximize negative social impacts.

The general conclusion is that green policies must be implemented in such a way as to balance appropriate levels of protection and unprotection within the system and within subsystems. Otherwise, they may lead to protection levels that could become socially unacceptable, and therefore, unsustainable.

References

World Commission on Environment and Development(WCED), 1987. *Our Common Future*. Oxford University Press, London.

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