

Payment for Ecosystem Services in the Developing World: Non-Market Contributors to National PES Program Development

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ABSTRACT

Declining ecosystem services throughout the developing world along with growing ecosystem service demands have prompted scientists, policymakers, and leaders to consider many innovative strategies to preserve ecosystem health. Payment for Ecosystem Services (PES), a presumably market-based environmental protection and sustainable development device, has become an increasingly popular response among developing nations to this critical environmental challenge. However, the market-based nature of national-level PES programs and the power of market forces to impel key PES processes have become highly questionable. This paper, therefore, explores the role of two non-market entities, namely states and international organizations, in shaping essential components of national PES programs. By examining four of the developing world's leading national PES schemes, this paper identifies several important trends concerning states' and international organizations' contributions to national PES program development.

PART I, INTRODUCTION

The developing world, a region deeply troubled by declining environmental conditions and developmental stagnation, has employed multiple strategies in recent decades for realizing the combined objectives of environmental health and socio-economic betterment. These two concerns have received increasing attention in large part due to historic international collaborations like the 1992 UN Earth Summit, the 2000 UN Millennium Summit, and the 2005 Millennium Ecosystem Assessment, compelling parties within and outside of developing nations to devise creative solutions. Yet many aspects of the strategies to date, their effectiveness, components, theoretical foundations, and long-term viability, remain incompletely understood. A substantial degree of uncertainty can be attributed to one particular, recently emerged and increasingly popular, sustainable development approach known as Payment for Ecosystem Services, or PES. PES is generally regarded as a market-based mechanism to secure the provision of ecosystem services, involving the compensation of land owners by potential ecosystem service recipients. Using financial incentives, parties affected by a land owner's

approach to property management can motivate land owners to adopt practices designed to sustain the ecosystem services that the property provides. These services might be clean water provision, natural disaster prevention, biodiversity protection, carbon sequestration, soil preservation, or any number of other possible benefits to society. PES is exercised at the local, regional, national, and international level, but the precise manner in which national-level PES schemes unfold presents perhaps the most puzzling aspect of this phenomenon. National PES program development is, therefore, the central focus of this investigation.

While PES advocates have voiced a captivating case for PES at all levels, citing what they believe to be the strategy's theoretical integrity and even PES success stories, the principal forces behind national-level PES schemes may have been thus-far misconstrued. In other words, what PES advocates have identified as the strategy's key advantage is not, in reality, the most critical determinant of how national PES programs have progressed. The fact that multiple robust and enduring national PES programs can be seen in the developing world despite the proven shortcomings of elementary PES design suggests that some unanticipated actors have played a major role in national PES program development. The emergence, administration, evolution, and strengthening of national PES schemes could be greatly affected by supportive institutions originally expected to play only a minimal role. Precisely how those institutions are impacting the development of PES programs is clearly a topic worthy of study.

The principle strength of PES, according to advocates, is its market-based nature. Demand for ecosystem services, broadly defined as benefits to society derived from the natural environment, are thought to inspire financial compensation to landowners in return for those services, thereby sustaining service provision, improving environmental conditions, alleviating poverty, and advancing other development aspirations. In actuality, however, market

mechanisms alone are seldom sufficient to realize these environmental and development outcomes. Moreover, the ecosystem service market does not necessarily guarantee sustained payments to ecosystem service providers, nor does it create the array of other requisite circumstances needed for lasting PES program operation. Instead, the input of a managing institution, presumably a national government, international institution, or both, along with additional political, legal, social, and economic conditions are often required for programs to perform in a meaningful and effective fashion.

Given that the power of the ecosystem service market cannot fully support the emergence, operation, and growth of numerous national-level PES programs throughout the developing world, this paper attempts to elaborate the roles of states and international institutions in driving those processes. The primary question confronted in this paper is: how do states and international organizations impact the development of national-level PES schemes? While a variety of forces potentially impact the way PES programs unfold, this investigation will give strongest consideration to the legal, policy, funding, and administrative roles performed by states and international institutions. These two institutional actors hold enormous potential for influencing the environmental and development affairs of developing nations and merit attention as possible leading influences on national PES programs. Not only will an investigation of this kind help to explain the true nature of a thus-far mischaracterized worldwide phenomenon, it should also assist in evaluating the actual merits of national PES schemes. Is PES a sustainable development approach that can and should be applied by an even greater number of developing nations? Are PES's strengths and potential at all contingent upon the market or do they rest exclusively upon institutional devices? These are larger concerns that a study of chief forces behind existing PES programs will help to address.

This paper will first provide necessary background, clarification, and examples of ecosystem services along with an explanation of why ecosystem services have, in recent years, received increasing attention from scientists, policy makers, and leaders. A summary of existing research on PES will then be presented in order to illustrate the limited role of market mechanisms in shaping key PES processes and to highlight the need to explore ways in which various non-market actors are influencing national program development. The concepts and relationships targeted by this study will be explained in greater detail along with a small handful of expectations concerning the outcomes of the investigation. This study will illuminate the relationships between states, international organizations, and national PES program development via a thorough review of national level programs in four developing nations: Mexico, Costa Rica, Vietnam, and China. Trends and differences across these country cases provide a number of important insights concerning the relationships in question. Additional details on key information sources and specific steps taken to answer this study's primary questions are presented in this paper's methods section. Findings drawn from an exhaustive review of available sources are arranged by country, by institution type, and by relevant program component. A significant number of factual details concerning states' and international organizations' contributions to specific aspects of program development are presented for each country. This data reveals seven important trends and three key differences concerning states' and international organizations' relationships to programs, all of which are identified in this paper's analysis section. A final discussion is offered on the implications of these trends, inferences related to why national programs exist, how they have taken on their current forms, and what overall function they perform.

PART II, BACKGROUND ON ECOSYSTEM SERVICES

Definition and Examples of Ecosystem Services

Humankind derives an incredible number of benefits, large, small, essential, and non-essential, from the world's ecosystems. These benefits to society are known in many scientific, academic, and other professional circles as ecosystem services. The concept of ecosystem services has been popularized in recent years by the 2005 Millennium Ecosystem Assessment, a landmark collaborative scientific report called for by the United Nations. The report's definition of ecosystem services is provided in very simple terms: "benefits people obtain from ecosystems" (Hassan, Scholes, and Ash VII). Four ecosystem service categories are outlined in the report: provisioning services, regulating services, cultural services, and support services (Hassan, Scholes, and Ash 7). Provisioning services include items like food, freshwater, and natural medicines. Examples of regulating services include climate regulation, disease regulation, erosion regulation, and water purification. Cultural services might come in the form of recreation and tourism, aesthetic values, or spiritual and religious values. Support services include items like soil formation, nutrient cycling, and water cycling. This list is by no means an exhaustive account of possible services provided by the earth's ecosystems. Many additional possibilities could be named. All of these services, however, are considered to be intimately linked to human welfare and many are regarded as essential to maintaining the necessary conditions for life on Earth.

Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment, the result of a massive, multiyear project launched in 2001, was predominantly concerned with understanding, evaluating, and elaborating

these linkages between human welfare and ecosystem services. The team undertaking this effort consisted of 1,360 experts from ninety-five different countries. The project was designed to “assess the consequences of ecosystem change for human well-being and to establish the scientific basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being” (Hassan, Scholes, and Ash VII). A critical step in this process was the evaluation of conditions and trends of ecosystems worldwide as well as the state of the services those ecosystems provide (Hassan, Scholes, and Ash XV). Assessment teams determined that human behaviors over the past half century “have altered ecosystems to an extent and degree unprecedented in human history” and that, as a result, continued improvements to human welfare may “be limited by an insufficient supply of key ecosystem services” (Hassan, Scholes, and Ash 2). According to the report, factors causing unfavorable ecosystem changes include “increasing demand for ecosystem services”, “overexploitation of natural resources”, “changing land use and land cover”, and “changing climate” (Hassan, Scholes, and Ash 4). Thus, the connections between ecosystem degradation, declining ecosystem services, and human behavior were made very clear. Perhaps less clear is exactly how sustainable use of ecosystems and the continued provision of vital ecosystem services are to be achieved. Responses to this question have generated an array of inventive environmental preservation and development strategies. Payment for ecosystem services has emerged, for better or worse, as one of the more popular strategies employed in the developing world.

PART III, EXISTING RESEARCH ON PES

Status, Forms, and Themes of Existing Research

The developing world presents a unique scenario in which PES can play a special role. This region is indeed characterized by sharp declines in ecosystem services over the past fifty years or longer as well as alarming poverty levels and grossly inadequate human services. Because of PES's potential for alleviating precisely these two categories of problems simultaneously, special attention is given by researchers to PES's role in this region in particular. Because of Latin America's seemingly stronger proclivity toward PES compared to other developing regions, the bulk of scholarly attention has been directed toward that section of the globe. Latin America "has been particularly receptive to the PES approach" and offers a greater number of opportunities for investigation (Pagiola, Rios, and Arcenas 300). However, ample consideration has been given to PES's arrival in both Asia and Africa as well, amounting to a large collection of investigative work.

Literature tends to emerge from two principle sources: peer-reviewed journal submissions by scholars and informative reports by development or environmental professionals. Case studies represent a significant portion of existing research, comprise the data on which many larger studies are based, and generate some important insights. Often, these case studies center on PES programs at the local or regional level, though a sizeable collection of studies has been produced on national-level programs in Mexico, Costa Rica, China, and Vietnam, among other nations. All told, this literature is vast and covers a remarkable variety of themes. The most recurrent themes, however, among studies to date are program outcomes, program design, participant characteristics, supporting features, and poverty reduction. A comprehensive study exploring

trends or differences in the roles of non-market actors in the more ambitious national PES programs is surprisingly absent. The primary goal of this paper is to address this particular lacuna.

Key Questions in Existing Literature

Existing studies are generally concerned with four fundamental issues: Does PES achieve desired environmental outcomes in the developing world? Does PES alleviate poverty in the developing world? When does PES achieve desired environmental outcomes? When does PES alleviate poverty? Answers to these questions, even though they are not the central focus of this paper, help to motivate the further inquiries this paper puts forth. Researchers' answers to these four questions have illustrated that environmental and economic outcomes are conditional upon forces beyond those of the ecosystem service market. Additional institutional support along with fitting socio-political and socio-economic circumstances is often required to make PES work. The primary findings already presented by scholars raise important questions concerning how relevant institutions, namely states and international institutions, have attempted to create the requisite circumstances for PES and how those efforts have impacted the evolution of national PES programs.

Factors Affecting Environmental Outcomes

Governance, Financing, and Support Elements

While PES is thought by many to be based on sound, straight-forward theory, its practice in developing nations is problematic due to “a plethora of institutional design and governance challenges” (Pattanayak, Wunder, and Ferraro 254). Institutional design strengths receive considerable attention as determinants of program performance and a large number of such

institutional traits are evaluated in the literature. It is important to note that much of the literature assessing institutional design features focuses on local or regional-level PES schemes. These studies, however, supply some important insights and questions that are clearly applicable to national-level programs. Wunder, Engel, and Pagiola are among the several researchers who consider the impact of user-program-financing versus government-program-financing on program effectiveness and program efficiency (836). This group determined that user-financed programs “were better targeted, more closely tailored to local conditions and needs, had better monitoring and a greater willingness to enforce conditionality, and had far fewer confounding side objectives than government-financed programs” (Wunder, Engel, and Pagiola 850). The question of user-financed mechanisms versus government-financed mechanisms is undoubtedly a central issue facing national PES schemes given the scale of such programs, the enormity of required cash flows, and the desired duration and consistency of ecosystem service payments. While Wunder, Engel, and Pagiola, along with a number of other professionals and scholars, have presented sharp criticisms of government-financed approaches, there is little evidence that nations hosting national-level PES programs have adhered to a user-financed method.

Multiple studies have found that PES payments alone are not inclined to change the practices of land users. We may again refer to Wunder et al.’s suggestion that enforcement and monitoring play integral roles in program performance (850). Garbach, Lubell, and DeClerck add to the list of support features impacting performance, maintaining that technical assistance combined with PES payments are more effective in achieving large-scale change in land use practices among cattle ranchers in Costa Rica than are payments without technical assistance (35). Monitoring, enforcement, technical assistance, and information sharing, in fact, receive frequent praise in other case studies that discuss factors impacting program outcomes. Some

studies acknowledge the independent usefulness of payments but consider whether short-term payments or long-term payments are needed to ensure adoption of sustainable land use practices (Pagiola et al. 383). Pagiola et al. have claimed that short-term payments “may sometimes be sufficient to ‘tip the balance’ towards adoption of the desired land use changes, but in most cases longer-term payments are likely to be required” (383). There certainly appears to be agreement among scholars that the critical challenge to PES program participants, governments, NGO’s, and other concerned parties is to “develop a sustainable financing framework where ES users flexibly compensate ES providers over a long period of time, and where continuous support for sustainable resource management is provided” (Cabrera, Soberanis, and Brown 759). It is difficult to imagine that the forces of the ecosystem service market alone can contribute much to these objectives. Instead, the institutions that assume the responsibility of supplying these needs are likely forced to take a more proactive approach. Exactly how state governments and international institutions attempt to accomplish these chores should be explored in some detail.

The Role of the Environmental, Political, Legal, and Social Setting

Several components of the atmosphere surrounding PES schemes are thought to impact PES’s chances for success. Authors Jack, Kousky, and Sims assert that “the environmental context, the socioeconomic context, the political context, and context dynamics” within which PES schemes operate are all critical factors “likely to interact with policy design to produce policy outcomes, including environmental effectiveness, cost-effectiveness, and poverty alleviation” (9465). Therefore, the impact of unique environmental, socioeconomic, and political circumstances surrounding PES programs raises doubts as to whether a universal program design for the developing world is a realistic aspiration (Jack, Kousky, and Sims 9470). It cannot be safely argued that the same PES program design can be applied to all areas of the developing

world nor can it be claimed that PES as a general strategy is an appropriate course for each and every developing nation. Yet a remarkable variation in environmental, political, economic, and social circumstances can be found among nations that have fostered national PES programs. Merely taking into account the most developed national PES programs, like those of China, Costa Rica, Mexico, and Vietnam, a noteworthy contrast in environmental, political, economic, and social conditions can be observed. A logical question to ask, then, is: how do states and international development institutions respond to the unique conditions within nations and what impact do those responses have on nations' PES programs? An answer to this question could very well expose significant contrasts among nations in terms of how their PES programs are shaped by states and international institutions. It is conceivable, however, that commonalities could be identified if states and international institutions go about the program tailoring process in a similar way, regardless of the nation in which the program is being developed.

Factors Affecting Development Outcomes

PES advocates highlight the belief that “low-income households and communities control much of the ecologically sensitive land in developing countries” as reason to investigate PES as a means to alleviate poverty (Milder, Scherr, and Bracer 1). There appears to be some amount of agreement on the notion that chances for poverty reduction rely largely on how many program participants are truly poor, how easily the poor can gain entry into programs, and the amount of money supplied for ecosystem service provision (Pagiola, Arcenas, and Platais 237). A logical assumption is that payments must not only cover the opportunity costs of alternative land use methods, they must also be sufficient to lift payment recipients out of poverty in order to constitute a viable poverty alleviation device. These conditions represent obstacles to poverty alleviation that the forces of the ecosystem market cannot be expected to overcome. Market

forces cannot guarantee that payments flow in the right direction, nor can they assure that payments are of the required magnitude. There is reasonable justification, then, for exploring states' and international institutions' efforts to compensate for these and other shortcomings.

Big Questions Raised by Existing Literature

Literature on PES to date has illustrated a striking contrast between “vision and execution”, to borrow the terminology of Fletcher and Breitling (408). The perceived promises of market-based mechanisms to singlehandedly correct severe environmental and socioeconomic calamities represent the vision. A substantial institutional role in nurturing virtually every component of the PES process is probably more representative of execution, the reality. In Latin America, two of the most celebrated national PES programs are Costa Rica and Mexico. Both have been heralded as highly inventive approaches and positive environmental and development results can certainly be traced these initiatives. However, to achieve desired results, these programs had to undergo significant modifications, movements away from market-based strategies. In Costa Rica, the “actual implementation of PSA [the nation’s PES program] thus far has deviated substantially from the market-oriented model promoted by many advocates both domestic and international, signaling, as asserted at the outset, a significant gap between vision and execution in the program’s administration in at least four essential aspects: (1) financing; (2) governance; (3) motivation; and (4) outcomes” (Fletcher and Breitling 408). In Mexico, “although the original intent of the PES program funders was to introduce market-efficiency into environmental protection, almost all attempts to create markets for ecosystem services, or even market-like policy mechanisms, have failed” (Shapiro-Garza 1).

Both of these programs, however, along with many other national level PES programs in the developing world, endure. This leaves much to be explained. The limited role of the market in guiding the administration and development of PES programs naturally compels a detailed exploration of alternative forces actually governing the ways in which such programs unfold. The PES literature provided thus far points to a few core areas that could be considered opportunities for the input of states and international institutions: (1) payment mechanisms and funding; (2) legal and policy components; and (3) technical support services. These aspects, of course, do not represent all areas in which states and international institutions can contribute, but they do appear to be areas in which state or international institution assistance, guidance, or authority is most needed. Existing studies have made some attempt to determine what supportive institutions should do to optimize PES program performance and many authors also attempt to portray what they see as the ideal image of national PES programs, one that resembles the conceptualization and model originally advocated by PES advocates. An insufficient amount of attention, however, is given to what impact states and international institutions are, generally speaking, actually having on programs. In other words, attempts to establish best practices are perhaps overshadowing the realities of PES in the developing world. This paper will concentrate on bringing to light the realities of states' and international institutions' contributions to PES program development, with a particular focus on two core areas in which the participation of institutions is most likely visible.

PART IV, CONCEPTS, RELATIONSHIPS, AND EXPECTATIONS

Concepts

In the most general terms, this study aims to elaborate the connections between two presumably influential entities, states and international organizations, and a third entity, the development of national PES programs in the developing world. Some further definition of these concepts and their components, however, is warranted. States, as they are regarded in this study, simply refer to the central governments of nations in which national PES programs have been launched. International organizations in this case refer to institutions, operating at an international level, that have traditionally been regarded as either development institutions, environmental institutions, or financing institutions. They may be affiliated with the national governments of developed nations or they may operate independently. While a notable variety of organization types will receive attention in this study, they will, for the sake of simplicity, be termed international organizations when they are referred to collectively. International organizations appearing in this study include the World Bank, Global Environmental Fund (GEF), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Winrock International, and USAID.

Conceptualizing the third entity should be approached with particular care, considering its broad nature. Because states and international organizations have the potential to impact a great variety of aspects of national PES program development, it is most likely advantageous to confine program development to a very general idea. This study is, however, predominantly concerned with two chief components of program development: payment mechanisms and funding; and legal and policy measures. An elaboration of states' and international

organizations' impacts on program development will be presented according to these two facets. How these characteristics tend to be shaped by states and international organizations will constitute much of the key findings of this study, but further interpretation of those findings will attempt to ascertain the degree to which states and international organizations are responsible for the emergence, preservation, and strengthening of programs. Because this study is very much exploratory, a great deal of unanticipated discoveries concerning program development, findings perhaps falling outside the range of the highlighted program components, will emerge from the data collected. Therefore, confining the dependent variable to the very general idea of national PES program development serves a number of valuable services.

Relationships

The foremost objective of this study is to determine what general statements can be made about the nature of states' and international organizations' connections to national PES programs. The aim is not to establish the extent to which these institutions help to yield program success, but rather to explain, in the simplest of terms, how they impact the way programs emerge, operate, and evolve. The literature to date has presented strong reasons to suspect the influence of states and international organizations in the areas of payment mechanisms and financial management, laws and policy, and technical support. However, questions concerning states' and international organizations' contributions to technical support components of PES programs are difficult to answer at this time due to a lack of sufficient data and are, thus, excluded from this study. Moreover, elaborating each and every aspect of states' and international organizations' connections to programs would represent a colossal undertaking, well beyond the reach of this investigation. This study will only explore states' and international organizations' bearing over the two former components: payment mechanisms and financial

management; and legal and policy measures. This paper merely begins the long and arduous process of understanding trends in institutional actors' relationships to program areas most likely to be affected, most likely to be influenced on a significant scale, and most likely to show visible evidence of institutional intervention. Understanding states' and international organizations' specific roles in two critical program components is an important finding unto itself, but it is also the means by which a more general idea of these institutions' part in the emergence, operation, and enrichment of programs can be assessed. While a significant amount of detail will be presented on each program component for four national PES schemes, this paper will ultimately use trends identified among those four cases to elicit a small handful of general comments about states' and international organizations' relationships to programs.

Expectations

A few anticipated outcomes of this study should be noted at the onset. Considering international organizations' history of influencing the course of development and environmental affairs of developing nations, it is reasonable to offer some predictions concerning their roles in PES program development. Additionally, the characteristic lack of resources, infrastructure, capital, and order among developing nations presents further reason to suspect a specific type and magnitude of contribution by international organizations. There may also be justification for expecting states' and international organizations' roles in program development to vary according to the program's age, the world region in which it is found, the nation's economic history, and perhaps other conditions. While predictions cannot be offered for every component of this study, four general presumptions should be presented here:

- (1) International organizations are expected to be largely responsible for compelling, crafting, or inspiring initial legal and policy decisions that enable the launch of national PES programs. States in the developing world are known to be regular recipients of sizable loans from international organizations. Those loans are frequently provided on the condition of legal and policy change pertaining to environmental and development affairs. Environmental and development laws and policies adopted by developing nations are often composed according to international organizations' preferences. International organizations are also known to perform advisory roles for developing nations, thereby inspiring policy change even when those changes are not compulsory.
- (2) States are anticipated to initiate additional legal and policy adjustments in the later stages of PES program development. States' recognition of flaws in original program design along with poor program performance is likely to inspire such changes.
- (3) International organizations are expected to supply a portion of program funding similar to that of states. States in the developing world are prone to lack sufficient capital to support key environmental and development endeavors. These deficiencies tend to be overcome by the financial support of international organizations. The four nations explored in this study, however, possess a stronger capacity to support internal operations than do many other developing nations. They are not the poorest of the poor. Therefore, states' financial contributions to PES programs are expected to meet or slightly exceed that of international organizations.
- (4) States are expected to make payments to ecosystem service providers on behalf of ecosystem service recipients. In other words, government-financed mechanisms are anticipated as opposed to user-financed mechanisms. The scale, regularity, and direction

of ecosystem service payments are inclined to necessitate heavy government involvement in this area.

These predictions do not represent the entirety of what this study will explore. They are simply a few probabilities that should be acknowledged given the realities of the developing world, the limited influence of market mechanisms, and the historical behaviors of international organizations. This study will present findings of states' and international institutions' impact on national PES programs in far greater depth and will cover a wider range of program characteristics. It is worthwhile, however, to note these few simple predictions early on because any findings that contest these assumptions would constitute a highly important discovery and raise some very puzzling questions.

PART V, DESIGN AND METHODS

Overview and Major Steps

This study's primary inquiries will be answered via a thorough review of four of the most committed national PES schemes in developing world. Drawing insights and information from four notable examples, this investigation will generate as clear a depiction as possible of the relationship between states, international organizations, and national PES programs. Costa Rica, Mexico, Vietnam, and China comprise the group of nations at which this study is aimed. Six key steps will be taken to assemble an accurate characterization of the relationships in question:

- (1) For each of the four nations investigated, an attempt will be made to identify and elaborate states' contributions to two central PES program components: payment mechanisms and financial management; and legal and policy measures.

- (2) For each of the four nations investigated, an attempt will be made to identify and elaborate international organizations' contributions to two central PES program components: payment mechanisms and financial management; and legal and policy measures.
- (3) Using the findings attained from a review of these four cases, an attempt will be made to identify trends among states' relationships to PES programs with respect to two central program components: payment mechanisms and financial management; and legal and policy measures.
- (4) Using the findings attained from a review of these four cases, an attempt will be made to identify trends among international organizations' relationships to PES programs with respect to two central program components: payment mechanisms and financial management; and legal and policy measures.
- (5) Using the findings attained from a review of these four cases, an attempt will be made to establish the degree to which program creation, preservation, and enrichment is dependent on state intervention.
- (6) Using the findings attained from a review of these four cases, an attempt will be made to establish the degree to which program creation, preservation, and enrichment is dependent on the intervention of international organizations.

Rationale for Selected Nations

Costa Rica, Mexico, Vietnam, and China host some of the most developed and ambitious national PES programs in the developing world. Their size, duration, and sophistication indicate a commitment to PES as opposed to mere experimentation. In other words, they are true national PES programs. In part due to their longer history and larger scale, the programs of these four

nations have received vast amounts of attention from scholars and professionals. A sizable amount of information and analyses can be found among a sea of case studies, reports, and government statements, easing the process of amassing the data needed to realize this study's ultimate objective. There is also enormous value in assembling a diversity of country types, which this group of nations clearly provides. Such variation presents an opportunity to specify precisely how trends or divergences in the nature of institutions' relationships to programs occur. For example, do states' or international organizations' relationships to programs bear resemblances or differences according to the world region in which the program is found? Are such similarities and divergences explained by the nation's historical economic model, or perhaps by the age of the program? The four nations selected for this study permit an examination of PES programs in two very different world regions, Latin America and Asia. This group also encompasses nations with very divergent recent ideological histories. Mexico and Costa Rica represent a more democratic, capitalist ideological heritage while China and Vietnam have leant more toward a communist school of thought. The age of these nations' programs vary significantly as well. Costa Rica's program, for instance, emerged in 1996 while Vietnam's program began to take shape in 2008. Perhaps the most important quality of this list, however, is the fact that four countries provide a sufficient number to observe trends among cases while still remaining a manageable study.

Rationale for Highlighted International Organizations

The World Bank, USAID, GEF, GIZ, and Winrock International have been highlighted as probable essential contributors to the national PES phenomenon in part because multiple case studies have made mention of these institutions' support for national programs, through funding or other forms of assistance. Recurrent evidence of their role appears throughout the literature.

However, they have also been selected for investigation because of their strong history of influence on multiple aspects of developing nations' domestic affairs. The World Bank and USAID, especially, have played integral roles in many development and environmental preservation processes throughout the developing world. The World Bank and USAID have sponsored or assisted numerous local and regional PES programs in developing nations, including those nations examined in this study. The largest of these five organizations possess financial, technical, human, and intellectual resources capable of sustaining national-level PES efforts. They also have a history of endorsing market mechanisms as a means to alleviate development stagnation. This feature may be most recognizable in the World Bank, but other development institutions have certainly advocated socio-economic betterment via free market strategies.

Information Sources

To improve chances for amassing the extensive amount of information this study requires, it is essential to extract information from a large and diverse set of sources. Where one source falls short, another may deliver, thereby filling data gaps. Four general categories of information sources have been selected for this study:

(1) Project and Program Records of International Development and Financing Institutions:

Development institutions tend to maintain detailed accounts of past, current, and planned environmental and development projects. The information contained in these reports covers financial commitments as well as technical, monitoring, and information and analysis services. Some also outline the legal and policy conditions attached to loans, helping to clarify international organizations' impact on legal and policy components of PES programs.

Information on the timing and duration of development institutions' involvements in national PES programs is clearly noted along with, in many cases, analyses of program outcomes. National PES program reports appear in some development institutions' online archives. Extremely valuable insights into development institutions' role in both the initial launch of the PES approach and the continued operation of the PES program can be derived from these sources. Examples of national PES program reports supplied by the World Bank include "Costa Rica: Ecomarkets Project", "Mexico: Environment Services Project", and "Costa Rica: Mainstreaming Market-Based Instruments for Environmental Management Project" (Worldbank.org).

- (2) National PES Program Case Studies: A number of national PES program case studies touch upon the contributions to national programs made by the state or by international organizations, emphasizing funding estimates and other support services. This type of information is fairly scattered throughout this source pool, but a clearer and more detailed picture of states' and international organizations' contributions to programs can emerge once data from these reports is consolidated, organized, and analyzed. Given the considerable number of case studies on Costa Rica, Mexico, China, and Vietnam, a large collection of data concerning institutions' effects on major program components is expected to be supplied by these sources.
- (3) National Environmental Departments' Reports and Statements: The departments or government wings under which PES programs operate are strongly inclined to furnish information on states' input as well as any assistance provided by international organizations. Given the likelihood of environmental departments' control over payment flows and support

services, data concerning state contributions to these areas in particular is expected to be found among departments' statements on PES program details.

- (4) Legal Documents of National Governments: The specific details of legal and policy measures taken by both states and international organizations are likely to be found among governments' official legal literature. Laws, decrees, and orders specifically tied to PES are easily accessible sources containing very precise language on specific legal developments relevant to programs.

The value of these sources and this research design lies not only in their capacity to confirm that strong connections between supportive institutions' and PES program development do, in fact, exist, but also in their ability to illustrate the precise nature of those relationships. The quantity and quality of data needed to identify trends across the four selected nations should be easily supplied by these means. At the very least, a review of these sources will constitute an exhaustive search of existing data. Thus, this approach will determine what general statements about the relationships in question are possible at this point in time.

PART VI, FINDINGS

The following findings include a sizeable number of critical details concerning states' and international organizations' roles in program development in each of the four country cases, two Latin American and two Asian, selected for this investigation. Data are presented by country and are also separated into distinct subcategories. Each country case contains a subsection on the state's contributions to payment mechanisms and financial management, a subsection on the state's contributions to legal and policy measures, a subsection on international organizations' contributions to the payment mechanisms and financial management components of programs

operating within that state, and a subsection on international organizations' contributions to legal and policy components of programs operating within that state. The details presented in this section are the means by which trends related to states' and international organizations' contributions to programs are later identified.

Costa Rica (State)

Payment Mechanisms and Financial Management

The payment apparatus and financial management approaches of Costa Rica's program reflect a massive level of state intervention. PSA, Costa Rica's national PES program, is an important part of the state's budget and the program is widely regarded as government-funded. Despite the government's sizable role in these areas, however, the state has proven incapable of sustaining the program entirely through its own resources. The state's contribution to program funding is supplied primarily through a 3.5% fossil fuel sales tax, the revenue from which is directed to FONAFIFO, the government agency under which PSA operates (World Bank 2). Additional state support is generated through a 25% national water-use tariff, derived from the consumer use of public water supplies, and these two sources together have represented roughly 40% of total PSA funding" (Blackman and Woodward 1629). The remainder has been provided by non-state sources. The state has recognized an increasing need to rely on tax revenues for program support, thus motivating the water-use tariff introduced some years after the establishment of the fuel tax. An extremely small portion of the land under PSA protection, just 3%, is funded by direct-user financing, well short of the amount needed to constitute a hybrid payment mechanism (Blackman and Woodward 1627). Challenges in securing sufficient funds for PSA's operation have also provoked the government's consideration of many other creative

fund-generating alternatives, though the fundamental aspects of PSA's payment model have remained largely unchanged.

The state determines payment amounts and payment periods based on the type of environmental enrichment effort the program participant is supporting. For example, land owners supporting conservation efforts will be paid different amounts over different lengths of time than will owners enrolled in agroforestry projects (Fletcher and Breitling 405). Payments are supposedly intended to cover the opportunity costs of alternative land uses, such as land clearing. However, the voluntary and market-based nature of these payment agreements is significantly reduced given the illegality of any land use change without prior government consultation and consent. Some view PSA's payment apparatus as a "subsidy in disguise, a means of supporting forest conservation through funds generated primarily via government borrowing and redistribution of tax revenue to forest owners as a form of compensation, less for the opportunity costs of alternate land use voluntarily foregone than for the state-mandated prohibition on their right to clear their land" (Fletcher and Breitling 408). It should also be noted that even outside sources of program funding, the borrowed or donated portions, are also "collected and redistributed" by government organs, thereby leaving the great majority of PES capital circulating according to government direction (Fletcher and Breitling 407). These types of state-controlled payment arrangements and financial management designs depart radically from the neoliberal PES vision and are likely to stay in place for quite some time.

Legal and Policy Measures

The core aspects of Costa Rica's PSA program implementation have been steered in large part by pivotal government legislation enacted just prior to the program's launch. The program

was, in fact, established by the 1996 Forestry Law No. 7575 and assigned to the National Fund for Forestry Financing (FONAFIFO) through the same piece of legislation. The law granted FONAFIFO much authority over the program and introduced the multiple financing sources to be used at FONAFIFO's disposal, including, but not limited to, tax revenues, grants and loans from various international institutions, and market instruments (Chomitz 163). Even though some room was provided for the input of market instruments, Costa Rica's legal measures instituted the PSA program as an essentially state-run and state-funded venture, supplemented to a significant degree by non-governmental organizations.

A primary component of the law was to officially recognize four specific environmental services supplied by forest ecosystems: “(a) mitigation of greenhouse-gas (GHG) emissions; (b) hydrological services, including provision of water for human consumption, irrigation, and energy production; (c) biodiversity conservation; and (d) provision of scenic beauty for recreation and ecotourism” (World Bank 1). This was a necessary step in justifying the state's compensation of forest environment owners. The law established the “legal and regulatory basis” as well as the “financial mechanism” for contractual arrangements with landowners providing ecosystem services (World Bank 1). Perhaps an even more critical feature of the 1996 Forestry Law, however, was the banning of unapproved forest clearing, or any other form of land use change. The law ended any such alterations to the Costa Rican landscape without “express government permission”, a measure that “has long been controversial due precisely to the constraints it imposes on individual property rights” (Fletcher and Breitling 404). State control over private forest management plans had a significant impact on what PSA ultimately became. While the program was originally promoted as a market-based conservation strategy, to some it is now perceived as “a quid pro quo for legal restrictions on clearing rather than an incentive for

forest preservation” (Fletcher and Breitling 404). How PSA took shape, how it was managed, how it was financed, and how its relationships with landowners materialized were, in large part, determined by Costa Rica’s initial legislative steps.

Costa Rica (International Organizations)

Payment Mechanisms and Financial Management

International organizations have, perhaps not surprisingly, supplied an even greater portion of total PSA funding than has the Costa Rican federal government. Forty-five percent of the program’s financing has been delivered by international financial institutions in the form of loans or grants (Blackman and Woodward 1629). The World Bank and the GEF have been the two greatest outside contributors of funds, which were provided “in direct recognition of the program’s failure to develop self-sustaining sources of financing via carbon markets, [and] to support current service payments as well as capacity building within FONAFIFO itself” (Fletcher and Breitling 407). The nation’s PES program had to adjust somewhat to the World Bank’s Loan Administrative Change Initiative (LACI), launched in 1996 and supposedly aimed at obliging sound financial management by bank borrowers. FONAFIFO “expended considerable financial and human resources to adapt its financial management system to LACI” (World Bank 9).

An additional 10% of program funding is donated by the German International Development Bank, which has focused on reforestation in Costa Rica’s northern regions (Blackman and Woodward 1629). Yet, the input of international organizations has not actually transformed PSA into a more traditional PES model. While funding contributions from these sources were “intended to provide temporary support to the current payment system while

simultaneously encouraging the future development of self-regulating markets, in the present they perpetuate the program's current state-dominated structure in that they are collected and redistributed by the very government organs the PSA market was intended to circumvent" (Fletcher and Breitling 407). Nevertheless, the joint supportive efforts of the GEF and World Bank have contributed much to the preservation and expansion of PSA's payment system. Perhaps the two most critical pieces of assistance were the payment of many of PSA's existing long-term commitments, formed in the program's early years, and the financing of countless new contracts (World Bank 38). Enabling PSA to honor its existing contracts with landowners was no doubt vital to the program's legitimacy and long-term survival.

Legal and Policy Measures

The integration of PES into Costa Rica's environmental and development policy structure along with the 1996 law that created and shaped PSA are directly traceable to World Bank initiatives. Like many environmental and development statutes fashioned by Latin American nations at the time, "both the program and law that founded it were instituted as part of the conditionality attendant to one of several structural adjustment programs demanded of Costa Rica by the World Bank and IMF, and to which receipt of the nation's third major World Bank loan was attached (Fletcher and Breitling 404). Forestry Law No. 7575 was, almost ironically, motivated by the World Bank to curtail the amount of state control and state spending on development and environmental affairs in Costa Rica. It was specifically intended to replace an existing system of subsidies to forest area landowners with a system of payments for ecosystem services, in theory installing market mechanisms in place of state expenditures. There was, for a time, a type of "governance gap" resulting from the bank's structural adjustments, but this gap was filled by additional loans and grants from international financing institutions (Fletcher and

Breitling 405). The ultimate outcome of the legal and policy changes inspired by the World Bank has been a greater degree of state governance in environmental affairs. This is not to say that World Bank intervention in Costa Rica's environmental laws was the cause of PSA's state-dominated nature. World Bank input, however, was responsible for the legal changes that formed the program and the program has entailed heavy state participation since its inception.

Mexico (State)

Payment Mechanisms and Financial Management

Mexico has launched multiple national-level PES initiatives. Its Payments for Hydrological Services Program (PSAH) was introduced in 2003 and in 2004 the nation established its Payments for Carbon, Biodiversity, and Agro-forestry Services Program (PSA-CABSA). Both of these programs operate under Mexico's National Forestry Commission (CONAFOR), though they each follow their own set of "procedural rules" (Cabrera et al. 748). They are similar in the fact that each program follows a system in which the Mexican government provides payments to rural landholders for the provision of ecosystem services. Funding for PES "has come almost entirely from the Mexican federal government, albeit with a large infusion from World Bank loans for the pilot program and again in 2006" (Shapiro-Garza 6). A portion of Mexico's government revenues are channeled to the Mexican Forestry Fund for PES purposes and payments are distributed to program participants by CONAFOR. Funding for PSAH is generated in large part by a portion of water use fees born by Mexico's federal water users, amounting to tens of millions of dollars annually (Dillaha et al. 76). While it is tempting to view water users, who represent the ecosystem service beneficiaries in this case, as the ultimate financiers of hydrological service payments, it should be emphasized that their water tax

payments are “compulsory fees”, ordered by the state (Engel et al. 666). Water users have had no real involvement in PES program design and lack the option to withhold payments if they do not receive satisfactory water services (Engel et al. 666). Thus, PSAH is very much a government-financed, government-driven program (Engel et al. 666). Under the PSAH program, state monies are “disbursed to individual and collective landowners possessing natural forests that serve watershed functions”, though per hectare payments for cloud forests are substantially greater than those for other types of forested land (Dillaha et al. 76). While PSAH payment levels vary according to environment type, it is the government that sets these amounts. PSA-CABSA biodiversity program participants are also paid according to a rough government estimate of their region’s biodiversity quality. PSA-CABSA funding, however, materializes in a much different manner than PSAH funding. PSA-CABSA monies are “annually negotiated” by Congress, which determines how much of Mexico’s federal budget should be allotted to the program (Cabrera et al. 748).

In addition to funding payments and setting payment levels, the Mexican government has much say over PES program participant selection, greatly impacting the direction of money flows. Mexico’s commitment to using PES as a poverty alleviation tool is evident in its increasing efforts to direct payments to marginalized groups of Mexican society. The state has adjusted aspects of its payment system to ensure that marginalized groups represent a greater proportion of payment recipients. CONAFOR has, for example, set an upper limit of 4000 hectares of land per program participant to ensure that large-scale landowners are excluded from PES payments (Shapiro-Garza 7). A study of 2003-2005 PSAH program participants revealed that “78% of participants lived in municipalities with ‘high’ or ‘very high’ degrees of marginalization” while “61% of the participating parcels were classified as having a ‘low’ or

‘very low’ risk of deforestation and 79% were in areas without officially recognized problems of water scarcity” (Shapiro-Garza 8). In 2007, CONAFOR initiated a requirement that all program participants be from areas categorized as either “marginalized” or “highly marginalized” and this measure, combined with earlier steps to prioritize marginalized groups, resulted in a 91.4% rate of participants falling into one of those categories by 2007 (Shapiro-Garza 8).

Highly reminiscent of Costa Rica’s PES program development, payment strategies in Mexico have so significantly deviated from the neoliberal program design that “as of 2012 the programs have essentially become federally funded rural subsidies (Shapiro-Garza 7). This characterization is, in fact, very much in line with the perceptions of many of Mexico’s program participants, who generally do not feel as though they are being paid for a tradable commodity but rather rewarded for their valuable environmental stewardship. Mexico’s PES programs have been specifically tailored by the state to serve the nation’s priorities. Evidently, poverty reduction is not just a secondary purpose of PES programs in Mexico, but is viewed as equally or more important than environmental protection. The state’s particular aims are clearly reflected in its PES program design, which is most accurately described as a government-created, government-funded, and government administered model. However, as a discussion of the legal and policy measures concerning Mexico’s PSA-CABSA program will show, the government’s creation of PSA-CABSA was carried out in direct consultation with important parties within Mexican civil society.

Legal and Policy Measures

The birth and many fundamental features of Mexico’s national PES programs are traceable to two key legislative agreements of 2003: the General Law for Sustainable Forest

Development and the National Rural Agreement. The General Law for Sustainable Forest Development contains the “legal basis for the development of national PES programmes in Mexico” (Cabrera et al. 748). Similar to early measures taken by the Costa Rican government, the General Law for Sustainable Forest Development took the critical step of recognizing and defining ecosystem services, among them carbon capture and hydrological services, as well as declaring the generation of environmental services a public utility (Government of Mexico 2003). It also defined distinct forest types, which are a major consideration in setting PES payment levels for transactions under the PSAH program (Government of Mexico 2003). Also critical to shaping the nature of PSAH program administration was a decision by Mexico’s Ministry of Finance to classify program funds collected via federal water fees as subsidies rather than as payments for service (McGafee and Shapiro 588). Mexican law stipulates that “subsidy funds must be distributed by a federal agency” (McGafee and Shapiro, pg. 588). Thus, federal control over the program, with funds held by the Mexican Forestry Fund and distributed by CONAFOR, was very much solidified by this small legal detail.

The National Rural Agreement was essential to the formation and design of Mexico’s PSA-CABSA program. The agreement was the product of state negotiations with a coalition of social movements aimed at furthering the rights, recognition, and interests of rural communities in Mexico and creating a sensible development plan for the Mexican countryside. The agreement covered “a number of strategic sectors for policy development and funding priorities, such as the development of a policy programme ‘to implement payments for ecosystem services: (i) on carbon fixation by forests to halt climate change; (ii) for rural communities who support biodiversity conservation; and (iii) for the development of agroforestry systems, specifically for shade-grown coffee plantations’” (Government of Mexico 2003; Kosoy et al. 2077). Among the

desires of these groups were specific PES policy reforms. Mexican President Fox signed the National Rural Agreement that “detailed policy changes promised during negotiations with MECNAM-affiliated groups (Diario Oficial de la Federación 2003; McAfee and Shapiro 590). Government cooperation with the coalition ultimately produced a new PES program, PSA-CABSA, which recognized active land management, not just leaving natural environments untouched, as an environmental service payable under PES plans. This approach would supply greater economic aid to rural communities by including them in the PES process and rewarding them for the type of environmental stewardship they were more inclined to provide. These legislative and policy steps demonstrated a clear government willingness to incorporate the interests of marginalized rural groups in PES program design, interests which may not have been served if programs were to follow the neoliberal model advocated by some PES theorists. Mexico’s two PES programs have since been consolidated under a new PROARBOL program and the government has stepped back from negotiations with the social movements. The changes from government negotiations with these groups, however, have had lasting effects and demonstrate the state’s capacity address Mexico’s specific priorities and reshape PES programs as needed through political process.

Mexico (International Organizations)

Payment Mechanisms and Financial Management

The World Bank and the GEF have made enormous contributions to the funding of Mexico’s PES programs, but have had a much smaller impact on programs’ actual payment mechanism designs. World Bank funding has been provided at multiple points throughout Mexico’s program development and has considerably aided program expansion. In 2001, the

World Bank supplied funding for the development of a pilot PES program to precede the national level program, but left the task of program design to the National Institute of Ecology (INE), a federal environmental policy and research agency. The World Bank funded “preliminary data collection and evaluation” during these early stages and “formed an advisory committee of academics and representatives from environmental organizations and municipal officials”, though this group “had no decision-making power” (Munoz-Pina et al. 726; McAfee and Shapiro 588). Thus, the World Bank’s role in Mexico’s early program development came primarily in the form of financial backing and consultative services. Subsequent financial assistance from the World Bank and the GEF has been quite substantial and beneficial, but the more recent attempts by these institutions to intervene in the course of PES program development has revealed their strong intention to counter the non-market features of Mexico’s PES schemes. In 2006, a \$45 million World Bank loan and a \$15 million GEF grant were awarded to Mexico to “restructure and expand the PES program” (McAfee and Shapiro 593). The Bank’s stated project goals included improving program efficiency, cultivating market-based PES processes, developing new financing mechanisms, and making actual payments to ecosystem service providers (World Bank IV-5). The GEF was also concerned with improving the targeting of the PSAH and “establishing an endowment fund for biodiversity conservation to provide long-term financing for payment for environmental services”, a fund which became the financial base of the PES program’s biodiversity component (World Bank IV). Another highlighted aim of the GEF was to “ensure that only sites with globally significant biodiversity will receive GEF funds under the national or local programs in the project area” (World Bank IV).

Repeated vigorous attempts have been made by the World Bank to introduce mechanisms more reminiscent of the neoliberal model, but these efforts have by and large failed to alter the pro-poor, pro-marginalized approaches devised by the Mexican government. In some of the more recent discussions between Mexico and the World Bank, Bank advisors have downplayed the primacy of poverty reduction as a PES program goal, claiming that “targeting aimed at poverty reduction ‘risks undermining (the) primary objective of generating valuable ecosystem services’ (McAfee and Shapiro 593). The Bank has also urged CONAFOR “to switch from flat rate payments to a system graduated by predicted risk of deforestation and by opportunity costs”, a move that would likely divert payments away from marginalized groups, and has encouraged the elimination of ecosystem service payments for agroforestry, payments which are strongly favored by Mexico’s poor rural communities (McAfee and Shapiro 594). Mexico has resisted both of these pressures, maintaining “full funding for improvement of existing agroforestry systems” and deeming “differentiated payments” to be “politically unviable and, to some, morally indefensible” (McAfee and Shapiro 594). In these and many other ways, Mexico has managed to ward off the World Bank’s attempts at program reshaping. Despite the persistence of international organizations, the Mexican government has preserved heavy influence over its PES programs and a payment strategy that prioritizes the country’s poor. Nevertheless, international organizations’ sizeable contributions to program funding in both the initial and advanced stages of program development have been of supreme importance to program creation, program continuation, and program expansion.

Legal and Policy Measures

The impact of the World Bank and GEF on the legal and policy components of Mexico’s PES programs is well elaborated in the previous subsections. The World Bank’s contribution to

early policy development came primarily in the form of data collection and advisory services, though ultimate decisions were made by agencies within the Mexican government itself. Subsequent attempts by the World Bank and GEF to drive policy toward a more market-based, neoliberal model have been strong and persistent but have thus far failed to alter the state-centered nature of programs.

Vietnam (State)

Payment Mechanisms and Financial Management

While Vietnam's PES payment mechanism has been characterized by some as a user-led plan, a closer look at the nation's methods reveals that this is far from an accurate description. Vietnam's national program is only user-led in the sense that those identified as beneficiaries of ecosystem services are those that act as the suppliers of ecosystem service payments. Four categories of ecosystem users are obliged to present such payments: hydropower production facilities; water utilities providers; tourism organizations; and industrial production firms (Guignier and Rieu-Clark 254). Most of these organizations, however, are themselves state enterprises. Identifying ecosystem service beneficiaries and mandating regular payments from these entities was an important step in initiating payment processes, though some view the limited number of recognized service users as a shortcoming of the program. Some fear the small list of user categories may "limit the scope of PES, as other users could be excluded from payments despite benefiting from the forest environmental services" (Guignier and Rieu-Clark 254) While this small handful of entities acts as service buyers, the state regards "local farmers, local farming households, and local farming communities who had already been allocated forest lands as the service providers" (Suhardiman et al. 66). It should be noted that Vietnam's forests

are not privately owned, but are managed by individuals or groups who have been granted temporary land-use rights by the government. The issue of land-use rights is of central importance to Vietnam's national PES program. Those lacking land-use rights are potentially "sidelined" from the PES process "as they will not fit into the supplier category" (Guignier and Reui-Clark 254). Moreover, those with so-called land-use rights are often obliged to participate in the state's payment for ecosystem service plans. Considerable state control is seen not only over who plays the part of buyer and seller, but in virtually every aspect of Vietnam's payment scheme. The state "defines the payment framework, regulates the payment mechanisms, decides on the types of services, identifies the buyers and sellers of ecosystem services, and ensures that the transaction or the payment occurs" (Suhardiman et al. 69). It is also responsible for ecosystem service valuations. Program participation from both buyers and sellers is compelled by the state.

PES funds are centrally managed with the state dictating the channeling of funds. Ecosystem service buyers "pay the environmental fee to the government rather than channel it directly to farmers or to farming communities as the service providers" (Suhardiman et al. 68). Collections and fund management are performed by Vietnam's Forest Protection and Development Fund. No negotiations occur between buyer and seller "regarding the amount of funds, types of services, or payment intervals" (Suhardiman et al. 68). As is the case in Costa Rica, there is some speculation as to what purpose Vietnam's PES program is truly meant to serve. Suhardiman et al. argue that the "dissonance in Vietnam's PES program design and implementation is driven primarily by the government's interest in using PES to generate additional revenue for forest protection and watershed management", allowing the state to "sustain and expand its role and importance in natural resource management" (69).

Legal and Policy Measures

Vietnam's PES program design has been fashioned by two essential and momentous legislative decisions, namely Decision 380 of 2008 and National Decree 99 of 2010, the latter also referred to as the Payments for Forest Ecosystem Services Law. Decision 380, the first clear indication of the nation's commitment to crafting a national PES policy, outlined the legal and administrative guidelines for PES in Vietnam and called for three pilot PES programs. The perceived success of these programs would later inspire the creation of a national PES policy, enacted through the 2010 National Decree, and initiate a nation-wide amplification of PES efforts. Decision 380 "stipulates the types of forest environmental services; norms of payment for use of services; the management of the money collected from FES provision; rights and responsibilities of the payees and payers of forest environmental services, and the responsibilities of the government agencies to the implementation of the policy on payment for forest environmental services" (Government of Vietnam 2008). The means of ecosystem service valuation, the forms of payments, the duration of payments, and the management of transactions are all prescribed by the decision (Government of Vietnam 2008). While the decision claims to endorse voluntary negotiations between buyers and sellers of ecosystem services, "contradictory language in the document seems to suggest precisely the opposite", implying "mandatory participation for both entities" (Kolinjivadi and Sunderland 5). The decision states that hydropower production facilities, water utilities providers, and tourism organizations will serve as buyers in Vietnam's pilot programs while "organizations, households, individuals, and village communities located within the identified pilot watershed sites are 'liable before the law for the implementation of the pilot policy as stipulated in this Decision'" (Government of Vietnam 2008) (Kolinjivadi and Sunderland 5). Thus, not only does the decision clearly pronounce a

massive state role at virtually every level of program implementation, it also legally commits individuals, groups, and organizations to the PES process. The mandatory participation of ecosystem service providers may, however, remedy problems created by Vietnam's inadequate land tenure rights. These have resulted in "limited motivation for land users, on both agricultural and forest lands, to manage land with long-term objectives and as a result widespread unsustainable use remains a concern" (Kolinjivadi and Sunderland 2). Legal liabilities for potential ecosystem service providers could certainly reduce this motivation deficit.

The 2010 National Decree, or Payments for Forest Ecosystem Services Law, embodies much of the substance of Decision 380, with a few modifications. The decree was intended, in large part, to elevate PES in Vietnam from the pilot stage to the national level. Similar to Decision 380, National Decree 99 "provides for the policy on payment for forest environment services in Vietnam, covering: (1) Types of forest environment services which are paid for by users to providers defined in this Decree; (2) Providers and users of forest environment services; (3) Management and use of the payment for forest environment services; (4) Rights and obligations of providers and users of forest environment services; (5) Responsibilities of state management agencies at all levels and of all sectors for the payment for forest environment services" (Government of Vietnam 2010). The Decree states in simple language that "beneficiaries of forest environment services shall pay for these services to owners of forests providing such services" (Government of Vietnam 2010). It also outlines formulas for setting payment levels according to beneficiary type. While the Decree allows for both direct payments, paid by ecosystem services users directly to providers, and indirect payments, paid through Vietnam's Forest Protection and Development Fund, there is little room for negotiating the actual conditions of payment arrangements in either scenario. In the case of direct payments, "the

provider and user of forest environment services shall reach agreement by themselves on types of services, level and method of payment for these services in accordance with the provisions of this Decree and other relevant provisions of law” and “the level of payment must not be lower than that set by the State for the same type of forest environment service” (Government of Vietnam 2010). In the case of indirect payments, “payment is made with the intervention and support of the State and with prices of forest environment services fixed by the State” (Government of Vietnam 2010). According to the 2010 National Decree, The Forest Protection and Development Fund is entitled to receive and allocate ecosystem service payments, identify payers and establish payment amounts, and represent ecosystem service providers in signing contracts (Government of Vietnam 2010). The ultimate impact of Decision 380 and National Decree 99 has been not only the initiation and propulsion of PES processes at a national scale, but also significant mandates for relevant parties and a legal basis for state intervention in every detail of PES implementation.

Vietnam (International Organizations)

Payment Mechanisms and Financial Management

Winrock International, USAID, and the German Agency for International Cooperation (GTZ) were the top contributors of financial and technical support of Vietnam’s pilot programs. The impact of these organizations on Vietnam’s pilot programs was absolutely essential to the country’s advancement to national-level PES initiatives and the formation of the National Decree on PES. USAID’s input came mainly in the form of funds, a three-year grant awarded to Winrock International to implement its Asia Regional Biodiversity Conservation Program (ARBCP) (Tan IV). Winrock’s ARBCP, however, was instrumental in shaping key aspects of the

programs' financial management design. The ARBCP supported Lam Dong Province's first Biodiversity Conservation Action Plan (BCAP), which "set out the framework for using funds generated by Payments for Ecosystem Services (PES) mechanisms to support and sustain the Province's priority conservation targets" (Charimba et al. 2). The ARBCP also performed the initial estimates of the "tangible economic value of two key environmental services provided by intact forests, namely water regulation and soil conservation", valuations described as "instrumental in securing the confidence of policymakers with regard to setting payment levels to environmental service providers" (Charimba et al. 4). In 2005 and 2006, before the announcement of Decision 380, the ARBCP conducted a series of feasibility studies that "helped determine the extent to which development of PES mechanisms would likely be able to offset the opportunity costs of biodiversity conservation" (Tan 15). It was the ARBCP that initially explored the possibilities for implementing PES contracts in Vietnam, securing ecosystem service buyers, and introducing successful PES payment plans (Tan 15). The positive outcomes of these assessments motivated the ARBCP to advise Vietnam's Ministry of Agriculture and Rural Development (MARD) and other government bodies to consider a PES pilot policy embracing Winrock's basic designs. The state did, of course, develop such a policy with Decision 380, which outlined payment mechanisms very much in line with Winrock's proposals. A second round of funding was provided to Winrock in 2009 to support the development of a full national PES policy. This support and collaborations between Winrock and Vietnam's MARD helped to ensure a successful two-year piloting phase which not only prompted National Decree 99, but also shaped much of the decree's content regarding payment mechanisms and financial management. GTZ, who claims much responsibility for the mechanism instruments

setup of the Son La province pilot, undoubtedly deserves some credit as well for informing the decree's payment mechanism details.

Legal and Policy Measures

Decision 380 has been viewed as a crowning achievement of Winrock International, just as it has been considered a major milestone for Vietnam. The decision could be regarded as the culmination of Winrock's efforts. Winrock has described itself as the "main partners to support the MARD in formulating the Policy on Pilot Payment for Forest Environmental Services" (USAID 2010). The pilot policy was indeed "based on independent analysis conducted by ARBCP in the first phase [of its program]" (Tan 16). Moreover, because Winrock and GTZ were such major players in Vietnam's PES pilot stages, they must be recognized as critical influences on the birth and substance of the 2010 National Decree. The approaches used in the piloting phase are "well embedded into the national policy framework on PES" (Tan 20). Decision 380 itself plainly states that its purpose is to "establish the basis for the development of the legal framework for a national policy on payment for forest environmental services to be applied in the whole country" (Government of Vietnam 2008). Thus, the linkage between Vietnam's current national legal framework and Winrock and GTZ is abundantly clear. This is not to say that the legal and policy components of Vietnam's PES program are purely a product of international organizations' efforts. The state did, after all, make the ultimate decisions with regard to policy details and the National PES Decree was by no means a forced legislative move. However, the process by which Vietnam's national PES policy and its specifics were generated relied greatly on USAID funding and the major advisory roles of both Winrock International and GTZ.

China (State)

Payment Mechanisms and Financial Management

While China's national government has given ample consideration to a strategy that utilizes both market mechanisms and "government guidance", the "government guidance" element of China's national-level PES programs is, in practice, sufficiently large to constitute a "predominantly public-sector driven approach" (Scherr and Bennett 2). The state plays an integral part in all aspects of the payment process, making most of the decisions concerning payment details. A system of government compensation for the provision of environmental services "is currently the most important and easily implementable" payment apparatus in China (Zhen and Zhang 10). The World Bank has characterized China's predominant payment scheme as an "Ecological Compensation Mechanisms (ECM) approach", which "relies on available government funds and directs them to conservation activities, as in the Grain for Green program that reaches some 30 million farm households and distributes some US\$8 billion per year (World Bank 7). Under an ECM plan, the government "decides what environmental services to support", using "general tax revenues to do so", and "there is no direct input from service users on what they want (or how much they are willing to pay for it)" (World Bank 7). China's national programs follow a system in which the state "identifies who should be compensated and how much should be paid by taking the provision and protection of ecosystem services into account" (Zhen and Zhang 10).

While China hosts a handful of national level programs and the exact methods of administering those programs vary considerably, all programs reflect substantial state control over payment processes and contract details. One interesting feature of China's largest national

PES program, its Sloping Land Conversion Program (SLCP), is its use of multiple forms of payment for services. Under the SLCP, the state “provides individual households with direct cash and in-kind (food grain and seedlings) payments to convert their steeply sloping farmland to forest or pasture” (Huang et al. 561). Payments under this program are generally regarded as subsidies. Grain and cash subsidy levels and the duration of compensation vary according to region and the specific forest type, “economic” or “ecological”, into which farmland is being converted (Zhen and Zhang 15). The specifics of these payment levels and durations are determined exclusively by the state. Government agencies “are tasked with releasing compensation in cash and grain, managing land contracts with farmers, mediating disputes, selecting and measuring land area for conversion, distributing saplings or grass species, issuing contracts, and monitoring results of conversion” (Kolinjivadi and Sunderland 3). While much financial management and other program planning occurs at the local level, major decisions generally must be approved by the central government (Kolinjivadi and Sunderland 4). The state has demonstrated a desire to target payments to benefit the particularly poor segments of the population. SLCP “has targeted poor rural areas where average household income is less than the average household income for rural China as a whole” (Huang et al. 572).

The degree to which participation in China’s national PES programs is voluntary is a question of some debate, but multiple studies have revealed widespread instances of compulsory involvement in programs. A 2007 USAID report notes that, while ecosystem service providers “can opt to participate in the Sloping Farming Lands Conversion Program PES scheme”, the government “specifies how the land is to be managed and farmer participation has not always been voluntary” (79-80). However, Kolinjivadi and Sunderland maintain in 2012 that SLCP “is established on the basis of voluntary participation in terms of farmer choice to be involved and

the choice of land management adopted” (2). It seems that, while SLCP has been promoted as a system of voluntarily formed contractual arrangements, “some farmers are forced to subscribe to the scheme both by their neighbors and by village councils who are themselves required to meet specific conversion targets originating from higher levels of government rather than based on local conditions, land use practices, or household needs” (Kolinjivadi and Sunderland 7). Moreover, like farmers in Vietnam, farmers in China reside on lands controlled by the state and are, thus, obligated in many cases to observe state guidelines concerning land management (Kolinjivadi and Sunderland 9). It might be more fitting, then, to view ecosystem service providers in China as a “contracted labor force to temporarily manage state forestland”, “required to undertake land management activities with compensation as a redundant token for otherwise required activity”, as opposed to voluntary program participants (Kolinjivadi and Sunderland 9).

Legal and Policy Measures

The Chinese government has taken many policy measures to affirm its commitment to PES as an environmental protection and sustainable development strategy and to establish the general principles guiding program implementation. As early as 2005, official government policy statements identified the development of eco-compensation mechanisms as a primary state objective. That year, China’s State Council released “Document No. 39, State Council Decision Regarding Using the Scientific Development View to Strengthen Environmental Protection, which states that the government ‘should improve eco-compensation policy and develop eco-compensation mechanisms as quickly as possible’” (State Council 2005; Zhang et al. 2). China’s 11th Five-Year Guidelines (2006-2010), part of a regular series of publicized environmental, social, and development plans, “calls for innovation in environmental policy, and the

development of eco-compensation pilots, and for policymakers to quicken the pace of development of eco-compensation mechanisms, to develop intra-regional and watershed-related eco-compensation mechanisms, and to resolve funding issues regarding conservation.” (Bennett 14). Responding to the Five-Year Guidelines, China’s Ministry of Environmental Protection released its “Guiding Opinions on the Development of Eco-compensation Pilot Work, which detailed four main areas of focus for the development of eco-compensation pilots: watersheds, key ecological function areas, mineral development areas and nature reserves” (Zhen and Zhang 16). It also highlighted five key principles to guide eco-compensation program development:

- (1) Those who develop and exploit resources should also protect the environment, those who destroy the environment should repair it, those who benefit from it should subsidize it, and those who pollute should pay;
- (2) Responsibility, right and power are synonymous;
- (3) “Win-win” development should be achieved by jointly realizing public construction of the environment and public benefit;
- (4) Government guidance should be combined with market regulation, wherein funding source diversification and greater harnessing of market forces is encouraged; and
- (5) Adapt central policy to local conditions and energetically innovate (Bennett 14).

However, the manner in which China’s national-level PES programs currently operate suggests that perhaps not all of these guiding principles have been heeded. In recent years, China has also been in the process of developing a national Eco-Compensation Ordinance, largely intended to strengthen the legal foundation of eco-compensation programs and clarify various eco-compensation policy instruments. Measures that are to be addressed in the Eco-Compensation Ordinance include “financial transfer payments”, the “continuation of preexisting ecological programs that have eco-compensation characteristics and functions”, and the “improvement of the related system of natural resource environmental taxes and fees” (Zhang and Bennett 5).

China (International Organizations)

An exploration of sources selected for this investigation has revealed no noteworthy contributions by international organizations to the development of China's national PES programs, neither to payment mechanisms and financial management nor to legal and policy program components. China has operated with remarkable independence in terms of financing, administration, and law and policy formation.

PART VII, ANALYSIS

The following analysis identifies and elaborates key trends and differences across the four country cases presented in the findings section. Seven important commonalities concerning states' and international organizations' relationships to program development are highlighted and discussed with a specific focus on two essential program components: payment mechanisms and financial management; and legal and policy measures. Trends related to states' contributions to program development are described separately from those related to international organizations' contributions because states and international organizations each play their own unique role. Each of these two institutional actors has its own distinct set of influences on program development. Three noteworthy differences are also presented according to the two key program components highlighted in this study. Clearly, the number of similarities significantly outweighs the number of variations. Divergences are seen by region, though it could also be said that divergences are seen by economic model. In other words, while divergences are observable between the Latin America region and the Asia region, divergences are also seen between nations that have followed a free market economic model and those that have traditionally followed a more state-dominated economic model. This overlap results from the fact that both

Latin American nations selected for this study lean towards a free market economic model while both Asian nations reflect a model that is more state-dominated. Two helpful visual illustrations are also presented in this section, one delineating major features of state contributions to national PES programs and another delineating major features of international organizations' contributions to national PES programs. These visual aids will be presented first, so that the following discussion of trends and differences can be better understood.

(Visual Aids and Analyses Presented Below)

Major Features of State Contributions to National PES Programs

(A feature being observable in at least three out of four country cases constitutes a trend)

(A feature not being observable in at least three out of four country cases constitutes a difference)

Country	Government Funding?	Government Administration?	Beneficiary Participation Compelled?	Provider Participation Compelled?	Gov't Determines Payment Details?	Gov't Controls Lands Under Contract?	National PES Laws/Policies Introduced?
<i>Mexico</i>	•	•	•		•		•
<i>Costa Rica</i>	•	•	•	•	•		•
<i>Vietnam</i>	•	•	•	•	•	•	•
<i>China</i>	•	•	•	•	•	•	•
Trends	<i>Government Funding</i>	<i>Government Administration</i>	<i>Beneficiary Participation Compelled</i>	<i>Provider Participation Compelled</i>	<i>Gov't Determines Payment Details</i>	<i>(Differs by Region)</i>	<i>National PES Laws/Policies Introduced</i>

Major Features of International Organizations' Contributions to National PES Programs

(A feature being observable in at least three out of four country cases constitutes a trend)

(A feature not being observable in at least three out of four country cases constitutes a difference)

Country	Advising, Compelling, or Supporting Initial PES Legislation/Policy?	Major Contributions to Program Funding?	Commitment to Altering Nature of Programs?
<i>Mexico</i>	•	•	•
<i>Costa Rica</i>	•	•	•
<i>Vietnam</i>	•		
<i>China</i>			
Trends	<i>Advising, Compelling, or Supporting Initial PES Legislation/Policy</i>	<i>(Differs by Region)</i>	<i>(Differs by Region)</i>

Trends Regarding States' Impacts on Payment Mechanisms and Financial Management

(1) Government Financing and Administration of Payments for Ecosystem Services

Perhaps the most important consistency among the four nations investigated is the government funding of ecosystem service payments and government administration of programs. The national PES programs examined in this study are by and large government-funded and government-run. While governments may amass the revenues used for payments from a variety of source types, including new program-specific taxes, mandatory environmental fees, international donors, or simply existing government monies, the fact remains that governments act as the providers of payments, the distributors of payments, and the predominant players in program coordination. Each country case, Costa Rica, Mexico, Vietnam, and China, demonstrates this type of government involvement.

(2) Government Control over Payment and Contract Details

In addition to supplying ecosystem service payments, governments determine the payments' key features. States set the criteria by which all payment details are decided. They identify the ecosystem services for which payments will be made, establish the value of those ecosystem services, and set payment levels, payment intervals, and payment durations. States identify who will act a buyer and who will act as seller. They arrange contracts, establish contract conditions, and enforce contracts. States also tend to steer the direction of payments to specific geographic areas, individuals, or communities in order to better serve national environmental preservation or poverty alleviation goals. Every critical aspect of payments and payment processes is fashioned by the state.

(3) Compulsory Participation of Ecosystem Service Beneficiaries

Governments tend to command the participation of those individuals, communities, and organizations they have identified as ecosystem service beneficiaries by imposing compulsory fees or other forms of payment. Ecosystem service beneficiaries often find themselves contributing to national PES program revenue pools without any real form of consent or independent decision-making. Taxes and other fees are often directly tied to a relevant ecosystem service, such as clean water provision, or some environmentally significant process, such as fossil fuel emission. Ecosystem service beneficiaries are generally not inclined to choose between discontinuing the use of the ecosystem service and entering into the national payment apparatus. Mexico's public water users, for instance, are naturally inclined to continue the use of public water supplies and are, therefore, automatically committed to participation in the nationwide PES payment scheme by way of the water utility tax. Similarly, users of fossil fuels in Costa Rica are automatically drawn into the PSA payment apparatus if they are to continue the use of fossil fuels. The compulsory nature of beneficiaries' participation in programs could also be more explicit, as in the case of Vietnam. Those organizations identified as ecosystem beneficiaries in Vietnam are bound by law to pay into the PES program revenue stream. Regardless of the precise measures states take to realize the participation of ecosystem service beneficiaries, beneficiaries' involvement in programs is consistently tied to government steps to integrate them into national payment systems. As a result of government measures, beneficiaries pay even if they have not agreed to payment.

Trends Regarding States' Impacts on Legal and Policy Program Components

(1) Major Government Legislation Legitimizing and Steering Programs

The emergence of national PES programs, formulation of general program strategies, and shaping of exact program management details tend to be tied to specific PES legislation enacted by national governments. The roles of relevant government agencies, rights and duties of program participants, legal foundations for programs, financial mechanisms, and official declarations of government commitment to PES as an environmental preservation and sustainable development strategy are typically introduced by decisive national laws, acts, and decrees. Therefore, the behaviors of governments, government branches, and program participants are shaped to a significant degree by such legislation. Costa Rica's 1996 Forestry Law 7575, Vietnam's Decision 380 and 2010 National Decree, and China's State Council Document No. 39 and Eco-Compensation Ordinance are all strong examples of legislative moves critically important to the introduction, development, and strengthening of nation-wide PES processes. The existence of programs, the major features of programs, and the manner in which programs are administered are greatly dependent on these types of legal measures and key policy decisions. Perhaps most importantly, these historic laws and decrees are vital to the process by which national PES programs take shape as state-run and state-funded enterprises.

(2) Government Compulsion of Program Participation through Laws, Decrees, and Orders

The participation of both ecosystem service providers and ecosystem service beneficiaries is often directly or indirectly induced by laws and other mandates generated by central governments. Different nations may use their own unique legal devices to compel the participation of relevant parties, but program participation tends to be traceable to specific

government orders. Multiple cases of ecosystem service providers participating in China's national programs are, for example, attributable to land conversion targets specified by the central government. Individuals and groups are forced to participate by local communities and village councils that are attempting to meet the state's land conversion goals. Participation in Costa Rica's PSA program is to some degree motivated by the illegality of land use change without government consent. The legal compulsion of program participation in Vietnam is an example of a more direct inducement, given that ecosystem service beneficiaries are specifically identified by law and ordered to supply ecosystem service payments and that service providers are explicitly pronounced liable before the law for the execution of PES program policies. The compulsory environmental taxes and fees that tend to be a major feature of national PES programs and that induce the participation of ecosystem service beneficiaries are also often introduced as part of PES legislation. Costa Rica's fossil fuel tax, for example, was instituted by the 1996 Forestry Law 7575. Regardless of the precise legal means by which it is achieved, program participation is frequently initiated and maintained by laws and mandates issued by the state.

(3) Legal Recognition and Definition of Ecosystem Services

A critical step taken by all nations examined in this study was the official state recognition of a small handful of ecosystem services. This was an important move for national governments and a pivotal point in national PES program development because it established which services would be paid for by program funds and justified the compensation of individuals or groups that furnished those services. The identification of particular services for which compensation would be awarded and the exclusion of other services from PES schemes naturally had an enormous impact on other program details. Establishing which services warranted

payment was a major step in resolving uncertainties concerning who would receive payments, how funds for payments would be raised, how much would be paid for services, and what geographic areas would be targeted for payment.

Trends Regarding IO's Roles in Legal and Policy Program Components

(1) Notable Role in Advising, Compelling, or Supporting Initial PES Legislation and Policy

With the exception of China, nations' initial legislative and policy efforts concerning the use of PES at the national level were either required, assisted, financed, or advised by international organizations. The degree to which international organizations participated in the early stages of law and policy formation and the exact nature of their involvement in those processes varied, but some form of participation was observable in the cases of Costa Rica, Mexico, and Vietnam. In Costa Rica, PES policies and the law that gave birth to the PSA program were adopted as part of a conditionality attendant to World Bank structural readjustment programs, making Costa Rica the only real example of international organizations compelling the use of PES as an environmental preservation tool. In Mexico, the World Bank's contribution to policy formation was limited mainly to consultative services, though the Bank did provide financial support for the 2001 pilot PES projects, data collection, and evaluations that preceded the creation of PES policies and the 2003 legislative agreements on PES. Thus, the Bank likely deserves some credit for supporting Mexico's adoption of the PES strategy. In Vietnam, international organizations demonstrated by far the greatest involvement in law and policy formation, not only funding the experimental and research stages of program development, but also playing a massive role in inspiring and advising the development of Decision 380 and the 2010 National Decree. In the cases of Vietnam, Costa Rica, and Mexico,

the importance of international organizations in motivating the adoption of some form of PES law and policy is clearly recognizable, regardless of the degree to which these organizations influenced the actual details of the laws and policies they helped to bring about.

Differences Regarding States' Impacts on Legal and Policy Program Components

(1) Gov't Control over Lands Managed by Ecosystem Service Providers (Differs by Region)

In the two Asia cases, farmers and other potential ecosystem service providers reside on lands that are state-controlled. Service providers in China and Vietnam do not, therefore, possess long-term land tenure rights, but rather temporary permission to manage assigned lands. Such conditions could have a profound impact on the true nature of PES programs in these two countries and mark a critical aspect in which Asian governments' influence on program development differs from that of Latin American governments. It may not be accurate to describe programs in China and Vietnam as systems in which land users consider their own individual interests while selecting from multiple land management options. Instead, because farmers in these two countries lack full land use rights, they are often required to adopt only those land management approaches that are in line with state preferences and goals. Often times, farmers adhere to specific forms of land management because they must, not out of anticipation of payments. This is not to say that farmers are not awarded payments, but there is reason to suspect that payments are not the primary motivation for farmers' behaviors. State requirements with regard to land usage are likely the main influence over farmers' decisions, even though payments are supplied. In the two Latin America cases, ecosystem service providers own the lands on which they reside. They are not legally bound to perform specific land management activities, but may opt to manage lands in a particular way in return for payment. Even in Costa

Rica, where land use change without government consent is illegal, land users can still enter into voluntary arrangements with the state in which payments are provided for agreed upon land use methods.

Differences Regarding IO's Roles in Payment Mechanisms and Financial Management

(1) Level of Funding Supplied by International Organizations (Differs by Region)

In the two Latin America cases, international organizations have contributed massive sums of money to fund payments for ecosystem services. Such contributions are not seen in the two Asia cases. While the experimental stages of Vietnam's PES program development were funded by large international donors, there is no evidence that these organizations continue to provide monies to Vietnam's PES schemes. In Mexico and Costa Rica, a huge portion of total program funding has been supplied by the World Bank and GEF via loans and grants. In fact, the preservation and expansion of these nations' programs has been very much reliant on the financial contributions of the World Bank and GEF. The programs of Vietnam and China, however, seem to be functioning with a far greater level of financial independence.

(2) Commitment to Altering the Nature of Programs (Differs by Region)

The Latin America cases have revealed repeated attempts by international organizations to bring the national PES programs of these two nations closer to the market-oriented, neoliberal model advocated by many PES theorists. Such attempts are not evident in the Asia cases. In Costa Rica and Mexico, efforts by the World Bank and GEF to cultivate market-based PES processes have thus far failed to alter the state-dominated nature of programs. In Vietnam, however, the actual details of program payment mechanisms and program administration are very much in line with the preferences of the particular international organizations that supported

the early stages of program development. Vietnam's national PES model is by no means market-oriented, but there is no evidence that Winrock International or GTZ were ever committed to establishing a program with strong neoliberal leanings in the first place. China's PES programs also have not been subject to pressures by outside forces to transition to a more market-oriented, neoliberal model. Thus, the fruitless attempts by international organizations to undo the state-dominated nature of PES programs are limited to the cases of the Latin America region.

PART VIII, IMPLICATIONS

Some significant broader insights into states' and international organizations' roles in program development are generated by the aforementioned findings and analyses. The discoveries emerging from this paper's exploration of leading national-level PES schemes shed considerable light on why national-level PES programs exist, how they came to take their present forms, and what overall function they serve in the nations that have opted for them.

International Organizations and the Presence of National-Level PES Programs

Discoveries emerging from this investigation suggest that international organizations are a predominant reason for the presence of national-level PES programs in the developing world. International organizations are, of course, only part of a much larger explanation for why programs exist. Declining ecosystem services, growing ecosystem service demands, the potential for PES to alleviate poverty, and the need for innovation in environmental preservation and sustainable development strategies are also significant pieces of this larger explanation. However, a complete and honest account for why programs exist must give significant recognition to international organizations' vital contributions to both the birth of programs and the continued operation of programs. Without the input, assistance, or pressure of international

organizations, there is ample room to doubt that programs would have been created and maintained. Even states that are already willing to embrace the PES strategy rely on international organizations to get the process moving and many of those same states rely, at least partially, on the financial support of international organizations to keep programs afloat. The apparent exceptions to these claims, however, are the national PES programs of China.

Generally speaking, some form of international organization input is observable at one or multiple key points in the program creation process or in program preservation efforts. Such input is seen, for example, in the research, analysis, experimentation, and evaluation efforts aimed at testing the feasibility of introducing large-scale PES operations. It is also observable in the financing of pilot projects that would ultimately grow into national-level schemes. The prompting of essential legal and policy measures that introduced programs and the funding of programs in their later stages are additional ways in which international organizations are responsible, at least in part, for the existence of programs. International organizations' strong and lasting ideological support and promotion of PES as a sustainable development tool is also of paramount importance to developing nations' embrace of the PES approach, even if developing nations' program designs are not fully attuned to international organizations' preferred strategies. These recurrent and multifaceted involvements of international organizations in program creation and program preservation go a long way in explaining why we are seeing national-level PES programs in operation in the developing world.

State Interests as Predominant Influence on What Direction Programs Take

While international organizations have been noticeably instrumental in the creation of PES programs and, in Latina America, the preservation of programs, states are nevertheless a

primary determinant of what form programs ultimately adopt and how programs operate. States have taken PES in their own direction, one that does not follow the path advocated by international organizations and traditional PES theorists. The exception to this claim, however, is Vietnam's national PES program. Vietnam's program does involve heavy state intervention and clearly departs from the neoliberal vision, but the program's core components and strategies were strongly influenced by the proposals of those international organizations guiding the program creation process. Because the particular international organizations involved in the development of Vietnam's national PES policies do not appear to be strongly devoted to the neoliberal philosophy, Vietnam's state-dominated program follows a strategy that is in line with both the state's and international organizations' preferences. Generally speaking, however, the state-dominated nature of national PES programs is primarily a reflection of state predilections and state needs.

States seem to have recognized something valuable, if not essential, in a state-dominated approach. The findings emerging from this investigation suggest that there are indeed significant benefits provided to states by state control of programs. These benefits in many ways justify the path that states have chosen with regard to PES. The foremost benefit of strong state intervention is the ability to achieve what market forces seem incapable of achieving on their own, including, but not limited to, the motivation and execution of payments for ecosystem services. States appear to have recognized that, in order to make payments happen in a regular and meaningful fashion, the state must be involved. Whether that involvement comes in the form of funding payments or compelling the participation of relevant parties, state management of programs is the leading reason payments take place. In addition to ensuring that payments occur, state influence also facilitates the alignment of PES with nations' specific environmental and

development goals and unique social, economic, and environmental conditions. Every nation faces a unique set of issues and concerns potentially relevant to PES, ranging from the demands of rural social groups, to a predisposition for a particular type of environmental problem or disaster, to questions concerning land use rights. Acknowledging the potential for state intervention to respond to these and other matters, states have steered PES programs in a way that suits their particular interests and circumstances. States' decisions with regard to program design and implementation clearly demonstrate a recognition of market forces' limited ability to drive payments, realize special objectives, and adapt to unique national challenges. It is entirely understandable why states in the developing world have not heeded the recommendations of international organizations and other advocates of neoliberal program design, but have instead opted for a strong state role. As the insights and information furnished by this investigation show, state involvement in programs accomplishes many things that market forces alone do not.

PART IX, CONCLUSION

This study has made significant progress in illuminating non-market actors' contributions to national PES program development in the developing world. This effort was motivated primarily by the recognition of the limited relevance of market forces in shaping key program details and in fueling the emergence, operation, and expansion of programs. An insufficient amount of scholarly and professional attention has been given to alternative forces potentially impacting the way national PES programs unfold. States and international organizations are particularly deserving of such attention and were, therefore, chosen as the focal points of this study. By exploring four of the developing world's most ambitious national-level PES schemes, this investigation unearthed a multitude of important findings concerning states' and international organizations' contributions to program payment mechanisms and financial

management as well as to legal and policy program components. This study has revealed seven significant commonalities and three important areas of divergence among the four selected nations. While the PES schemes of these four nations are by no means identical, findings presented in this paper depict national PES programs in the developing world as predominantly state-run ventures, supplemented to a significant degree by international organizations, demonstrating a clear departure from the neoliberal vision endorsed by PES theorists. This departure, however, could very well mark a key strength in each of the four PES schemes explored.

Among the most important discoveries emerging from this investigation is the recurrent state role in funding ecosystem service payments, administering programs, determining payment details, compelling the participation of ecosystem service beneficiaries and providers, legally recognizing specific ecosystem services, and introducing key PES legislation to legitimize and guide program implementation. These trends reflect states' need and desire to compensate for the underperformance of the ecosystem service market in driving ecosystem service payments and other critical PES program processes. This exploration of leading national PES schemes has also revealed international organizations' consistent role in advising, compelling, or supporting initial PES legislation and policy and their critical importance in financing Latin American programs. International organizations' remarkable importance to the existence of national PES programs in the developing world is demonstrated by these and other vital contributions to program creation and program preservation. Notable divergences among country cases were seen by region and by nations' economic model. Government control of lands managed by ecosystem service providers, level of international organizations' contributions to program funding, and

international organizations' interest in altering program strategies are key areas in which Latin American programs and Asian programs differed.

A significant shortcoming of this study, however, is its lack of attention to states' and international organizations' contributions to the technical support component of PES programs. Existing literature on PES has strongly suggested that this component is a critical area in which states and international organizations can play a special role. Understanding the ways states and international organizations impact program development could be greatly enhanced by clarification of this very important detail. Unfortunately, data on this particular subject is extremely lacking, much to the dismay of PES researchers and professionals. An investigation into this program component would also represent an enormous and highly tedious task. Answers to this question might involve a close look at advanced satellite technologies and spatial assessments of forest cover, other monitoring efforts, training services, and economic analysis services. Until this program component has been fully explored, an understanding of states' and international organizations' connections to program development is incomplete.

Moreover, while this paper does begin the process of clarifying the relationships between states, international organizations, and national PES program development, elucidating the connections between additional forces and program development are a reasonable next step in the effort to fully understand the PES phenomenon. Many questions remain concerning how programs emerge and how specific details of program management are determined. A number of other non-market forces merit attention as possible influences on program development and these should be a central focus of further research. Future research efforts should give strong consideration to the role of social movements and the interests of various social groups in creating programs and shaping PES design. Researchers should also consider the unique

environmental conditions within nations, the state of nations' ecosystem services, and nations' vulnerability to certain forms of natural disasters as possible leading influences on program development. It would be particularly interesting to learn what type of program strategy nations most desperate to save ecosystem services and protect against natural disasters would choose. Economic conditions within countries, economic policy, and the quality of government infrastructure and institutional development are additional factors that might have some bearing over the way PES programs unfold. Researchers could add much to the understanding of national PES programs through a close examination of these potentially influential elements.

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