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PAYMENTS FOR ENVIRONMENTAL SERVICES WITHIN THE CONTEXT OF THE GREEN ECONOMY

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DEFINITION AND SCOPE OF THE GREEN ECONOMY

The concept of a green economy has lately gained currency as the world has been searching for solution to multiple global changes, especially in the midst of the global economic crisis in 2008. The UN Joint Crisis Initiative 4 on the Green Economy, led by UNEP, is currently investigating this concept and a Green Economy Report, covering all sectors' contributions to the green economy is being prepared. The United Nations General Assembly has selected the "green economy in the context of sustainable development and poverty alleviation" as one of the main themes of the UN Conference on Sustainable Development (UNCSD) to be held in Rio, Brazil in 2012.

Current discussions led to a common understanding of green economy as a "concept that brings together a suite of policies to promote investment in environmentally-significant sectors while contributing to the pursuit of sustainable development and poverty eradication. These are derived from a range of economic approaches, concepts, ideas and principles, many of which have been articulated over the past twenty years"¹. However, when the first Preparatory Committee of the UNCSD met in May 2010, it appeared that there is still no complete consensus on what a green economy entails and its relationship with the broader concept of sustainable development.²

A green economy is historically understood as an economic system that is compatible with the natural environment and thus, is environmentally friendly. Today, the concept of green economy has evolved to consider also social issues. By using clean technology and clean energy, the green economy is expected to provide safer and healthier environments, create alternative green jobs³ and preserve the development of societies. The concept of green economy is often associated with ideas such as "low-carbon growth" or "green growth". In the context of green economy, the term "growth" does not simply mean economic output growth, but indicates "sustainable economic progress". In fact, green economy aims to overcome the reductionist approach that has considered gross domestic product as a simple measure of overall market economic activity as a signal of progress and societal well-being. This approach proved to be misleading, as current climate and economic crisis demonstrate that growth is unsustainable with over-exploitation; in fact, destroying the natural resource base hampers present and future livelihoods.

Therefore, "low-carbon growth" and "green growth" are different ways to express the paradigm shift that not longer positions "green" against "development", but seeks ways to enforce sustainability. Sustainable development is the highest priority of the global international and national agenda, and the green economy can be considered as a multi-faceted pathway to sustainable development. Each country will have its own specific pathway and will design its own policies, institutional structure and implementation measures, depending on national resource endowments, challenges, needs and priorities⁴.

¹ UNEP, 2010. First Meeting of the Issue Management Group on Green Economy 23-24 March 2010, Washington.

² First Preparatory Committee Meeting for the UN Conference on Sustainable Development 2012.Co-Chairs' Summary, 19 May 2010.

³ Green jobs are defined as work in agricultural, manufacturing, research and development, administrative, and service activities that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high efficiency strategies; de-carbonize the economy; and minimize or altogether avoid generation of all forms of waste and pollution (UNEP, 2008).

⁴ UNEP, 2009. Global Green New Deal. An Update for the G20 Pittsburgh Summit.

There is a general agreement that discussions related to the definition of the green economy should always be considered in the wider context of sustainability and poverty eradication. The implementation of a green economy must be consistent with the 27 sustainability principles identified in 1992 Earth Summit (see Annex 1). According to these principles, each country has the right to development (principle 3) and the responsibility to protect the environment as an integral part of the development process (principle 4). Moreover, in the global international scenario, a key principle to achieve equity and justice is that countries will have 'common but differentiated responsibilities'^{5,6}. This principle recognizes historical differences in the contributions of developed and developing countries to global environmental problems, and differences in their respective economic and technical capacity to tackle these problems.

MAIN ELEMENTS OF THE GREEN ECONOMY

The green economy embraces a vision that tries to steer economic development in the direction of sustainability. According to the current understanding of the green economy concept, there are five main elements which support the transition to a more sustainable pattern of production and consumption (see Table 1).

Table 1: Main elements of the green economy

Generation and use of renewable energy	Refers to any source of usable and renewable energy intended to replace fossil fuel sources without the undesired consequences of greenhouse gas emissions and other pollutants derived from fossil fuel combustion
Energy efficiency	Seeks to adopt means and a more efficient technology that uses less energy to provide the same level of energy service
Waste minimization and management	Considers different approaches from prevention, minimization, reduction, reuse, recycling, waste conversion and disposal in order to ensure that the use of materials and waste generation remains within the regenerative and absorptive capacities of the Planet
Preservation and sustainable use of existing natural resources	Recognizes the importance and economic value of natural resources, such as freshwaters, forests, soils, coral reefs and ecosystem services provided by functional and healthy ecosystems
Green job creation	Promotes decent jobs that offer adequate wages, safe working conditions, job security, reasonable career prospects and workers' rights

Being referred to as also “low-carbon⁷ economy”, the green economy:

- o has a strong commitment in the use of renewable energy resources, such as wind, hydropower, biofuel, photovoltaic, solar thermal, solid waste and bagasse;
- o seeks management approaches and new technologies that increase energy efficiency in all economic sectors. For example, climate-friendly management could seek not only reducing greenhouse gas emissions but also compensating unavoidable emissions with increased carbon sequestration;

⁵ The Rio Declaration states: “In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command”.

⁶ The Framework Convention on Climate Change states that parties should act to protect the climate system “on the basis of equality and in accordance with their common but differentiated responsibilities and respective capabilities.”

⁷ The term “carbon” is used for all greenhouse gases as carbon emission calculations convert methane and nitrous oxides into carbon-equivalent units.

- aims to reduce waste and improve waste-energy conversion;
- takes action to preserve the natural capital or to make a sustainable use of it;
- boosts employment through the creation of green jobs.

These five elements of change can be implemented in all economic sectors: the primary sector which transform natural resources into primary products and includes agriculture, forestry, fishing, and all mining and quarrying industries; the secondary sector which takes the output of the primary sector and manufactures finished goods; and the tertiary sector that provides information and services. For all sectors, the aim is to establish – to the extent possible - closed or semi-closed nutrient and energy cycles and at least, minimize waste and boost recycling.

Therefore, the transition and reconversion to a green economy is expected to create an employment shift. In all economic sectors, alternative green jobs can be created, some employment will be substituted, certain jobs may be eliminated without direct replacement, many existing jobs will simply be redefined and profiles will be greened. Still, concerns persist about possible job losses during a green economy transition and the need to address costs for workers, including investment in job retraining and social protection⁸.

FRAMEWORK FOR A PUBLIC SECTOR DRIVEN GREEN GROWTH STRATEGY

The transition towards a green economy will require political will and economic investments in order to restructure the present development context. UNEP⁹ has recently pinpointed the different actions needed for this transition to take place. Using the UNEP study, a framework for a public sector driven green growth strategy is hereby proposed (see Figure 1).

For green economy activities to be attractive, viable, profitable and supported by society, certain conditions may need to be changed, shifted or created. These conditions, commonly referred as “enabling conditions”, have roots in institutional and legal frameworks, education and research and market economies. The depth and ramification within which conditions are interlocked with green economy developments vary amongst countries, according to specific historical, political, geographical, economic and cultural contexts.

Upon the introduction of enabling conditions and when consensus is obtained by a given group for the development of green economy activities, the public sector is expected to play a major role in ensuring a level playing field for vibrant markets. In particular, the public sector is in position to pledge necessary resources, address and (re)design incentives and remove/reform harmful subsidies. In most cases, in order to make positive incentives rewarding, complementary disincentives may need to be enforced.

Levelling the field of prices, while still part of setting enabling conditions in the economic sector, has a strong operational aspect; given its implementation output, it can be considered a first type of market intervention for green growth.

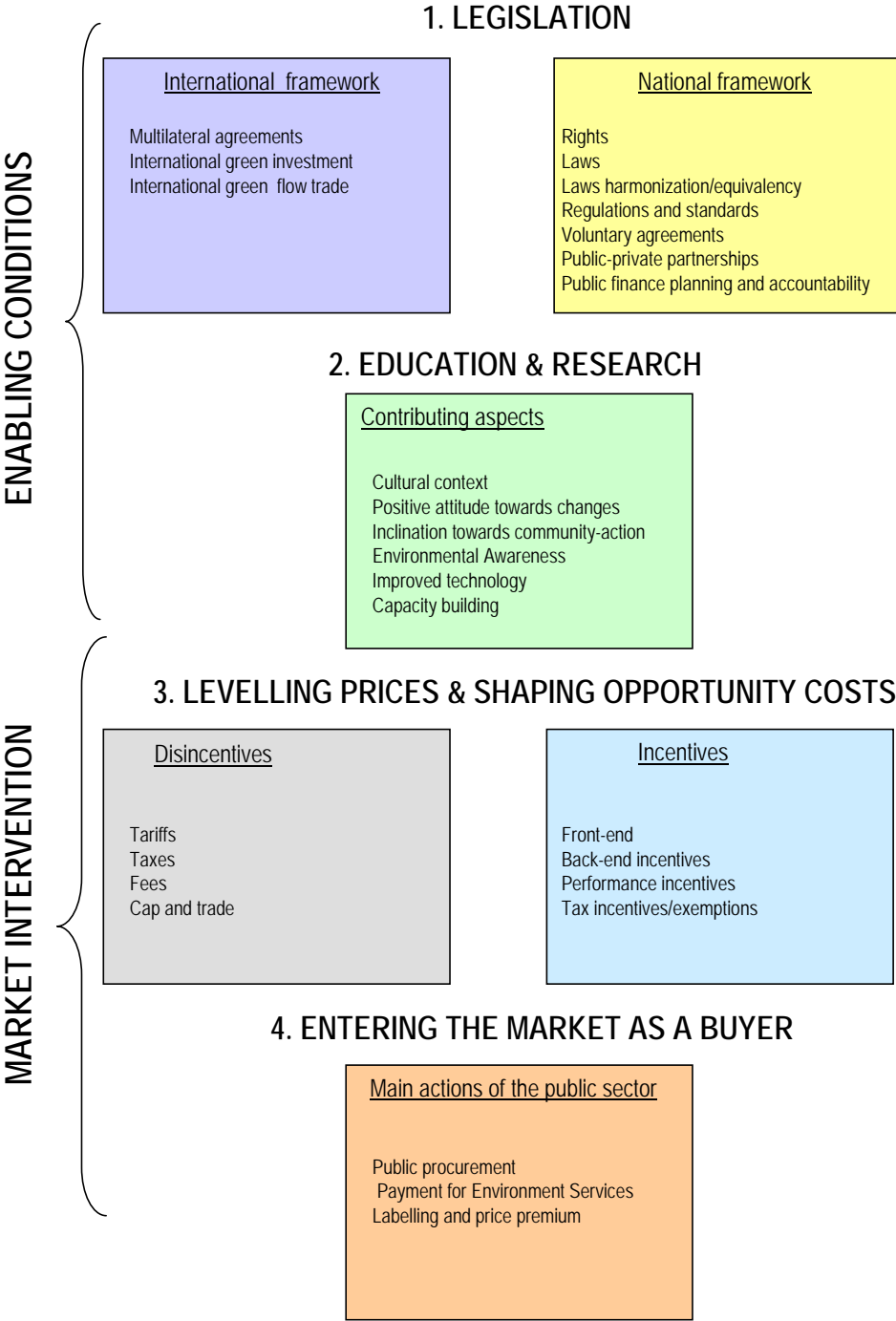
A second type of intervention expected from a public sector entering the green market, is that of a buyer providing a direct investment in the green economy. This often opens and supports new market avenues, provided that there is convergence with other market instruments in place. For example, attention must be given to existing subsidies and tax breaks that would hinder the full-scale development of a vibrant green economy. Also, public procurement is

⁸ UNEP, 2008. Green Jobs. Towards Decent Work in a Sustainable, Low-Carbon World. Available at: www.unep.org/labour_environment/features/greenjobs.asp

⁹ UNEP (forthcoming). Green Economy Report. Chapter on Enabling Conditions.

often weighted against lowest price competitive tendering and is subject to significant pressure in times of public expenditures cutbacks. Therefore, procurement based on non-price factors such as environmentally-produced goods needs to be justified in terms of its overall public benefits. In brief, by levelling prices and setting opportunity costs for different green economy activities, the public sector can create enabling conditions for investments and business, driven by a multitude of different stakeholder groups, including international business companies, public-private partnerships, private sector, NGOs, etc.

Figure 1: Framework for a public sector led green growth strategy



Colour legend

- PES international focus
 - PES national legal framework
 - PES participation
- PES complementary tool
 - PES and pro-PES financial tools
 - PES implementation

THE GREEN GROWTH STRATEGY AND PAYMENT FOR ENVIRONMENTAL SERVICES

Looking at the above-mentioned green growth strategy, one might ask: how does the implementation of Payment for Environmental Services (PES) fit into this framework? What could be the likely contribution of PES to a green economy? Are enabling conditions for the green economy conducive to PES requirements?

PES, originally meant as voluntary cash transfers, include all financial and non-financial rewards (or compensation mechanisms) between buyers and sellers for the provision of an environmental service¹⁰. A concrete way to move towards sustainable development is to guarantee the good functioning and delivery to society of all types of ecosystem services, including: supporting services (e.g. biodiversity, photosynthesis, nutrient cycling and soil formation); provisioning services (e.g. food, water, wood, fiber and fuel); regulating services (e.g. climate regulation, flood regulation, drought control, water purification, disease regulation, predation and pollination); and cultural services (e.g. recreation, aesthetic experience, cognitive development, relaxation, and spiritual reflection).

Clearly, PES is a market tool through which the public sector can directly and actively enter the green market and become a “buyer” of environmental services. A deep insight reveals that the PES mechanism is strictly inter-linked to the conditions that enable a green economy as a whole.

In the following sections, an analysis is made for each component of the above-mentioned green growth strategy, with concrete examples of how the different types of interventions are linked to PES and identifying the enabling conditions most crucial for a successful PES implementation.

1. Legal enabling conditions for PES

International frameworks

- Multilateral agreements and international green investment

At international level, the key multilateral agreement which had major repercussions on the PES market has been the introduction of reduction of emissions from deforestation and forest degradation (REDD) in the global agreement for climate mitigation. Deforestation and degradation account for around 20 percent of global anthropogenic greenhouse gas emissions, widely believed to drive climate change. The rationale of REDD is simple: countries that are willing and able to reduce emissions from deforestation should be financially compensated for doing so.

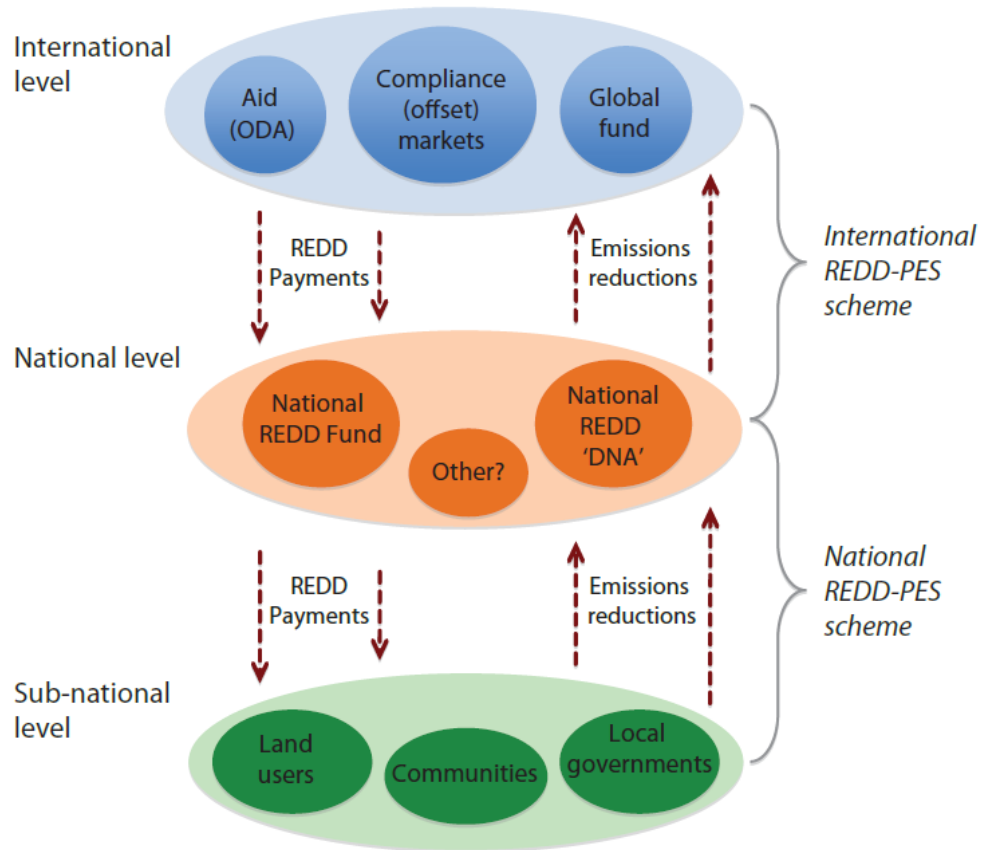
The process has been lengthy and the final situation is still viable for effective conservation of forests. In the 1997 global climate agreement, the Kyoto Protocol, policies related to deforestation and degradation were excluded. In 2005 at the UNFCCC/COP11, the Coalition of Rainforest Nations initiated a request to consider reducing emissions from deforestation in developing countries. In 2007, COP13 agreed that a comprehensive approach to mitigate climate change should include “policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries (i.e. commonly addressed by REDD programmes) and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (i.e. commonly addressed by REDD+ programmes)”¹¹. In 2009, COP15 introduced an agreement (not legally-

¹⁰ Wunder S, 2007. The Efficiency of Payments for Environmental Services in Tropical Conservation. *Conservation Biology* 21(1): 48–58

¹¹ Parker C. *et al.*, 2009. The little REDD+ Book. Available at <http://www.globalcanopy.org/>

binding) for including agriculture and wetlands in the Kyoto Protocol. It was also proposed that REDD be considered as a multilevel nested PES scheme, ranging from international to sub-national level (see Figure 2).

Figure 2. Conceptual model of a multi-level REDD-PES scheme¹²



However, one of main key issue for REDD to become an effective tool to help reducing the carbon emission and contribute to the preservation of natural capital is the definition of forest. According to the CDM of the Kyoto Protocol, a "forest" is an area of more than 0.5–1.0 ha with a minimum "tree" crown cover of 10–30 percent, with "tree" defined as a plant with the capability of growing to be more than 2–5 m tall¹³. Participating countries can choose from the specified ranges for a "forest" definition tailored to their needs. While any definition suitable for global application will necessarily be composed of few easily measured parameters, the range of the proposed parameters jeopardise the conservation of many forests and allows continued unsustainable exploitation of forest resources - principally because natural forests and plantations are not differentiated and because thresholds for crown cover are so low that the carbon consequences of continued indiscriminate extraction of commercially valuable tree species are not officially recognized¹⁴.

¹³ UNFCCC, 2002. Report of the Seventh Session of the Conference of the Parties, Marrakesh 2001. Available at: <http://unfccc.int/resource/docs/cop7/13a01.pdf>

¹⁴ Sasaki *et al.*, 2009. Critical Need for New Definitions of "Forest" and "Forest Degradation" in Global Climate Change Agreements. *Conservation Letters* 2: 226–232.

➤ International green flow trade

The Marrakech Process on Sustainable Consumption and Production is an initiative led by UNEP and UNDESA¹⁵. It has seven different task forces entrusted to internationally promote sustainable patterns of production and consumptions. Amongst them, there is a task force to promote Sustainable Public Procurement (SPP) by scoping existing supply-side capacities in sustainable goods and services, with a view to develop country-based SPP. Clearly, such initiative at international level is expected to have major impact in the role of the public sector of participating countries as buyers in the green market.

National legal frameworks

➤ Rights

PES contractual agreements are based on land property rights. Ownership implies different types of rights: access and use rights, control rights and transfer rights (see Table 2). In particular, control rights can be further split into more specific use rights, such as the rights for the management of natural resources but also rights for ecosystem services. These different types of rights can be inseparably attached to all different types of ownership, or exist as separate rights involving different actors.

PES implementation is highly influenced by the national legal framework and circumstances that define land property rights, land tenure (by which informal holdings of public assets are legally recognized and transferred to private families and individuals), accessibility rights and user's rights.

Table 2: Property, ownership rights and laws¹⁶

Who has property rights	Type of ownership rights	Statutory or customary laws
Public (held by the state)	Access and use rights (Rights to access the land to use its natural resources)	Statutory law (i.e. the written and codified law of a country including both state and municipal legislation)
Private (held by a natural or legal person)	Control rights (Rights to make decisions on how the land and its natural resources should be used)	Customary law (i.e. traditional rules, norms and customs)
Communal (held by each member of a community)	Transfer rights (Rights to sell, convey, mortgage, reallocate access, use and control rights and transmit the land to heirs)	
Openly accessible (not assigned to anyone)	Not specified	Not specified

¹⁵ <http://esa.un.org/marrakechprocess/taskforces.shtml>

¹⁶ Source: Greiber, 2009. Payment for Ecosystem Services. Legal and Institutional Frameworks. IUCN, Gland, Switzerland.

In the implementation of REDD, other specific rights linked to the forest use and management should also be considered. These rights include usufruct rights, commercial rights on some timber species, and carbon property rights. The framework for REDD in Ghana provides an example on how these different legal layers interact with each other.

In Ghana, naturally regenerated trees are nominally owned by the traditional authority or chieftaincy, while management and commercial rights to timber species belong to the State in both protected areas and off-reserve areas. Thus, neither the land owner, nor the land users have tree tenure on timber species naturally occurring on their land. They are certainly the stakeholders that influence the vegetation that is allowed to grow, and for how long. However, if they cannot own the tree, can they have any right to the REDD benefit of carbon stored inside it? Moreover, besides property rights, user's right should also be considered. Farmers may have user rights to fell trees for agricultural purposes on land with naturally regenerated trees, being highly incentivised to clear land as this is often the customary manner in which land is claimed. Thus, for REDD to work in Ghana, farmers in off-reserve areas would have to be compensated for the opportunity cost of not exercising their user's right to clear land.

Once forests, under the REDD policy, become a product that can be traded, the issue of forest and carbon ownerships become critical. Communal management and ownership of forests is very common in developing countries, with 20 percent of forests formally recognised as community reserves or community-owned¹⁷. If the State decides to retain carbon property rights, the government will control all potential benefits. Communities (or other stakeholders) will not have additional motivation to protect forests unless their benefits will be secured and guaranteed by a clear legal mandate. Legal recognition of land titles *per se* can be a pro-poor strategy, as farmer incomes can increase up to 30 percent (e.g. Sumberjaya, Lampung Province, Indonesia¹²), as they no longer have to pay bribes to keep from being evicted from their lands.

When land titles are formalised, a well-defined legal apparatus is also needed to enforce property rights and contest land claims when they arise. Flexible approaches to property rights and open criteria for participation in PES contribute to the success of PES schemes.

➤ Laws

The importance of a legal framework for successful PES development varies with the type of PES scheme. A private PES scheme, in which both buyers and sellers are private entities, uses basic legal requirements for agreements contracts, which include:

- absence of any legal provision that would outlaw PES schemes;
- a basic legal principle based on "*pacta sunt servanda*" (i.e. agreements must be kept);
- a civil law to enforce contract rights in case of non-compliance with contract obligations;
- general respect for the rule of law.

In a public PES scheme, there is the involvement of at least one public entity as a contract party. In this case, the legal framework should provide the authority the adequate process for a public entity to enter into legal agreements. The statutory legislation should also determine the rights and responsibilities of a supervised independent authority that should monitor and supervise the process to ensure transparency¹⁷.

¹⁷ Wendland K, 2008. Rewards for Ecosystem Services and Collective Land Tenure: Lessons from Ecuador and Indonesia. Land Tenure Centre 1-10.

A PES-specific legislation can be created with some clear advantages. However, according to the extent to which the legislation is developed and harmonized, some disadvantages might also occur (see Table 3).

Table 3: Advantages or disadvantages of a PES-specific law¹⁸

Advantages	Disadvantages
Attention drawn to PES in general	
Awareness raised for PES as a legitimate policy instrument	
Facilitating PES national implementation	
Comprehensive codification developed	Environmental legislation further fragmented
Scope of PES instruments clarified	Complexity of legal framework increased
Legal certainty created	Conflicting legal framework created
Implementation supported	Implementation hampered

If legal uncertainty arises by incomplete PES-specific legislation, this can be a strong disincentive for both buyers and sellers to enter into agreements. A general criterion of PES-specific legislation is that while aiming at facilitating PES development and implementation, intervention in the legislation should be kept at minimum to avoid over-regulation and bureaucracy.

There is no blueprint for an ideal institutional set-up. Institutions should be adjusted to national or local circumstances and to the government system structure (e.g. unitary versus federal).

To date, PES-specific laws exist in Costa Rica and Argentina. Costa Rica Forest Law No.7575, enacted in 1996, explicitly recognized four environmental services provided by forest ecosystems: mitigation of greenhouse gas emissions; hydrological services, including provision of water for human consumption, irrigation, and energy production; biodiversity conservation; and provision of scenic beauty for recreation and ecotourism. The law provides the regulatory basis to contract landowners for the services provided by their lands, and establishes the National Fund for Forest Financing (Fondo Nacional de Financiamiento Forestal, FONAFIFO).¹⁹

Although there is no need for constitutional recognition of PES (as PES uses basic legal requirements for agreements contracts), the constitution must not prevent the development of PES schemes²⁰.

➤ Law harmonization/equivalency

If PES is regulated in a PES-specific law, attention must be paid to its integration in the existing legal and institutional frameworks, in particular those laws that regulate the different ecosystems.

¹⁸ Modified from Greiber, 2009. Payment for Ecosystem Services. Legal and Institutional Frameworks. IUCN, Gland, Switzerland.

¹⁹ Pagiola S, 2006. Payments for Environmental Services in Costa Rica. MPRA Paper No. 2010. Available at: <http://mpira.ub.uni-muenchen.de/2010/>

²⁰ Greiber, 2009.

For example, in Costa Rica forestry legislation, the prohibition of forest clearing reinforces the potential success of PES programmes, as it restricts more income-generating options from forested land and makes PES more economically attractive. In Indonesia, the Rewarding Upland Poor for Environmental Services (RUPES) programme is working to provide incentives to farmers to maintain mixed jungle rubber agro-forestry systems. However, an existing law in Indonesia provides government subsidies to farmers who clear land for conversion to rubber monoculture²¹.

Clearly, the lack of harmonization amongst new and existing policies is one of the major obstacles hampering the success and development of new development strategies.

➤ Regulation and standards

Regulation and standards have a crucial role, as PES programmes often operate in contexts in which various command-and-control regulations pre-exist. In several instances, PES can be thought to provide a carrot that makes the stick of regulations more palatable. In other cases, regulations can reduce the expected gain from non-compliance and can define opportunity costs for PES schemes.

Standards can be also voluntary, as practiced by the agri-food industry through environmental labels (e.g. Rainforest Alliance, Marine Stewardship, Forest Stewardship, biodynamic agriculture) which are in demand by environmentally-aware consumers willing to pay price premiums for quality and/or specialty products. For example, organic markets (currently representing 2 percent of global food retails) have grown for decades on the basis of voluntary standards and labels relating to geographical indications are very common. In such markets, the fact that consumers' demand is the main driver of growth stresses the importance of building awareness on the benefits of internalizing environmental values in commodity prices.

In the PES literature, the Vittel (Nestlé Waters) privately financed PES programme is often mentioned as a "perfect PES case". This programme, implemented in a 5 100 hectare catchment in the Vosges Mountains (North-Eastern France), aims to maintain high water quality²². Since 1993, Vittel is paying 26 farmers in the watershed to adopt best low-impact practices in dairy farming; long-term contracts (18-30 years) and payments are adjusted according to opportunity costs on a farm-by-farm basis. Land use and water quality are monitored over time, and this has provided evidence of improvement in relevant ecosystem services, compared to an otherwise declining baseline.

This programme took almost 10 years to be fully implemented. The interest of this private company in securing a successful PES programmes arises from the fact that in France, regulation on natural mineral water is very strict. Standards for a "natural mineral water" label require: elimination of natural unstable elements such as iron and manganese, no pesticides and not more than 4.5 mg of nitrates per litre of water. Even more important, the legislation does not allow natural mineral waters treatment. As the legislation makes farmers' payment as the cheapest solution, it has induced the market strategy of Nestlé Waters; a similar approach is being followed by other mineral water brands, such as Perrier and Contrex.

²¹ Kartodihardjo H. *et al.*, 2000. The Impact of Sectoral Development on National Forest Conversion and Degradation: The Case of Timber and Tree Crop Plantations in Indonesia. Center for International Forestry Research, Jakarta, Indonesia.

²² Perrot-Maître D. 2006. The Vittel Payments for Ecosystem Services: a "Perfect" PES Case? International Institute for Environment and Development, London, UK.

- Voluntary agreements

Amongst possible tools to mainstream the green economy, voluntary agreements are expected to be a promising alternative to government rules and regulations, as they represent a more inclusive solution by involving different stakeholders. Voluntary agreements are particularly promising when the regulatory capacity is weak, or where there is no regulatory authority at all.

PES is a type of voluntary agreement, which also poses also some constraints for the implementation of eco-efficient solutions in ecosystem management. For example, the voluntary nature of PES programmes determines: the possibility for land owners to withdraw from a contract at any time; the likelihood of land owners not joining the programme to act as free-riders, or even worst, to become an obstacle to the success of the programme; the eventual lack of spatial connectivity amongst lands subject to the PES programmes.

However, recent attempts to implement voluntary and cooperative PES schemes^{23,24} have greatly enhanced the potential of PES schemes to overcome some of these limitations (see section below on Sustainable PES).

- Public-private partnerships

Attracting green investments is one of the major accelerator for green growth. In some cases, governments leverage private investments in specific areas by co-investing through public-private partnerships, which sets market conditions attractive to private investments.

The key issue in deciding the possibility or the degree to which ecosystem services could be privatized is the extent to which they are public goods. PES schemes constitute a very flexible tool that can attract private investments as well as public-private partnerships.

- Planning and accountability of public finance

In some countries, PES schemes could be hampered by the short-term planning and accountability systems of public finance. For example, in the Cidanau watershed of Indonesia, major difficulties were encountered in 2002 by the PES programme, as the government budget plan was applicable only for one year²⁵.

Usually, the implementation of PES requires a PES contract of at least 5-10 years, which implies a multiple year public budgeting commitment, which is a main hurdle in public financing, considering the relatively short election cycles.

2. Education and research enabling conditions for PES

- Environmental awareness

Environmental awareness influences daily choices and investments of different stakeholders, whose behaviour in turn creates as feedback opportunity costs and market avenues for green public and private investments. Environmental awareness critically influences the willingness to participate in PES programmes.

²³ Goldman *et al.*, 2007. Institutional Incentives for Managing the Landscape: Inducing Cooperation for the Production of Ecosystem Services. *Ecological Economics*, 64: 333-343.

²⁴ Parkhurst G.M. *et al.*, 2007. Spatial Incentives to Coordinate Contiguous Habitat. *Ecological Economics*, 64: 344-355.

²⁵ Gelar *et al.*, 2008. Concept and Implementation of PES Programme in the Cidanau Watershed: a Lesson Learned for Future Environmental Policy. *Analisis Kebijakan Pertanian*, 6: 37-55.

For example, a survey was carried out in Florida to examine the willingness of private forest owners to participate in a conservation programme that required adopting silvicultural management practices beyond the existing regulations. The survey of 1 500 random sampled forest owners revealed that forestry and conservation organization membership increased the probability of forest owner to participate in the programme²⁶.

➤ Cultural context

The cultural context can encourage the development of policies and institutions to achieve social equity and respect for natural resources.

For example, the “Andean Water Vision²⁷,” built on indigenous culture, requires water to be considered as a public property in the constitution and under the control of society as a whole. In this cultural context, PES can be considered socially inappropriate, and there may be strong resistance towards for payment for services of water provision and water quality, particularly if this is accomplished with an agreement with the private sector.

➤ Positive attitude towards changes and inclination towards community action

Communities are often heterogeneous and the degree of inclination towards community action varies according to its members.

In Ecuador, a Biodiversity PES programme led by GTZ and Conservation International was agreed with three communities, comprising approximately 300 households, living in the Gran Reserva Chachi, an area of high biodiversity value facing strong pressures from timber companies and from the expansion of oil palm plantations. The success of PES varied amongst the three communities, depending on the willingness of individuals to abandon income earned from logging and traditional subsistence wildlife hunting¹².

➤ Improved practices, technology and capacity building

The green economy relies highly on improved management practices, technology and capacity building to adopt renewable energy generation and energy efficiency. Improved green technology and the ecosystem approach to management can indeed be the focus of some PES schemes.

In fact, while PES forest schemes for biodiversity conservation or carbon sequestration call for retaining existing land uses, others PES schemes call for switching to new silvo-pastoral^{28,29} and agro-ecological practices^{17,30}. Improved technology which is mainstreamed in some PES schemes is promoted to avoid soil erosion, contamination of water supplies, air pollution, and landscape degradation. Farmers enrolling in these PES scheme usually learn how to terrace their lands, to plant trees and shrubs in areas of degraded pastures, to use local and fast-growing trees and shrubs for fencing and wind screens or to clear infesting alien invasive trees.

²⁶ Matta *et al.*, 2009. Incentives for Biodiversity Conservation Beyond the Best Management Practices: Are Forestland Owners Interested ? *Land Economics*, 85: 132-143.

²⁷ The Andean Vision of Water, 2003. <http://www.condesan.org/memoria/agua/AndeanVisionWater.pdf>

²⁸ Pagiola S. *et al.*, 2007. Can the Poor Participate in Payments for Environmental Services? Lessons from the Silvopastoral Project in Nicaragua. MPRA Paper No. 3705. <http://mpra.ub.uni-muenchen.de/3705/>

²⁹ Rios A. R. *et al.*, 2009. Poor Household Participation in Payments for Environmental Services in Nicaragua and Colombia. MPRA Paper No. 13727. <http://mpra.ub.uni-muenchen.de/13727/>

³⁰ Turpie J. K. *et al.*, 2008. The Working for Water Programme: Evolution of a Payments for Ecosystem Services Mechanism that Addresses Both Poverty and Ecosystem Service Delivery in South Africa. *Ecological Economics*, 65: 788-798.

It has been suggested that a PES scheme could also be designed to invent or adopt innovative approaches³¹. Rewarding the target without binding the farmer to certain practices could encourage farmers to experiment and implement also innovative approaches, such as reduction of sediment loads. For example, the RUPES project in Indonesia rewards farmers for erosion-control activities in their coffee farms. However, PES schemes could also be designed to reward performance, that is, reduction of sediment loads in the nearby streams.

It is assumed that when innovations to achieve renewable energy generation and energy efficiency become available or adopted at large scale, PES schemes could be a possible way to encourage and disseminate the use of different practices and technologies.

3. Levelling prices and shaping opportunities costs for PES

The opportunity cost of different investments and activities is highly dependent on the resulting interaction in the market between incentives and disincentives. Redesigning existing incentives *per se* can be extremely efficient to redirect economy into a greener direction. For example, when Ghana reformed its fuel subsidies, fees for attending primary and junior-secondary schools were eliminated and the government made extra funds available for primary health care programmes concentrated in the poorest areas³². It is generally more efficient to raise the cost of unsustainable activities through regulation or instruments that help price them at their true cost, making sustainable alternatives relatively more attractive.

Disincentives

➤ Tariffs

Tariffs are usually applied to the trade of some products or can be feed-in tariff, where the cost of the production of a product or activity is included into its price. For example, in Costa Rica, water users used to be charged near-zero nominal fees. In 2005, a tariff on water consumption was introduced for watershed conservation. Twenty five percent of the tariff revenue was implemented to finance a national PES on water quality³³.

➤ Taxes

Tax application and exemptions could be another tool through which the public sector can influence consumers and citizens choices. In particular, the vision of green taxes is based on the principles of 'the polluter pays' and 'tax what you take, not what you make'. The revenue that is raised from such taxes can be used in a variety of ways: to help undo the damage done by unsustainable production and consumption; to promote green economy activities; or to contribute to other priority areas where government spending for society is necessary⁷. For example in Costa Rica, the bulk of the PES programme financing has been obtained by allocating to the National Fund for Forests Financing (FONAFIFO) 3.5 percent of the revenues from a fossil fuel sales tax (about USD10 million a year).

➤ Fees

Fees can be applied by users of certain goods with rates charged differently to certain user groups (e.g. commercial, non commercial) and/or can be associated to a permit or a

³¹ Jack *et al.*, 2008. Designing Payments for Ecosystem Services: Lessons from Previous Experience with Incentive-Based Mechanisms. PNAS 105: 9465-9470.

³² IMF, 2008. Fuel and Food Price Subsidies: Issues and Reform Options. IMF, Washington D.C.

³³ Fallas J, 2006. Identificación de zonas de importancia hídrica y estimación de ingresos por canon de aguas para cada zona. Fondo Nacional de Financiamiento Forestal (FONAFIFO), San José.

concession. The revenue raised by such fees can be reinvested into green activities generating positive feedbacks.

For example, in Germany, the Bundesländer (Federal State) applies groundwater extraction fee to water utility company, part of which is used to pay farmers for provision of environmental services encouraging them to reduce use of nitrogen-based fertilizers and pesticides. Such cooperation between local water utilities and farmers ensures the protection of groundwater, and thus provides water quality and use for both stakeholders. The success and popularity of very simple PES programme as the one just described can be measured by its scale of implementation. In 2002, 33 000 farmers over 850 000 hectares (i.e. 5 percent of agricultural land in Germany) were involved in the programme.

➤ Cap and Trade

Cap and trade is another market tool that can be used for national and international markets. By establishing a cap (i.e. an aggregate maximum amount), this regulation allocates permits which divide the allowable overall total among users of natural resources and allow trading of permits between those who do not need permits and those who need more than their allocation. The linkage between cap and trade mechanisms and PES is clearly shown by the carbon finance cap and trade system and REDD.

Incentives

➤ Front-end incentives

Front-end incentives are often a major propeller of change as provide financial resources for any change to be implemented. In PES, front-end incentives might be very important if the programme aims to involve the poorest stakeholders. Front incentives might cover transaction costs, which often in very tight household budget constitute one of the major constraints to programme participation.

➤ Back-end incentives

The current rewards of payment for ecosystem services can be considered as a back-end incentives that is given once the negotiation phase has been concluded and the contract has been agreed and signed by the two counterparts.

➤ Performance incentives

While back-end incentives are usually issued as a consequence of the end of a negotiation/implementation process, performance incentives are meant to be issued on the basis of a monitoring process. Performance incentives are a form of direct-payment where reward system is provided upon a tangible, direct effect that can signal the success of the programme. PES based on performance aims to overcome the gap usually existing between indirect-payment conservation interventions (e.g. eco-friendly commercial activities) and the temporal and spatial dimensions of ecosystem conservation objectives.

For example, an indirect-payment conservation initiative, in 1991-1995 in the Eastern rain forest of Madagascar, provided bee-hives to farmers. As the production of honey and beeswax requires nectar and pollen inputs from melliferous plants, which are found in the rain forest, bee-keeping incentives were aimed to indirectly provide forest conservation. However, it was shown that the implementation of this initiative might lead to the opposite effect. In fact, honey bees feed on a small set of melliferous plants with a heterogeneous distribution; thus, the interest of the farmer could be just addressed to conserve some patches of forest or not the whole forest extent. Moreover, the honey

bees foraging preferences might bring to a manipulation of forest specie composition as farmers might decide to eliminate the 25 percent of the species which are not used by honey bees. The forest conservation focus might be also decreased by the observation that 0-97 percent of the pollen came from secondary forests and exotic plantations. Last but not least, as farmers cannot exclude honey bees coming from neighbouring fields to forage on their forest patches, the best course of action might be to fell trees to use land for agriculture and allow honey bees to forage on neighbouring forest parcels and/or plantations³⁴.

➤ Tax incentives/exemptions

In the green economy, tax exemption can be considered a way to provide a preferential to support the development of new technologies, new practices, and new markets. As taxes are considered one of the main means to achieve long-term funding for PES, tax exemption linked to a PES should be always evaluated into a larger framework of equity and social justice.

4. Entering the market as a buyer

There are mainly three ways in which the public sector can enter the market as a direct buyer: through public procurement (by sourcing environmentally-friendly products and thus, encouraging production of environmental goods and services); through labelling (by regulating environmental labels, thus ensuring a fair play in terms of price premiums whereby consumers pay for environmental stewardship); and through payment for ecosystem services. Ecosystem services can be a critical tool for the public sector to administrate, preserve and restore public goods, while opening green development pathways.

STRENGTHENING THE GREEN ECONOMY WITH PES

The consideration of the various elements of a green growth strategy reveals that most enabling conditions are also crucial for the implementation of PES schemes.

This implies that green growth policies can highly influence the success of PES schemes. Similarly, PES schemes, depending on the scale of their implementation, can promote social acceptance and stakeholder participation in a green economy. PES will certainly contribute to the understanding of the importance of the ecosystem services, bringing ecological awareness, as well as active social participation in governance.

Moreover, PES schemes could also be implemented in the respect of the equity principle; the green jobs concept could in fact be designed to mainstream preservation of ecosystem services and poverty alleviation.

PES is not a silver bullet and clearly will not work if:

- governance is weak and unable to set favourable enabling conditions;
- transaction costs are very high, for instance due to land fragmentation;
- competing destructive resource usages are highly lucrative
- resources tenure or use rights are insufficiently defined or enforced, especially in the high seas, some mangroves, coral reefs, flood plains and forests without clear ownership.

However, under such circumstances, it is unlikely that governments will have effective alternative tools to effectively manage ecosystem services, as also command-and-control regulations will be likely to fail. Thus, a negative evaluation obtained during a feasibility

³⁴ Ferraro *et al.*, 2002. The Cost-Effectiveness of Conservation Payments. *Land Economics*, 78 (3): 339–353.

study for a PES project can be important to pinpoint priority areas of intervention in market and institutions.

The real contribution and efficacy of PES to the development of a green economy mainly depends on the capacity to design sustainable PES programmes.

Principles of the Rio Declaration, Earth Summit, 1992

Principle 1. The role of humans. Human beings are at the centre of concern for sustainable development.

Principle 2. State sovereignty. States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Principle 3. The Right to development. The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

Principle 4. Environmental Protection in the Development Process. In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

Principle 5. Eradication of Poverty. All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.

Principle 6. Priority for the Least Developed. The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.

Principle 7. State Cooperation to Protect Ecosystem. States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.

Principle 8. Reduction of Unsustainable Patterns of Production and Consumption. To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.

Principle 9. Capacity Building for Sustainable Development. States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.

Principle 10. Public participation. Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

Principle 11. National Environmental Legislation. States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.

Principle 12. Supportive and Open International Economic System. States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus.

Principle 13. Compensation for Victims of Pollution and other Environmental Damage. States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.

Principle 14. State Cooperation to prevent environmental dumping. States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.

Principle 15. Precautionary principle. In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Principle 16. Internalization of Environmental Costs. National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.

Principle 17. Environmental Impact Assessments. Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.

Principle 18. Notification of Natural Disaster. States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.

Principle 19. Prior and Timely Notification. States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith.

Principle 20. Women have a Vital Role. Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.

Principle 21. Youth Mobilization. The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.

Principle 22. Indigenous Peoples have a Vital Role. Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Principle 23. People under Oppression. The environment and natural resources of people under oppression, domination and occupation shall be protected.

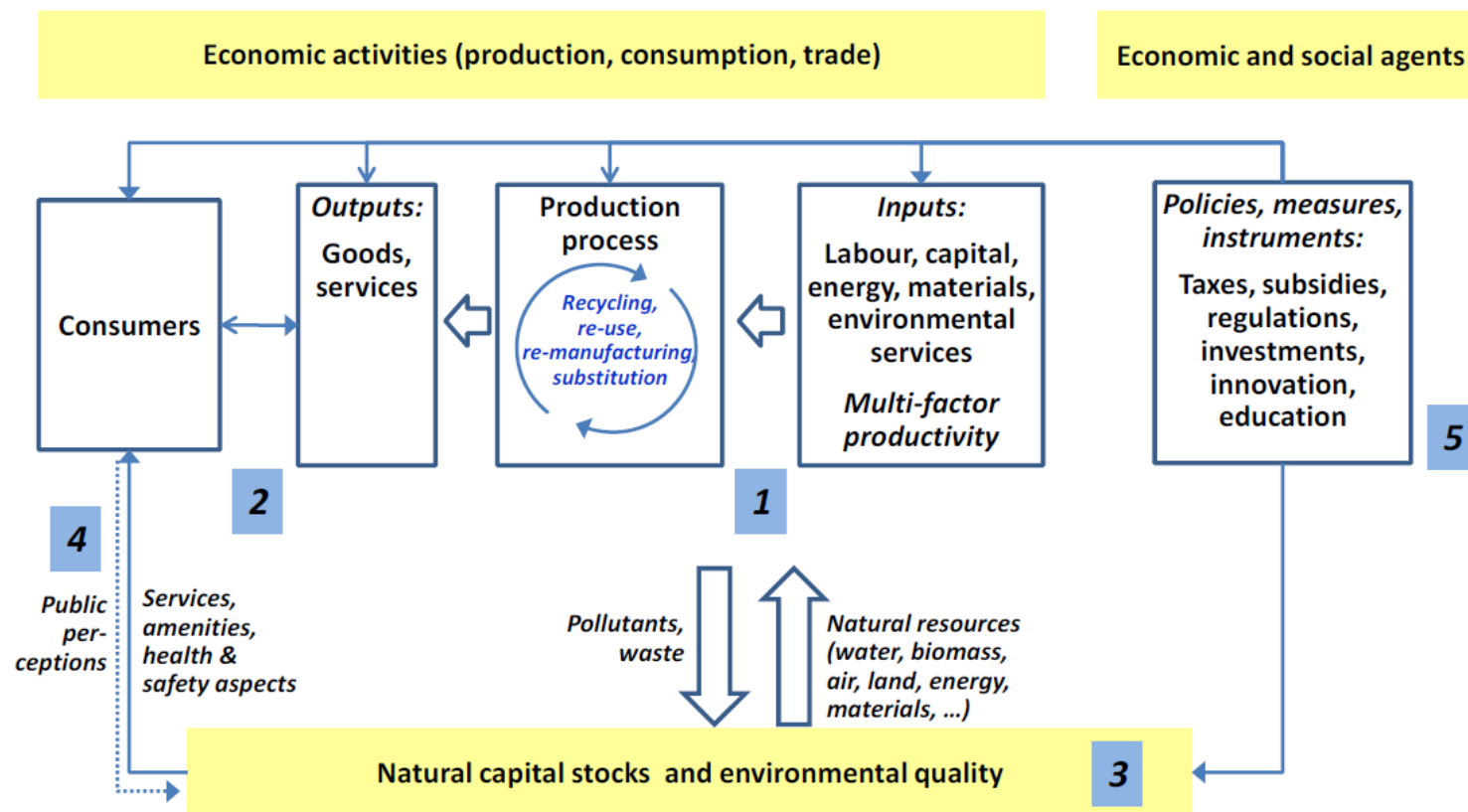
Principle 24. Warfare. Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary.

Principle 25. Peace, Development and Environmental Protection. Peace, development and environmental protection are interdependent and indivisible.

Principle 26. Resolution of Environmental Disputes. States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations.

Principle 27. Cooperation between State and People. States and people shall cooperate in good faith and in a spirit of partnership in the fulfilment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development.

FRAMEWORK FOR A SYSTEM OF INDICATORS ON GREEN GROWTH



- 1: Indicators of environmental efficiency of production and changes in production patterns
 2: Indicators of environmental efficiency of consumption and changes in consumption patterns
 3: Indicators of stocks of natural capital and environmental quality
 4: Indicators of objective and subjective environmental quality of life
 5: Indicators of responses by economic actors

REDD Forest Definition Parameters Adopted by Tropical Countries for Participation in the UNFCCC

Country (§)	Minimum tree crown cover (%)	Minimum area (ha)	Minimum tree height (m)	Forest area (*) (000 ha)
Brazil	30	1.00	5	477,698
Cambodia	10	0.05	5	10,447
Colombia	30	1.00	5	60,728
Costa Rica	30	1.00	5	2,391
Ecuador	30	1.00	5	10,853
El Salvador	30	0.05	5	298
Ethiopia	20	0.05	2	13
Ghana	15	0.01	2	5,517
Honduras	30	1.00	5	4,648
India	15	0.05	2	67,701
Indonesia	N/A	N/A	N/A	88,495
Kenya	30	0.01	2	3,522
Madagascar	30	1.00	5	12,838
Malaysia	30	0.05	5	20,89
Mexico	30	1.00	4	64,238
Morocco	25	1.00	2	4,364
Nicaragua	20	1.00	4	5,189
Niger	30	1.00	4	1,266
Panama	30	1.00	5	4,294
Paraguay	25	0.05	5	18,475
Peru	30	0.05	5	68,742
South Africa	30	0.05	2	9,203
Thailand	30	0.16	3	14,52
Uganda	30	1.00	5	3,627
Uruguay	30	0.25	3	1,506
Vietnam	30	0.05	3	12,931

(§) Countries whose parameters of forest definitions are available at:
<http://cdm.unfccc.int/DNA/index.html>

(*) Estimates FAO (2005) Global Forest Resources Assessment 2005. Progress Towards Sustainable Forest Management. FAO Forestry Paper 147, Rome.

SELECTED RESOURCES

Sector	INSTITUTION	Publication	Available at:
ENABLING CONDITIONS and ANALYSIS of GREEN SECTORS (including Water, Agriculture, Fishery)	UNEP Green Economy Initiative (GEI)	Green Economy Report (In press 2010)	Expected to be published by October 2010
POLICIES and INDICATORS of GREEN GROWTH	OECD	Interim report of the Green Growth Strategy: implementing our commitment for a sustainable future (2010)	http://tinyurl.com/39g25sl
POLICIES TOWARDS A GREEN GROWTH	OECD	Green Growth Strategy Synthesis Report (in press 2011)	
PROGRESS REPORT on GREEN STIMULUS in SEVERAL COUNTRIES	UNEP	Global Green New Deal (2009)	http://tinyurl.com/2w2u2oo
ROLE of ECOSYSTEMS in CLIMATE MITIGATION	UNEP	The natural fix? The role of ecosystems in climate mitigation (2009)	http://tinyurl.com/n4p75s
GREEN JOBS	UNEP	Green jobs: towards decent work in a sustainable, low-carbon world (2008)	http://tinyurl.com/4hryow