

## **Can commercialization really solve externalities in the forested area? Lessons learned from payment for environmental services schemes in Indonesia.**

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### Abstract

Market failure and policy failures in common property resources have led to negative externalities, imposing social costs to society. An unclear property right in the forested area, for example, has led to negative externalities in the form of environmental degradation and disruption of environmental services such as clean water to downstream communities. Commercialization of the ecological goods and services, which are common in nature, to internalize environmental externalities has been widely adopted as a Coasian prescription of such problems. Nowadays, this portfolio of commercialization is expanded to include environmental services known as payment for environmental services (PES). PES scheme provides incentives or rewards to those who provide useful environmental services by means of market transaction. Nevertheless, in the context of developing countries, market based alone is not guarantee to work due to the fact that complex institutional dimension in the form of rules and regulation, including social norms which have been built within society play a critical role in solving common property resources. This hinders the efficiency gains which should have been occurred from market forces. Incentives based in the context of resource and environmental services, to some extent, have created moral hazard and “hostage effect” due to complexity of the nature of ecosystems and institutional dimensions. This paper discusses Indonesian experiences with such market based incentives derived from various PES schemes practiced in the country. It shows how this instrument transforms non-market incentives which had been practiced in the society and how it changes the structure of norms and built-in institution in the communities. The paper also examines some critical thoughts on whether the market based instruments are appropriate compared with other communities built-in instruments when dealing with externalities.

Keywords: externalities, market based instrumen, institutional dimensions, payment for environmental services.

## 1. Introduction

Even though natural resources such as forest, fish, oil and gas account for 25 % of Indonesia's national wealth (World Bank, 2006), and have been the engine of growth for Indonesia's economic development, these resources, especially the renewable ones, have been rapidly depleted with significant costs to economic development. Leitman et al (2009), for example estimate that the economic costs from environmental degradation ranges from 0.13% to 7% of Indonesia's GDP. In the forestry sector, for example, Indonesian forest sector has suffered massive degradation due to deforestation and illegal logging activities. Although Indonesia's forests account for about 10% of the world's remaining forests and are important for Indonesia's economy, biodiversity, and freshwater supply, the forest cover has declined over the last two decades. Data from various sources indicate that Indonesia's forest degradation occurred at a rate of 1.8 to 3.6 million hectares per year during the 1990s until 2000, and at an average rate of 728 thousand hectares per year from 2001-2006 (Yeager, 2008). Unclear property rights and the complexity on institutional governance, as well as the complexity of ecosystem interaction in the forestry sector have led to negative externalities in the form of environmental degradation and disruption of environmental services such as clean water to downstream communities.

Various strategies have been developed to overcome environmental externalities in the forestry sector. In addition to the conventional command and control mechanisms such as the recently introduced verification system and moratorium policy for logging activities, market-based instruments in which environmental services can be traded in the market are also being practiced in the the country. Such a commercialization of ecological goods and services, also known as markets for ecosystem services (Jaeger, 2011), is a real implementation of Coasian principle to solve environmental externalities. The philosophy behind this Coasian prescription is simple. Market forces are to be the only efficient mechanism to allocate resources so that externalities can be minimized. Pricing mechanism could be considered as an effective way to change people's behavior and practices by providing them with incentive to conserve. Such a principle, however, might work well if goods and services are owned privately. In another word, the property right of goods and services is well defined. Many ecosystem services such as water derived from forested area, however, are subject to public goods and susceptible to free-rider problems in which individual can benefit from ecosystem services without having to pay the full costs to others. The nature of public goods would also lead to externalities in which individual actions adversely affects ecosystem provision for others. All of these constraints might hinder the effectiveness of using market for environmental services.

Despite those constraints for implementation of market based mechanism to solve externalities in the public goods arena, such a mechanism has been widely adopted both in developed and developing countries. Indonesia has also adopted payment for environmental services (PES) schemes as a way to solve many environmental and conservation problems in the degraded forested area and to overcome the disruption of clean water provision in the downstream areas. Market based instruments such as PES, environmental taxation, charges have now been

recognized in the Environmental Act Number 32/2009 that replaces the old Environmental Act of 1987, thus making it legal binding and could be become mandatory instruments instead of voluntary one as intended by market mechanism.

This paper discusses Indonesian experiences with such market based incentives derived from various PES schemes practiced in the country. It shows how this instrument transforms non-market incentives which had been practiced in the society and how it changes the structure of norms and built-in institution in the communities. The paper also examines some critical thoughts on whether the market based instruments are appropriate compared with other communities built-in instruments when dealing with externalities. Even though several studies have been done to show that the PES schemes operate in Indonesia to overcome environmental problems (Pender et al., 2008; Pirard, 2012; Arifin, 2005; Suyanto et al., 2005; Prasetyo et al., 2009; Linddal, 2011) and some critics associated with PES schemes (see for example Tacconi, 2011, Wendland et al, 2010), none of them have discussed the effectiveness of such a market based instrument and the effect commercialization of environmental services with regard to conflicting issues between social market and market-based instruments and other institutional matters associated with PES implementation. This article attempts to bridge that gap and address the complexity of rules and regulations and their interaction with market-based instruments.

## **2. Methods**

An analysis of the effect commercialization on environmental goods and services to solve externalities and the complexity of interaction between a market-based instrument and a non-market-based instrument was drawn from two PES schemes in Indonesia. The first PES scheme was located in the West Lombok regency of the West Nusa Tenggara province while the second was located in Sumber Jaya in the Lampung province, Sumatra (see Figure 1).

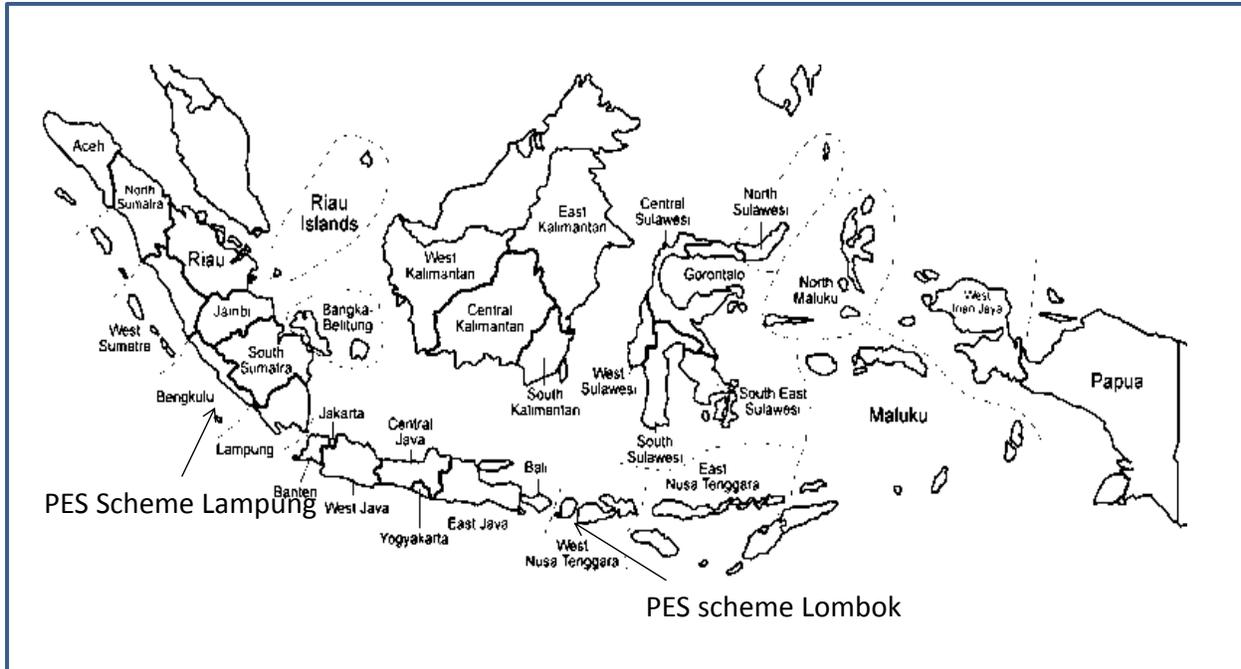


Figure 1. The locations of two PES water-based schemes in Indonesia.

Data were gathered from focus group discussions (FGDs) with various key stakeholders. These FGDs were held in two locations during the period of 2011-2012. Data gathering in Sumber Jaya was held consecutively over two days (May 11 to May 12, 2011) due to the difficulty in accessing this location. In the Lombok case, FGDs were held intermittently during 2011 and 2012. The first and second FGDs were held on the same day, while the third FGD was held a year after the first one. The interviews were held based on pre-selected questions related to the acceptance of PES schemes, the benefits and costs of participating in the scheme, the norms and social knowledge that play roles in conservation programs, and the challenges and opportunities of implementing a PES scheme in the location. Participants of FGDs were key stakeholders in the PES schemes such as farmer groups, local forest agency, private sectors, local NGOs and local leaders.

The analysis was also complemented by a secondary data set from a review of the regulations related to environmental management and fiscal regulation at the national level, and a review of the local regulations related to PES schemes at local levels. Additional information was also obtained from reports prepared by the World Wide Fund for Nature (WWF) Lombok Chapter and the West Nusa Tenggara Regency (for the Lombok case), and from reports from the hydropower company in Way Besai (the Lampung case).

### 3. Results

The PES scheme in Lampung is located in the village of Sumber Jaya (which means “source of glory”) in the regency of West Lampung. The majority of the residents of this village are migrant people from West Java who have migrated to the area since 1952. Fifty percent of the area of Sumber Jaya is either protected forest or national park while the rest is designated for plantation

and agricultural activities. Nevertheless, only 10% of this protected area is still forested. The rest has been deforested for quite some time (Pender et al., 2008).

Downstream from Sumber Jaya, a hydropower company in Way Besai generates more than 100 megawatts of electricity for Lampung and the surrounding areas. The hydropower dam has been experiencing a water deficit and sedimentation due to logging, and deforestation from both clearing and farming activities in the upstream area. The forested area and its watershed in Sumber Jaya not only play a pivotal role in ensuring the functionality of the hydropower dam, they also play a crucial role in maintaining the livelihood of the upstream communities. The forested area and its watershed contain fertile soil that supports coffee and rice cultivation, which are two of the commodities that local residents rely on.

Realizing the vital role of the remaining forested area for the functionality of the hydroelectric dam, the hydropower company has been using its Corporate Social Responsibility (CSR) funding to compensate the farmers upstream for conserving the area. In this case, the company is acting as the “buyer” while the group of farmers in the upstream area is considered the “seller.” This type of scheme might not look like a typical PES scheme. Nevertheless, the market-based component or the “P” component of PES (Wunder, 2006) is used in terms of the monetary incentives given to the community in return for conservational activities such as planting trees and maintaining the water flow. The payment is linked to a proposal submitted by the farmer’s group to the company. If the funding is approved after careful review by a facilitator, the program can be executed with monitoring by the company and a third party agreed upon by the farmer’s group. The objective of the scheme is twofold: (1) to reduce sedimentation, which ensures water quality and water flow to the dam, and (2) to rehabilitate the deforested area while ensuring a sustainable livelihood for the residents in the upstream communities.

The main critical aspect of the PES scheme in Sumber Jaya is the property right of the land. Conflict over access to and use of land has been continuing since Suharto’s regime. Uncertainty in land tenure during Suharto’s era led to a series of conflicts between migrant farmers, which led to a series of evictions (Wendland et al., 2010). In response to these conflicts and evictions, farmers illegally cultivate the land and deforest the area. To address this issue and facilitate the PES scheme, the local forestry agency intervened by providing temporary land ownership using the legal umbrella of the Forestry Ministerial Decree Number 31/2001. This decree recognizes that the community-based forest management or *Hutan Kemasyarakatan* (often abbreviated as HKm) and the agency can grant a five-year tenure of land to the community as long as the community forms a farmer’s group. Nevertheless, since the initial allocation of land tenure was based on a “first come, first serve” basis, conflict over access to and the use of state-owned land still occurs due to the heterogeneity of the community and weak enforcement by government agencies. Most of the people living in this area are migrant workers from the Island of Java, and they face continuing encroachment from other migrant people from outside of Java. At the same time, the number of forest enforcement officers (known as *Polisi Hutan* or Forest Police) is limited. Therefore, the PES scheme in Lampung faces two critical questions: (1) how to ensure continuing funding from the hydroelectricity company when no formal contract is written and (2) how to ensure that conflict over land ownership will not jeopardize the system.

The second case of a PES scheme is in Lombok in the West Nusa Tenggara province. A detailed description of this PES scheme is provided in Prasetyo et al (2009). The scheme is

located in the village of Sedau where “the heart of the water sources” of Lombok is found. The upstream area is part of the Rinjani Mountain, one of the volcanic mountains in West Nusa Tenggara. Forest degradation, illegal logging, unsustainable farming, and shifting cultivation practices in this area have led to severe environmental problems. These problems have resulted in decreased water quantity and quality for the residents of Mataram City (the capital of the province). Prasetyo et al. (2009) found that, by 2003, 40% of the 85 springs in the area had disappeared due to the aforementioned destructive practices. The decrease in water quantity and quality has been exacerbated further by growth in the tourism industry in these catchment areas (e.g. the hotel industry and other tourism infrastructure development).

Recognizing these critical issues related to forested regions and water problems, the PES scheme was established in 2004 after a study of the economic valuation of Mount Rinjani’s ecosystem was completed, a survey of the resident’s willingness to pay for environmental services was administered, stakeholder dialogues were held, and other similar processes were completed. The PES scheme in the Lombok area is relatively simple. Farmers in the upstream area are compensated for planting trees and preserving water resources. The source of funding is derived from the downstream users of the water resources. In this case, the funding comes from residents in the city of Mataram who use tap water from the regional drinking water firm known as PDAM (*Perusahaan Daerah Air Minum* or “the Regional Firm of Drinking Water”). These water users pay a flat rate of 1,000 rupiahs (Rp) per month (approximately U.S. \$0.01). The payment is embedded in their monthly water bill, is designated specifically as the *Pembayaran Jasa Lingkungan* or PES, and is enforced by local regulation (bylaw). In this sense, the payment is mandatory rather than voluntary (Pillard, 2012). The money collected from the users is then managed by a multi-stakeholder institution or IMP (*Institusi Multi Pihak*) consisting of local government agencies (led by the forestry agency), NGOs, the drinking water firm (PDAM), and representatives of the upstream communities. The IMP is recognized in the Mataram City Bylaw and is the official agency designated to manage the PES scheme in the watershed areas of Lombok. The revenue is collected from PDAM by DISPENDA (*Dinas Pendapatan Daerah*) or the Local Revenue Office and is deposited in the Local Revenue Office under the *Dinas Kehutanan* or Local Forestry Office’s account. The Local Revenue Office then distributes the funding to the IMP, which then allocates the money throughout the forested community based on proposed programs submitted to the IMP. Of the funding received from PDAM users, 75% is supposed to be allocated to the farmers groups for conservation and rehabilitation programs, while the remaining is supposed to be used for management and administrative purposes within the IMP. After a proposal is approved, the funding is to be disbursed based on the annual work plan of the community for forest restoration and other economic programs.

#### **4. Discussion**

Most PES schemes in Indonesia have evolved from conservation concerns in the forested areas. This is not surprising since the Indonesian forest sector has suffered massive degradation compared to the marine ecosystem as a result of deforestation and illegal logging activities. Other reasons for developing the PES scheme in forested areas concern water issues. Forests serve as catchment areas for water resources. The demand for water for domestic and industrial consumption in downstream areas is increasing. A disruption in the water supply would impose significant social and financial costs to the water users downstream. Industrial sectors such as state electricity companies, steel industries, and drinking water industries rely heavily on a

supply of water from upstream areas. Therefore, in Indonesia, PES schemes are commonly found in areas where the interests of these industries are at stake due to a decreasing supply of water.

A comprehensive overview of the PES schemes in Indonesia can be found in Suyanto et al. (2005). Even though other PES schemes such as carbon sequestration, natural scenic beauty, and biodiversity conservation are equally likely to be developed in Indonesia, these types of PES schemes are in a relatively early stage of development. Due to conflicting regulatory frameworks, they are also facing more challenging issues than the PES schemes that concern water issues and the watershed development issue.

An examination of the PES cases Lombok and Sumber Jaya reveals that, first, both PES schemes are not voluntary transactions as conceived in PES theory. Complexity in institutional matters is part of the PES scheme in developing countries (Greiber, 2009; Vatn, 2009; Vatn, 2010; Norgaard, 2010, Corbera et al, 2009). Institutional matters such as land ownership and the involvement of many players in the scheme program force the government to intervene by means of establishing regulations at both the national and local levels. However, clearly defined and enforced property rights are pre-requisites for a well-functioning PES program. Zbinden and Lee (2004), for example, show that land tenure and legal land title are critical to participation in a PES program in Costa Rica. Conflict over land ownership in the Lampung case, for example, forced the local government to grant limited property rights in order to ensure that the PES scheme would function. Therefore, additional policy interventions such as land reform are needed to make the PES scheme workable. Payment mechanisms involving a public fund is also subject to strict regulations. Law Number 28/2009 on regional taxation, Law Number 17/2003 on state financing, and Law Number 20/1997 on Non-Taxation Revenues do not recognize revenue from environmental services. Therefore, there is no room for earmarking such revenue. Problems related to this issue have been found in the Lombok case. In fact, the complexity of the fiscal arrangement has caused the PES payment scheme in Lombok to be suspended temporarily. Individuals involved in the collection of payments were questioned and accused of wrongdoing by the local police and the district attorney for collecting money from tap water users, which is not recognized under the taxation law. This is a clear indication of the conflict between the existing government regulations and the market-based instrument. Such a situation has hindered the implementation of the PES scheme and prevented it from achieving its goal of conservation and poverty reduction.

In order to understand why the PES scheme will not achieve its efficiency, the interplay between market and choice needs to be discussed. The PES scheme is a market-based instrument and it involves trade, and trade involve choice to maximize gain from trade (Reeson et al, 2009). In the market theory, buyers and sellers should freely choose what they are willing to pay for goods and services. Wunder (2006) notes that, if a PES is carefully designed, it should increase the capability and freedom of choice of the recipient. Therefore, it should not reduce the recipient's capability and freedom of choice. The market based instrument will also function well and achieve a socially efficient outcome if self-interested actions by individuals are voluntary (Reeson et al., 2009). In a well functioning market, the price will provide the right signal to allocate scarce resources, no need for government intervention. Yet, in the Indonesian case, the truth is the opposite. Without government involvement, the scheme probably will not work. This makes the PES scheme in Indonesia rather "mandatory" (Pillard, 2012) as opposed to voluntary as intended in the ideal PES scheme. The mandatory element means that choice is not only

limited, but, also, that the market mechanism is rather weak. This can be seen, for example, in the choice of the trees the farmers have to plant. The farmers would prefer to plant trees that will give higher economic returns such as bamboos, mango trees, and coffee. Bamboo is highly demanded for construction and domestic use while mangos fetch higher prices in the market. Similarly, farmers in Sumber Jaya have been planting coffee as their source of livelihood. Yet, the PES scheme only allows farmers to plant certain kinds of trees such as *sengon* trees (*Paraserianthes falcataria*) and other trees from which the farmers are not able to reap benefits.

The presence of many regulations on the fiscal aspects has also created a “hostage” effect on the transfer payment. This concerns whether the buyer should transfer the payment directly to the seller (farmers) as the market dictates or whether the buyer should follow government regulations by means of a fiscal arrangement. If buyers follow the first option, they will end up liable for wrongdoing. If they follow the second option, there is no guarantee that the money will be distributed and earmarked for the PES scheme.

The second aspect worth discussing is the transformation of social norms from the social market to the payment-based market instrument (Heyman and Ariely, 2004; Wunder, 2006). Heyman and Ariely (2004) argue that the relationship between payment and effort will depend on the type of exchange (either money or social markets). The social market is a non-monetary system of exchange and reciprocity among individuals, and is often shaped by altruism and social norms. With perfect information and zero transaction costs, the PES theory (or the neo-classical economic theory) expects market-based mechanisms to be more efficient than other non-market-based or social market mechanisms. However, there is no such thing as perfect information and transaction costs are ubiquitous. The PES scheme transactions involve human behaviour where information tends to be asymmetrical and positive transaction costs arise such as the cost of establishing rights and enforcing rights. In addition, the efforts and exchange system incorporated a PES scheme is also influenced by social norms instead of only by the price mechanism. Therefore, the social market still plays a pivotal role in a conservation program.

In developing countries such as Indonesia, the social market is part of rural cultures, which have been embedded in their social life. In the past, Indonesian rural people practiced *gotong royong* in which each member of community contributed his or her effort (usually in non-monetary form) without expecting any monetary return from their contribution. This *gotong royong* tradition is now eroded and the people expect some monetary reward for every contribution they make (even for attending a meeting). However, traditional communities also have their own social norm called *adat* (“customary law”) which relies on a strong attachment to traditional values to conserve and protect their environment. This norm still exists and it could be used as a vehicle for conservation measures. A traditional Dayak community in Borneo, for example, declared the forest area as a “sacred” area so that no one will perform destructive activities in the forest. Therefore, no additional monetary incentive mechanism is necessary to protect the forest in this area.

These arguments indicate that a monetary incentive scheme based on a market-based instrument such as a PES scheme often counteract the social market which has been embedded within a community. Various studies such as Gomez-Baggethun et al. (2012), Gomez-Baggethun (2010), and Jack (2009) show that local knowledge and local belief play a critical role in conservation programs by creating social cohesion and enhancing social-ecological resilience to hazards. The presence of a market-based instrument often creates a “crowding-out effect”

whereby monetary incentives crowd-out or undermine local rules and social norms and may influence the intrinsic motivation for conservation (Farley and Constanza, 2010; Frey and Jegen, 2001; Muradian et al., 2010; Clements et al., 2010). The crowding-out effect might also arise with regard to the presence of a formal regulation such as Indonesian Law Number 32/2009 on environmental protection, in which the PES schemes will be regulated by government regulation. As pointed out by Cardenas et al. (2000), environmental regulations designed to improve social welfare might crowd-out a group regarding their behaviour to protect the environment. The crowding-out effect is shown from the lack of *gotong royong* activities (group regarding behaviour) for conservation in the two PES areas being studied.

The conflict between the norm of the social market and the monetary incentive can be found in the PES scheme in Lampung. In one of the focus group discussions (FGDs) in the village of Sumber Jaya, a local leader challenged the author about the effectiveness of the PES scheme. He disagreed with the PES scheme and preferred the social instruments such as norms and moral suasion to conserve the forest. In his statement, he said: “We don’t need a *market* for environmental services, what we need is a “*market for feelings*” (village secretary). When asked what he meant by a “market for feeling,” he said that everyone has to feel the pain and how we suffer when the water runs dry, when the trees are gone, and when disaster occurs due to irresponsible logging. Hsee and Rottenstreich (2004) acknowledge the presence of feeling in the valuation assessment. They refer to this situation as “valuation by feeling” in contrast to “valuation by calculation” in which incentives and market mechanism play a greater role. They demonstrate that systematic differences arise between these two valuations and yield different outcomes. Valuation by feeling is sensitive to the presence or absence of stimulus. In this example, it is not the number of trees being planted or the cubic meters of water being delivered downstream that motivate the population to conserve their environmental resources, it is rather how the absence of trees and the lack of water will induce pain in the community in the form of natural hazards and increase the risks to livelihoods. If this social market (i.e. the social norms and voluntary motivation) is maintained, there is no need for compensation from outsiders such as the private sector or the government since everyone will benefit from their own effort. For example, a motto among the rural people of Sumber Jaya states: “Let the water (tears) from our eyes run dry, but not the water from our river.” This motto has created a strong willingness among these people to preserve water resources in the upstream area at any cost, even without compensation. The PES scheme could serve as a complementary scheme to the existing social system of preserving environment or it could be used as a direct monetary scheme for reducing poverty in the community rather than as a direct payment scheme for providing ecosystem services.

The existence of different interests between farmers and “buyers” with regard to the choice of the trees for the conservation program and the conflicts between the monetary incentive and the social incentives has led to serious problems with regard to the sustainability of the PES schemes. A recent report from Lampung (Sumaryo, personal comment, 2012) revealed that the hydroelectric company is still facing a serious water deficit for its dam and that some of its turbines are not functioning due to the drop in water levels. This has led to disruption in the electricity supply to the Lampung region. This indicates that the PES scheme in Lampung is not functioning well as dictated by the PES criteria. A combination of factors such as land conflicts, low participation, regulatory problems, the high cost of monitoring, and conflicts between economic incentives and social norms hinder the PES scheme.

Critiques of the superiority of the PES scheme as a market-based mechanism for poverty reduction arise from the socio-economic impact of the program. Discussions with farmers in both Sumber Jaya and Lombok revealed that the PES schemes have significantly improved their household income. The leader of the group in the Lombok case, for example, claimed that his income from the coffee business has increased due to funding from the PES scheme. According to him, this increase in income is attributed to an increase in the frequency of grinding coffee beans from once a week before the PES scheme to three times a week after the PES scheme. He stated that the increase in the frequency of grinding the beans increases his revenues from selling the coffee to the markets. This claim, however, was heard from group leaders only and should be interpreted with caution since it could lead to the so-called *Bernaully's error*. Coined by Kahneman (2011), this term refers to a situation when the utility of welfare is assumed to be the same regardless of the initial welfare of the person. It is assumed that the utility of welfare is determined only by recent *changes* in their wealth. Yet, the welfare impact is determined not only by recent changes, but also by changes relative to a different state of wealth, which depends on the perception and sensation of the individual or individuals involved. That is, the reference point is important and matters. A failure to recognize this reference point will lead to false claims about the welfare impact. In the market-based theory, the reference point does not matter. This leads to a different assessment about the welfare impact.

In both cases of the PES scheme in Indonesia examined in this article, no reference point is available to be used as a basis to assess the poverty reduction program. Since no reference point is available, it is difficult to assess whether the improvement of the welfare of the group leader in Lombok is derived from the PES program or from the combination of many socio-economic factors. In this case, there is no conditionality about the use of money received from the PES scheme. The money can be used for other programs as well. Therefore, in Lombok, the money from the PES scheme is also used for lending and borrowing among members of the group so that it creates a micro-banking system within the village. In fact, only 10% of funding received by the farmer group in Lombok was used to direct the conservation program. This might also contribute to the welfare impact of the leader and the group, and this impact can be felt *recently* without any reference points.

A trade-off always exists between conservation programs and poverty reduction when a PES scheme is implemented (Zilberman et al., 2008; Jourdain et al., 2009; Pagiola et al., 2005; Lindell-Mills and Poras, 2002). For example, Zilberman et al. (2008) note that, in terms of a poverty reduction program, PES programs are good for landowners. That is, they are beneficial when the ownership of land is well-defined. This is not the case for Indonesia where most participants of PES schemes do not own the land. Similarly, Jourdain et al. (2009) found that the overall effect on poverty of a PES scheme in Vietnam was negative due to diminishing labour productivity. In fact, in Asia in general, PES schemes have not yet been proven to reduce poverty (Huang and Upadhyaya, 2007).

## **5. Concluding Remarks**

Although commercialization of environmental goods and services using market based mechanism such as PES, is gaining popularity and is proposed to be adopted widely in Indonesia as a mean for environmental conservation, they cannot be separated from their institutional facet. The market-based mechanism alone will not solve the complex problems related to natural resource management and environmental conservation. This paper has shown the two contrasting

aspects of (1) rules, norms, and regulations which constitute the non-market aspect (or social market), and (2) monetary incentives or commercialization of the PES scheme. The monetary incentives might partially solve the problems of environmental, conservation, and poverty issues, but they might overlook the norms, regulations, and institutional aspects surrounding the scheme.

In the context of the developing country's PES scheme, identifying which one of these two aspects dominates is difficult since both play a different role in the PES scheme. Market-based incentives will provide signals through the pricing mechanism about the costs and benefits of conservation programs. However, these market-based incentives alone will not work without support from the rules, regulations, and social markets which are embedded within the communities. The PES scheme should be aligned with existing governance institutions. In fact, in Indonesia, a lack of support from governance institutions will likely to lead the failure of PES programs. This has raised a lesson learned that, while PES schemes in the developed world tend to be more aligned with governance institutions which make the PES scheme work, this is not the case in developing countries. Therefore, the PES scheme in developing countries should be aligned with local knowledge, rules, norms, practices, beliefs, and organization structures within the community. It should also adopt the behavioural aspects of the poor. Finally, the PES scheme in developing countries should address the crucial aspect of insecure property rights, which is a key institutional weakness, so that whether the market will work or not is addressed properly.

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