

RESEARCH ARTICLE

(Open Access)

The Possibility of Establishing a Scheme for Payments for Ecosystem Services at the Bovilla Watershed (Tirana)

VALMIR BALOSHI*, FRAN GJOKA, NEHAT ÇOLLAKU, ELVIN TOROMANI

Agricultural University of Tirana, 1029 Kodër-Kamez, Tirana, Albania

Abstract

This paper focuses on identifying and evaluating the possibility of establishing schemes for payments for ecosystem services at the Bovilla watershed (Tirane) in order to promote the adoption of sustainable land management practices that will result in improved quality water in this watershed. We selected this watershed as over 5% of its total land area is used for plant cultivation, and that it includes a reservoir that supplies drinking water to Tirana city. As a result of improper land use practices in the watershed, soil erosion has become an inhibiting factor for sustainable development of agriculture and conservation of natural resources including water resources. The aim of this study was to assess the willingness of stakeholders in the *upper and lower* parts of Bovilla watershed to be included in an agreed scheme for payments for ecosystem services. Willingness was assessed by site surveys (interviews) conducted with farmers which living in the areas considered as hotspots and with the personnel staff of the Tirana Water Supply at their central office. The results of the processing of the collected data show that 100% of farmers and 70% of respondents from the Tirana Water Supply Company are ready to sign a negotiated scheme for payments for ecosystem services at Bovilla watershed. To implement a scheme for payments for ecosystem services local farmers need a satisfactory financial compensation, and the Tirana water supply company needed the preparation of a well-defined legal framework for defining responsibilities, the role of public institutions and agencies and governmental in pursuing, implementing and monitoring payments for ecosystem services scheme.

Keywords Ecosystem Services, Payment, Sustainable Land Management Practices, Water Quality.

1. Introduction

Land degradation has been identified as a major problem of natural resource management in Albania. Various natural ecosystems, including forests, pastures, etc., offer a variety of economically valuable services. If the use of agricultural land, forestry and pasture are not controlled then this system can be easily damaged. Therefore a good method of preserving ecosystem values is the Payment for Ecosystem Services (PES). The concept of Payment for Ecosystem Services (PES) requires that landowners and land users be compensated for providing a service to society, such as water flow regulation, sequestration of carbon, biodiversity conservation, and etc. In recent years, "knowledge of ecosystem services and their value has

increased efforts to internationalize ecosystem services through direct payments for ecosystem services (PES)" [6].

The idea of PES is to carry out direct, contractual and conditional payments by environmental service beneficiaries to farmers, local owners or land users as a reward for adopting practices to ensure the ecosystem conservation and rehabilitation [7]. Payment for Ecosystem Services (PES) provide a framework in which those providing ecosystem services are compensated or rewarded for forgoing an alternative land use by the beneficiaries of that service. The PES concept has shown global interest as a cost-effective that means improve ecosystem management by rewarding farmer or local residents for their efforts in providing Environmental services of value to societies

*Corresponding author: Valmir Baloshi; E-mail: rimlav_2004@hotmail.com

(Accepted for publication July 16, 2019)

ISSN: 2218-2020, © Agricultural University of Tirana

[8]. PES plays an important role in the lives of environmental services providers by providing them a better live and possibility to improving their well-being [5]. According to the OECD, there were already more than 300 PES od PES-like programmes in place around the world by 2010 at national, regional and local levels [4]. Bovilla watershed is prone to erosion where 68.88% of surface is considered as a hotspot or hot erosion site where the land loss exceeds 10 tonnes / ha / year which is considered as a tolerable soil loss [2]. The aim of this study was to assess the willingness of stakeholders such as farmers in the upper part of the watershed and Tirana Water Supply in the lower part to be included in an agreed scheme for payments for ecosystem services.

2. Materials and Methods

2.1 Study area

The study area is Bovilla watershed. It is located between 41°30'-41°15' N latitudes and 19°50'-20° 05' E longitudes, northeastern Tirana, and has an area of 95 km². The climate is Mediterranean, when the mean annual temperature is 13.9°C, the rainfall is 1718.6 mm and the potential evaporation is 916 mm [3]. Geologically, the study area is divided into two main areas: peripheral area consisting predominantly by carbonate deposits and central area consisting mainly of flysch. The study area has a dissected topography and contains a variety of landforms. DEM of the study area indicates that around 80% of it has an inclination from 15°-30° and an elevation from 300-1800 m above sea level. The major soil groups in the study area are Leptosol, Cambisol and Phaeozem. Land cover is dominated by broadleaves forest, pastures, riparian vegetation and agriculture lands. More detailed information on the study area is given by [1].

2.2 Questionnaires

Farmers and personnel staff of Water Sypply of Tirana were randomly interviewed with a pre-constructed questionnaire. Two different questionnaires were developed for the collection of the required information for the two interest groups: i) Water supply in Tirana, which is the main beneficiary of environmental services; and ii) Zall-Bastari administrative unit farmers as environmental service providers. The questionnaires were constructed in such a way as to get as much information as possible. So the questionnaires were included open questions and closed questions.

The farmer`s questionnaire consists of 19 questions that includ categories: data about number of family, the types of land they iwn or useing, types of crops and the revenues from them, the aways of plowing and irrigation water resources, the number of livestock breeding, the way of grazing and food ensure, current fertilizers and pesticides that are useing, famers incomes, attitudes towards adopting sustainable land management practices such as PES scheme.

While the questionnaire for the Tirana Water Supply consists of 24 questions in five categories: the first part requires information about the staff personnel (name surname, job position and gender), in the second part information on water treatment / use, in the third part information if there are problems with erosion, in the fourth part information on turbulent / sedimentation flows, and in the fifth part information on environmental services, potential benefits and if they are willing to accept agreements to pay residents living in the part upper basin so as to change the land use of the territory to reduce / avoid the adverse effects on erosion, sedimentation and water pollution. Interviews were conducted in the hot erosion areas in the village of Zall-Bastar and in the village Vilëz by random residents, while interviews with the Tirana Water Supply Company were conducted in the Directorate General of water supply with managers and employees of the administration of this entity.

2.3 Data Analysis

The survey`s results have been processed with Statistical Package for the Social Sciences (SPSS) to assess the percentage of answers per query.

3. Results and Discussion

3.1 Targeting of interest groups

In our study, to assess the readiness of interest groups to involve in the establishing of the PES mechanism, we are focused only on two main groups: farmers living in the upper part of the watershed as well as Tirana water supply.

a) Farmers living in the upper part of the Boville watershed have only been evaluated in the areas that resulted from the study as hotspots from the standpoint of erosion. It is worth pointing out those farmers as a

group of interests result in ownership rights over agricultural land.

b) Tirana Water Supply, as the main interest group.

We assessed the readiness of the above two groups of interest (farmers and water supply of Tirana) through surveys / questionnaires prepared for both categories. Farmer survey results. Surveys have been conducted in the areas that are most affected by erosion such as Zall-Bastari and Vilëz. Survey results were analyzed using the SPSS program. Survey results show that the families of farmers consist of 2 to 8 members. Generally, farmers own farmland with different

surfaces and slopes, pasture for livestock and forestry land. Among the most commonly used crops are corn, wheat, forage and vegetables (such as tomatoes, peppers, cucumbers, green salads, eggplants, etc.). They sow just enough to meet their family needs and only a few farmers sow for sale. The land is ploughed in one of three ways: mechanized, with animals and with wings. Watering is a source of natural flooding, and in some areas where they have planted vegetables, they carry out point irrigation. Also, they use various fertilizers such as phosphate, ammonium nitrate, urea, DAP, organic fertilizers and some pesticides.

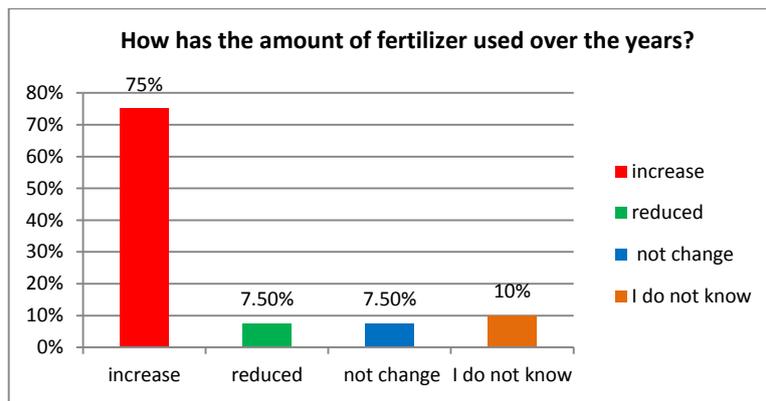


Figure 1. Change of fertilizer usage in years

As it is seen from the chart, 75% of farmers answered that the use of fertilizers increases annually. As far as the domestic animals they own, it results that almost all of them have at least one cow and also sheep and goats in different numbers according to their ability to feed them in free grazing. Animal feed is provided by

themselves but when they cannot provided, they buy it from other farmers. Also, all farm families own chickens from 10 to 50 or an average of 30 chickens per family. In general, the income of the farm families in the area survey area was low.

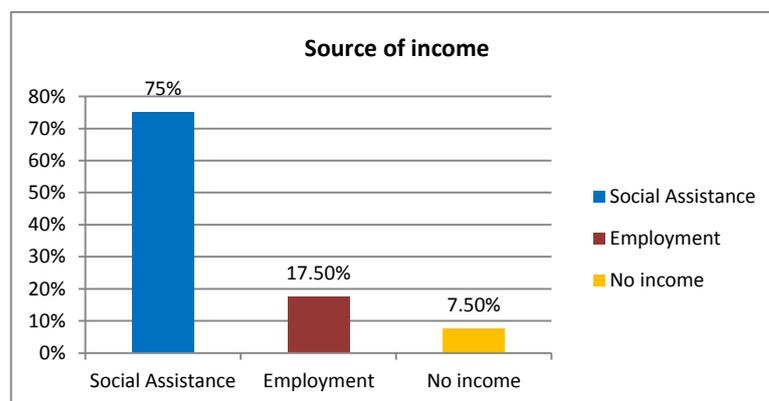


Figure 2. The source of income

Regarding the source of income, the survey shows that 75% of the surveyed farm families in the surveyed area have a major income as a social assistance or retirement ranging from 25 to 69 Euro / month, while 17.5% of the

surveyed families have an employee and 7.5% of families have no income. All this shows that the main source for farm families remains agriculture and livestock. As far as the question is concerned, if they

are aware that their activities as form of land use categories, forest cutting, over grazing affect other actors located at the bottom of the Bovilla watershed.

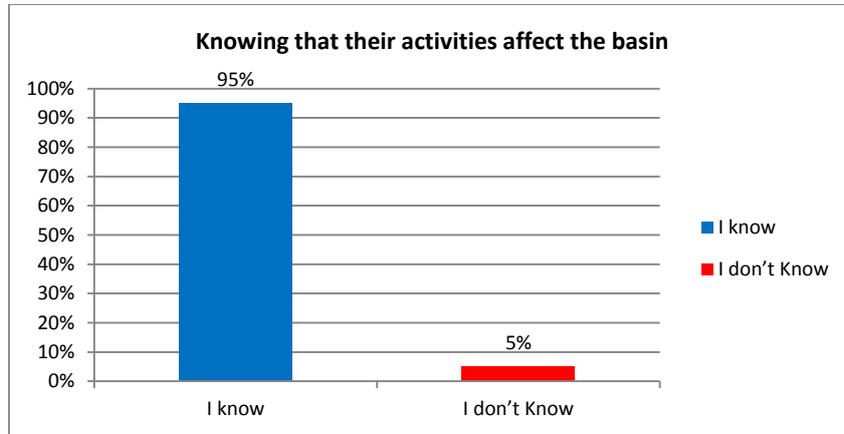


Figure 3. Knowing that their activities affect the Boville basin

As it is shown in the graph above, 95% of farmers were aware that activity / interventions in the upper part of the watershed affect Boville basin in terms of water flow, quality and quantity of water, while only 5% think that activities in the basin the upper part of the basin does not affect the Bovilla basin. As well as the question of whether they are willing to reduce the activities / interventions that occur in the upper part of watershed and negatively impact the

watershed in order to increase environmental services for the beneficiary of services such as Tirana Water Supply it resulted that: 77.5% of farmers are as willing as possible to reduce negative activities in order to increase positive benefits. While the rest say that they will be willing to reduce or adjust their activities if there is financial support.

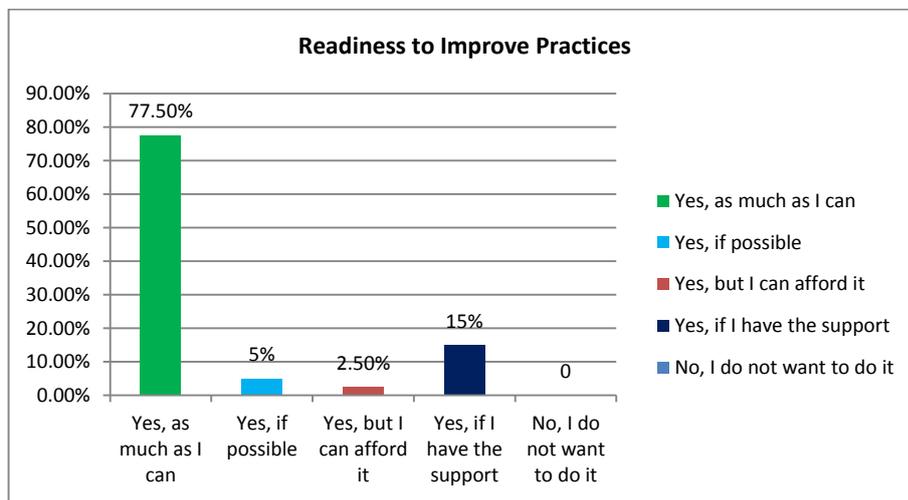


Figure 4 Readiness in changing activities from negative to positive

Moreover, the survey shows that despite the readiness to adopt land management practices, it is underlined that change of usage practices will only occur if farmers are financially supported and will be satisfied with the extent of financial support.

Tirana Water Supply Survey results. Based on the surveys made on the Tirana Water Supply (TWS) we can say that: (i) The respondents were part of the main staff, employed in the positions as a director, supervisor and administration employees; (ii) All personnel staff of Tirana water supply declared that the quality of water is very important, while when asked what the

most problems they had with water it resulted that their main problem was turbulence, then come inert and very little chemical pollution.

Also, personnel staff of Tirana water supply reported that they had problems with seasonal fluctuations and seasonal water fluctuations during the dry season. Moreover, the interview results show that TWS deals with cleaning, filtering and disinfection of water to bring it to the appropriate usage parameters. Normally, to accomplish the above filtration processes, water disinfection takes time and financial resources.

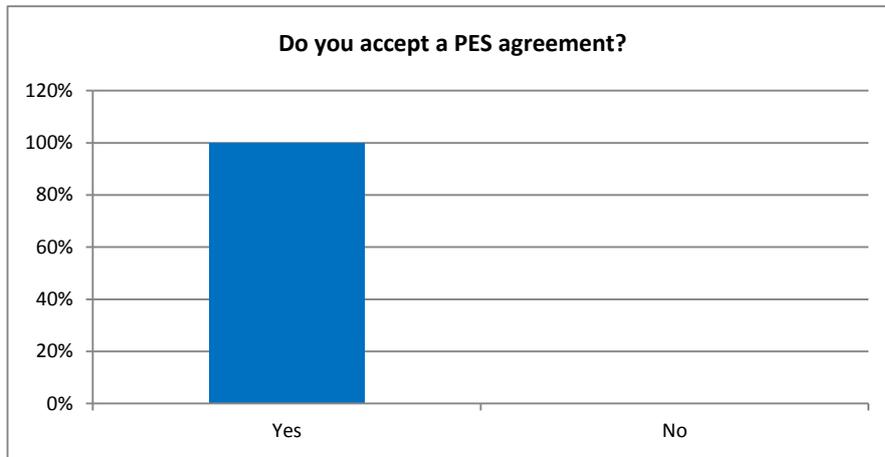


Figura 5. Acceptance of the PES agreement

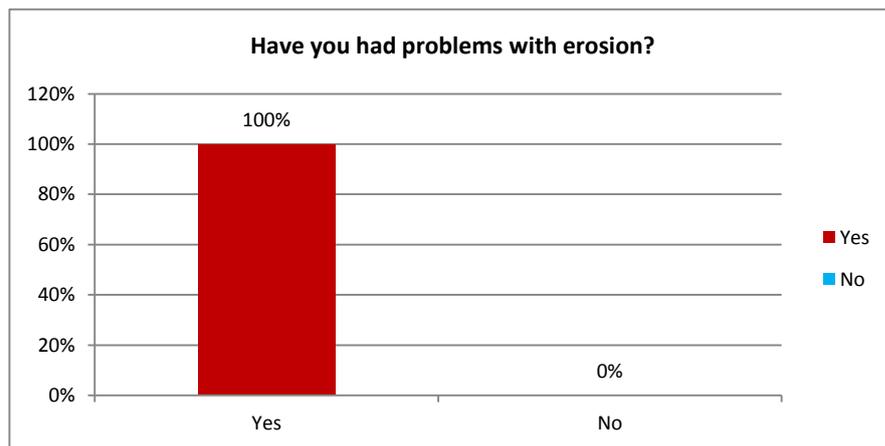


Figura 6 Answering the question about erosion problems.

As it is shown in the figure above, it turns out that 100% of personnel staff of TWS answered that they had erosion problems 1 time or 2-3 times a year. Also 100% of respondents admitted that they did not make any

economic assessment of the damage caused by erosion. So far no measures have been taken to reduce or control it, except activities done by the farmers for their needs.

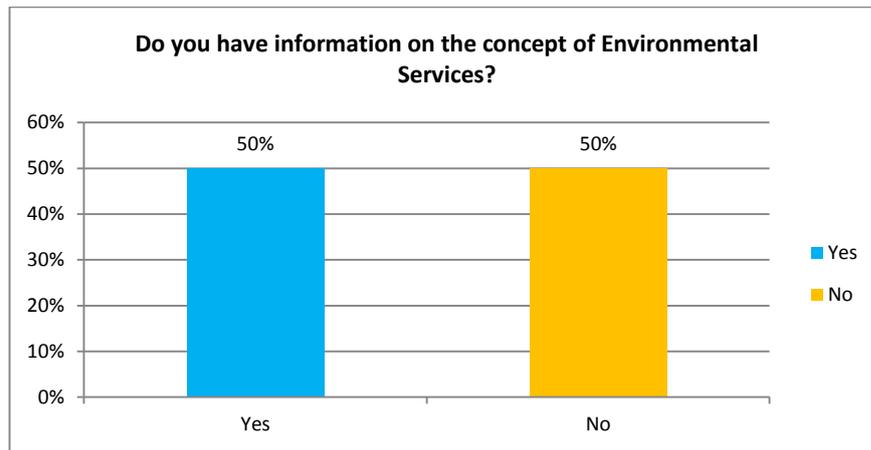


Figure 7 Answering the question about environmental services

Regarding the knowledge that water supply companies have to the concept of ecosystem services, it turns out that 50% of TWS personnel staff were aware, while 50% hadn't previously heard about the concept of ecosystem services. This means that more information, knowledge and trainings should be provided to different actors related to PES. Meanwhile, regarding the question of whether someone should pay for the benefits of environmental services, it turns out

that 100% of TWS personnel staff answered yes, pointing out that the citizens of the Tirana and Kamza municipalities should be interested in quality water or should pay TWS for PES as beneficiary of the environmental service.

Also, it resulted that 90% of TWS personnel staff were unaware of the existence of Environmental Services Payments (PES).

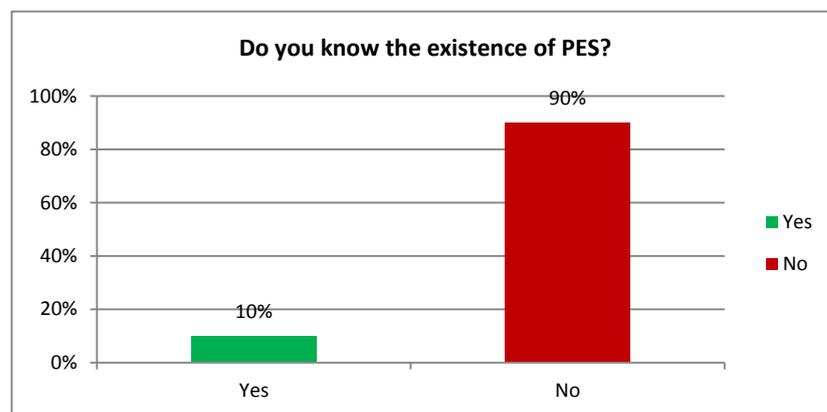


Figure 8 Response to PES knowledge.

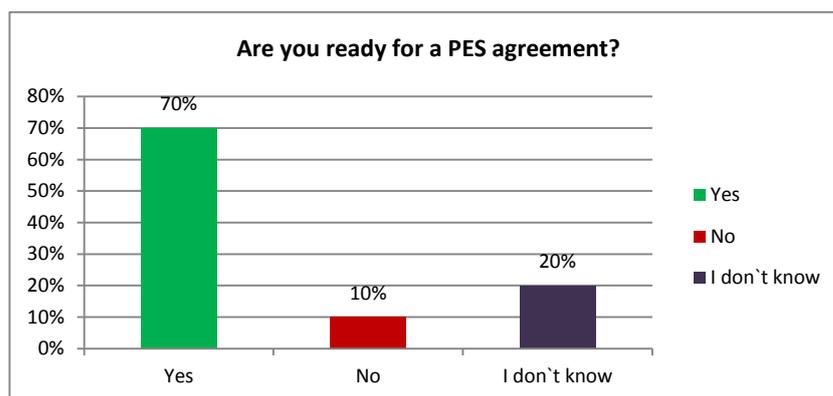


Figure 9 Response on the readiness for a PES agreement

Regarding the readiness to implement a PES agreement, it resulted that 70% were ready for a PES deal, 10% were not, while 20% were not currently decided to enter into a PES agreement. The surveyed representatives of Tirana's water supply emphasize that on the one hand they believe that such an agreement could be accepted by the policy and would be effective in reducing erosion, protecting water resources, and the ability to have more quality water, meanwhile which on the other hand raised the problem of the uncertainty of the legal framework for the implementation of the PES scheme. In fact, in the Albanian legal framework PES is neither explicitly permitted nor prohibited by law. Regardless, the Tirana Water Supply Efforts so far have not been formally offered to be a party of the agreement for establishing a PES scheme, justifying it with the ambiguity of the legal framework for implementing the PES scheme.

4. Conclusions

This survey, conducted to see the readiness of the two main interest groups (local farmers and Tirana water supply) for the possibility to implementing a PES agreement at the Bovilla watershed showed that 95% of local farmers were aware that their activities would affect in the watershed and that they were 100 % willing to accept a PES agreement by changing land management practices only if they are financially supported to a satisfactory extent. While the Tirana water Supply results that 90% of them had not heard about the existence of PES and only 70% of respondents were willing to accept a PES deal. So, in order to promote PES mechanisms and to put them in place the financial resources are very important and should be provided immediately to the farmers who live in

the upper part of the basin. In conclusion, we can conclude that, in order to move further towards the implement of PES schemes, needed more awareness of the society, interest groups, responsible institutions and the preparation of a well-defined legal framework for defining responsibilities, the role of public institutions and agencies and governmental in pursuing, implementing and monitoring PES schemes. To establish PES mechanisms the basic operational environment related to tenure, providers and beneficiaries of the services, the policy and legal framework, and governance structure need to be in place.

5. Acknowledgements.

The author thanks all the persons who participated in this survey.

6. References

1. Baloshi, V., F. Gjoka, N. Collaku, E. Toromani, L. K. Iaroslav: **Relationship between Surface Water Quality and Land Use in Bovilla Watershed, Tirana Region (Albania)**. – *Fresenius Environmental Bulletin*, 28(6), 4435-4441 (2019).
2. Borrelli, P., David A. Robinson, Larissa R. Fleischer, Emanuele Lugato, Cristiano Ballabio, Christine Alewell, Katrin Meusburger, Sirio Modugno, Brigitta Schütt, Vito Ferro, Vincenzo Bagarello, Kristof Van Oost, Luca Montanarella, Panos Panagos: **An assessment of the global impact of 21st**

- century land use change on soil erosion.** *Nature Communications* 8: 2013 DOI10.1038/s41467-017-02142-7. www.nature.com/naturecommunications.
3. OECD (2010). **Paying for biodiversity: enhancing the cost-effectiveness of payments for ecosystem services.** OECD, Paris.
 4. Peçuli, V: **L'evapotraspirazione e il suo calcolo nel territorio della R.P.S. dell'Albania.** Istituto Di Ecologia Agraria, Universita Degli Studi Perugia (1981), 22.
 5. Pirard, R., and R. Billé: **Payments for environmental services (PES): a reality check (stories from Indonesia).** No. 3. Institut du développement durable et des relations internationales (IDDRI), Paris, France (2010).
 6. Wertz-Kanounnoff, S: **Payments for environmental services - A solution for biodiversity conservation?** Idées pour le débat, 12. IDDRI, 17 p (2006).
 7. Wunder, S: **Payments for environmental services: Some nuts and bolts;** CIFOR Occasional Paper No. 42; ISSN 0854-9818, 2005 by Center for International Forestry Research. http://www.cifor.org/publications/pdf_files/OccPapers/OP-42.pdf
 8. Zilberman, D. V: **Payments for environmental services: who gains who loses? Agricultural and Resource Economics Update,** 2007 11(1):1.