

## **Honduras- Jesus de Otoro**

### *(PASOLAC initiative)*

#### **SUMMARY**

The Program for Sustainable Agriculture in Hillside of Central America (PASOLAC)-supported local micro-watershed initiative. The Payment for Environmental Services (PES) scheme in the town of Jesus de Otoro compensates upstream landholders for conserving forests and for adopting better environmental practices.

#### **MATURITY OF THE INITIATIVE**

Launched in 2002, ongoing in 2010.

#### **DRIVER**

Conflict resolution led by NGO (PASOLAC). The creation of the local NGO Council for Administration of Water and Sewage Disposal (JAPOE) was a response to serious problems of water access and quality that Jesus de Otoro faced at the beginning of the 1990s. There were a lot of conflicts between downstream residents concerned about pollution of drinking water supplies and upstream coffee producers. In 1996, the downstream community resorted to destruction with machetes of coffee seedbeds of upstream producers arguing that this activity was the main source of water pollution. In 2001, PASOLAC, financed by Swiss international cooperation, proposed to the JAPOE the establishment of a payment scheme for environmental services in the watershed, and provided a seed fund of US\$4,000.

#### **STAKEHOLDERS**

##### **Supply**

*Private landowners* in the watershed of the Cumes River. Total area of the sub-basin is 9,180 hectares (including downstream). Upstream target area is approximately 2,500 hectares. Current land use: around 53 per cent of the watershed is covered by forest, most of it pines and oaks. Part of the watershed is within the Montecillos Nature Reserve (protected area). Highest elevation is 2,200 metres above sea level. Current coverage of the PES scheme is 75.85 hectares of private land, expected to rise to 200 hectares. At the time the fieldwork by Kosoy et al. was conducted in 2004, the scheme offered payments to only four providers and covered around 22 hectares. Later, the coverage was expanded to 18 providers and 74 hectares. The properties under PES are small (range: 9.5-16 hectares, average: 13 hectares).

##### **Demand**

NGO managing water resources. The Cumes watershed supplies water to the town of Jesus de Otoro (with 5,200 inhabitants, 70 per cent with piped connections and the rest using wells and rivers). Funds for the programme come from two sources: an additional fee on water bills charged by JAPOE to 1,269 households (in 2004 this was US\$ 0.06 or one Lempira per household per month). The Municipality is supposed to contribute 1 per cent of its annual income to the PES fund (which until 2004 had not been made effective). Seed capital was facilitated by the Swiss Agency for Development and Cooperation (SDC) through their local representative PASOLAC for US\$4,000.

*Willingness to pay.* A survey among water users downstream (100 users) shows that the average income per household is \$275 per month. 57 per cent of them drink water directly from the tap. Forty-three per cent of them are aware of the PES programme and 72 per cent agree that the payment (one lempira per household, or US\$0.06) is fair. Almost 80 per cent of households believe that the quality of water has improved in the past two years. The survey did not examine if they thought it was because of the PES or not.

## Intermediary

**NGO intermediary:** The scheme is administered by the local NGO *Council for Administration of Water and Sewage Disposal* (JAPOE). The NGO was created in 1995 with support from the Catholic Relief Service (CRS), to manage water provision and sanitation in Jesus de Otoro. Before that the municipality was in charge, but serious difficulties in access and quality forced them to accept transfer of authority to JAPOE. The NGO is a decentralized and participatory institution for urban management of water and sanitation, and its members are elected in general assemblies in 10 different areas of the town.

## MARKET DESIGN

### Service

*Water quality.* The scheme is meant to reduce water pollution, mainly by promoting the adoption of more environmentally friendly agricultural practices. Perceptions about the benefits from the forests in terms of water are strong. A survey of downstream water users revealed that 85 per cent believe that increased forest area results in better water quality, 93 per cent that this increases water quantity. Fifty-seven per cent of households think that the main benefit from forests is water provision (and eight per cent more watershed protection). Interestingly nobody mentioned that the main benefit from forest is biodiversity protection or landscape beauty.

### Commodity

*Improved management practices that include:* no burning before, during or after planting; use of vegetation fences, irrigation ditches and terraces; establishment of agro forestry systems; production of organic fertilizers; recycling of coffee pulp and management of wastes from coffee processing; implementation of organic agriculture; agroforestry systems;

*Conservation of existing ecosystems: forests in good condition*

JAPOE signs a contract with each of the providers. In these contracts, the amount of the payment and the commitments for upstream land use changes are set.

### Payment mechanism

*Intermediary-based water fee.* JAPOE charges one lempira per household per month (approximately US\$0.06). The municipality is supposed to pay one per cent of its annual income.

The amount of the payment depends on the number of better practices adopted and on the type of forest protection. Payments are:

Primary forest 5.52  
Secondary forest 4.14  
Young forest 2.76

Short cycle crop (2 better practices adopted) 5.52  
Short cycle crop (3 better practices adopted) 8.29  
Short cycle crop (4+ better practices adopted) 11.05

Permanent crop (2 better practices adopted) 8.29  
Permanent crop (3 better practices adopted) 11.05  
Permanent crop (4+ better practices adopted) 13.81

Agroforestry (2 better practices adopted) 11.05  
Agroforestry (3 better practices adopted) 13.81  
Agroforestry (4+ better practices adopted) 16.57

## Terms of payment

Cash payment - continuous through contracts. Each contract is signed every year, and could be easily renewed if the supplier complies with the agreement. Payments are made at the end of the year.

Users pay an (continuous) environmental fee. The actual fee for PES was only 3.6 per cent of the estimated willingness to pay among water users, and was decided politically at the JAPOE through voting of representatives from the different water sectors in town (Kosoy et al., 2004).

## Funds involved

Unclear.

## ANALYSIS OF COSTS AND BENEFITS

### Economic

The study by Kosoy et al. (2004) of the original four farmers included in the PES scheme found that their average gross income (on-farm and off-farm) is US\$8,350 per year and net profits averaged US\$397.7 per hectare. PES payments range from US\$5.52 to \$16.57 which means that their share of both profits and gross income is minuscule (0.4 to 1.2 per cent of gross income). Participants consider a "fair PES" to be in the region of US\$30 per hectare per year. Information from 10 potential new participants shows an average gross annual income of US\$1,940, with a net farm income ranging from US\$190 to 1,078 per hectare per year. Again, the payments are unlikely to have much impact on income.

*Opportunity cost.* The payments cover at most 12 per cent of the opportunity costs of changes in upstream land practices and use under the PES agreement (Kosoy et al., 2005).

*Transaction costs.* The overall cost of design and initial implementation of the scheme was about US\$30,000.

### Environmental

Total size of the watershed is 3,180 hectares, with approximately 50 per cent in uses other than forests. Until 2004 the proportion of the watershed covered by the programme was very small (22 hectares). Even if the programme scales up to 200 hectares (Kosoy et al., 2004), the impact will remain very small or even imperceptible. The project is unlikely to achieve threshold levels unless coverage is increased.

*"The JAPOE has undertaken chemical analyses of water quality in Jesus de Otoro on an annual basis since 1999. Even though there has been an improvement in several indicators of water quality, in 2004 fecal coliforms and turbidity were still above the standards for drinking water"* (Kosoy et al., 2005). However, it is difficult to see how protecting 22 hectares of forest in a 3,000+ watershed will have discernible impacts on water quality at the operational level.

### Social

*Inclusion of small farmers.* Providers in Jesus de Otoro are traditional peasants, close to a subsistence economy. In Central America, peasant systems combine the production of traditional crops for self-consumption (typically maize and beans), with cash crops, such as coffee, banana, or pineapple, and other sources of off-farm income (usually commerce).

*In-kind benefits.* Other benefits such as capatown building and training in changing land use to other more socially acceptable forms of use are possibly the main reasons for upstream farmers to join the programme. PES reduces the pressure on the landholders to fully convert to forestry again, or lose their farms to protected areas if they do not adopt water-friendly land uses. Sanitation has improved livelihoods in upstream communities as well.

*Conflict resolution.* The PES scheme in Jesus de Otoro is useful for lessening conflict between downstream and upstream stakeholders produced by the deterioration of water quality. "This case suggests that PES schemes depend upon and may help to create appropriate institutional settings for easing downstream-upstream cooperation and promoting conflict resolution. The role of the institutions dealing with the functioning of PES in watershed management is a subject that deserves considerable further research" (Kosoy et al., 2004).

### **LEGISLATION ISSUES**

No information available.

### **MONITORING**

The Municipality is in charge of auditing the fund and has delegated an environmental technician to support monitoring and control activities of the PES scheme.

### **MAIN CONSTRAINTS**

The size covered is too small to make any significant impact on the environmental service, discernible enough to convince downstream users that keeping up the payments is worthwhile. The level of the payment upstream is not high enough to compete with the opportunity cost of land.

### **MAIN POLICY LESSONS**

*The impact of the PES scheme on the income of both providers and users is very low.* Having a small payment downstream has some important benefits for downstream users:  
1) Users are keen to pay it and agree with the scheme (US\$0.06 per household per month and an average income of \$245 per household per month;  
2) The existing service's good reputation lends support to the scheme.  
3) Because it is small it does not have negative effects reducing the demand of water.  
But a small payment for upstream users has potential limitations, mainly in the form of making the PES vulnerable to external factors (e.g. upward changes in prices of the locally-produced agricultural products) and probably an ineffective tool for poverty alleviation or wealth redistribution.

*Results of political negotiation may bear little relation to findings of technical studies.* Technical studies providing "lip service rather than a real input" to the decision making process (Kosoy et al., 2005). The amount of the downstream fee and upstream payments finally agreed in our case studies were the result of a long, complex and political process, in which local institutions and leaderships played a significant role. The way technical issues, including economic valuations, are integrated into decision making on PES design is a subject that needs considerable further research (Kosoy et al., 2005).

*Unsustainability of the scheme.* PES seems financially unsustainable in the long run, since current collection levels of user fees are only able to cover 70 hectares of the 200 hectares identified as priority areas. One possibility is to convert this land into a reserve but the owners disagree (Kosoy et al., 2005).

*Opportunity costs.* The estimates of the opportunity costs differ considerably depending on the method used, and they do not coincide with the value of estimates of on-farm profits. As a result, most providers do not think that the amount they receive as payment for environmental services is "fair."

*Strong perceptions that more forest leads to more and better water.* The majority of users believe that a larger forest cover will lead to both better water quality and greater water availability. Most users think that water provision is the most important benefit from forests.



*Lack of information.* Most users are not aware of the existence of the PES scheme. However, when explained, most of them agree with the scheme and the amount of the payment.

*Good existing service.* A large majority of users think that the water service provided by the intermediary is good and reliable throughout the year.

*Willingness to participate in the programme could arise from:* 1) Providers feel they get an important benefit as in-kind payments, such as training and technical advice; 2) Social pressure for improved land use upstream that will benefit the commons: the incentive, although small in terms of impact on the household's economy, is effective (as a "tip") in creating incentives for the implementation of socially desirable activities, such as forest conservation or the adoption of better agricultural practices. Latent threat of expropriation if they do not adopt more water-friendly land uses.

## **MONITORING**

Kosoy et al. (2004) stress the importance of monitoring and communicating results particularly in those cases where PES schemes are meant to improve (instead of preventing the deterioration of) the condition of water resources, otherwise it would be unable to demonstrate a real impact on the condition of water resources. Local participation in water quality assessment increases community empowerment and might reduce considerably the logistic costs.

## **OTHER INFORMATION**

No information available.

## **CONTACT**

Manuel A. Martínez, PASOLAC –Honduras EMAIL.

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**Watershed  
Markets**

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**LINKS**

<http://www.pasolac.org.ni/paginas/documentos/PASOLAC-Payment%20for%20Environmental%20Services%20-%202005.pdf>

[http://www.esee2005.org/papers/134\\_1104466857275\\_fullpaper.pdf](http://www.esee2005.org/papers/134_1104466857275_fullpaper.pdf)

[http://www.unece.org/env/water/meetings/payment\\_ecosystems/Discpapers/Kosoy\\_%20Uni%20Barcelona\\_e.pdf](http://www.unece.org/env/water/meetings/payment_ecosystems/Discpapers/Kosoy_%20Uni%20Barcelona_e.pdf)