

## Ecuador-Cuenca

### *Cuenca City - Land acquisition & watershed protection contracts*

#### SUMMARY

In 1984, the Cuenca municipal water utility, ETAPA, introduced a surcharge on the water bill to finance watershed management projects; other water users contribute with annual payment. Funds are pooled into a water fund, administered by representatives from users and providers. No cash payments are made directly to landowners but investment in watershed management (mostly by buying and directly managing critical areas) and increasing efficiency in water use. The project provides loans and technical advice to farmers in the mid-watershed to help them increase their water use efficiency. Once the loans are repaid, somebody else can benefit from a loan as well.

In the early 1980s, ETAPA developed a municipal master plan for water, which included three main strategies: water supply, rational water use and wastewater treatment. Since 1984 ETAPA has invested more than US\$2 million in watershed conservation, especially through land purchases and direct administration of critical areas. What began as a land acquisition programme developed into a programme of integrated management of water resources, which includes protection of watersheds, rational use of water and treatment of waste water. (Echavarria et al 2003)

#### MATURITY OF THE INITIATIVE

Mature - set up in 1984.

#### DRIVER

Recognition of importance of forests to water supply and growing competition for water downstream.

Some of the water threats faced by ETAPA are: (1) Over-use of the resource: more water has been assigned than is available, as shown by the study of the Machangara watershed developed with the Water Resources National Council. (2) Erosion: Sedimentation of reservoirs is a problem for hydroelectric generation, as well as for drinking water and irrigation systems. (3) Wastewater pollution: the operation of industries, a meat processing plant and many flower plantations, added to untreated wastewater from rural communities has seriously affected water quality. (see Echavarria et al, 2003)

#### STAKEHOLDERS

##### Supply

*Public national park and private landowners.* The city of Cuenca has four main river watersheds: Machángara, Tarqui, Yanuncay and Tomebamba. These four rivers are tributaries of the Cuenca River. At present, the two main watersheds, Machángara and Tomebamba provide 17.5 m<sup>3</sup>/s to meet the city's demand (60% and 40%, respectively). Machangara also serves 50% of the city's industrial park, cattle ranching and fish production, and hydropower. At present almost 50,000 hectares in the Cajas National Park (in the upper parts of the Tomebamba river) and the Machangara Watershed have been protected. The mid-sections of the Machangara watershed are under watershed management through the Machangara irrigation users.

##### Demand

Local government through the municipality. Contributions from water users (drinking water, hydroelectricity, irrigation) are pooled by the watershed council. ETAPA is the Municipal Enterprise for Telecommunications, drinking water, sewers, and environmental management in Cuenca-Ecuador and it is the biggest contributor to the scheme. Since 1984 it has invested more than US\$2 million in the conservation of the watershed, especially through buying and directly managing critical areas. The watershed serves more than 260,000 inhabitants in the city.

The four watersheds provide water for the following uses: Drinking water for the municipality; Irrigation for potatoes, grains and other crops; Cattle raising for milk production; Recreational activities for local, national and international tourism such as fishing and hot springs. Also Elecaastro, the electricity utility company generates 50% of the electricity for Cuenca city and the provinces of Cañar and Morona



Santiago from the Machángara River. Cuenca's industrial park takes water directly from the Machángara River. There are also trout farms within these watersheds.

#### **Intermediary**

*Local government-led - Users Council.* In July 1998, with the leadership of ETAPA, a Watershed Council was created in order to build an adequate legal framework that guarantees the conservation of the resource in all the watersheds involved, with the participation of the water users (Lloret, 2000). This council has nine member institutions: the electrical utility company (Elecaastro), the Center for the Economic Development of Azuay, Cañar and Morona Santiago provinces (CREA), the National Water Council (CNRH), Cuenca University, the Azuay provincial government, the Environmental Ministry, the water irrigation boards of the Machángara river (that includes 4,500 families who use a major irrigation canal in the lower part of the watershed), the municipality's environmental council and ETAPA.

#### **Facilitator**

*Unclear.*

### **MARKET DESIGN**

#### **Service**

Regulation of water quantity (through improvements in water use) and water quality through reduction in sediments.

#### **Commodity**

*Best management practices* through watershed protection contracts in the mid-sections of the watershed.

*Conservation and protection of existing ecosystems*, through management of a National Park and purchase of over 8,000 ha of land by ETAPA in the upper parts of the watershed.

#### **Payment mechanism**

*Pooled transaction/user fees. Intermediary-based* through a stakeholder council. The water utility (managed by the municipality) imposes a 5% surcharge on water bills and a local hydropower company (ELECAUSTRO) has contributed significant annual sums to the fund. The fund is administered by a multi-stakeholder group that makes decisions on the use of the income. A secretariat coordinates disbursements, technical assistance and field visits.

There are no direct cash payments to farmers. The project provides loans from a revolving fund and technical advice to farmers in the mid-watershed to help them increase their water use efficiency..

#### **Type of payment**

*From users:* continuous cash payments based on water bill collection from ETAPA, and periodic (mostly annual) from ELECAUSTRO).

*For farmers in the mid-watershed.* No direct cash payments are currently used. There is technical assistance and loans in improving water use and productivity in the farm. ETAPA is currently considering a payment for environmental services to farmers in the Yanuncay watershed to encourage forest conservation.. It carried out a feasibility study (also for Yanuncay watershed - in 2005 ETAPA was planning to start extracting water from there to expand its drinking water system).

#### **Funds involved**

Costs of watershed protection to date amount to more than US\$2 million. No figures for benefits.

### **ANALYSIS OF COSTS AND BENEFITS**

#### **Economic**

Farmers in the mid-watershed benefit from credit access to improve their production. Technical assistance supports and encourages technology transfers. No information is available about the number of families who benefit from the loans and technical advice.

*Activities implemented by the Machangara Council:*

- Technical assistance to a savings cooperative with 55 active members in Chiquintad for the development of an ecotourism operation in a native forest.
- Created community nurseries with over 50,000 trees.



- Training in production of native tree species.
- Creation of sixty family gardens that provide food for the families and allow some surplus to be sold locally.
- Improvement of pastures.
- Soil conservation program.
- Community training in pastures, family gardens, rational use of water and beekeeping for adults and children.
- Honey production with eighteen women from the Sidcay town.
- Use of non-forest products.

#### **Environmental**

Water losses are reduced through more efficient use of water for irrigation. Farmers switched from irrigation by flooding (which caused considerable soil loss) to drop-irrigation and the use of greenhouses. Purchase of critical areas and management of the park in the *paramo* area guarantees the protection of important recharge areas.

*Environmental activities implemented by the Machangara Council:*

- Studies to analyse and implement solutions to control the damage caused by the landslide of the Soroche stream.
- Water quality and soil studies in the watershed.
- Installation of four meteorological stations, connected to the network in the Paute watershed.
- With the National Water Resources Council, a comparative study of available water versus the water designated for all users in the watershed.

#### **Social**

Farmers are happy with the results, and by paying back their loans they support the fund and allow other farmers to access credit. Field visits and exchanges among farmers are encouraged by the council. Capacity building, environmental education and alternative income activities are encouraged.

*Activities implemented by the Machangara Council:*

- In a participatory process, a Development Plan was designed for the 110 member Board of Irrigators of the Machangara, which then evolved into the preparation of a Development Plan for Chiquitad, a small town of 3,000 people.
- With three towns, totalling 6,000 people the first phase of a reforestation plan of the mid-upper part of the watershed was developed. 144 hectares were planted with 86,400 trees, which has greatly improved the relationship between the electrical utility and the community.

### **LEGISLATION ISSUES**

Supporters of this initiative are enthusiastic about the way that local solutions have been discussed and found for local problems, within existing regulations and without involving national government.

### **MONITORING**

Monitoring is done through the Secretariat. It is not clear what happens with non-compliance.

### **MAIN CONSTRAINTS**

Unclear.

### **MAIN POLICY LESSONS**

The project offers several important lessons. The creation of a multi-stakeholder committee that involves both users and "providers" encourages the feeling of ownership and provides a useful platform for discussing water issues. The use of a revolving credit fund (instead of direct payments) ensures that smaller amounts of money go further, and reduces the expectation of subsidies from the farmers. By encouraging water-saving activities and protecting important recharge areas the project is able to ensure the availability of water flows (rather than assuming that protection of forests or *paramo* will increase flows). The project presents an excellent example of where local groups gather together and deal with a local problem rather than waiting for a national-level solution. Representatives of the council are proud of their decentralised approach(ref?).



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## OTHER INFORMATION

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### REFERENCES

Echavarría, M., J. Vogel, M. Albán, and F. Meneses. 2003. *The impacts of payments for watershed services in Ecuador. Emerging lessons from Pimampiro and Cuenca*. Markets for Environmental Services Series (4) International Institute for Environment and Development, London.

<http://www.iied.org/pubs/pdf/full/9285IIED.pdf>

Personal communications with the project managers and visits to the area.

### LINKS

<http://www.etapa.com.ec/pag/home.jsp>