

SOCIO-ECONOMIC ASSESSMENT IN WATER AND SANITATION: ANALYSIS OF IMPACT ON POVERTY AND VALUATION OF BENEFITS

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Abstract

Water and sanitation actions executed by international cooperation nongovernmental organizations (NGO) in poor countries of Asia, Africa and Latin America constitute a “laboratory” within which is possible to study the crossed behavior of several variables associated to trinomial environment–poverty–development. On this argument, the impact of a water development project performed by the NGO Action against Hunger – Spain, in terms of poverty reduction within a rural community stricken by armed conflict in Colombia was assessed. The methodological approach to problem was made via the Water Poverty Index (WPI), a numeric index that captures the most relevant factors of the interaction water–poverty. WPI is structured in five components (Resources, Access, Capacity, Use and Environment) and each of them combines various subcomponents. WPI allows to relate a human group poverty situation (in a wide sense of concept) with the water services conditions, and to make spatial and temporal comparisons. Knowing the effect of an international cooperation project in water and sanitation on addressees’ life conditions, given their special vulnerability as conflict victims, means an additional value to the intervention’s purpose. Furthermore, a socioeconomic valuing of project was carried out. The analysis covered several impact types and it was developed for two recipient subgroups (semi-urban and rural inhabitants). The indicators (present net value, return rate and benefit–cost ratio) showed an unequal performance depending on action item, and a large asymmetry between two collectives on investments and benefits was checked. These outcomes could be extrapolated or adapted to other similar geographic, natural and social environments.

Key words: *Millennium Development Goals, Poverty, International Cooperation, Water Poverty Index; Social Cost Benefit Analysis. Colombia*

Introduction

In order to achieve the Millennium Development Goals, and given the increasing economic and politic significance of the international cooperation in the water and sanitation field, it is required to evaluate the effect of these development projects on poverty, and to estimate or at least to infer an approximate magnitude of costs and benefits of such actions for all the implied agents, both in North as in South (donors, NGO, governments, communities). This was the justification to carry out the appraisal of impact on poverty and economic valuing of a project of hydraulic development and community

strengthening, executed in 2004 by the NGO Action against Hunger – Spain (ACF-E due its French acronym) funded by the Spanish Agency for International Development Cooperation (AECID due its Spanish acronym), in eight rural villages of the municipality of Moñitos (Córdoba – Colombia).

It is well known that water and sanitation projects have an important positive impact upon poverty in the recipient communities. From the point of view of decision makers, however, it is important to identify the different components of this benefit, and see how they are related to the different aspects of each project, in order to increase the efficiency of investment. The Water Poverty Index is a powerful tool in this sense, but it may well be complemented with a more thoughtful analysis of the social profitability of the investment. The point is illustrated with the help of a case study in Northern Colombia.

Methods

✓ Case study

Area

Communities of eight rural localities in Moñitos municipality (Córdoba department, Colombia): 4.400 inhabitants.

Problem

- Difficult access to water and pollution for human consumption and domestic use.
- Deficient evacuation system of faeces and gray water.
- Insufficient environmental sanitation in scholar infrastructures.
- Moñitos municipality: 82% basic needs non satisfied and 48% extreme poverty.

Intervention

- **Water:** construction of 4 reservoirs; restoration of 3 reservoirs; upgrading of 3 aqueducts; construction of 15 tanks 40m³; provision of 11 tanks 2m³ for kindergartens, 610 tanks 25 lt (human consumption) and 248 tanks 110 lt (domestic use).
- **Sanitation:** upgrading of 33 family latrines; construction of 215 family latrines and 7 scholar bathroom fittings; construction of 4 kindergarten latrines.
- **Food security:** construction of 8 scholar refectories; establishment of 6 community farms (chickens, pigs, rams, fishes and associated crops).

✓ **Analysis of impact on poverty**

Water Poverty Index

$$WPI = \frac{w_r R + w_a A + w_c C + w_u U + w_e E}{w_r + w_a + w_c + w_u + w_e}$$

Weigh average of five components: Resources (R), Access (A), Capacity (C), Use (U) and Environment (E). Standardized components from 0 to 100, so resultant WPI fluctuates from 0 to 100 too: 100 is the best situation (lowest possible level of "poverty of water"), and 0 is the worst one. Each component is formed by subcomponents, combined in the same way.

Collection and analysis of information

- **Design, application and process of survey:** 36 families (20 semi-urban and 16 rural).
- **Definition of population groups:** semi-urban beneficiaries before, semi-urban beneficiaries after, rural beneficiaries.
- **Number of subcomponents:** 3 in Resources, 7 in Access, 10 in Capacity, 8 en Use and 5 in Environment.
- **Weigh of components and subcomponents:** Analytic Hierarchic Process (multi-criterion technique).

✓ **Valuation of benefits**

Benefit types and valuation method

- **Health:** treatment cost.
- **Increase in consumption:** foods prices.
- **Productivity:** lost days wages due water induced illnesses.
- **Dwelling price:** appreciation because of infrastructure upgrading.
- **Time and money in water purchase:** expenditure and days wages losses.
- **Scholar nutrition:** expenditure in daily snack.

Methodological approach

- **Collection, process and analysis of information:** primary and secondary sources.
- **Identification and valuation of benefits:** focus in Las Mujeres village.

Results and Discussion

The Figure 1 shows the WPI values for the three groups of beneficiaries, and the Figure 2 shows the distribution of annual benefits for sub-urban collective. Both figures correspond to Las Mujeres village.

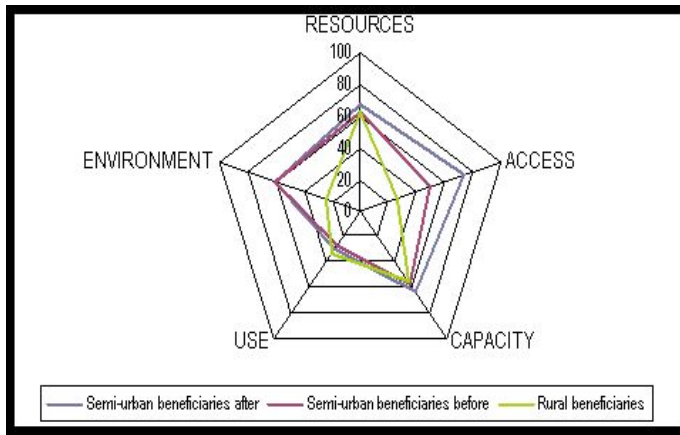


Figure 1. WPI

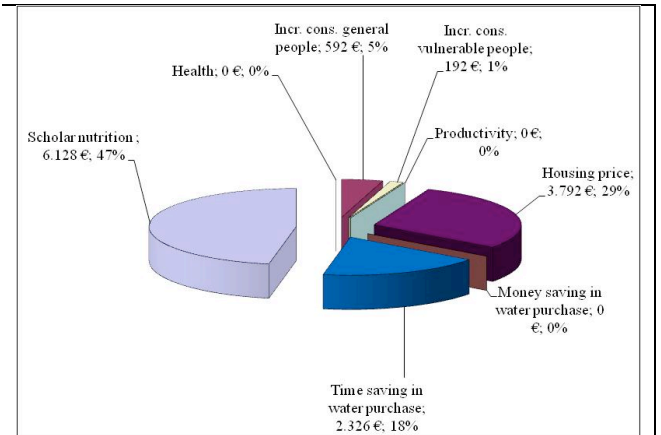


Figure 2. Distribution of annual benefits

The only “benefit” to the rural beneficiaries is the 25-l plastic tank they received. However, as this was not coupled with any new access to water supply, there was no change in the values of the WPI for them. This is why their situation before and after the project is the same regarding the value of the WPI.

In the other hand, the net economic benefits of this project would be far from evident:

- Applying a 5% value for the Consumption Rate of Interest, the Net Present Value (NPV) of the investment would be negative: -385 euros.
- Lowering this discount factor to 4% moves the result to the positive side, 1,424 euros but, still, quite low.
- In fact, the Internal Rate of Return (IRR) of this investment is only 4.78%.

Conclusions

According to the change in value of the WPI, the project seems to have been moderately successful. From the perspective of economic benefits, the project as a whole was few profitable. However, there were some items (construction of latrines, for instance) highly beneficial in terms of social wellness.

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