Ecuador: Urban Development Babahoyo

Ex post evaluation report

OECD sector	43030 / Urban development and urban management	
BMZ project ID	1987 66 461	
Project executing agency	City of Babahoyo / EMSABA	
Consultant	Asociación Consultores Babahoyo: (Consulting Engineers Salzgitter (CES)/ASTEC/ Hidroestudios/ ICP/ACSAM)	
Year of ex post evaluation report	**2008**	
	Project appraisal (planned)	**Ex post evaluation (actual)**
Start of implementation	01/1989	10/1991
Period of implementation	5 years	17 years
Investment costs	EUR 24.3 million	EUR 31.7 million
Counterpart contribution	EUR 3.8 million	EUR 6.5 million
Financing, of which FC funds	EUR 20.5 million	EUR 25.2 million
Other institutions/donors involved	GTZ	GTZ
Performance rating	**2**	
• **Relevance**	**1**	
• **Effectiveness**	**1**	
• **Efficiency**	**3**	
• **Overarching developmental impact**	**1**	
• **Sustainability**	**3**	

Brief description, overall objective and project objectives with indicators

The project objectives were to protect the city of Babahoyo against flooding and to improve drinking water supply and sewage disposal (WS and SD) in the central area of the city both quantitatively and qualitatively, thus establishing the preconditions for the further economic and social development of the community and reducing health hazards for the population (overall objectives). The following indicators were defined to measure achievement of project objectives:

- The dyked area of the city was to be protected against flood levels such as occur only once in 50 years;
- 85% of the population in the central area of the city were to be supplied 24 hours a day with high-quality drinking water, providing for a per capita consumption of 100 l/cd and with 75% of the population in this area being connected to the central sewerage network.

The target group was the population of the city of Babahoyo, which counted 56,000 inhabitants at the time of project appraisal (now ca. 114,000). The project included

investment measures in the field of flood control, WS and SD, as well as storm water drainage (SWD). In the context of Technical Cooperation, the municipality of Babahoyo and the local water utility EMSABA were supported institutionally until 2004.

Project design / major deviations from the original project planning and their main causes

Flood protection measures included the construction of protective dykes, bank stabilisation, a storm water drainage system, and land filling. To improve the water supply, 4 deep wells were bored and equipped north of the city, which were connected to a newly constructed drinking water treatment plant (including storage tank) via a transport line. Distribution is effected via a new drinking water supply network about 48.4 km in length. As planned, SD and SWD have been implemented as separate systems. The SD network feeds via a collector sewer into the central sewage treatment plant, one of the few functioning plants in the country using anaerobic technology and which is a model project. The SD network enables the safe sanitary disposal of urban sewage produced by about 63% of the total population of Babahoyo. Its configuration allows for extension and expanded capacity. SWD consists of a drain system to collect and drain off storm water with subsequent interim storage in five smaller detention basins.

Newly developed settlement areas within the flood protection zone are now being connected step by step to the SD and SWD systems by the municipality and/or EMSABA. For this purpose, EMSABA has also built an additional pumping station. In order to improve the technical efficiency at EMSABA in operating the wastewater treatment plant, initial and further training was provided for maintenance and operational staff. A laboratory financed from project funding enables EMSABA to regularly test wastewater quality.

Key results of the impact analysis and performance rating

Overall, the economic and social development of Babahoyo since project appraisal is to be judged positive, the measures taken under the project being a vital precondition. The losses in human lives and material assets caused by annual flooding within the urban area before implementation of the project were significantly reduced, bringing substantial savings in remedying consequential damage. In the canton of Babahoyo, the child mortality rate fell from 66.9 to 28.3 or 13.4 ‰ (depending on the source) between 1985 and 2001. While in 1985 Babahoyo recorded a general mortality rate above the national average, due for the most part to water-related diseases like diarrhoea, typhus, and hepatitis, in 2006 no more than 6 deaths caused by water-related diseases were registered. Women were major beneficiaries of the improved living conditions, since, given the prevailing traditional role patterns, they still have to bear the main burden in emergency situations and when illness occurs in the family. Apart from the direct effects of the project, it can be assumed that the improved situation for the local economy created by flood control will generate additional, positive impacts for some sections of the population. The project has directly and indirectly benefited the greater part of the population – including many poor people – and the overall objective can be considered to have been attained.

Flood protection: Whereas before the project was launched, about 50% of the population, some 30,000 people, were little threatened by floods (although protection was far from complete) owing to the topographic situation of the then city centre, some 70% of the population – 80,000 people – now benefit from permanent and adequate protection against flooding. About 50,000 mostly poor residents of the city benefited directly and fully from the flood protection measures carried out under the project, while

for a further 30,000 people flood protection was improved in relative terms. Despite increasing precipitation intensities, the flood prevention measures have so far performed their function with few reservations, even during the flood of 2008, the highest in 50 years, which inundated all other cities in the coastal area. Not only was the urban area protected by dykes: the storm water drainage system ensured that precipitation was rapidly drained from the city centre.

WS: In the extended urban area of Babahoyo, the drinking water supply coverage for the population is 100%. In relation to the entire urban area including outlying districts, 82% of the population is supplied with drinking water. With rare exceptions, drinking water is supplied without interruption 24 hours a day. Water quality is largely in keeping with WHO standards. The average per capita consumption of all private households is 132 l/d.

SD: In the extended urban area (project intervention area), the SD connection rate, like drinking water supply was 100%. In relation to the entire urban area, some 45% of households are connected to the central SD system. Sewage treatment operates satisfactorily.

The technical operational procedures in drinking water supply are well organised. For the most part, however, EMSABA does not practice preventive maintenance but repairs the systems the need arises to keep them in operation. For the entire EMSABA service area, estimated technical and administrative water losses amount to 47% and for the project area to about 35%, in comparison to a water loss rate of > 60% at the time of project appraisal. So far, SD has been neglected from an operational point of view, especially as regards maintenance. Owing to the lack of technical means, only repairs and indispensable cleaning work are carried out. On the whole, the sewage treatment plant works well; the staff have just the necessary basic knowledge to ensure stable operation. The technical equipment available for operational and maintenance work is minimal. To some extent, damaged components are not repaired at all or only inexpertly. EMSABA documentation in the fields of technology and bookkeeping/finance is insufficient and at times contradictory and unclear.

The main commercial problem facing EMSABA is the large proportion of customers without a water meter and who, when they are in arrears of payment, cannot for technical reasons be sanctioned by cutting off their water supply, so that payment ethics are unsatisfactory. For this reason, EMSABA is endeavouring to equip all service connections with water meters as rapidly as possible.

The WS and SD tariffs completely cover operational costs but not total costs including the replacement of old plant and equipment. Of major importance for EMSABA's economic situation and sustainability was a marked adjustment of tariffs in 2006. Whereas any rise in nominal WS/SD charges in the near future is unlikely for political reasons, EMSABA will probably be able to further reduce its commercial losses by installing more water meters. The monthly burden for individual households from WS/SD tariffs can become bearable owing to socially differential charging, too. On the other hand, it can be assumed that the project will have brought substantial savings for the greater part of the population owing to the avoidance of losses consequential on flooding and lower sickness costs.

From the ex-post perspective, the effective protection of Babahoyo against flooding can be regarded as the indispensable, basic precondition for implementing the WS and SD components and for the positive urban development that emerged through the project.

Before the project, parts of Babahoyo and the main access roads to Guayaquil and the north of the country were under water during the main rainy season almost every year, sometimes for several months, much to the detriment of traffic and public life. The city now benefits from undisrupted economic development and, not having to remedy flood damage to the same extent, the authorities have greater financial scope for investing in the urban infrastructure, which has since markedly improved.

Some of the problems and delays that occurred during implementation of the project initially appeared to confirm the high perceived risk of the project. However, given the good results the unusually long engagement of German Development Cooperation ultimately paid off.

The increased probability of extraordinary climatic events like El Niño and the immense damage they cause has lent much greater importance to preventive flood protection measures in the project region. In view of the frequent floods, a safe drinking water supply and an environmentally sound wastewater disposal system are also very important for keeping the higher probability of water-induced diseases in these periods in check and for preventing germs from spreading into water bodies. Over the more than 20 year course of the project, the institutional capacities of the municipality and EMSABA, and hence the general efforts towards decentralisation in Ecuador, were significantly enhanced in the sense of alignment. The project was in keeping with the priorities set for German-Ecuadorian cooperation and complemented the activities of other donors in Ecuador. Overall, the project conception was adequate for coping with the original problem. Rating for relevance: 1 (very good).

The project objectives were all attained. Flood protection proved its mettle during the once in 50 years flood of 2008. The experience gathered in Babahoyo is considered exemplary, which has been shown by the selection and presentation of Babohoyo as one of the 4 most successful examples throughout the country of preventive disaster control on the occasion of various conferences on the subject, including international meetings. The objectives for drinking water supply were attained in relation to quality and exceeded with respect to the proportion of households supplied and per capita consumption. Sewage disposal also satisfied the goal indicators. The sewage treatment plant serves as a model. Rating for effectiveness: 1 (very good).

Technical and commercial water losses, amounting to 35% for the new WS networks and 47% for the entire EMSABA service area, still tend to be too high, but the situation has been considerably ameliorated since the beginning of the project. In view of specific per capita investment costs of EUR 142 for WS and EUR 157 for SD, the production efficiency of the WS/SD systems is still reasonable. Given 192% cost coverage for operating costs and 77% for dynamic production costs, allocation efficiency in the WS/SD fields satisfied expectations. Owing to insufficient documentation of operational procedures, intransparent financial and cost accounting, and a lack of internal control mechanisms (revision), the general efficiency of the agency is difficult to assess. Although no ex-ante and ex-post cost-benefit analysis was carried out, the extraordinarily positive effects suggest a positive cost-benefit ratio (with regard to flood damage avoided) for the flood prevention measures. Rating for efficiency: 3 (satisfactory).

The overall objectives can be considered to have been attained. Living conditions for a large proportion of the predominantly poor population of Babahoyo have been considerably improved by both effective flood protection and better WS and SD. The

project therefore had a major impact on poverty. The child mortality rate as a proxy indicator for the general health situation has fallen by more than 50% since the time of project appraisal. It can be assumed that the project has also had a considerable positive indirect impact on income and employment, especially in the service sector. Flood prevention was the decisive precondition for subsequent positive urban development. On the other hand, some 30% of the total population remained without sufficient protection against flooding, particularly in the fast-growing suburbs Barreiro and El Salto, which had, however, not been covered by project measures. Rating for overarching developmental impact: 1 (very good).

The executing agency shows weaknesses in the technical and management fields. Maintenance measures have to date mostly not been preventive nor systematically carried out and documented; maintenance and repairs tend to be undertaken only ad hoc when the need has arisen. Nevertheless, EMSABA has meanwhile ordered a sewer cleaning vehicle for the preventive maintenance of the SD/SWD system. From our point of view, the deficiencies to date in the preventive maintenance of the WS/SD systems do not call the sustainability of the project into question. Overall, the WS/SD/SWD systems are in an acceptable condition. Experts judge that repairs to the WS/SD systems can in the future be paid from inhouse resources. They estimate that comprehensive investment in replacement or extensions will continue to require state subsidies or loans. Outstanding customer debts are extraordinarily high (about 15 times the monthly turnover). On the other hand, EMSABA has managed in recent times to collect old debts more successfully. The installation of water meters, which has been intensively pursued since 2006, has improved EMSABA's revenue situation and can be expected to further increase the average charge and thus the cost-recovery ratio. We consider the sustainability risks arising from the economic situation to be limited. Owing to global climate change, we consider extraordinary flood elevations and greater concomitant inundation risks to be more probable. Rating for sustainability: 3 (satisfactory).

Taking the partial ratings and risks discussed above into consideration, we assign the project an overall rating of 2 for its good developmental effectiveness.

General conclusions and recommendations

This project clearly shows that continuous and far-reaching Financial Cooperation in conjunction with the wide-ranging development policy tools available to German Development Cooperation (stipulations, policy dialogue, Technical and Financial Cooperation) can produce successful results even in high-risk projects with major difficulties in implementation.

In the future, KfW should insist more strongly that executing agencies comply with the provisions of the Separate Agreement (e.g. external audit).

Notes on the methods used to evaluate project success (project rating)

Projects are evaluated on a six-point scale, the criteria being relevance, effectiveness (outcome), "overarching developmental impact" and efficiency. The ratings are also used to arrive at a final assessment of a project's overall developmental efficacy. The scale is as follows:

1 Very good rating that clearly exceeds expectations

2 Good rating fully in line with expectations and without any significant shortcomings

3 Satisfactory rating – project falls short of expectations but the positive results dominate

4 Unsatisfactory rating – significantly below expectations, with negative results dominating despite discernible positive results

5 Clearly inadequate rating – despite some positive partial results the negative results clearly dominate

6 The project has no positive results or the situation has actually deteriorated

A rating of 1 to 3 is a positive assessment and indicates a successful project while a rating of 4 to 6 is a negative assessment and indicates a project which has no sufficiently positive results.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability)

The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability)

The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected.)

Sustainability level 3 (satisfactory sustainability)

The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability)

The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and an improvement is very unlikely. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The overall rating on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. A rating of 1 to 3 indicates a “successful” project while a rating of 4 to 6 indicates an “unsuccessful” project. In using (with a project-specific weighting) the five key factors to form a overall rating, it should be noted that a project can generally only be considered developmentally “successful” if the achievement of the project objective (“effectiveness”), the impact on the overall objective (“overarching developmental impact”) and the sustainability are considered at least “satisfactory” (rating 3).