

Ex-post evaluation

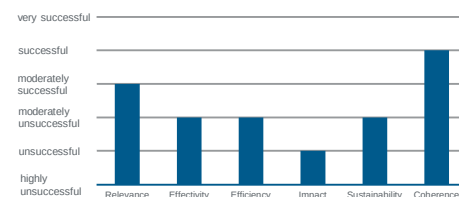
Water Supply/Waste Water Disposal Tumbes, Peru

Title	Water Supply and Waste Water Disposal Tumbes		
Sector and CRS code	1401000 Water sector policy and administrative management		
Project number	2002 66 080		
Commissioned by	German Federal Ministry for Economic Cooperation and Development (BMZ)		
Recipient/Executing agency	Republic of Peru, represented by the Ministry of Economic Affairs and Finance/EMFAPATUMBES or its legal successor Aguas de Tumbes (ATUSA)		
Project volume/ Financing instrument	EUR 5.06 million FC loan; EUR 2.37 million FC grant		
Project duration	2004–2021		
Year of report	2024	Year of random sample	2023

Objectives and project outline

The objective at outcome level was the continuous supply of safe drinking water to the population as well as hygienically and environmentally safe waste water disposal in the project areas. At impact level, the aim was to contribute to improving living conditions, the fundamentals for economic development and the ecological situation in the project area. The project included the rehabilitation and expansion of water supply and waste water disposal. The participation of the private sector was a prerequisite for the implementation of the project.

Overall rating:
moderately unsuccessful



Key findings

The project achieved limited developmental effectiveness and sustainability. The project has been rated “moderately unsuccessful” for the following reasons:

- The project’s investment plan could not be implemented, only limited individual measures (in particular the construction of an elevated reservoir water tower) were carried out. Against this background, it was not possible to achieve the objectives at outcome level, even though the continuity of the drinking water supply was temporarily increased.
- The project was primarily aimed at supply areas with a comparatively poor population outside the Tumbes municipal area. However, the concessionaire gave priority to the City of Tumbes with regard to implementing fast-acting measures.
- Private sector participation was unsuccessful. After the concession was cancelled in 2018, the central government authority OTASS took over operations management. Today, the “U.E. Aguas Tumbes” utility is considered to be in deficit.
- The actual duration of the concession until its closure was 13 years. From today’s perspective, the effort required to set up a concession was not proportional to the results achieved, in terms of costs and administrative burden.

Conclusions

- Although the participation of the private sector was an important success factor of the project, it was not considered part of the target system.
- The private sector’s involvement in the provision of basic supply does not per se lead to an improved quality of service. Clear legal frameworks are required to ensure an appropriate risk allocation that is in line with remuneration. These must be reliably enforced by regulators and the judiciary.
- A preparatory measure to establish the necessary structures for private actors in the sector would have greatly facilitated the implementation of the project.

Ex- post evaluation – rating according to OECD-DAC criteria

Overall context

The project “Water supply and waste water disposal Tumbes, Peru” (BMZ no.: 2002 66 080) was appraised in 2002 and began with the signing of the loan and financing agreement at the end of 2004. As the water utility EM-FAPA - *Empresa Fronteriza Municipal de Agua Potable y Alcantarillado de Tumbes*, had serious technical and economic deficits at the time of the appraisal, private sector participation was made a condition for the implementation of the project.

The project was the first private sector investment in the Peruvian water sector. As part of using a preparatory Transaction Advisor, the privatisation concept was divided into two phases: a management contract phase over the first five years with FC financing of the investments and then the transition to a concession phase over 25 years. The intent of the FC financing was to provide financial security for necessary investments for the first phase of the project so that the concessionaire can quickly contribute its own investments to achieving the targets in the concession phase. The concession agreement stipulated that the new operator would use FC funds up to an amount of USD 2 million to implement fast-acting measures in the first five years. In addition, part of the private operator's costs were covered by the co-financing of the management fee (fixed fee) from the FC complementary measure.

The competitive bidding for private sector participation was won by a consortium of an international company and a local partner who participated in the new water utility (*Aguas de Tumbes – ATUSA*). The implementation of the project began with the signing of the concession agreement between ATUSA and the municipalities of Tumbes, Zarumilla and Contralmirante Villar (provincial mayoral offices) in 2005.

From the start, the FC project was implemented slowly. When the project began, the annual targets agreed in the concession agreement could only be achieved by implementing the above-mentioned rapidly effective measures. The completion of an investment plan was delayed and in 2010, the international company withdrew from the bidder consortium due to unresolvable differences with the regulatory authority SUNASS with regard to the degree of target achievement. Another international company joined the consortium and worked with limited success on the implementation of a revised investment plan from 2011 to 2016. Due to financial difficulties, the operator ATUSA was acquired in 2016 by a third consortium (formed by changing the consortium's international partner). In the same year, the role of concession provider was transferred from the three municipalities to the National Water Authority in order to simplify the concession relationship. The third concessionaire initiated negotiations for an addendum to the concession agreement, the intention of which was to allow for clearer responsibilities as well as investment and operating cost subsidies from the Authority to the operator. Nevertheless, due to lack of implementation prospects in Tumbes in 2018, it decided to return its share in the operating company ATUSA to the three municipalities without compensation. The local partner also did this. The National Water Authority then intervened through OTASS (*Organismo Técnico de Administración de Servicios de Saneamiento*) and took over the operation of the water utility.

At the beginning of 2019, the Ministerio de Vivienda, the legal successor of ATUSA, requested that KfW reduce the loan (from EUR 8.1 million to EUR 5.1 million) and the grant (from EUR 8.1 million to EUR 2.4 million) after the concession agreement between the municipalities and ATUSA was declared void in November 2018.

Project summary

The project included various investment measures aimed at providing the population with a continuous supply of safe drinking water throughout the year, as well as hygienically and environmentally safe waste water disposal for the connected population at cost-covering and socially compatible tariffs. The target group was the population in Tumbes and the connected towns (a total of around 180,000 inhabitants before 2000, around 227,000 inhabitants were expected by 2010), in which an estimated 259,500 inhabitants live today.

In the first three years of the project, the concessionaire focused on implementing rapidly effective measures such as the rehabilitation and improvement of distribution networks or the mechanical and control-related

conversion of pumping stations, especially in the area of water supply. The intent was that this would lead to improvements in the short to medium term through an increase in supply.

As part of the project, a detailed investment plan was drawn up and adapted several times. Due to various failed award procedures, delays due to missing land and environmental permits, as well as different priorities between the concessionaire at the time and the municipalities and the population, only the procurement and installation of 28,339 water meters, including planning and competitive bidding, as well as the construction and equipment of a water tank in the municipality of Zarumilla, were possible. The final design for the expansion of the El Milagro treatment plant in Tumbes, which was also financed as part of the project, had to be discontinued when ATUSA terminated the contract partner's concession.

In addition to the aforementioned management remuneration, the complementary measure financed various measures to improve operational efficiency, such as the introduction of a user register, a comprehensive operational management system and a communication campaign.

Map of project country incl. project areas

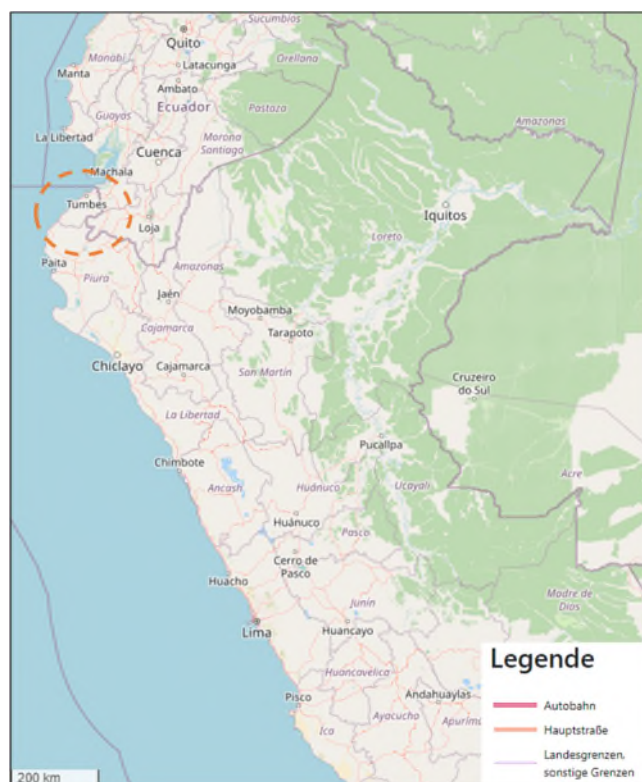


Figure 1: Map of Peru with the Tumbes region (project area)

Source: openstreetmaps.org, edited by KfW, 2023.



Figure 2: Location of project locations and systems

Source: Final report, 2021

Total costs

EUR Million	Investment (planned)	Investment (actual)	Complementary measure (planned)	Complementary measure (actual)
Investment costs (total)	20.50	10.64	1.35	1.45
Counterpart contribution	4.31	0.62	—	0.10
Financing	16.19	10.02	1.35	1.35
Of which BMZ funds	16.19	7.48	1.35	1.35

Rating according to OECD-DAC criteria

Relevance

Alignment with policies and priorities

The situation in the Peruvian residential water sector was characterised by significant infrastructure deficits at the time of the appraisal, despite years of international and national commitment. This was due to inadequate technical and economic operations by the mostly urban water utilities and the significant local political influence on operations management. The main challenges for the sector were to increase the connection rate and continuity of services, reduce the uncollected water charges due to the low number of water meters and improve operational, commercial, administrative and financial corporate governance.

In 2002, the Ministry of Housing, Construction and Sanitation (MVCS) was established with a Vice Ministry of Sanitation (VMS) exercising policy competence and strategic leadership of the sector. The *Plan Nacional de Saneamiento* 2005–2015 set out the following objectives: (i) modernising management, (ii) promoting sustainability, (iii) improving quality, (iv) promoting the financial viability of the water utilities (including clearer foundations for

private sector participation) and (v) improving access to services. The government estimated the need for investment for the period 2000 to 2005 at USD 2.7 billion, an amount that the public sector was unable to raise.

To restore macroeconomic equilibrium and make the economy more efficient, Peru introduced a structural reform programme in 1990 that included private sector participation in public services. The government agency PROIN-VERSION was responsible for promoting private investment and supporting municipalities in the PSP process. When the project was designed, there was little concrete experience of private sector involvement in the operation of the Peruvian water utilities.

The participation of the private sector in the operation of EMPAFA was determined in the government consultations in 2000 as a prerequisite for the implementation of the FC project, after the company was not able to show any significant improvements despite TC support (including in the preparation and implementation of an emergency plan). It is not clear to what extent the local government was involved in the decision, but the audit report states that KfW fully informed local decision-makers about the process.

Prior to the competitive bidding for the concession, it was a prerequisite for the signing of the contract that the three responsible government levels (national, regional, municipal government) agreed in writing to awarding the management/concession contract. However, this approval could not prevent the concession agreement for the project from being severely criticised in January 2007 after the new mayors took office (except for one district mayor, all were newly elected). In particular, the mayors outside the city of Tumbes called for the reversal of the contract to some extent. The experiences were similar in a similar project in Pucallpa (FC) and in Piura (SECO and the IDB), ¹where the local governments did not support the priority of private sector participation of the central government and thus the projects could not be continued as planned.

Alignment with needs and capacities of persons concerned

EMFAPA could not guarantee the proper operation of the plants, as already mentioned. The supply shortages had a direct impact on customer acceptance and willingness to pay, and thus contributed significantly to the company's poor financial situation. EMFAPA had a large deficit, was over-indebted and was unable to make urgently needed investments. Although these deficits were not directly attributable to structural weaknesses as a public enterprise, private sector involvement was expected to ensure better technical and administrative management of resources and availability of the funds needed for necessary investments.

Prior to the start of the project, the supply continuity in the entire supply area was an average of eight hours/day; checking the production capacities and the zonal water consumption was not possible due to the lack of bulk water meters and the percentage of house connections equipped with water meters was only 6%. The technical losses were estimated at approximately 40%. At the same time, the villages only had rudimentary sewage systems with significant maintenance deficiencies. Most of the city's waste water flowed into the Rio Tumbes untreated. The project was thus geared to the needs of the target group. The inadequate quality and quantity of drinking water supply and waste water disposal affected the quality of life of the project population, particularly outside the urban area of Tumbes, where poor or extremely poor parts of the population were only connected to the supply network to a very small extent. Private sector participation should be designed to take particular account of the needs of the poor population.

The project did not specifically intend to have a positive effect on women. However, the study report noted that women often have to travel long distances in unconnected areas and are mostly responsible for taking care of those with waterborne diseases.

Suitability of project concept

The project included measures for the rehabilitation and expansion of water supply and waste water disposal. The outputs were intended to enable the continuous supply of safe drinking water to the population and regulated waste water disposal. This was expected to contribute to improving living conditions, the basis for economic development and the ecological situation in the project area.

The project objective at impact level at the time of the project appraisal in 2002 was "to improve the living conditions of the population through improved WS/WWD, in particular to reduce the health risk and to create a better

¹ Swiss FC (SECO) and the Inter-American Development Bank (IDB)

basis for economic development as well as to reduce the environmental impact in the urban area and in the nearby Rio Tumbes, which flows into the Pacific Ocean". This objective has been clarified over the years in order to limit the effect of the project to a "contribution" to improving living conditions, which is more appropriate from today's perspective. Three objectives were set forth at outcome level: (i) the continuous supply of safe drinking water to the connected population throughout the year in reasonable quantities at cost-covering and socially acceptable tariffs, (ii) ensuring central collection of waste water that is safe for residential hygiene and the environment and, improving sewage treatment performance through better technical operation and (iii) the reduction of technical unaccounted for water following recognition of the quantities of water discharged into and consumed by the network and of administrative losses through more efficient operation. The relationship between the measures and the objectives at outcome level was appropriate from the point of view at the time, but the effects in the three areas were not defined concretely enough to measure the achievement of the objectives. Although the audit report stated that "waterborne diseases account for a total of 15% of the statistically recorded disease cases in the population and are therefore the second most common cause of disease", no corresponding impact indicators were determined. The indicators at outcome level did not match the PMO indicators² (only defined later), which makes monitoring difficult as the PMO indicators are reviewed annually by the SUNASS supervision authority. The target group was the population in the supply area (poor: 46%, extremely poor: 7%), in particular the population without access to the supply.

The definition of the criteria for selecting the individual measures financed by FC, as well as the planned activities in the complementary measure, are based on the objective at outcome level and are comprehensible. The intent was to coordinate the final definition of the measures between the operator, the owners of EMFAPA and KfW in the form of an investment plan after subcontracting. Looking back, some of the planned investments were based on an overly optimistic assessment of the private operator's capacities. The FC grant's focus on investments in the area of waste water disposal and financial sustainability are still considered justified from today's perspective.

The investments appear to be very relevant in the light of the EMFAPA's low supply continuity, rudimentary waste water systems, high levels of unaccounted for water and large administrative deficits at the time of the appraisal. The project concept underlying the theory of change also seems plausible from today's perspective. The project's design takes into account both ecological (safe drinking water quality and improvement of sewage treatment performance) and economic (focus on loss reduction and covering of the costs) and social (security of supply and customer orientation) aspects of sustainability and pursues a holistic approach accordingly. However, the outcome targets were formulated under the assumption of a smooth takeover of the water utility by the private operator, which resulted in considerable organisational effort. Due to the dependence of the project's success on this assumption, the objectives and the corresponding indicators are not appropriate from today's perspective.

Reaction to changes/adaptability

During the course of the project, important modifications were made, such as the composition of the concessionaire – in line with the concession agreement after the first five years – the investment plan and even the implementation structure. These modifications were made in order to achieve the project's objectives despite difficulties in implementation such as the controversy between the concession holder and SUNASS after the first year of the concession, the resistance of the mayors outside Tumbes, as well as missing land and environmental permits.

Rating summary:

In summary, it has been determined that the project is very well aligned with the policies and priorities as well as with the needs and capacities of those involved and affected. The design of the project generally seems appropriate. In addition, the design and thus the project proved to be sufficiently adaptable to changing framework conditions. Due to the limited verifiability of the target system and the fact that the success of involving the private sector has not been included in the theory of change, the relevance must be assessed as moderately successful.

Relevance: 3

Coherence

² PMO: *Plan Maestro Optimizado* is the investment plan defined by the concessionaire, which determines its tariff structure.

Internal coherence

The project in Tumbes was implemented in parallel with other comparable FC projects in the cities of Pisco (BMZ No. 1995 66 142³), Cajamarca (BMZ No. 1996 66 181⁴), Puno (BMZ No. 1999 55 499), Ayacucho (BMZ No. 1997 66 793) and Huancavelica (BMZ No. 2000 66 423⁵). These projects also implemented measures in both the water sector and the waste water sector in an integrated approach. FC activities to promote private sector participation in the Peruvian water sector included the financing of feasibility studies in the run-up to the project and initially, together with GTZ (now GIZ), advising the Peruvian sector institutions and water utilities on the establishment of suitable counterpart structures for upcoming PSP processes.

In 2000, the GTZ sector advisory programme PROAGUA supported EMPAFA in the implementation of a contingency plan aimed at restoring a minimum level of services and finding management alternatives for the long-term maintenance of services. This measure was completed prior to concluding the FC project. Although PROAGUA was still active in Peru, no further activities were carried out in Tumbes.

In 2008, the project was integrated into the DC programme “Drinking water and sanitation in selected cities” and subsequently in 2017 into the DC programme “Sustainable urban development in the age of climate change”. As part of these programmes, measures were carried out in the waste water and water supply system at various locations, including waste water disposal in provincial cities, the programme to reduce unaccounted for water and activities to improve the framework conditions for the private sector’s participation in residential water management. None of these programmes financed additional measures in Tumbes.

The project is consistent with international norms and standards; the project’s measures were intended to contribute to achieving the Millennium Development Goals (MDG 4, Sub-objective 5 – Reduce child mortality, MDG 5, Sub-objective 6 – Reduce maternal mortality, MDG 7, Sub-objective 10 – Improve sustainable access to safe drinking water and basic sanitation).

External coherence

The projects supported the efforts of the Peruvian government in rehabilitating the water supply and waste water disposal infrastructure and thus consequently improving the water supply in the project areas by providing a large part of the required funds. In addition, it supported the government’s strategy of integrating the private sector into the water sector and was the first national concession for WS/WW services to potentially have a pilot character for further projects. The Peruvian side’s own contribution included the pro rata financing of the measures as well as the preparation and monitoring of private sector participation.

In 2007, Germany was the most important bilateral donor in the water sector in Peru. KfW co-financed the residential water management⁶ sector reform programme as Policy Based Lending (PBL) in cooperation with IDB from 2006 to 2015. Among other things, the programme supported a national strategy to involve the private sector in the water sector. To this end, an attempt was also made to set up a private sector participation programme in co-financing with the IDB, but this did not happen. At the time, the World Bank concentrated its exposure in residential water management on the rural and small-town areas as well as the metropolitan region of Lima. Other important DC actors were SECO and Japanese Development Cooperation (JBIC). The donor coordination in the sector was managed by the “Water Group” (*Grupo Agua de Cooperación Internacional*) established in 2004. To this day, international financiers are voting on specific interventions to ensure harmonisation. The group is today recognised by the Peruvian Government as the official point of contact for donor coordination in the sector.

Rating summary:

In summary, coherence within German DC was considered successful for the present project, coordination between the national and local levels was considered moderately successful, and coordination between the bilateral

³ Evaluated in 2019 with overall rating 4

⁴ Evaluated in 2017 with overall rating 3

⁵ Evaluated in 2017 with overall rating 3

⁶ Phases V and VI evaluated in 2019 with overall rating 2

and multilateral donors was considered to be predominantly successful. The coherence is rated as successful overall.

Coherence: 2

Effectivity

Achievement of (intended) goals

The project objective at outcome level was divided into three objectives: (i) the continuous supply of safe drinking water to the connected population throughout the year in reasonable quantities at cost-covering and socially acceptable tariffs, (ii) ensuring central collection of waste water that is safe for residential hygiene and the environment, and improving sewage treatment performance through better technical operation and (iii) the reduction of technical unaccounted for water following recognition of the quantities of water discharged into and consumed by the network and of administrative losses through more efficient operation.

The achievement of the objectives at outcome level can be summarised as follows:

Indicator	Status at PA	Target value at PA/EPE	Actual value at PCR	Actual value at EPE ⁷
(1) Drinking water is continuously available in sufficient quantities (120 l/p/d ⁸) and in accordance with WHO quality standards	n/a (l/p/d) 8 h/d	120 (l/p/d) 24 h/d	115 (l/p/d) 14.5 h/d not achieved	9.2 h/d not achieved
(2) 165,000 residents (77% of the forecast population) are connected to the central water distribution system via house connections ⁹	126,000 residents 70%	165,000 residents 77%	174,230 residents 75% not achieved	209,684 residents 82% achieved
(3) at least 90% of private water consumers and 100% of public abstractions are continuously recorded via water meters as well as the quantities of water dispensed per consumption zone via bulk water meters	6%	90% private 100% public	75% 70% not achieved	N/A Only data for the time of the final inspection (2020) are available. At that time, the target value was not achieved.
(4) 127,000 residents (59% of the population) are connected to the central WWD	95,000 residents 52.7%	127,00 residents 59%	112,612 residents 48% not achieved	138,084 residents 54% partially achieved ¹⁰

⁷ Latest information from 2021 available

⁸ l/p/d: litres per person per day

⁹ Indicator at outcome level in conjunction with Indicator (1)

¹⁰ the indicator was met in absolute figures, but not in relation to the total population

(5) unaccounted for water (technical and administrative) is reduced to 25% of gross production volume	60%	25%	45% not achieved	64% not achieved
(6) studies prove the covering of the costs and the social compatibility of the tariffs	N/A	Achieved	N/A	N/A

Overall, the indicators were not achieved. The figures listed in the tables in this section are taken from reports from the regulatory agency SUNASS.

Note on indicator (6): The indicator does not point to a specific source and was therefore not measured during the project's term. No corresponding studies are available.

Contribution to goal achievement

In the first three years, the concessionaire focused on implementing rapidly effective measures such as the rehabilitation and improvement of distribution networks or the mechanical and control-related conversion of pumping stations, especially in the area of water supply, in order to create short- to medium-term improvements through an increase in supply. The concession agreement provided that the concessionaire could finance fast-acting measures under its own responsibility up to an amount of USD 2 million from FC funds; this amount was increased to a total of USD 6.8 million (around EUR 5 million). By the end of 2008, all these measures were largely completed. By implementing the fast-acting measures, ATUSA was able to improve the quality of the water supply in the short term. The daily supply duration in the Tumbes municipal area was increased from 10 to 22 hours in 2008, but in the same year the average supply duration per day in the entire supply area was approx. 15.7 hours/day; in some towns, the supply duration was still four hours/day. The 2009–2010 progress reports noted that the concessionaire achieved the supply targets almost exclusively in the most populated location of the concession (the city of Tumbes) and only through production increases, while the technical and administrative unaccounted for water remained high, so that there was no improvement in the efficiency of the water supply, and the continuity of supply declined again in subsequent years.

The complementary measure financed various measures to improve operational efficiency, such as the introduction of a user register, a comprehensive operation management system and a communication campaign. These were supported from 2006 until the end of 2009 and, according to the final report by ATUSA, were successfully continued until at least 2012. The introduction of new accounting software and regular updates to the land register enabled the first concessionary, ATUSA, to increase transparency on the revenue and expenditure side, reduce illegal connections and thus recover outstanding accounts. Public relations work has also increased the acceptance of the concession in 2006–2010 in the supply area.

A detailed investment plan for the implementation of the larger investment measures to be financed from FC funds during the term of the management contract (the first five years of the concession) was drawn up and adapted several times; the final version of the plan was not approved until 2008. The investment plan foresaw investments with a total volume of approximately EUR 12.5 million, of which only two were actually realised: (i) the procurement and installation of 28,339 water meters incl. design and competitive bidding as well as (ii) the construction and equipping of the Zarumilla water tank. The final report points out that, due to the population's resistance to the installation of water meters, it can be assumed that no more than 50% of the meters supplied under the project have been installed by 2021. This risk was probably underestimated before. Although there was an awareness-raising campaign on the acceptance of private sector participation as an implementing agreement, the particular challenge of installing new meters was not addressed at this point. The working design for the maximum possible expansion of the El Milagro treatment plant in Tumbes was seen as part of the investment plan and as a central component for improving the region's drinking water supply. However, its progress was slow due to the lack of technical expertise on the part of the third concessionaire, and it was halted in 2018 when the concession was declared null and void. There were no measures that specifically addressed gender impact potential. Other investments, in particular in waste water disposal, were not realised due to a lack of land, environmental permits and different priorities between the concessionaire, the ministry and the communities.

The operating framework conditions of the concessionaire were identified as a significant obstacle in the project. At municipal level, the legal relationships were not clearly enough defined, which meant that individual municipalities followed their own interests, hindering important decisions by the concessionaire. As the National Water Authority acted as the interface, the private operator had to comply with the rules and procedures of the public sector, such as permit procedures for construction projects, which led to unnecessary delays. In general, the operating, monitoring and regulatory procedures of the sector were not adapted to a private actor, which generally has greater freedom to make decisions and is tied to specific performance objectives.

Quality of implementation

The project began with the implementation of the competitive bidding for the concession, which was led by the Peruvian agency Proinversion and supported by a transaction advisor. The process involved many stakeholders such as the National Water Authority, local decision-makers, the regulatory authority SUNASS and KfW. The initial delay due to an inadequately defined and clarified procedure for transferring operations from the public to the private operator at the start of the concession, as well as subsequent misunderstandings between the concessionaire and SUNASS, suggested that the concept for private sector involvement may not have been sufficiently developed or that the quality of the transaction advisor's results was insufficient.

The mentioned misunderstandings are related to the increase in tariffs. As specified in the regulation, it was agreed in the concession agreement that SUNASS will approve annual tariff increases after meeting predefined targets. In the review of the target achievement in the first concession year, SUNASS found that this was insufficient, in particular because ATUSA counted rehabilitated connections as new connections, which led to a lengthy negotiation process. ATUSA initiated arbitration in October 2008. The result was that the indicators in the concession contract were not able to serve as a basis for contract termination during the first five years of the concession term. For the second phase of the concession (2011–2015), the target indicators were renegotiated and a tariff increase for the concession was only approved at the end of 2013. Since the main shareholders of the concession (international private companies) made their long-term commitment to Tumbes dependent on the expected tariff increases and primarily relied on FC financing, they made few or none of their own funds available for the necessary measures to improve the unprofitable supply and disposal situation.

The progress control reports and internal communication show that the substantive work of the second concessionaire (2011–2016) had shortcomings, which led to numerous coordination rounds between VMCS and KfW as well as intensive appraisal and supervision by project managers (PM) and technical experts (TE).

Unintended effects (positive or negative)

It was not possible to identify unintended effects from the project, neither in the population in the project area nor in the personnel of the water utility.

Rating summary:

Most of the objectives at outcome level were not achieved. Although fast-acting measures have helped to increase the continuity of the drinking water supply, they were not sufficient to achieve the objective, especially as they were concentrated in the Tumbes municipal area. No relevant measure was financed in the area of waste water, and unaccounted for water increased during the course of the project.

Effectiveness: 4

Efficiency

Production efficiency

The investment costs (the fast-acting measures and the implemented measures of the investment plan) totalled EUR 8.4 million and are comparable to the costs of similar programmes. The partner's counterpart contribution to the investment measures amounted to EUR 0.6 million. The costs for the consultancy services, including the complementary measures, totalled EUR 3.6 million, which represents 30% of the total costs and is considered to be very high. The concessionaire contributed EUR 0.1 million of this with its own funds. The efficiency of

commercial operations is to be classified as unprofitable. Tariff revenues were insufficient, so the concessionaire used them primarily to cover operating costs and relied on FC financing for investment measures.

The implementation of the project, i.e. the phase of the management contract in which the investments were to be supported by FC financing, was planned for a period of five years. The actual duration of the concession until its completion was 13 years. From today's perspective, the effort involved in creating a concession was not appropriate in relation to the results achieved, measured in terms of costs and administrative burden. The most important results of the project were related to the fast-acting measures implemented over a period of four years at the start of the concession. This partially improved the continuity of the drinking water supply, but the efficiency of the water supply remained low as unaccounted for water remained high. It is conceivable that the fast-acting measures could have been successfully implemented with a different project concept (without private sector participation).

Allocation efficiency

The financing of the management fee via the FC complementary measure aimed to secure the financial sustainability of the concession. After disbursement of the complementary measure in the first five years, the first concessionaire saw no revenue security, in particular due to discrepancies with the regulatory authority and political difficulties in implementing the planned tariff increases. The political set-up can be considered inefficient, as changing political decision-makers have delayed the project, and the intended representative body of the communities has not been officially established.

According to the concession agreement, the concessionaire was allowed to sell the shares after the end of the first five years. However, it is possible that the first concessionaire would have pursued a long-term strategy for ATUSA without this option. Due to the two changes of the concessionaire, it can be assumed that efficiency losses occurred during the transfer of operations.

The financial additionality of the public funds in the project was given due to the deficit situation of the state-owned company EMPAFA and the high poverty rate in the supply area, which did not permit the necessary increase in water tariffs.

Rating summary:

The specific costs seem reasonable, but the consultancy costs are disproportionate. The project was not fully implemented and the FC financing was reduced after a term of 15 years. Overall, the ratio between input and output/outcome is considered unsatisfactory.

Efficiency: 4

Impact

Overarching (intended) developmental changes

The objective confirmed during the final evaluation was to make a significant contribution to improving living conditions, the foundation for economic development and the environmental situation in the project area. The objective at impact level defined three areas for the project's positive impact on living conditions: health, economic development and the environment.

The 2002 project appraisal report indicated that, in addition to respiratory diseases (65%), waterborne diarrhoea in various forms (15%) was the most common disease in the population of the Departamento Tumbes. No current source could be found that allows a direct comparison with this information. According to the Peruvian Ministry of Health (MINSA), more than 25,000 cases of infectious bowel diseases were reported in Departamento Tumbes between 2021 and 2023. With a total population of approximately 260,000 people, this is still significant, especially as it can be assumed that a high number of cases will not be recorded in the statistics. A reduction in waterborne diseases is therefore not detectable.

Between 2000 and 2021, the Human Development Index value for Peru rose from 0.68 to 0.76, which corresponds to an increase of 12.7%, which is slightly below global development (13.4%). Peru experienced strong

economic development during the project period. At the time of the project appraisal (2002), 54.1% of the population was considered poor¹¹ nationwide and 48.4% in Departamento Tumbes. In 2018, this indicator was 20.5% nationwide and 12.6% in Tumbes. Nevertheless, a majority of the population of Tumbes (over 70%) belongs to the socio-economic categories which use more than 80% of their income for household spending.

With regard to the environmental dimension, it should be noted that the Tumbes River is currently heavily polluted. This is due to the fact that mining (both legal and illegal) takes place upstream in southern Ecuador, and solid waste is discharged untreated into the river's tributaries. In addition, there are still no facilities in Tumbes for adequate treatment of the wastewater discharged directly into the river.

Contribution to overarching (intended) developmental changes

Due to the data situation, no indicators were defined for the objective at impact level during the project appraisal. In view of the limited outputs/outcomes, the project cannot be expected to contribute to reducing waterborne diseases or environmental impacts in Departamento Tumbes. The improvements in water supply achieved through the fast-acting measures contributed in part to economic development, but these were concentrated in the Tumbes municipal area and not in the rural areas, where the most disadvantaged population was only connected to the supply network to a very small extent (see "Efficiency" section).

It is difficult to estimate how the water supply and waste water disposal in Tumbes would have developed without the project. At the time of the project appraisal, the state-owned water utility EMPAFA was in an extreme deficit, which was why a drastic intervention was necessary at the time to improve the situation. A preparatory measure to establish the necessary structures for private actors in the sector would have greatly facilitated the implementation of the project.

Private sector participation remains an option in Peru to finance public investments, including in the water sector, but only to build and/or operate certain infrastructure projects (e.g. sewage treatment plants) and not at the level of utility service providers. Following the project in Tumbes, no other projects with a comparable approach were designed in Peru.

Contribution to overarching (unintended) developmental changes

The failure of private sector participation in Tumbes has probably created a negative signalling effect for further concessions in the water sector, as it was considered a pilot project. In 2016, it was decided that the most inefficient water utilities would be transferred by the central governmental agency OTASS (*Organismo Técnico de Administración de Servicios de Saneamiento* – organisation for technical support in the water sector, a department of the National Water Authority) into a "transitional aid regime" (*Regimen de Apoyo Transitorio, RAT*) where OTASS takes control of the company instead of the municipality. Under this regime, OTASS is now responsible for managing 20 of the 50 Peruvian water utilities.

Rating summary:

The project has led to an improvement in the water supply in some areas in the city of Tumbes and thus contributed to improving living conditions. The project does not make a significant contribution to reducing waterborne diseases. Since the daily supply duration has only increased slightly, it cannot be assumed that this will provide a significant impetus for economic development. Nor can it be assumed that pollution in the project area has been reduced. The target at impact level was not achieved.

Impact: 5

Sustainability

Capacities of persons concerned

Following the termination of the concession in 2018, the central government agency OTASS took over the management of ATUSA under the name "U.E. Agua Tumbes". Both the loan agreement and the grant component

¹¹ based on the national poverty line (source: Instituto Nacional de Estadística e Informática – Perú)

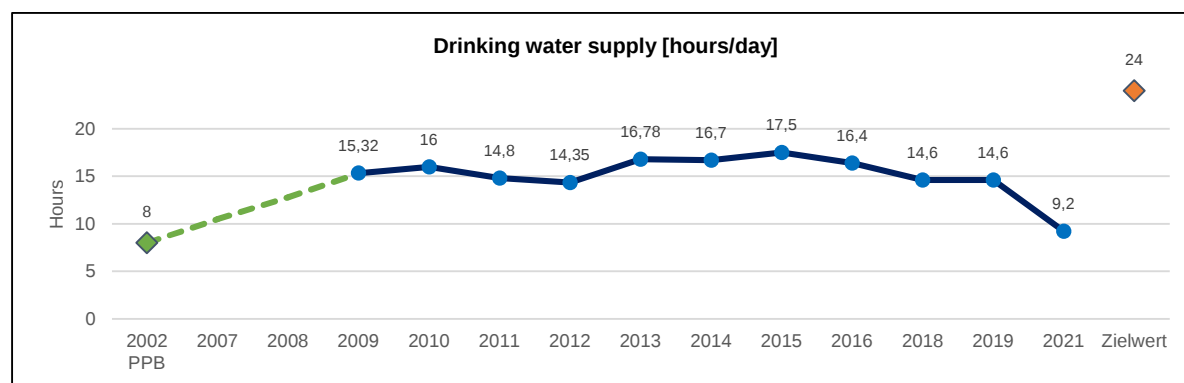
were reduced. No alternatives for continuing the project were examined because the project-executing agency did not have sufficient implementation prospects and capacities.

The final report points out that the company U.E. Agua Tumbes, like its predecessor, the state-owned company EMPAFA, developed into an unprofitable water utility. The tariff study prepared by SUNASS for U.E. Agua Tumbes (2023) confirms that the company is still unable to finance investments as the income generated is not sufficient to cover all running costs. As a result, transfer payments have been made from the Treasury in recent years to cover these deficits. In addition, U.E. Agua Tumbes takes second-to-last place in its group in the latest ranking of SUNASS (2022), which measures the performance of the water utility in Peru according to technical and administrative parameters.

Contribution to support for sustainable capacities

The intensive complementary measures in the area of operational management in the period 2006–2009 (introduction of a user register, an operational management system, updating of the register and GIS information and a communication campaign) contributed to the reduction of illegal connections or their replacement with legal connections. As a result, and due to new connections, revenues increased. Nevertheless, technical and administrative unaccounted for water remains high (around 68%), as water meters were only installed reluctantly and the supply network was only divided into different pressure and supply zones in sections. An IDB audit report from 2021 shows that the operating efficiency of U.E. Aguas Tumbes remains low and value of un-billed water is 60% on average over the last four years. Similarly, it is estimated that around 63% of customers do not have a water meter. In addition, the IDB has assessed the U.E. Aguas Tumbes register as outdated and incomplete. This suggests that the activities financed by the complementary measure have not been continued in recent years.

By implementing fast-acting measures in the same period (2006–2009), bottlenecks in the water supply and sewage system in Tumbes/Nuevo Tumbes and other project sites were eliminated. The average continuity of the drinking water supply was noticeably increased, from 8 to 15 hours a day throughout the area. As the investment plan was not implemented, this figure did not increase significantly in the following years and showed a declining trend in recent years (see figure).



Source: Outcome indicators – progress reports (2006 to 2019) and SUNASS (2021).

Durability of effects over time

Although the political context in Peru has developed dynamically in recent years, the institutional framework for the water and waste water sector and its objectives and strategies have remained stable. Since the project's impact objectives were not achieved, no statement can be made about the durability of the effects.

Rating summary:

Against the background of the weak operational and financial sustainability of the water utility and the termination of the concession or private sector commitment, the sustainability of the project impacts as a whole is classified as unsuccessful.

Sustainability: 4

Overall rating: 4

In the overall assessment, the project is rated as moderately unsuccessful. The objectives at outcome level were not achieved, the temporary improvement in the drinking water supply was not maintained, the private sector participation has failed and the project-executing agency is currently in a similar deficit situation to the state-owned company at the start of the project.

Contributions to Agenda 2030

The project is in line with the international Sustainable Development Goals (SDGs), which provide the framework for Germany's DC activities. From today's perspective, in theory, the project makes a direct contribution to SDG 6 (Ensure availability and sustainable management of water and sanitation for all), specifically SDG 6.1 (achieve universal and equitable access to safe and affordable drinking water for all). The project's design takes into account environmental, economic and social aspects of sustainability and pursues a holistic approach accordingly. Despite the proximity of the investments to the target group (e.g. house connections, network rehabilitation), inclusivity was not the aim of the project.

Project specific strengths/weaknesses and general conclusions/lessons learned

The project had the following strengths and weaknesses in particular:

Strengths:

- The coordination of the Peruvian institutions at the start of the project in order to initiate private sector participation in a previously unknown form and via a successful tendering procedure with six bidders.
- The opportunity for the private operator to increase the budget for fast-acting measures in order to achieve short-term improvements.

Weaknesses:

- Participation by the private sector was not considered an objective of the project. However, its success was a basic prerequisite for achieving all outcome goals within the set timeframe.
- The complexity of the project seems particularly critical. Due to the Peruvian legal situation, it was not possible to disburse the FC funds directly to the private operator. Instead, they had to be channelled via the public project-executing agency (DNS). Accordingly, the disbursements planned by ATUSA were projected in the sector's overall budget, resulting in delays.
- The lack of individual measures ready for investments: The duration and complexity of the building permit procedures were not taken into account in the project schedule.
- The legal relationships were not defined clearly enough in the concession contract to prevent political actors (at municipal level) from influencing the concession.
- The framework conditions for private sector participation were not met. The institutions (National Water Authority, regulatory authority) did not have sufficient capacity, and the operational, monitoring and regulatory procedures were not aligned with a private actor.
- The "Unidad Coordinadora Municipal" was to serve as the municipality's representative body under the concession contract, but it was not officially established.
- The project was primarily aimed at supply areas with a comparatively poor population outside the Tumbes municipal area. However, the concessionaire gave priority to the City of Tumbes with regard to implementing fast-acting measures.
- The concessionaire focused on increasing production and made little effort to improve water supply efficiency.

Conclusions and lessons learned:

- The private sector's involvement in the provision of basic supply does not per se lead to an improved quality of service. Clear legal framework conditions are required to ensure an appropriate risk distribution that is consistent with, for example, the remuneration of a concessionaire. These must be reliably enforced by regulators and the judiciary.

- If a project foresees the new introduction of a private sector component, it should be examined in advance whether the necessary structures (especially at institutional level and for the legal framework conditions in the sector) are already in place or whether further preparation is necessary.
- If a private operator is involved in the public utility corporation, care should be taken to ensure that it receives incentives for achieving project target parameters (e.g. remuneration dependent on unaccounted for water, inclusion of socially deprived supply areas, increase in daily supply duration)

Evaluation approach and methods

Ex-post evaluation methodology

The ex-post evaluation follows the methodology of a rapid appraisal, which is a data-supported qualitative contribution analysis and constitutes an expert judgement. Effects are attributed to the project considering plausibilities, based on thorough analysis of documents, facts and impressions. This includes – if possible – the use of advanced technology (e.g. satellite imagery, online interviews, geocoding). There is a follow-up on possible conflicting information, attempting to eliminate inconsistencies and to base the rating on information that – to the extent possible – has been confirmed through different sources (triangulation).

Documents:

1) Internal project documents

- Tumbes drinking water supply / waste water disposal project appraisal report (19 December 2002)
- Final inspection report, FC module: Water Supply and Waste Water Disposal Tumbes, Peru. (30 June 2021)
- Financial cooperation with Peru Progress review with a focus on drinking water, water management, waste water /waste disposal (2006–2019)
- Back-to-office reports (2011–2018)
- Consulting reports
 - Feasibility study report from Halcrow. *Estudio de viabilidad financiera, técnica y legal para la participación del sector privado en EMFAPATUMBES* (March 2002)
 - *Estrategia de participación del sector privado*. HYTSA 2004
 - Legal opinions
- Project-executing agency reports (ATUSA) for the years 2011, 2012, 2014 and 2017 as well as interim reports from PROINVERSION on the tendering procedure for the concession.
- Investment plan and modifications
 - *Concepción Modificada de las Inversiones en Infraestructura Sanitaria* (October 2006)
 - *Plan Maestro Optimizado de la empresa prestadora de servicios de saneamiento aguas de tumbes s.a. para el periodo 2010–2039*
 - *Plan Estratégico de Inversiones* 2008
- ATUSA tariff study. SUNASS 2011
- Concession contract, *contrato de concesión* (2005)
- Loan agreement – *contrato Tumbes versión final* (23 November 2004)
- Separate agreements (30 January 2006)
- Country strategy for Peru
- Internal key figure reports

2) Secondary literature

- *La concesión de agua en Tumbes*. Sergio Salinas Rivas. 2012
- IDB. *Agua perdida: compromisos institucionales para el suministro de servicios públicos sanitarios* / Pablo T. Spiller and William D. Savedoff, editors
- IDB. *Perfil de las asociaciones público-privadas en activos y servicios de agua y saneamiento de América Latina y el Caribe: principales cifras y tendencias del sector* / María Pilar Castrosin, Ancor Suárez-Alemán, Gastón Astesiano, Lucio Javier García Merino, María Eduarda Gouvea Berto.

3) Other documents

- *Benchmarking regulatorio de empresas prestadoras*. SUNASS. 2022
- Tariff study "Inidad ejecutora 002 servicios de saneamiento de Tumbes (UESST)" . SUNASS 2022
- Viceministerio de Gobernanza Territorial. *Información territorial del Departamento Tumbes*. 2021
- IDB audit report 2005: "Programa de apoyo al desarrollo del sector Saneamiento" (PE-0142)
- IDB audit report 2023. "Proyecto de inversión mejoramiento y ampliación del servicio de agua potable, alcantarillado sanitario y tratamiento de aguas residuales en los distritos de Zarumilla y Aguas Verdes de la provincia de Zarumilla – departamento de Tumbes" (PE-L1256)
- IDB 2021. *Documento de marco sectorial de agua y saneamiento*

Data sources and analysis tools: national statistics; reports from the project-executing agency (ATUSA) for 2011, 2012, 2014 and 2017

Interview partners: Technical expert responsible for the project between 2012–2018), former local water sector coordinator at KfW in Peru.¹²

The analysis of project effects is based on the theory of change defined at project appraisal and documented within the impact matrix, which may be updated for the purposes of the evaluation. The evaluation report argues which factors contributed to the observed effects and why – as well as the probable extent of the project's contribution (contribution analysis). The context of the project is taken into account concerning its influence on the results. The conclusions are put into perspective regarding the availability and accuracy of the available data. An evaluation concept is the frame of reference for the evaluation.

On average, the methods offer a balanced cost-benefit ratio for project evaluations that maintains a balance between the knowledge gained and the evaluation costs, and allows an assessment of the effectiveness of FC projects across all project evaluations. The individual ex post evaluation therefore does not meet the requirements of a scientific assessment in line with a clear causal analysis.

Following aspects caused limitations for the evaluation: Insufficient data situation. Due to the long term of the project and the time span until the ex post evaluation, the availability of contacts with experience implementing the project is limited.

¹² Interviews with the current operator were planned, but multiple contact attempts went unanswered

Rating methodology

Projects are rated on a six-point scale for each of the OECD DAC criteria. The scale is as follows:

- Level 1** very successful: result that clearly exceeds expectations
- Level 2** successful: fully in line with expectations and without any significant shortcomings
- Level 3** moderately successful: project falls short of expectations but the positive results dominate
- Level 4** moderately unsuccessful: significantly below expectations, with negative results dominating despite discernible positive results
- Level 5** unsuccessful: despite some positive partial results, the negative results clearly dominate
- Level 6** highly unsuccessful: the project has no impact or the situation has actually deteriorated

The overall rating on the six-point-scale is compiled by weighting all six individual criteria as appropriate to the project in question. Rating levels 1–3 of the overall rating denote a "successful" project while rating levels 4–6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally "successful" only if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("impact") and the sustainability are rated at least "moderately successful" (level 3).

The annex to this report is available upon request (german only).

About this publication

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