Program Budgeting and Benefit Incidence Analysis: Water and Sanitation

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Contents

[Contents 2](#_Toc254912246)

[Introduction 3](#_Toc254912247)

[*I. General Description of the Water and Sanitation Sector* 4](#_Toc254912248)

[*A.* *Sector Organization* 4](#_Toc254912249)

[*B.* *Main Indicators* 5](#_Toc254912250)

[II. Program Budgeting Analysis 9](#_Toc254912251)

[*A.* *List and Description of Funding Sources* 9](#_Toc254912252)

[*B.* *Methodology and Assumptions made* 10](#_Toc254912253)

[*C.* *Results and Discussion* 11](#_Toc254912254)

[III. Benefit Incidence Analysis 17](#_Toc254912255)

[*A.* *List and Description of Data Sources Used* 17](#_Toc254912256)

[*B.* *Methodology* 17](#_Toc254912257)

[*C.* *Results and discussion* 19](#_Toc254912258)

[*D.* *Assumptions made* 22](#_Toc254912259)

[IV. Conclusions and Policy Implications 23](#_Toc254912260)

[V. Challenges to conducting this work 24](#_Toc254912261)

[VI. Possible extensions 25](#_Toc254912262)

[VII. Plans for dissemination 26](#_Toc254912263)

[VIII. Bibliography 27](#_Toc254912264)

[IX. Appendixes 28](#_Toc254912265)

[*A.* *Appendix 1: PRONASAR* 28](#_Toc254912266)

[*B.* *Appendix 2: Names of the 50 EPS* 29](#_Toc254912267)

[*C.* *Appendix 3: Departments by GDP per Capita (in Nuevos Soles)* 30](#_Toc254912268)

Introduction

The Water and Sanitation sector in Peru still requires a lot of action. One of the main problems is the lack of an appropriate water provision in many areas of the country, especially in rural ones. This situation gets more complicated in countries like Peru, due to its geographical conditions and the difficulty to access very sparsely populated rural areas. That is why the current administration has prioritized the national program: “Water for Everyone” (Agua para Todos, in Spanish). The main objective of this program is to ensure an adequate water and sanitation service for the whole population. For rural areas, the project PRONASAR has been implemented.

Moreover, it is also well known that in order to provide water and sanitation services it is required a large proportion of physical capital investment. In the midst of a recession, this sector would be one of those selected for countercyclical fiscal expansion. These are some of the reasons why, since 2006, this “Agua para Todos” program has become one of the flagships of the current administration.

The purpose of this document is to have a more comprehensive diagnosis of the water and sanitation sector using two methodological procedures linked to budget analysis. The program budgeting analysis is a useful methodology to get a more detailed analysis about the budget items and the allocation of resources. On the other hand, the benefit incidence analysis shows the value of government subsidizes in water services in order to assess the real family burden by expenditure quintile.

The reminder of the study is organized as follows. Section 1 presents a general description of the sanitation sector, including a description of the sector organization and some of the main indicators about the water and sanitation services. Section 2 contains information on the Program Budgeting Analysis. Section 3 presents the Benefit Incidence Analysis. Both second and third sections include the methodology, results, discussion and assumptions made. Section 4 concludes. Finally, the document ends with the challenges, the possible extensions and the dissemination plans.

I. General Description of the Water and Sanitation Sector

## Sector Organization

The structure of this sector has gone under several legal and administrative changes throughout the decades. It now involves five government departments and many other agencies. The following figure gives a broad perspective of the most important ones:

Figure 1: Structure of the Sanitation Sector

Executive Power

Local Governments

National Government

Provincial and District Municipalities

Municipal Council

Town Halls

EPS

INVERSAN

Cabinet

Council

DIGESA

Proinversión

FONAFE

SEDAPAL

Hidrological Resources Intendent

Industrial Enviromental Affairs Directorate

Ministry of Agriculture

Ministry of Economics and Finance

Ministry of Health

Ministry of Production

Ministry of Public Works

Deputy Ministry of Sanitation and Construction

Regulator Agency

SUNASS

INRENA

National Directorate of Sanitation

Water for Everyone program

Source: Sunass

The main institution in this sector is the Ministry of Public Works (Ministerio de Vivienda, Construcción y Saneamiento, MVCS). It approves, executes and supervises national policies in matters of housing, urbanism, construction and sanitation. It has two divisions: the first one is the Vice Ministerio de Vivienda y Urbanismo and the second one is the Vice Ministro de Construcción y Saneamiento. This last one is in direct charge of the sanitation sector and includes the Dirección Nacional de Saneamiento (DNS) and the Direcciones Regionales de Vivienda, Construcción y Saneamiento. These entities are responsible for overseeing and developing programs, regulating, assigning resources, among other duties. An important office is the regulatory agency called Superintendencia Nacional de Servicios de Saneamiento (SUNASS). It supervises, regulates and sanctions according to claims made by the users. It is autonomous from the MVCS and responds to the Presidencia del Consejo de Ministros (PCM).

The Ministerio de Salud (MINSA) also has an important stake in the organization of functions. Through the Dirección General de Salud Ambiental (DIGESA), it supervises the protection of the environment for health reasons. Also, the Dirección Ejecutiva de Saneamiento Básico (DESAB) deals with the quality of the water in order to assure that it is proper for human consumption. Another government department involved is the Ministerio de Economía y Finanzas (MEF), which has decision in prioritizing investments, approving projects and distributing money and resources.

The institutions that are directly involved in executing the operation, maintaining and managing the services are the Empresas Prestadoras de Servicios Municipales (EPS). These entities are mostly focused in urban areas, whereas small town halls and communal organizations deal with the rural ones. There are many other actors like Organizaciones No Gubernamentales (ONGs), the Private Sector, International Institutions, among several. Their roles are mainly to provide technical advice, training, and procure funds for new projects.

##

## Main Indicators

It is important to mention a few facts to understand the Peruvian context. For starters, note that its population is now mostly urban (74.8%), as Figure 2 shows. The urbanization of the population accelerated from 1940 to 1970.

Figure 2: Distribution of the Population



Source: Census 2007

Another important aspect to take into consideration is the different sources of water. It can be seen in Figure 3 that the main source is the private connection one, which is due largely to the fact that the majority of the population lives in cities, but still the percentage is well below the urbanization rate.

Figure 3: Water Sources



 Source: Census 2007

If the sample is divided into urban and rural, almost 70% of the people in cities have private connections and the rest of the options are fairly distributed. However, in the rural areas, just 13% have this type of water provision. As can be seen in Figure 4, half of the water used comes from natural sources like rivers and springs. In second place is wells and in third, private connections. The problem with this distribution is that most of these sources are not reliable as a source of drinking water and may expose the population to diseases.

Figure 4: Water Sources in Rural Areas



 Source: Census 2007

It is also important to evaluate the quality of the service provided. One way of doing this is to know if the people have water all the days of the week. For the urban areas, only 10% do not have water every day.

In the case of the rural ones, this percentage increases to 14%. Therefore is important to know within this group how many days exactly they do have it. Figure 5 shows that there are still a large number of rural households that just have the service for one or two days.

Figure 5: Number of Days with Water Service in Rural Areas (In thousands of people)



 Source: Census 2007

It is also important to evaluate the access to a sewerage system and facilities. Similarly to the case of the water supply, the principal source is the private connection. However, an important 17% does not have any type and 22% depends on latrines and cesspools (see Figure 6).

Figure 6: Availability of a Sewerage System



Source: Census 2007

For the case or urban areas, this situation greatly improves, with only 9% that does not have any source of water and 13% who depend on latrines and cesspools. Figure 7 shows that the main difficulties are faced in rural areas, where 42% of the population does not have a sewerage system and 47% of people use latrines and cesspools as their sewerage system.

Figure 7: Availability of a Sewerage System in Rural Areas



 Source: Census 2007

This broad view of the sector signals the fact that urban areas, which by themselves still need to provide more coverage and systems, have far better infrastructure and depend less on alternatives that have proven to be disease prone.

#

II. Program Budgeting Analysis

## List and Description of Funding Sources

The first step in understanding this sector is to see how it is financed. There are five main items in which the funding is consolidated:

1. The first one is ordinary resources which are the fiscal incomes that do not correspond directly to any entity, therefore being of free disposal. It does not count collection commissions and banking services.
2. Resources directly collected are the proceeds of the EPS (already described at the first section) that are directly managed by them, such as the payment for provision of services, the financial benefits of their investments and the results of previous fiscal years, among others.
3. The third, resources by credit operations, has both internal and external sources that come from deals made by the government with international institutions, foreign states and credit lines. Other accounts included are the results of its operations in the capital markets, results from previous fiscal years and exchange differentials.
4. The next one has two main divisions. Donations include non refundable funds received from international development agencies, governments, individuals and business from the country or foreign. Transfers are operations that do not require any compensation from private or public entities. It includes financial benefits, exchange differentials and the results of previous fiscal years.
5. Finally, selected resources is a broad account that includes municipal taxes (at a local government level), the Fondo de Compensación Municipal (a fund that was established by the government to promote municipal investments redistributing national income tax proceeds according to a rule that attempts to compensate those district with larger needs), customs revenues, canon, sobrecanon and royalties (the last three are resources paid by primary industries such as mining, gas, and others).

Table 1 presents the main accounts and Table 2 shows their relative importance.

Table 1: Funding Sources (In millions of Nuevos Soles of 2006)



Source: MEF – Transparencia Económica

Table 2: Funding Sources (Percentage of Total, by year)



Source: MEF – Transparencia Económica

It is worth pointing out that the numbers for 2009 are the initial estimates, therefore, as it will be discussed in the next subsection, are subject to substantial changes during the year. That is why the analysis will mainly focus on the previous years.

It can be seen that the relative importance of ordinary resources has gone down considerably from the starting point of 2006. However in absolute terms it has not decreased. The other sources are the ones who have risen well beyond this first one, with the exception of resources by credit operations. The fact that resources directly collected have increased is explained because many projects have already become operational and therefore have become new sources of income for the EPS.

On the other hand, the donations and transfers item is explained basically by the transfer section. In the last two years (2007-2008) the economy experienced high growth rates, which meant that the government had more income to distribute given that the extra resources came from a commodity price boom. Those high prices made it possible to have more canon and sobrecanon and royalties, which in turn helped promote different infrastructure investments.

## Methodology and Assumptions made

The methodology starts by analyzing the sanitation budget and decomposing its accounts in order to have information of how it is financed and how are the resources spent. The first step was identifying the sanitation sector. Then, information was given of how it was financed and through which channels. After this first exploration, the expenditures were analyzed. They were classified in current and capital following the definitions established by the MEF and the information was then summarized for the years required.

To select the entries related to wages it was clear that more detail was needed because general items like goods and services also include short term contracts that are not accounted in personnel and social obligations. Therefore, a close inspection of each category was needed to sort them out correctly. For example, in the budget’s categories it was found that the Consultancy Services Hiring (CAS, for its Spanish acronym) was part of the spending related to the Goods and Services category. However, for the purpose of this analysis, it has been assumed that CAS must be considered as part of the Wages expenses. Otherwise, this category could be underestimated and the analysis could lead us to mistaken conclusions.

Also, in the donations for capital expenditure, each of the subcategories that composed this broader one had to be analyzed to identify which amounts donated had been used for this specific purpose.

## Results and Discussion

Table 3 indicates the level of expenditure in the sanitation sector. There is a trend of growing spending (despite the fact that for 2009 it was initially budgeted only 1 667 millions of Nuevos Soles, later modifications have rendered this amount to be more than 3 000 millions, in constant prices).

Table 3



Source: MEF – Transparencia Económica

As expected in this sector the infrastructure is the principal account. Even though recurrent expenditures have risen considerably, still the capital is the main issue to consider, as can be seen in Table 4.

Table 4



Source: MEF – Transparencia Económica

Another important aspect is that the Donors and Transfers item has increased its participation on total spending. However, these accounts refer mostly to transferences between higher government instances to lower ones. The data set does not let it split in two different budget items, but it is estimated that Donors represents less than 5% of this account. Thus, the increased in the participation of this item is mainly due to the decentralization process, in which some funding sources have progressively been transferred.

Table 5 gives a general perspective of the sector for the year 2008. It represents less than 1% of the total GDP and its mayor source of funding is the national government (as it has been already mentioned, the donor and transfers account includes transfers from this level to the others). This includes several programs of national scope which are implemented by the executive power through the MVCS.

Also important is the local or district level. This is due to the fact that this is the level of government in direct charge of supervising the EPS and implementing new projects. The payments done by households allow the EPS to be self sustainable. This means that the government does not need to subsidize their operations. In order for the system to work, each EPS determines its tariffs in blocks according to consumption and if the user is industrial, a state dependency or a house. This allows for cross subsidize and to recover the costs.

Table 5



Source: MEF – Transparencia Económica

Regarding sanitation sector efficiency, one of the main issues that the budgeting process must face is its ability to execute the amounts established. However, in recent years, the sanitation sector has not been able to fully spend the resources destined to each year. This is a common fact around all budgetary units local, provincial and national in these years, which is partly explained by the sudden increase in budgets and rules that earmarked the use of funds only to investment. For example, in many cases the extra money could not be used for the studies required for new projects. As Figure 8 shows, most years analyzed show that an important part of the budged was not actually spent (the year 2009 is until the month of October).

Figure 8: Budget Execution



 Source: MEF – Transparencia Económica

In order to see why this is happening, it is important to consider the structure of the expenditures. Figure 9 shows the composition for the year 2008, which is similar to previous years.

Figure 9: Execution of the Main Items in the Budget - 2008



 Source: MEF – Transparencia Económica

In most cases, there is a high enough rate of completion. However, the investment item is significantly lower the rest. Due to the fact that this is more than half of the budget for this sector, this explains why as a whole it seems to be far behind its goals.

Figure 10: Weight of the Main Items in the Budget - 2008



 Source: MEF – Transparencia Económica

In most cases, there is a high enough rate of completion. However, the investment item is significantly lowering the rest. Due to the fact that this is more than half of the budget for this sector, this explains why as a whole it seems to be far behind its goals.

When the investments are looked carefully, four items are the most important ones in terms of expenditures. Also, these four have a rate of completion similar to the total average of the sector, with the exception of Retributions and Complements - Fixed Term Contracts, which is almost at 75%.

Two of them are related to third party services, which mainly explain why they are behind schedule. Because these items include the construction of infrastructure and different studies like planning or feasibility, may take longer than expected due to unexpected complications in the process. However, inaccurate measurement of the deadline of a project may cause extra expenses which ultimately generate inefficiencies.

Figure 11: Investments



 Source: MEF – Transparencia Económica

A second point noted earlier is the fact that the expenditures in this sector are primarily focused on infrastructure. As seen in Figure 12, the proportion of capital is considerably important, though in the years of 2007 and 2008 a more relevant role was given to recurrent expenditures.

Figure 12: Proportion of Recurrent and Capital Expenditures



 Source: MEF – Transparencia Económica

Figure 11 showed that the two capital expenditure items are investments and other capital expenditures. The investment side was previously analyzed in the preceding point. Therefore, Figure 13 presents this second use of capital.

Figure 13: Other Capital Expenditures



Source: MEF – Transparencia Económica

It can be seen that it is mostly composed by transferences to lower levels of government and business. These cover some financial necessities of the entities regarding planning, installation, construction and maintenance of connections, sewerages and waste, among other uses regarding the sector.

Finally, one last point worth mentioning in this part is the great difference between initial budgets and successive modifications. The Presupuesto Institucional de Apertura (PIA) is the original one whereas the Presupuesto Institucional Modificado (PIM) includes all the changes done during the year. Is important to mention that there is a common practice formulating budgets with very conservative tax revenues projections and include any additional funds during the year through new appropriations (supplemental credits in the Peruvian budget jargon). That is why the 2009 PIA budget would become an almost double PIM at the end of the year.

Other important issue might be inefficiencies in the budgetary process. That may be the case of underestimating initial costs and then having to expand the budget to cover them. In this case, a faulty or an incomplete proposal might cause these extra costs later on during the year. Also, one might consider unexpected complications and events that make the projects more expensive than initially planned.

Table 6



Source: MEF – Transparencia Económica

III. Benefit Incidence Analysis

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## List and Description of Data Sources Used

For the purposes of this project, the main source of budget information is the Ministerio de Economía y Finanzas (MEF) who presents through its web page all the information regarding the national budget. This portal is called *Transparencia Económica* and allows the user to explore each account in detail, in order to track financing and spending of each program and government level. Also, the information is updated daily, so it is current to the date of elaboration of this report.

On the other hand, the ENAHO data set is a household survey conducted by the National Statistics Institute (INEI) that has nearly 400 questions. It gathers information at an individual and household level of demographic variables, income, health, expenditures, education, living conditions, housing, social programs, etc. This information is acquired from approximately twenty thousand homes and is statistically representative at the department level. However, it is not representative at lower levels of organization. All individuals older than 14 years in the home are required to answer the questionnaire. One of the benefits is that this information is public and it is freely available through the INEI’s web page[[1]](#footnote-2). For this paper, the modules consulted were the first (Characteristics of the Housing and Household) and the fifth ones (Employment and Income).

## Methodology

In order to prepare the following tables required by the study, a first step is to define what will be considered as the relevant subsidies and expenditures. The subsidy in this sector can come from different sources. It could be cheaper access for those that already have some water provision. It could also take the form of increasing the population served thanks to some government program. Finally, it could be represented as an increase in the quality for those families that already had a source of water. In all cases, we are thinking about the subsidy attached to a particular household.

For this study is important to consider the fact that the current tariff structure of the sector aims to be self-sustainable. Therefore, the net subsidy is zero as the tariffs charged are designed including cross subsidies between consumers but maintaining the assumption that the EPS do not need government intervention to cover their costs.

Consequently, the subsidies are not in the operation of the companies or the investments they make financed by users. However, the State does play an important role in the expansion of the infrastructure and in training the personnel in charge of this sector, both from the supervision and execution side.

Many projects are financed entirely by the government or receive some kind of help from it. They can expand the responsibilities of an EPS or invest in public connections to reach population in rural areas. The program that has this function is called “Agua para Todos”, which includes many subprograms.

Also, due to the fact that projects in the sanitation sector take longer than one year in order to be completed, the timeline used for the evaluation of the subsidy is August 2006 to October 2009. This is due to the fact that many of them started in August and several of them are still ongoing as of October 2009.

In order to establish the differences between private and public connection investments subsidized by the state, it is necessary to divide this program in its different components, because each of them has a different function. For example, PRONASAR which was discussed in the first section had the objective of investing mainly in public connections for rural areas.

Figure 14: Composition of the Agua Para Todos Program (August 2006 to October 2009)



Source: MVCS

That is why the methodology consisted in revising each of the program components and evaluate whether or not it was linked to projects of public or private connection. This would allow obtaining an estimate of the cost per type of connection made by the state, which due to the fact that it was completely covered by the government, it would constitute the subsidy.

The next step was to determine the level of water usage. This posed a problem due to the fact that the household data sources record only the expenditure in water services, but not the quantity. In this case, the Encuesta Nacional de Hogares (ENAHO) was used.

Therefore, the solution consisted in several steps: the first one was to separate the data by departments (regions). Each EPS operate in a geographical area, within a department, so the next step was analyze the price structure of each EPS. In the cases that more than one EPS worked in the same department, we constructed an average price weighted by the number of connections of the EPS.

The complication was that there are 50 EPS and many of them have price structures that vary according to the consumption level. For example, one Nuevo Sol per cubic meter until 20 meters and from then the tariff goes to 1.50 Nuevos Soles. The costs of having a sewerage service were also taken in account. A list of all the EPS is presented in Annex I.

However, the ENAHO has a question that permitted to identify if the household had a private of public connection. The private option was connection directly to the house, whereas the public one included common connections, common use pylon, wells, rivers, etc. After calculating the level of expenditure according to consumption, the spending of each household was divided for each department. The last part in this procedure was to order them according to their level of income to determine their expenditure quintile.

Finally, we need to calculate the distribution of benefits of water expenditures. For that we obtained the level of expenditure in the sector by department. Then, the spending was sorted between projects of private or public objectives.

The Instituto Nacional de Estadística e Informática (INEI) has calculated recently the GNP per department[[2]](#footnote-3). With this information, the departments were sorted according to their expenditure level forming the relevant expenditure quintiles. However, the capital Lima, in which an important part of the investments go, is in the highest quintile. The problem is that in Lima the poorest areas are the ones that actually receive this expenditure, so taking Lima as a whole would skew the distribution. So, the solution was separating Lima in its 42 districts and consider each of them as a department.

## Results and discussion

The following table shows the average subsidy made from the government by each type of connection. It is important to understand that this is the marginal cost of a new connection to an already existing network. There is a fixed cost that we are not considering which is related to install a new network.

Table 7



Source: MEF – Transparencia Económica and MVCS

Table 8 presents the monthly usage of water measured in cubic meters and ordered by each connection and the expenditure quintile.

Table 8

Source: ENAHO and SUNASS

The next table adds information to Table 8. In this case, it is presented the monetary amount spend for the water service.

Table 9



Source: MEF – Transparencia Económica and INEI

The last set of tables in this section has the distribution of benefits of the government spending in the water sector by the kind of connection and the expenditure quintile that is directed to. As expected the government subsidies are more or less well focused. The first three quintiles received more than three quarts of the total expenditure. What is not clear is how efficient is the government choice of 65% of that is given through private connection and only 35% by public connections. We must defer this discussion to the next paper in which we tackle cost-effectiveness issues.

Table 10



Source: MEF – Transparencia Económica and INEI

Table 11 has the same structure of table 10 but its level of detail is purely departmental. As it was discussed in the methodology section, in order to prepare table 10 the expenditure quintiles used were of departmental GDP per capita. However, due to the great amount destined to Lima and its unequal distribution of income, we have to treat each Lima district as a department in order to rank them properly.

Table 11 shows how would the results have been if this precision was not made. Clearly, because Lima is in the highest quintile, it skews the distribution. However, most of the investments in Lima were done in poor districts, therefore would be an inaccurate measure.

Table 11



Source: MEF – Transparencia Económica and INEI

The analysis of the previous results gives a broad perspective of the efficiency of the expenditure of the sanitation sector. Table 7 shows that a private connection is in fact more expensive than a public one. However, their costs are not considerably different. Private connections are not as expensive where there is a system already in place, such as in big cities because it is only necessary to connect the new pipes to the existing network.

However, when there is not the infrastructure needed, it requires a considerable amount invested to set up the network. This is the case of small cities and big rural communities. This raises the cost per connection considerably. As an example, in the case of Lima, the biggest EPS that functions in the city itself is SEDAPAL. This firm presents in its “Tabla de Precios”[[3]](#footnote-4) (Price Schedule) that a sewerage connection costs 1366.13 Nuevos Soles. Therefore the difference is explained by the cost of building a network, instead of simply connecting one pipe to an already existing one.

In the case of public connections, it includes important costs because water has to be directed to distant and mostly rural areas. This means redirecting rivers, digging wells, etc. However, because one public connection benefits more than one household, the investment required is not as high per connection as in the private case.

Table 8 presents a clear indicator that richer households tend to consume more water that the ones of lower income. For example, they may have a pool or bigger gardens that demand more water usage. Also, as one would expect, houses with private connections tend to use more water than the ones with public ones. Clearly, the facility of obtaining this resource is in direct relation with the level of usage for every quintile, in most cases by more than double. On the other hand, the poorest households with public connection are the ones that demand the lowest quantity of water. In their case, the expenses of this service are an important percentage of their income.

Table 9 shows that the price is not linear. There are thresholds in which beyond that level of consumption, the price charged changes. Therefore, the highest quintile pays considerable more than the others. Finally, Table 10 indicates where the expenditure of this sector is going. It is mainly focused in private connections, which implies a better standard of living.

However, it is relevant to notice that the lowest quintile receives far less that the second lowest in terms of private connections, although they have more invested in public connections than any other category. This might mean that for the first quintile, it is more cost effective to provide the service through public connections.

In the case of a distant rural community, the cost of a private connection project might be too high so the alternative to zero provision is public connections. The second and third quintiles on the other hand, might be more focused in small cities or rural communities near big cities. Therefore is more feasible to provide them with private connections. The highest quintile, on the other hand, receives the least amount of expenditure, which is consistent with the fact that they do not need it because the live in areas where this service is already in place.

## Assumptions made

The first assumption made was that for Table 7, the different projects were grouped together into the broad categories of public and private. For example, the cost of a private connection in Lima (which is mostly an urban area and is the capital) is quite different from one in Ayacucho (a rural department with a low level of income). Also, another point is that these estimates do not only include the cost of installing the connections. They also take in consideration rehabilitation of previous connections and the training EPS employees to operate them.

In Table 8 we assume that to compute an average price in departments with more than one EPS we must use as weights the number of connections of each EPS. However, the number of connections is not necessarily equal to the number of people that pay the EPS price. For example, in the case of public connections, only a few people may actually use them so their importance is lesser than supposed.

In the case of Table 10, we assume that the GDP of each department (except in the case of Lima) is a good indicator of the overall income level for the people who live there. To see in which quintile corresponds to which department, see the annex II. In general it could be a useful simplification. However, in certain cases, such as in mining departments, their income is considerably skewed within the department. This is mitigated by the fact that individual ordering is not as relevant because quintiles are used. For Lima, due to the fact that almost a third of the population of Peru lives in this department, it was relevant to go into a more detail. Also, Lima as a department is in the highest expenditure quintile but the investments made benefited the poorest districts so it could have skewed the results.

IV. Conclusions and Policy Implications

Social inequality can also be perceived regarding water and sanitation conditions. There are significant differences between urban and rural areas that are quite difficult to solve given geographical restrictions and household habit changes implied. Nevertheless, in the last years the government efforts to improve water and sanitation conditions have considerably increased. During the period 2006-2009, annual funding sources allocated to this sector have been more than triplicate. Moreover, at the political level, the “Agua para Todos” program is one the flagships of the current government, which stimulates an attitude of close monitoring in the civil society and an accountability culture.

Methods like the PBA and the BIA are designed precisely to facilitate evaluation and monitoring of the items covered by water and sanitation programs. About the first one, as it had been expected, it was found that this sector is basically capital intensive (it represents 79% of total water and sanitation expenditure). That might mean that even when it is expected that EPS and other water and sanitation companies become self-sustainable, the government frequently subsidies fixed costs (which are very high in this sector) in order to promote investments and to increase the access to a water service of better quality. After that, water and sanitation companies are supposed to cover all their operating costs with their tariff system.

It was also found evidence of an inefficient budgeting process, based mainly on two facts: i) the wide mismatch between the Institutional Opening Budget and the Adjusted Planning Budget, and ii) the inability to execute the entire planned budget. Because these items include the construction of infrastructure and different studies like planning or feasibility, they may take longer than expected due to complications in the process. However, inaccurate measurement of the deadline of a project may cause extra expenses which ultimately generate inefficiencies. Thus, a better understanding of the budget accounts will allow government to prepare more realistic and transparent budget plans.

About the BIA, the analysis of the government subsidies was particularly useful for a better understanding of the service provided to population of different socio-economic status. For example, it was found that lowest expenditure quintile receives far less that the second lowest in terms of private connections, although they have more invested in public connections than any other category. This might mean that for the first quintile, it is more cost effective to provide the service through public connections. In the case of a distant rural community, the cost of a private connection project might be too high so the alternative is public connections as well. The second and third quintiles on the other hand, might be more focused in small cities or rural communities near big cities. Therefore is more feasible to provide them with private connections. The highest quintile, on the other hand, receives the least amount of expenditure, which is consistent with the fact that they do not need it because the live in areas where this service is already in place.

V. Challenges conducting this work

The biggest challenged faced in the PBA analysis was the fact that many of the entries in the budget had a diverse composition of sub classes that require extra work to be sorted out in order to present the information as it was needed by this project. However, the data was available and updated, so this chore could be done without recurring to other sources than the MEF. Therefore, the consistency of the data was assured by using the same database.

In contrast, the biggest challenge during the BIA analysis came from looking for ways to estimate and present the data. For example, for Table 8 there were no direct measurements of water usage classified by connection and expenditure level. Therefore, an estimated price had to be used. This meant searching the price structures for 50 EPS and calculating the average for each department.

Another important issue is our definition of subsidy. We have assumed that the money spent under the program “Agua para Todos” since the start of this administration is the right way to compute the subsidy. Our argument is that this type of investment usually takes more than two years in order to be completed.

Also, due to the large number of projects, some simplifications were needed, like the ones explained in part VII of the present document. One important way to simplify the procedures and resort to fewer assumptions would be to include a question in the ENAHO for the amount of water (in cubic meters) consumed, instead of only expenditure.

Another issue is the level of detail for the geographical location of beneficiaries. In some projects that involve more than one district, a clear division of beneficiaries and investments is needed. Therefore, aggregated district information is required for each of the programs Involved.

VI. Possible extensions

One interesting extension to this analysis is to evaluate the expenditure in this sector from the users’ point of view. For example, survey communities to know if they consider the investments made were adequate compared with their needs. Also, it could be asked their degree of satisfaction with the projects. This subjective quality perception might help policy makers to take into account expectations for future programs and empower the population by giving them voice in the process.

It would also be an interesting possible extension to analyze how is the process in which a part of the population access water services. When it starts as a rural or distant community, first it may receive public connections or depend on natural sources like rivers and wells. However, once it reaches a critical mass, it might become of interest to provide them with private connections. This may also be a political decision, as the government may decide to invest in this service in order to boost its approval ratings in election periods. Also, the level of organization and or income of the community may lead them to request this facility from their local authorities. Also, if there is a high incidence of diseases and mortality, the authorities may be more prone to invest in water and sanitation for the community.

Another relevant point that can be researched is how efficient is the process of implementing a project. To measure how budgeted costs and time line differ from the actual ones might provide important information about which companies do a better job and are more reliable. This information might be used later on as part of the decision process of elaborating tenders and awarding points to companies with better performance.

VII. Plans for dissemination

|  |  |  |
| --- | --- | --- |
| **No.** | **Product** | **Comments** |
| 1 | Books | It could be a standalone book, can collect other related pieces to prepare a specialized reading. Approximately 500. |
| 2 | Journal articles | Te research center has a journal. *Apuntes*. Size of article 25 pages*.* |
| 3 | Web site of the research center | Working document after passing a peer reviewing |
| 4 | Press conference with book launch | The university normally prepares a press conference after a main seminar, or press is invited to the event |
| 5 | Special memos or briefs requested by policymakers | Next year will be election year, so it is a good time to have materials prepare for political parties |
| 6 | Roundtables & similar events | It is very possible that the team get contact with the National Council of Education |
| 7 | Placing articles in newspapers, popular magazines | Yes, also in the university magazine *Punto de Equilibrio.* Language less academic than in Journal *Apuntes* |
| 8 | TV appearances related to policy research | Maybe, yes. The University has a very active media and communications department |
| 9 | Radio appearances related to policy research | Maybe, yes. The University has a very active media and communications department |

VIII. Bibliography

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IX. Appendixes

## Appendix 1: PRONASAR

As it was shown in the previous discussion of section two, the rural sector is largely at risk of diseases and has poor living conditions due to the fact that it does not have much water and sewerage infrastructure. Therefore, an important initiative from the state comes in the form of a program names Programa Nacional de Agua y Saneamiento Rural (PRONASAR). It focuses mainly in rural areas and small cities that do not have the infrastructure needed to provide these services to the communities.

Its main objective is to reduce diseases through the implementation and better quality of water and sewerage services. In order to do so, it has to capacitate the municipalities so they can manage the operations of the water investments. Also, it destines resources to the construction and modernization of the provision of water. It links the communities, regional government, private sector, state officials and technical personnel in order to assess the situations and come up with solutions that are sustainable.

Their guidelines to select where to begin projects include the area’s poverty index, the incidence of diarrheic diseases and the coverage of water and sewerage systems. The program has four defined stages. The fist one is water supply and sanitation in rural communities. The second has the same objectives bur for small cities. The third is the construction of capacities for local officials. Finally, the last one is administration of the projects.

Table 12 shows the investments made by the program in each of its four phases. The total budged destined is $80 million, of which about half has already been spend in Arequipa, Ayacucho, Huancavelica, Huánuco, Lima, Junín, Pasco and Piura.

Table 12: Investments Made by PRONASAR



 Source: MVCS

The total population benefited by the program is estimated in 275 thousand and 60% of them are located in Piura, Junín and Ayacucho.

##  Appendix 2: Names of the 50 EPS



##  Appendix 3: Departments by GDP per Capita (in Nuevos Soles)

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1. <http://www.inei.gob.pe/> [↑](#footnote-ref-2)
2. INEI (Agosto 2009) “Informe Técnico: PBI Departamental 2008” [↑](#footnote-ref-3)
3. <http://www.sunass.gob.pe/consulta_tarifas.php> [↑](#footnote-ref-4)