Policy Briefing

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Summary

Water accounts in Guatemala revealed important national issues concerning quantities, users, and productivity. These findings triggered an open policy dialogue and further studies around Guatemala City, which is the largest urban population in the country. This has led to the design of a water conservation fund to support better water provision.

Background

This brief is written by Ina Porras from IIED. It is based on the environmental-economic accounts developed through a partnership between several government agencies and a private research institute — the Agriculture, Natural Resources, and Environment Institute (IARNA) from Universidad Rafael Landívar. The accounts were developed for 2001-2010.

The water sector in Guatemala: a cup half-full or half-empty?

Water is probably Guatemala's most precious resource: abundant, renewable and fairly predictable despite variations from climate change. Water supports human life, fuels industry and feeds rich and biodiverse ecosystems. Despite this, the infrastructure required to convert water into wealth is lacking — where it does exist it is not available to all. Natural capital accounts are helping the government to understand the impact of water on wealth creation, providing vital information to make sure that investments are allocated where they are most needed and where their impact will be greatest.

The main messages that emerge are:

- Water is abundant in the country but there are many conflicts over its distribution.
- Agriculture uses a lot of water but does not use it efficiently.
- Productivity of water in terms of wealth creation in the GDP (US$/m^3) has remained mostly stagnant – suggesting the need to invest in technologies that increase productivity per unit of inputs used.
- Industry and services have a high productivity in terms of water used but they also generate large amounts of waste, some of it toxic.
- Domestic water use is increasing, yet it still uses less than 1 per cent of all water resources. Conflicts in the sector are due to inefficiencies in distribution rather than availability.

Semuc Champey, Guatemala.
Water is abundant in Guatemala; the issue is over its distribution.
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Rich but choppy waters

Water abounds in Guatemala. Its geographic location results in an annual average of nearly 6,000 m^3 per person. There is plenty of water for households, and as inputs for agriculture, industry, and hydropower. Rivers flowing into the sea support wetlands and mangroves, contributing to coastal and marine ecosystems. Water is basic to the existence of forests, which cover over one third of the country and provide multiple benefits, from timber to protection of biodiversity.[1]

Like most tropical countries, seasonality of rainfall and inadequate infrastructure lead to constant flood-drought cycles. The population in Guatemala grows 2.5 per cent every year. Mass migration from rural poverty and civil instability puts severe pressure on services in urban areas, principally around Guatemala City. Water is needed for homes and for industry that provides jobs. But a lack of adequate infrastructure for water delivery and disposal of waste leads to constant shortages of safe, potable water and increases river pollution, especially in poorer areas of the cities, leading to discontent.

To complicate matters, Guatemala lacks an institution with the legal authority to coordinate action, assign rights and mediate conflict. Policies are drafted with little information on water users and needs, and the impact of these policies and investments on the economy. This reduces the capacity to capture value and invest in better infrastructure.

Accounting for water

Figure 1 shows how water resources enter the economy and are transformed from a natural resource into wealth. It also shows the institutions, infrastructure and rules that link resources to users.

A recent development is the approval of the National Water Law, and a government agreement to implement better watershed management, improving water supply networks and better treatment of industrial effluents. The agenda will be executed by CONAGUA, Guatemala's national water authority, in coordination with other authorities such as SEGEPLAN (the planning ministry) and the President's Ministry of Water Resources.

Policies are drafted with little information on water users and needs.

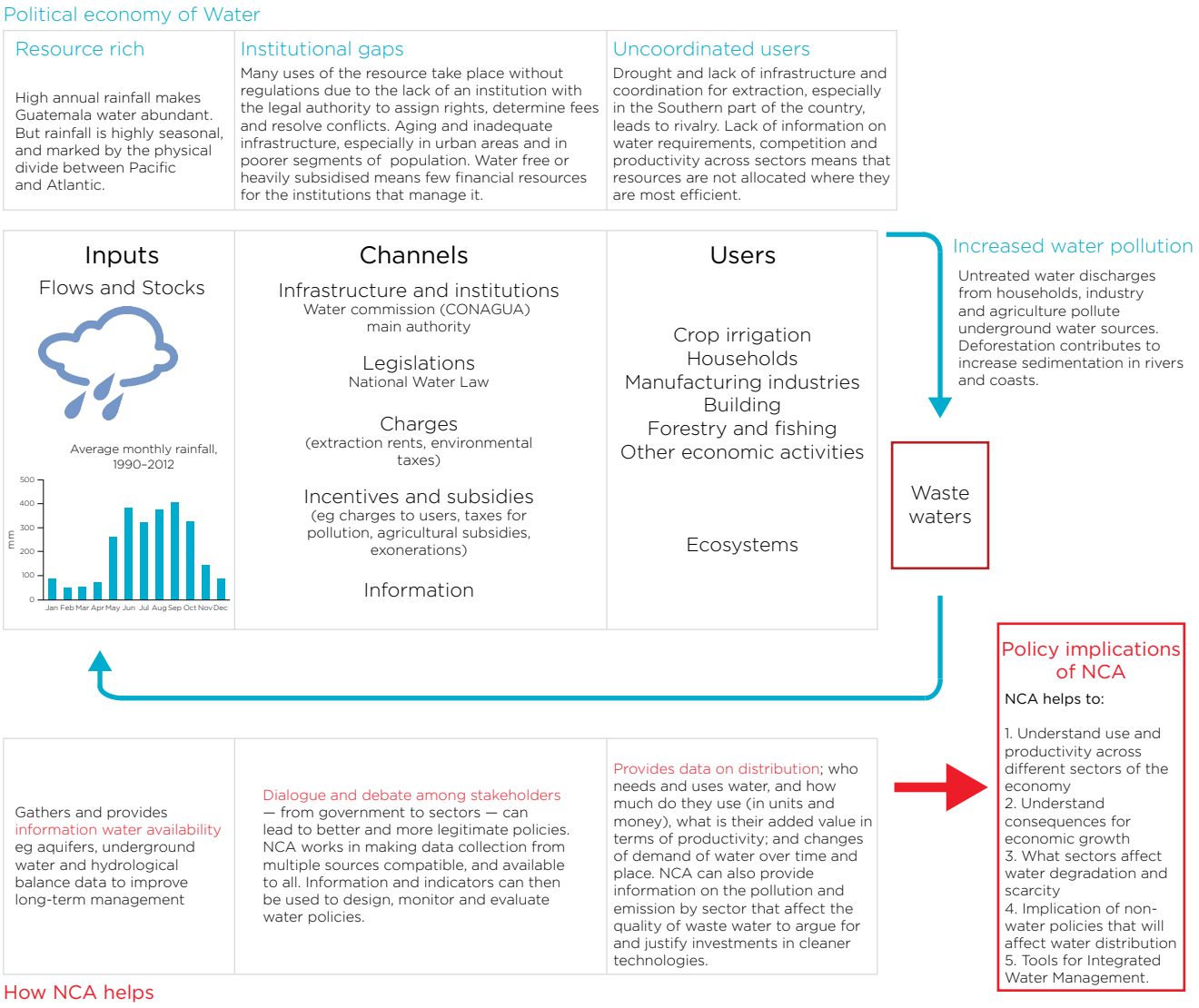

Figure 1. A snapshot of the Guatemalan water sector and its links to the economy

The water accounts provide the information that underpins this law and its implementation. Through the accounts we know how much water is available each year (both underground and through surface sources) and how much the different sectors of the economy use over that period. By linking sectors to GDP accounting it is possible to understand the impact of water on national wealth generation.

What have we learned?

The statistics agency collected an initial set of water accounts for the period 2001-2010.[2] Analysis of the data is helping researchers refine their models and inform policymakers. Some of the main results are discussed here.

Structure of the water account

Figure 2 presents the building blocks of the water account, and Table 1 presents a summary of the results for 2010. The accounts show how much of the total available water during a year is used by intermediate users, using water as an input for their activities, such as agriculture or manufacture but also natural ecosystems, and by final users – homes, for instance. Additional information is available in terms of how much of this water is distributed through existing systems, pipes for example. It also

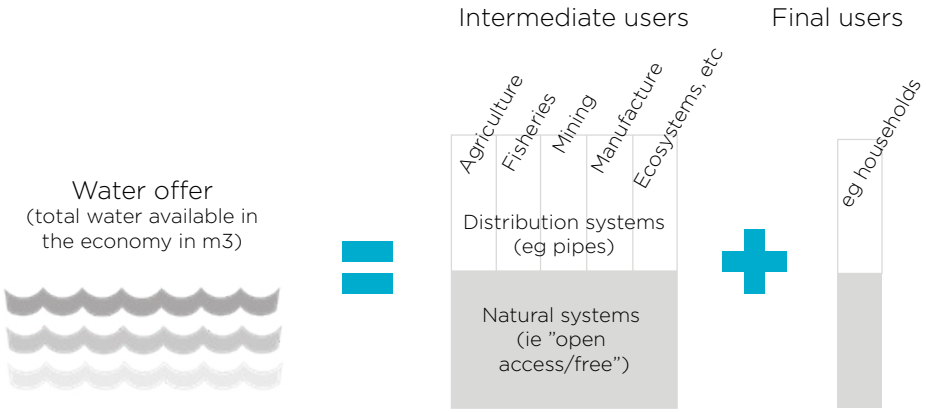

Figure 2. Structure of the water accounts

shows how much is extracted directly from the natural environment (rivers, rain or underground) – usually not controlled.

Very little water is paid for

Only the water used through distributions systems, such as pipes, is likely to be measured and charged for. The accounts show that of all the water flowing through the economy in 2010, only 1.2 per cent (418 million m^3) went through managed distribution systems. In essence, this means that Guatemala can only capitalize, by charging, on just over 1 per cent of its most precious natural resource and most of the water in Guatemala is, at the moment, free.

Agriculture takes the most water

In 2010 the agriculture sector used 60 per cent of water resources – an increase of 6,322 million m^3 over 10 years. Non-traditional crops use a lot of water and in 2010 accounted for 47 per cent of all water flows (up from 37 per

	Intermediate users									Final users (eg households)	Total
	Agriculture	Silviculture, hunting, fisheries	Mining	Manufacture	Electricity, gas, building	Building	Services	Natural environment	Sub-total		
Water from distribution systems (eg pipes)	9	0	1	201	0	0	118	—	330	88	418
Water from natural systems	21,143	1,043	5	1,040	5,057	76	—	6,402	34,765	374	35,139
Total flows in the economy	21,152	1,043	6	1,241	5,057	76	118	6,402	35,095	462	35,557

Table 1. Total water flows in the Guatemala economy in 2010 (million m^3)

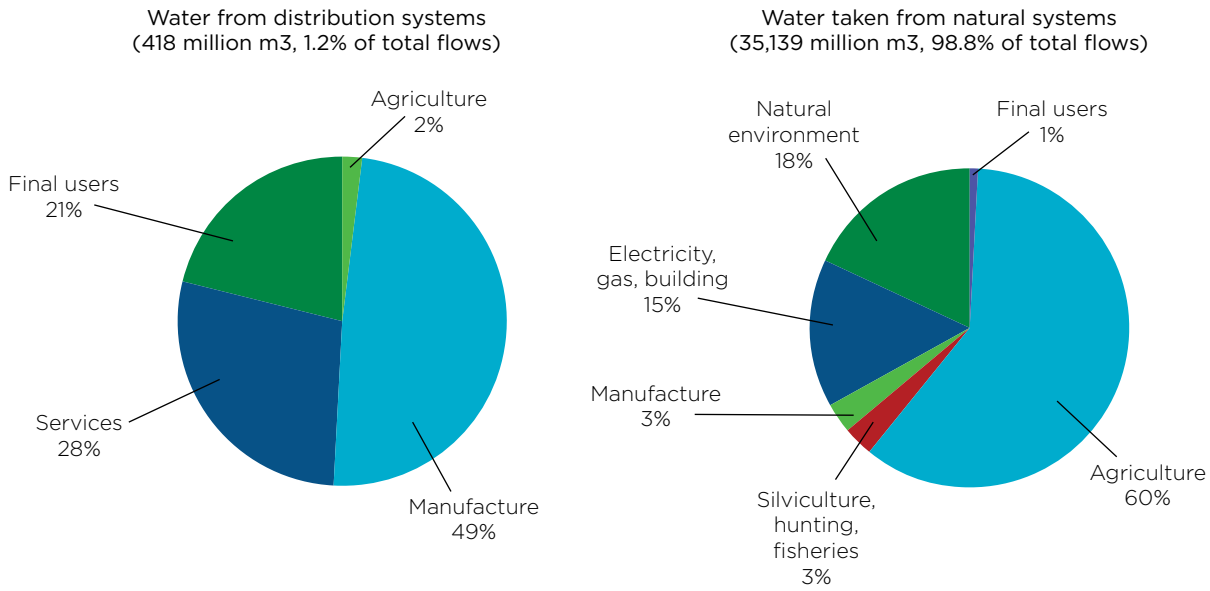

Figure 3. Water sources and water users in 2010

cent in 2001) — equivalent to almost 16.5 million m^3 in a year — as well as 8.8 million m^3 of water from distribution systems such as irrigation projects. It is worth noting that while the water use increased, the participation of the agriculture sector in GDP declined from 9.7 per cent in 2001 to 9 per cent in 2010.

Manufacture and services use most of water distributed

The manufacturing sector uses almost half of all water distributed through infrastructure, followed by the services sector (28 per cent). Both sectors play an important role in the economy, providing many jobs. However, these sectors also generate a lot of waste water, most of which is dumped directly into rivers and lakes with little treatment. Their need for water competes directly with domestic households.

Uneven increase in domestic water use

Water used by final users, such as households, increased from 373.3 million m^3 in 2001 to 462 million m^3 in 2010, reflecting the increase in the population. In 2010 only 19 per cent of the water distributed to final users came from distribution systems, leaving millions of people without adequate access to water and exposed to unregulated, usually polluted water sources. For those receiving piped water, the service is intermittent, and only a small percentage has received treatment to make it potable. Access is geographically uneven: people in Guatemala City use on average about 150 liters per day, while those in the rural areas of the northwest part of the country use one third of that.

Increase in untreated waste waters

The water accounts also show volumes of water returning to ecosystems, and discharges of pollutants by activity. According to SEGEPLAN (2006),[3] just 5 per cent of residual water used by economic activities returning to the environment receives any type of treatment and most water is discharged directly into the environment. The biggest pollutant sources are agro industrial waste (47 per cent), homes (40 per cent), and industrial effluents (13 per cent).

In 2010 only 19 per cent of the water distributed to final users came from distribution systems.

The continuous pollution of water bodies has had direct impacts on health – for example the emergency created by bacterial pollution in Atitlán Lake in 2009.

From water to wealth – emerging policy messages

The Gross Domestic Product (GDP) in Guatemala has been steadily increasing since 2001, at an average of 3.5 per cent annually.[4] Water is an important input in the productivity of sectors such as agriculture, manufacturing and the beverage industry. On average each cubic meter of water in Guatemala helped to generate about 5.7 quetzales (US$0.75) in 2010, an increase from 5.1 Quetzales in 2001 (US$ 0.66).

But the impact on productivity is far from homogeneous. Table 2 presents the impact on the economy per cubic meter of water, and how it has changed between 2001 and 2010. Agriculture, by far the largest user of water in Guatemala, has low productivity per m^3. At approximately 10 and 16 US cents per cubic meter for non-traditional and traditional crops respectively, the productivity of this sector has remained low throughout the study period. At an average of US$1.71/$m^3$ the rest of the economy has much higher productivity – which has also been increasing significantly since 2001. Unlocking the potential of water to support the agriculture sector will require looking into how to increase the productivity of this sector.

Solving conflict

Although the amount of water going to final users is increasing, it only represents a minuscule part of the total water used in the country. Any effort to resolve conflict in the water sector needs to look beyond domestic water users and into other sectors of the economy.

Water allocations, and allocations of investments in infrastructure to

	2001		2010	
	Quetzales	USD	Quetzales	USD
Rest of the economy	9.3	1.22	13.0	1.71
Traditional crops	1.1	0.15	1.2	0.16
Non-traditional crops	0.9	0.12	0.8	0.10
Total for the economy	5.1	0.66	5.7	0.75

Table 2. Contribution of water to sector productivity, in US$/$m^3$

reach specific sectors will benefit from a better understanding of the multiplier impacts from these investments across the economy. For example, 'services' use a relatively small amount of water but contribute to nearly 50 per cent of GDP. Attempts to price water or institute management measures traditionally target households (as do most willingness-to-pay studies) but this sector uses a small amount of the water. Just because it is easier to implement charges in the domestic sector does not mean that it is the most equitable approach to making capital from water resources.

The links between water and wealth creation become particularly significant in times of drought when resource scarcity requires more careful water allocation. For policymakers, water accounts provide useful information for deciding on where to allocate resources and support adaptation of technologies and water management strategies. In this way, the actions stemming from the National Water Policy will stand a better chance of success.

What next?

The information provided by the water accounts is helping foster dialogue across sectors, and informing research.

For example, a study by Banguat and URL-Iarna[5] looked at the intensity of water use in metropolitan areas of Guatemala. The detailed information is helping municipalities in the area prepare their long-term goals for water security. Demand is linked to better hydrological models that predict water supply, and the effects of different land uses and climate change on water availability. A further example, a study by URL-Iarna and TNC,[6] suggests that restoring natural forests in the water recharge areas around Guatemala City can help increase resilience to climate change, slowing down runoff and improving infiltration into the soil. Alongside a policy that manages extraction permits, the information can help match supply and demand of water and prevent conflict. The study also included some measures of willingness to pay for conservation and reforestation of these areas from households. The Metropolitan Water Conservation Fund Area (FONCAGUA) emerged from this dialogue, bringing together local authorities, the municipal water company, civil society, NGOs and other stakeholders to consolidate

Rehabilitation of a water system, funded by the European Commission. Image credit: DG ECHO/ Creative Commons via Flickr

Signboard detailing the history of an ancient water system in Guatemala.
Image credit: npatterson/Creative Commons via Flickr

the tools and guarantee the provision of water on the medium and long term.

This is an important step forward, but investments in recharge areas need to be matched by efforts to improve the distribution channels, to ensure that the population is suitably served with water. Efforts should go into engaging with the biggest users of water: agriculture, manufacture and services sectors. Investments should also focus on technologies that improve the sectors' productivity in terms of water use, reducing water waste and pollution of sources – especially for industry and agriculture.

Notes

1. Banguat y URL-Iarna, 2009. Cuenta Integrada de Recursos Hídricos. Bases teóricas, conceptuales y metodológicas. Guatemala: Instituto de Agricultura, Recursos Naturales y Ambiente, Universidad Rafael Landívar.
2. INE, 2013. Sistema de Contabilidad Ambiental y Económica de Guatemala 2001-2010: Compendio estadístico (SCAE 2001-2010) Cuenta de recursos hídricos. Guatemala: Instituto Nacional de Estadística, INE.
3. SEGEPLAN, 2006. Estrategia para la gestión integrada de los recursos hídricos de Guatemala: Diagnóstico. SEGEPLAN, Guatemala, 83 p.
4. http://banguat.gob.gt/inc/
5. Ibid reference 1
6. URL-Iarna y TNC, 2013. Bases técnicas para la gestión del agua con visión de largo plazo en la zona metropolitana de Guatemala". Guatemala: Instituto de Agricultura, Recursos Naturales y Ambiente, Universidad Rafael Landívar.