Developing knowledge and capacity in water and sanitation

Fact Sheet

# The role of Multiple uses of water (MUS) for the poor in rural areas of Latin America and The Caribbean (LAC)

**Despite the urbanization process in LAC, there is still a significant rural population. Most of this population lives under poverty, and their income depends totally or partly on agriculture. Access to water is also uneven for rural areas compared to urban areas. The MUS approach represents an opportunity to reduce poverty in the region, since it promotes service provision in quantities that allow using water for productive activities income-generating.**

## The rural LAC

The region is made up of 41 countries in which 570 million people live. It is culturally, linguistically and biologically diverse. This is the most urbanized developing region of the planet; 75% of the people live in urban areas, although, in some countries like Haiti, Guatemala and Honduras over 50% of their population still live in rural areas (UNFPA, n.d.). Even with migration to cities, rural populations continue to grow (World Bank, 2008).

## Poverty and inequality

LAC has the highest levels of socio-economic inequality in the world. By 2006, 36.5% of the population was in poverty. From the 194 million poor, 67 million were rural poor (CEPAL, 2007). The richest 10% receives 48% of total income, while the poorest 10% receives only 1.6% (UNFPA, n.d.). Inequality is also expressed in the difficulties that face rural people to get access to education, health, water, sanitation, and on the unequal access to land (CEPAL, 2007)

## Livelihoods

Agriculture is an important socio-economic sector. Although, its contribution to national Gross Domestic Product (GDP) varies widely across the region, it provides a source of livelihood to millions of rural household farms, and a source of income and employment to many rural workers. For countries such as Nicaragua, Haiti, Paraguay, Guatemala, Honduras, and Bolivia, it represents above 20% of the total GDP (San Martin, 2002).

## Access to water

Many LAC countries had implemented reforms in the water sector with the aim to improve services and decentralization. These policies have shown progress in urban areas, but have left voids in rural areas.

In most cases, responsibility for provision in rural areas has been devolved to local governments. Although, those often lack capacities to provide support to rural communities, and many times, address the needs of the urban at the expense of rural communities (Lockwood, 2002).

In most rural areas, communities provide and maintain their own water systems, which commonly present weak performance (UNDP, 2006).

**For 2006, access to improved water supply was 97% in urban areas, while it was 73% in rural areas (World Bank, 2009)**

## Poverty, livelihoods and access to water

In rural households, water supply systems are used for domestic purposes and as an asset to develop productive activities in which people´s livelihoods are based.

Examples of productive activities are crop irrigation, livestock, fisheries, pottery, etc. (van Koppen et al., 2009).

Access to a reliable supply of water make possible for people to diversify their livelihoods, increase production, create income and employment, which are pathways to escape from poverty (World Bank, 2008)

## The MUS approach[1]

Despite the potential benefits of the use of water systems for productive uses, small-scale uses are normally ignored in formal planning process. Traditionally, the water and sanitation sector has been responsible to supply water for domestic activities, and the agricultural sector has been in charge of water for food production (van Koppen et al., 2009).

"*MUS looks to acknowledge people's multiple water needs and their full participation from the outset in water projects to really meet people's water demands as a strategy to enhance people's livelihoods, contribute to poverty alleviation and achieve sustainability of water systems, without deprivation of the supporting water resources and environment"* (van Koppen et al., 2009)

[1] The MUS concept is detailed on Smits (2005) "Water and livelihoods factsheet" http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/water%20and%20live.htm

Design norms for water provision in the domestic sector are normally in a range of 25-40 lpcd. These quantities are frequently insufficient to develop home-based activities. In contrast, MUS suggests the provision of quantities of water adequate for meeting multiple basic human needs, and recognizes that, multiple sources at homestead scale should be considered to enhance the total quantities required (van Koppen et al., 2009).

## Water uses and consumption

In rural communities demand estimation requires the analysis of household livelihoods, potential uses, required quantities and seasonal variations. Some of the most representative categories of water uses at rural homesteads are:

### Water for domestic use

Norms by international organizations suggest a minimum requirement of 50 l/day as a quantity sufficient for drinking, basic personal hygiene, bathing and laundry (UNDP, 2006). Different countries have different basic needs figures used for planning purposes. Some studies in Colombia and Honduras have shown, than in rural areas, depending on local customs, personal preferences and water availability, the use of water for exclusively domestic purposes ranges between 45 lpcd – 178 lpcd (Barrios, 2008; Roa & Brown, 2009; Smits et al., 2010)

### Water for livestock

In LAC about 20 million km$^2$ are dedicated to livestock, being a vital asset to enhance income and cope with unexpected family expenses or shocks. Water provision is crucial for livestock. Air and water temperature, type and class of animal, life stages, water and salt content in the forage influence quantities required (Molden, 2007).

Some studies in Colombia estimated the quantity of water that cannot be provided by the moisture content of the forage and should be considered when water supply systems will allow for cattle demands. It ranges between 9 – 25 l/head*day (Roa, 2005; Barrios, 2008)

### Water for agriculture

With few exceptions, agricultural extractions represent over 70% of total water extractions in LAC (San Martin, 2002).

In the region, the percentage of cultivated land under rainfed systems is almost 90% (Molden, 2007). However, many systems classified as rainfed may involve eventual applications of supplemental water (Sulser et al., 2009).

Estimation of water demands for agriculture, require data on crops, climate, soil, water quality (salinity), water infrastructure, water management, etc.

### Water for multiple uses

When water is available on or around the households from one or more sources, most users have productive activities. When service level is between 50-100 lpcd, productive uses are more substantial and from 100 – 200 lpcd all domestic needs and several different productive activities can be developed (van Koppen et al., 2009).

Studies in some countries of LAC shown that the use of water for domestic purposes may vary between 27 – 100 lpcd, and productive consumption may varies from 3 to 484 lpcd, depending on the scale and type of productive activities at the household (Table 1).

**<u>Water quantities for productive use in *La Palma Tres Puertas aqueduct*</u> (Dominguez, 2010)**
**People who used less than 20 lpcd were mostly day-labourers and unemployed, with small plots. They did not have crops or animals and if they did, they had few. 20% of them lived on less than 2 US $/day.**
**People who used around 74 lpcd were small farmers, whose livelihoods depended mainly on rainfed crops. Their income levels varied.**
**People who used around 413 lpcd were mostly farmers, although several did not live permanently in the area, and thus, their income probably, did not depend solely on agriculture. These users developed productive activities that depend on water simultaneously, especially raised cattle on a larger scale.**

**Table 1.** Water quantities for MUS

| Source | Country | Domestic (lpcd) | Productive (lpcd) |
|---|---|---|---|
| Bustamante et al. (2005) | Bolivia | 27 - 72 | 13 - 290 |
| Roa & Brown (2009) | Colombia | 62 - 85 | 250 |
| Smits et al. (2010) | Honduras | 45 - 110 | 3 - 484 |
| Domínguez (2010) | Colombia | 88 - 109 | 19 - 413 |

## Water availability

Globally, from the total precipitation over the continents only a third becomes runoff in rivers and recharge aquifers (blue water) and the remaining two thirds infiltrates into the soil (green water) (Molden, 2007).

People traditionally have had more interaction with blue water. However, in recent years, much attention has turned to the green water, for the need to feed a rapidly growing world population.

To balance water availability against multiple demands, information regarding the components of the hydrological cycle and its associated human and natural ecosystems is required. Knowledge about blue water, together with green water is important to estimate the water necessities for any proposed development. Water balances and budgets are important tools to achieve this purpose.

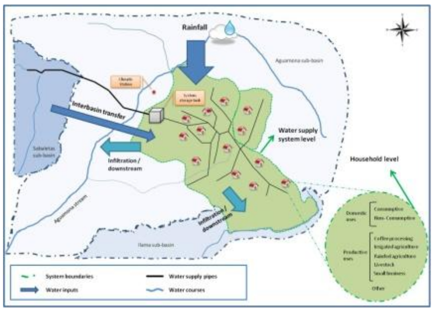
## Water balances and planning for MUS

Water balances quantify the components of the hydrological cycle based on the conservation of mass principle (Healy et al., 1997)

*Flow In – Flow Out = Change In Storage*

The water balance equation can be adapted according to the aims and scale of any particular study. Most hydrologic computer-simulation models are based on the water balance equation. Water budgets have been more widely used in the irrigation sector and for planning at the basin level. However, water budgets can also be applied having political units as domains (Healy et al., 2007).

Water balance concepts and budgets can be used at the scale of a MUS system, shaped by administrative boundaries, incorporating multiple water demands and water availability, as green water and blue water. This is a useful strategy for understanding the dynamics of the hydrological cycle and the human cycle in a system, and planning how to meet multiple demands, according to real people needs and water available from different sources.

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