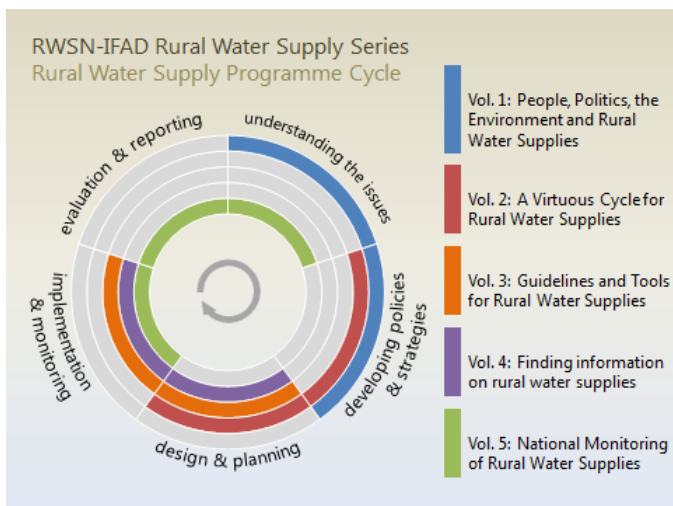


# People, Politics, the Environment and Rural Water Supplies



## RWSN-IFAD Rural Water Supply Series

The Rural Water Supply Network (RWSN) and the International Fund for Agricultural Development (IFAD) have prepared a series of five publications which bring together the key aspects of rural water supply programming. Each volume is a stand-alone document, but as a set, they cover the programme cycle from understanding the issues right through to implementation and reporting (see figure below).



Volume 1: People, Politics, the Environment and Rural Water Supplies (RWSN 2012a) reflects on rural development, politics, environmental sustainability and how these relate to rural water supply services.

Volume 2: A Virtuous Cycle for Rural Water Supplies (RWSN 2012b) presents a variety of support and implementation aspects, from sector coordination to mapping and more, that can contribute towards sustainable rural water service delivery.

Volume 3: Guidelines and Tools for Rural Water Supplies (RWSN 2012c) provides a structured annotated directory of over 40 useful guidelines and toolkits on rural water supplies.

Volume 4: Finding Information on Rural Water Supplies (RWSN 2012d) is an overview of current information sources with respect to access to water supply sources, the national context, the natural environment and finance.

Finally, Volume 5; National Monitoring of Rural Water Supplies (RWSN 2012e) documents experiences of national performance measurement for rural water supplies in Uganda and provides guidance for those interested in establishing such a comprehensive process in other countries.

### Abbreviations

OECD	Organisation for Economic Co-operation and Development
MDGs	Millennium Development Goals
MUS	Multiple-Use Services (MUS)
CPRC	Chronic Poverty Research Centre

## Summary

Water, Sanitation and Hygiene (WASH) has become a well-established development sector. However, it should not become a silo, working in isolation of other efforts to reduce poverty, such as agriculture, rural development or social protection. People, politics and the environment have a huge bearing on what works and what doesn't; of who is provided services and who is excluded. This is particularly true for the urban poor and rural dwellers. This publication focuses on people living in rural areas.

Settlement patterns may be changing as the world urbanises, but rural populations will not just vanish in the coming years. The number of rural dwellers is still growing, and services are hardly keeping up. There also remain huge questions as to whether urban areas will effectively absorb labour migrating from rural places.

Rural poverty is staggering; with inadequate drinking water just one aspect. Five out of six people without access to an improved water supply live in rural areas. The lack of voice of rural dwellers in shaping policies and decision-making is partly to blame, fuelled by remoteness and poverty. Rural poverty is a vicious circle which is proving extremely hard to break.

So what can be done? With this publication we explore some of the realities of rural life. We shed some light on the different ways that WASH specialists can join hands with others to make improvements not only to drinking water supplies, but also water for agriculture, and wider rural development. Not just improvements to physical infrastructure, but to associations, to the environment and to enable the voices of the rural poor to be better heard.

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## 1 Introduction

### Five out of six people without improved drinking water globally live in rural areas.

(JMP 2012)

Over the next 25 to 50 years, we are faced with the challenge of redressing the huge rural–urban imbalance in access to drinking water supply services. We must also keep up with population growth, which does not only take place in urban areas. In fact, the rural populations of many developing countries are predicted to rise until 2025. In Africa, rural populations are expected to continue to rise until 2045. We must not let existing services slip.

In many low and middle-income countries, Rural Water Supply *Service Delivery* takes place within a context of remoteness, poverty and a range of livelihoods. Imbalanced rural-urban and rich-poor power relations affect resource allocations, usually to the detriment of the rural poor.

### Rural dwellers deserve a much greater voice locally, nationally and internationally to shape how their basic needs are met, including water supplies.

Increasing environmental degradation will make it even more difficult to improve and sustain drinking water access in rural areas. In fact, reaching the remaining 650 million rural dwellers without access to a safe drinking-water supply is a tremendous challenge. And remember that this number will grow as rural populations continue to rise.

With the first volume of this RWSN-IFAD series of publications on rural water supplies we examine people, politics and the environment and their relation to water supplies. Most of these issues are not new but well-known within disciplines that fall outside the traditional WASH (Water, Sanitation and Hygiene) sector. With this publication, the authors pull these issues together.

We argue that there is an urgent need to consider the influence of people, politics and the environment to a much greater extent in rural drinking water policies and interventions. There is need for to build synergies and link up with other efforts to reduce poverty, address power imbalances and improve environmental sustainability.

We write this publication for three distinct audiences:

- those working in rural development or agricultural development with limited knowledge of current thinking in rural water supply;
- those with a water supply background who want to understand more about rural dynamics, politics and the environment
- extension staff who have to deal with rural realities on a daily basis, including rural water supply improvements, but rarely find accessible and short publications that bring these diverse aspects together.

The publication starts by trying to answer the question of how to define rural, noting the urban bias within development thinking and practice. It considers key aspects of rural realities, including poverty, remoteness and livelihood strategies.

It then focuses on the environment, noting that improving and sustaining rural drinking-water supplies can provide an incentive for explicit actions that protect the environment. Within the politics chapter, the publication explores power relations and introduces the human right to water and sanitation.

Finally, the publication sets out how rural water supplies is broadly understood today, including technologies, past trends, new approaches and targets and indicators. This is for readers who want to learn more from the subsequent four volumes of this RWSN-IFAD series on rural water supplies.

We hope that this publication can help those of you working in agriculture, poverty reduction, the environment and rural drinking water to all have a better understanding of each other.

**“If you want to go fast, go alone.  
If you want to go far, go together.”**

(African Proverb)

We have tried to avoid the use of jargon. However some of the key terms with which you may not be familiar are in *italics*. Explanations set out in the glossary on page 17.

## 2 Rural Realities

### 2.1 What is rural?

When you think of the word *rural*, what comes into your mind? Rolling agricultural landscapes, tropical forests, village life or small market towns? Sadly, rural is often associated with backward in the minds of the world’s urban residents. Rural is usually referred to as *what is not urban* (UN 1998 and 2004). Thus, to define rural, one needs to define urban (Box 1).

Rural communities living even short distances apart can be very different in terms of climate, language, tradition and ways of using the natural environment. Yet rural people also have a much in common. The primary livelihood for rural people in most low and middle income countries is agriculture, and will remain so for the foreseeable future (Box 4).

Rural areas are often distanced from the national capital, can be far from main roads, face poverty and lack of access to basic services.

Box 1 indicates that rural settlement patterns and population densities vary enormously. These stark rural realities are a challenge for “off-the-shelf” technical and managerial solutions for rural water services. In fact, different solutions are needed for different population densities as well as other social, economic, environmental and cultural aspects.

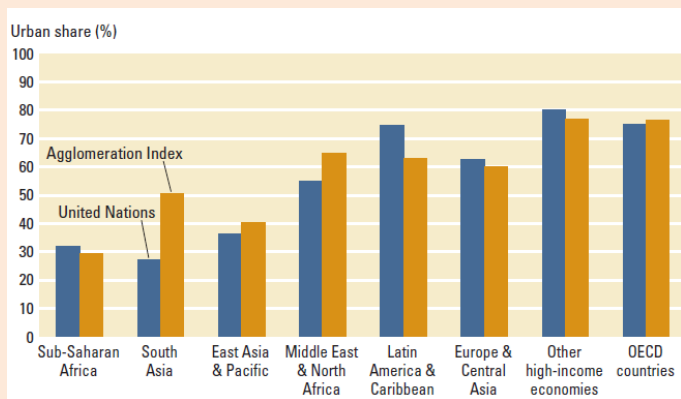
In rural areas, social, economic, environmental and cultural spheres tend to be closely interrelated and many people live on or close to natural resources upon which they directly depend for their survival. The boundaries between people and the environment may be very close, but this does not mean that there is necessarily harmony in the relationship. There may be high levels of cooperation between community members for certain activities such as during key harvesting periods or for life events such as birth, marriage or death. However, this does not mean that there is equality within the community, or that there is no discrimination.

**Box 1: What does 'Rural' and 'Urban' and mean?**

There is no commonly accepted definition of urban. Enumeration methods vary between countries. Urban can be referred to in terms of labels such as "major cities", "municipalities", or "administrative centres", or using a quantitative threshold (e.g. populations over 2,000 in several Latin American and West African countries; over 200 in Iceland and over 10,000 in Italy and Benin). In some cases complex socio-economic definitions are used to define urban (UN 2004). In other cases there is no official breakdown of the urban population (Potts 2012). These national differences are reflected in the global statistics maintained by the United Nations (FAO 2005). The World Development Report – *Reshaping Economic Geography* (World Bank 2009) advocates for the Agglomeration Index to be considered as a complimentary data source to the UN data to enable comparison of urban populations.

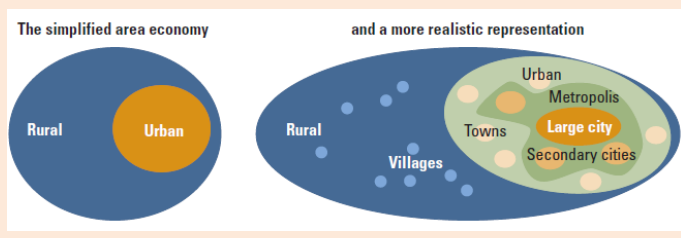
The Agglomeration Index classifies people as living in an urban area if the following three criteria are satisfied: (1) population density greater than 150 people per km<sup>2</sup>; (2) minimum population size of 50,000 people and (3) access to a sizeable settlement within one hour travel time, by road (World Bank, 2009). The proportion of this number of people to the total population of the country is the Index. It incorporates a series of Geographic Information Systems data and analysis based on transport networks, off-road surfaces, slope and travel speeds, population density (namely GRUMP and LandScan gridded population), and other nationally collected biophysical and infrastructure variables (Uchida & Nelson 2010).

The Figure (below) compares UN data with that of the Agglomeration Index. Significant differences are shown with respect to South Asia, which may be more urban than national data suggests. In contrast, Latin America and the Caribbean are perhaps not as urbanised as previously thought (Uchida & Nelson 2010).



The nature of rural life is changing in many places. There is not always a distinct rural-urban divide. Rather, one finds a continuum of population densities, from a country's largest city to a spectrum of settlements including secondary cities, small urban centres and towns, nuclear villages, hamlets, scattered homesteads and the mobile settlements of nomadic and semi-pastoralists.

Figure: From dichotomy to a continuum: a portfolio of places (World Bank 2009)



**2.2 Rural Populations**

It is widely accepted that the world is "urbanising", with the urban population growing at a faster rate than the national population. Box 2 describes urbanisation trends and biases, including the evolutionist view of world development with a rural-urban transition. There is an on-going debate between industrialists/urbanists and agriculturalists/ruralists. The former are of the view that that manufacturing is the driver of employment with an urban-led economic growth. The latter consider agriculture as a major way of reducing rural poverty (Box 2). Rural development specialists also remind us that it is rural people that hold the key to national food production and are responsible for safeguarding many of the planet's wildlife habitats, water sources and other environmental treasures.

Hagglblade *et al.* (2010) offer a bridge between these two polar views. They suggest that urban-led transformation of rural areas may be most powerful in rapidly growing countries like India and China. In contrast, such opportunities may be much more limited in poorer, less densely populated, and more slowly growing economies, such as much of Africa. In section 2.6 we explore poverty and poverty reduction in more detail.

**Whatever school of thought one subscribes to, the urban bias has drawn attention away from rural people and rural development**

(Lipton 1977)

Despite continued urbanisation, it is estimated that globally, 2.8 billion people will still reside in rural areas in 2050. Sub-Saharan Africa and South Asia are expected to account for two thirds of the world's rural population by 2050 (Losch *et al* 2011).

**The prevalence of rural poverty is staggering.**

There is inequality within and between rural and urban settings, and the prevalence of rural poverty is staggering. However, every rural person has their stories to tell, as well as aspirations for the future. Not all of these aspirations are a desire to reside in cities (IFAD 2011).

**Now, and for the foreseeable future, it is critical to direct greater attention and resources to creating new economic opportunities in the rural areas for tomorrow's generations (IFAD 2011). A challenge is not to do this at the expense of the environment.**

Despite the huge rural populations, empirical knowledge about the characteristics of rural economies, livelihoods and how income is generated is lacking, and information tends to be based on scattered case studies (Losch *et al* 2011).

The World Bank's RuralStruc Programme (2006 to 2010) undertook detailed analysis of over 8,000 households in select regions of seven countries (Mexico, Nicaragua, Morocco, Mali, Senegal, Kenya and Madagascar) and provides data on rural life (Losch *et al* 2011). Other useful sources are the RIGA Database (FAO 2012) and the ten years of research undertaken by the Chronic Poverty Research Centre (2011). We draw upon these information sources.

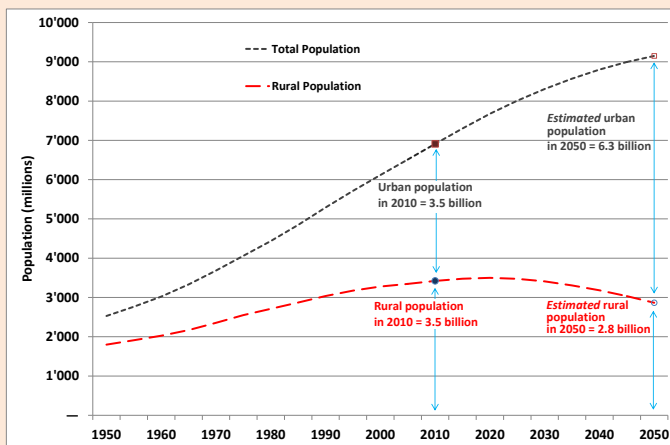
## Box 2: Urbanisation Trends and Urban Biases

There are major regional differences with respect to urbanisation:

- In South and Central Asia, the Middle East and North Africa, rural populations are expected to decline after **2025**.
- African rural populations are expected to decline after **2045**.

However, for some countries, these predictions are based on very limited data. For example, only ten countries in sub-Saharan Africa witnessed more than two censuses between 1970 and 1995 (World Bank 2009). Potts (2012) challenges accepted rural-urban migration patterns, pointing out that UN-Habitat data suggest that the *urbanisation* level actually declined in 11 countries in sub-Saharan Africa between 2001 and 2010. Previous predictions of city size have not always proved to be correct (World Bank 2009).

Figure (below) The world's population is projected to reach 9.1 billion by 2050 (Data from UN-DESA 2010)



*Reshaping Economic Geography* (World Bank 2009) states that as countries become richer, transforming from an agrarian to an industrial economy, economic activity becomes more densely packed into towns, cities and metropolises. It claims that during economic development, standards of living between rural and urban areas diverge before eventually converging. The report states that there should not be a debate on limiting rural-urban migration, but rather on the efficiency and transformation of a rural economy into an urban one – through the stages of incipient, intermediate and advanced urbanisation.

Critics of this evolutionist view (Hart 2011) point out that there are huge questions around the ability of certain urban areas to absorb labour. This is particularly the case in sub-Saharan Africa, which is not extensively industrialising (Losch *et al* 2011). It is argued that investment in rural areas is paramount to ensure smoother urbanisation.

Perhaps even more chilling is the shadow that the current world development model casts for future generations. "The existing growth trajectory of the world is ... challenged by the depletion of natural resources, consequences of climate change and high risks associated with asymmetric economic development among the world's regions" World Bank (Losch *et al* 2011).

The Global Footprint Network (2012) estimates that on the 27<sup>th</sup> September 2011, humans had already used up the Earth's natural resources for the year and declared it Global Overshoot Day. The marginalisation of the countryside, *el campo* has become a political concern in Mexico (Losch *et al* 2011), leading to not only massive poverty but also violence.

## 2.3 Rural Influence

Rural communities tend to have fewer opportunities to influence government policies compared to people living in urban areas, and their voice tends to be weak in national fora. They are often the marginalised and excluded from decision-making. Rural populations may have distinct cultures and traditions that are not well understood. In some countries, rural areas are home to indigenous populations. Their lack of proximity to government institutions, limited access to communication technologies, information sharing, transportation and commercial networks also serves to isolate rural dwellers. The story from Mr Mouli, an Indian rural dweller who attended the 6<sup>th</sup> World Water Forum in 2011, provides a reality check (Box 3).

### Box 3: Reflections from Mr Raja Mouli at the 6<sup>th</sup> World Water Forum (Danert 2012; Mouli 2012)

"The fact that water as a basic human right is discussed [at the World Water Forum] ... is really an amazing thing for me and I am happy that this discussion is taking place. But I am only worried about whether this will ... go down to our level at the villagers, at the water ... I am not sure that everyone at the village level will have the opportunity to know... unless you reach [village] level I am really apprehensive about how we can take it forward..."

In our cases at the village level we are making a lot of plans and asking the government to allocate budget but when our action plans reach to the district level and the state level we don't even know where our applications are going and hiding. And most of the time it is the political influence [of] the urban level villages who [benefit]. Most of the remote villages do not even [get] recognised in the allocations and we never receive the funding. So I am more worried how we can percolate down to our level... I am going to go and mobilise my own villagers and my own friends that this is your right. So let us all go and move to our local villages and politicians, especially at our district level and out level and we go and influence."

In rural areas, basic services are often less accessible with education and healthcare facilities often some distance away. Rural communities may be unfavourably viewed by urban dwellers and national governments. Indeed the world is urbanising, yet rural dwellers deserve a much greater voice locally, nationally and internationally to shape how their basic needs are met, including water supplies.

## 2.4 Rural Remoteness

The highest rates of poverty are often found in remote, low potential, marginal or weakly integrated areas (CPRC 2004). Remoteness is particularly relevant for rural water supply services. The further from urban markets due to sheer distance or poor road infrastructure, the more difficult it can be to ensure that modern water supply services with pumps or pipes obtain spare parts and are maintained. Remoteness, which tends to come with lack of economic and political integration, also has a huge bearing on people's ability to demand for services.

As easier-to-reach populations benefit from service improvements, the areas being left behind will become increasingly difficult to serve. In Morocco, for example, the remaining 9% of the population without access to a safe drinking water supply reside in very remote rural areas (Danert 2012). END/JMP (2012) notes

remote and politically marginalised regions such as the Chittagong Hill Tracts in Bangladesh, the North-Eastern States of the Indian sub-continent, the Terai region in Nepal and some indigenous communities in the United States.

In many countries, remote areas are where indigenous peoples are concentrated. In Latin America, rural poverty tends to be very unequally distributed spatially, the result of a long history of the poor being pushed into areas of low agricultural potential (IFAD, 2011). Some countries (e.g. Nepal), are much less politically and economically integrated than others (e.g. Bangladesh). IFAD (2010) is particularly mindful of the need to integrate remote areas into the national economy. Territorial development approaches, which have been pioneered in Latin America, are attempting to do just that.

Improved road infrastructure and telecommunications are reducing remoteness in some places. But not everybody is becoming better connected, and political integration may be lacking. Comprehensive data on the travel times of rural populations from major road networks is lacking. However, while road density in Ethiopia increased from 21km per 1,000km<sup>2</sup> in 1995 to 38.5km per 1,000km<sup>2</sup> in 2008, only 10.5% of the rural population were within 2km of a road (Foster & Morella 2010), with 33% of the rural population within a distance of 5km (Worku 2011). Given that around 76% of Ethiopia's population live in rural areas, this has serious repercussions for the country as a whole. Looking wider, there are still places in the world where it can take ten days or more of travel to reach a major city (EU 2010).

Information flow between rural communities is also lacking. A group of people may have made significant improvements in their water supplies, developed innovative approaches, or succeeded in lobbying their elites. Unfortunately, news of this may never get beyond the specific village or district. The Farmer Dialogues [www.fd.iofc.org](http://www.fd.iofc.org) is a rare initiative which is trying to improve connectedness and exchange in rural areas. Shack/Slum Dwellers International [www.sdinet.org](http://www.sdinet.org) is a global network for the urban poor. In contrast, it seems that there are major gaps in terms of organised action by the rural poor. Rural people urgently need more opportunities for sharing and learning from one another. These may also help to stimulate rural water supply developments.

**Figure 1: Women carrying firewood in Gollom, Niger**



## 2.5 Rural Livelihoods

Agriculture is the key livelihood in most rural areas (Box 4). In the aftermath of food price hikes between 2006 and 2008, agriculture, including small family-farms, received more global attention than in the past (IFAD, 2011). As an example, the Cannes Declaration by the G20 in 2011 agreed to “further invest in agriculture, in particular in the poorest countries, and bearing in mind the importance of smallholders, through responsible public and private investment” (Interagency Report to the Mexican G20 Presidency, 2012). The price of basic commodities dropped a little since the hikes but growing populations, increased demand, and the resultant scarcity of natural resources and energy sources are here to stay. The world is likely to see a trend of higher prices, at least for basic food commodities (IFAD 2011).

Two out of the three billion rural people in developing countries live in smallholder households, of which many are poor, food insecure and with limited market access (FAO 2010). *Smallholders* are important in terms of their sheer numbers, as well as significance for the economy. Increases in smallholder incomes can stimulate economic production in other areas, but there are no silver bullet solutions (Haggblade *et al*, 2010)

Livelihood diversification is considered as important for poverty reduction, whether at household, community or country levels. Non-farm activities account for 10% to 30% of rural full-time employment in Asia/Latin America, West Asia/North Africa and sub-Saharan Africa (Haggblade *et al* 2010). Rural populations in all developing countries are deriving more and more of their incomes from non-farm sources (e.g. wage-paying activities, self-employment in commerce and manufacture). Reardon (1998) cites average non-farm incomes in Africa, Asia and Latin America as 42%, 40% and 32% of total incomes respectively. Remittances from family members working outside rural areas have also increased dramatically (IFAD 2008)

However, the World Bank (2011) found that while many households have diversified their livelihood strategies, few have been able to leave agriculture altogether. Alternatives to farming, such agricultural and non-agricultural wage employment and non-agricultural self-employment are actually quite limited (Losch *et al* 2011). IFAD (2010) recognises that there is no blueprint solution to promoting the non-farm economy. Construction activities such as improving existing wells or building new water supply infrastructure, known as Self Supply (Sutton, 2010), have a contribution to make to the rural non-farm economy.

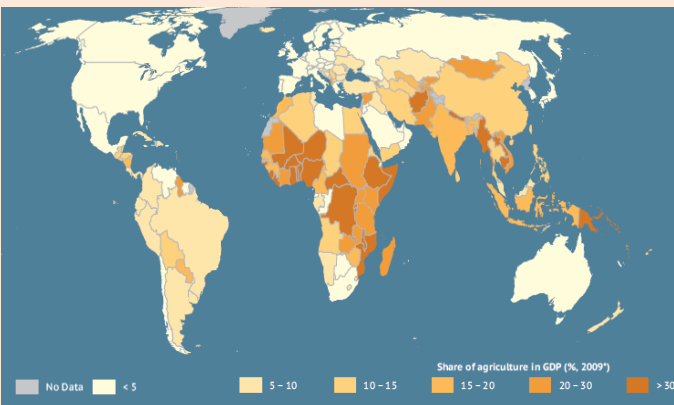
Both IFAD (2010) and the FAO (2010) recognise the importance of small groups and local associations with respect to improving smallholder agriculture and reducing poverty. Such informal organisations can also achieve tremendous results in improving their own water supply infrastructure, for example through women's savings groups building rainwater facilities (Danert 2012).

Drinking water specialists also need to pay particular attention to smallholder agriculture. In terms of field implementation it may be prudent in some cases to consider water supply for smallholder agricultural and domestic use together, rather than separately. This is an implementation approach that is promoted under the theme of Multiple-Use Services (MUS) (Adank *et al*, 2012). However, conflicts can arise when the most suitable drinking water sources are already used for productive purposes. Lower- quality or distant sources may end up tapped, leading to higher capital and operational costs for drinking water.

**Box 4: The importance of agriculture in rural areas and challenges for smallholders**

“Agriculture for Development” (World Bank 2007) provides a reminder of the central role of agriculture in the development process and its contribution to poverty alleviation. It defines the three worlds of agriculture-based, transforming or urbanised countries. In many developing countries, more than 25% of the Gross Domestic Product (GDP) is derived from agriculture (Figure below). In the developing countries, agriculture also accounts for a very high proportion of labour absorption.

Figure (below) Share of Agriculture of Gross Domestic Product in 2009 (World Bank 2007)



For decades, OECD country agriculture has benefited from high levels of subsidy and restrictive trade rules. Efficient large-scale producers, particularly in Latin America, as well as smallholder producers in Asian countries, who responded to green revolution technologies and benefited from supporting policies and public investments, have been able to massively increase agricultural productivity (IFAD 2011).

In contrast, the global low prices of commodities of the past have contributed to the persisting marginalisation of agriculture, and more broadly of rural economies in the developing world. Varying domestic factors such as lack of “public and private investments in agriculture, thin and uncompetitive local markets, weak rural infrastructure, inadequate production and financial services for farmers and a declining resource base” are also to blame (IFAD 2011). Engagement of smallholders in expanding markets is limited, risky and relatively unprofitable as a result.

Although they may improve livelihoods in the short term, poor agricultural, pastoral, and forestry management practices have a severe negative impact on source water quality and quantity over the long term. Land management practices have already been shown to have a significant effect upon the lifespans of dams. Over-extraction of ground water and poor irrigation techniques have led to saltwater intrusion, dramatically falling water tables, and loss of arability under diverse local conditions. The links are many and critical, though typically poorly understood by rural water supply specialists.

Currently, agriculture represents about 70% of total water withdrawals worldwide (OECD 2012). In some parts of the world, agricultural withdrawals have led to falling groundwater tables, which has a direct detrimental effect on drinking water supplies (e.g. India example in Box 9).

The environmental footprint of urban dwellers extends into rural areas. However, one must also recognise the negative impact that rural people can have on the environment, at times on a very large scale, and particularly in relation to water, soils and biodiversity.

**The main challenge for a sustainable world is striking a balance between economic development and the environment.**

## 2.6 Rural Poverty

Water source improvements can contribute to reducing poverty (defined in Box 5), hence the inclusion of safe drinking water within the Millennium Development Goal Targets (see Section 5.7). “Improved access to adequate water can have a significant impact on health, participation and successful completion of formal or informal education programmes, economic productivity, and dignity in rural areas and thus plays a key role in efforts to reduce poverty” (WHO 2011)

**Box 5: How is poverty defined?**

When examining survey data and analysis on poverty, it is important to know what is behind the figures in terms of definitions and data. Let us start with **poverty**.

At the World Summit on Social Development in Copenhagen (UN 1995), **absolute poverty** was defined as “a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but on access to services.” **Poverty** has various manifestations, including “lack of productive resources to ensure sustainable livelihoods...social discrimination and exclusion...lack of participation in decision-making...”.

CPRC (2009) refers to the **multidimensionality of poverty**. This means that there are many ways in which people can experience poverty such as ‘money-metric’ or material indicators (low income, expenditure, consumption, physical assets); ‘human capital’ indicators (poor nutrition, health, education status); or ‘socio-political’ indicators (lack of access to services, common property or social networks; powerlessness, marginalisation, stigma).

The poverty threshold, or poverty line, is the minimum level of *income* (see glossary) deemed adequate in a given country. At national level poverty thresholds have been set, with proportions estimated from national surveys. It should be noted that discussions abound as to whether specific levels are correct, and as to what difference it actually makes to a person when he or she rises just above the poverty line:

- In the United States, the poverty threshold for one person under 65 was US\$11,344 (annual income); the threshold for a family group of four, including two children, was US\$22,133.
- India has different poverty levels for people living in rural and urban areas, at 356.35 rupees per month (~ USD \$7.50) and 538.60 rupees (~ USD \$12) per month respectively.

Internationally, the *poverty line* used by World Bank is loosely referred to as a “dollar-a-day”, currently set to \$ 1.25 at 2005 international prices. It is calculated using purchasing power parity (PPP), a method for calculating exchange equivalences based on consumer prices (see glossary).

A water source within a very short distance from the homestead that provides a regular, safe water supply can improve school attendance and free up time used to fetch water from distant sources. Coupled with improved sanitation and good hygiene practices, water supplies can reduce non-productive time due to poor health and save on medical bills. In fact, the OECD (2011a) estimated that benefit-to-cost ratios for investments in basic water and sanitation services in developing countries can be as high as 7:1. However, these benefits are money not spent, rather than income. Thus rural poverty will not go away with rural water supply (and sanitation) development alone.

In the first decade of the 21<sup>st</sup> century, the power of economic growth and human development has brought large numbers out of poverty. Poverty has reduced from 80% to 60%, although this is mainly due to massive reductions in East Asia. Of the 1.4 billion people living in extreme poverty in 2005, 1 billion resided in rural areas (IFAD 2010).

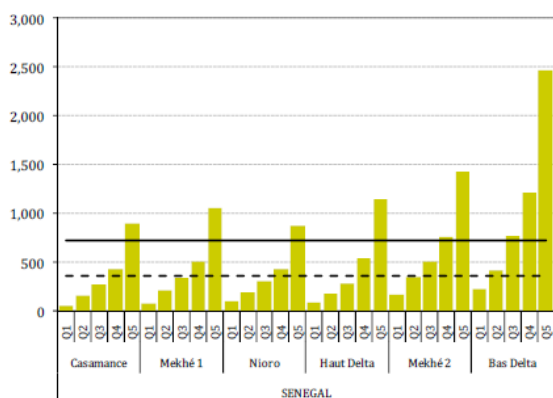
**“Poverty remains a largely rural problem, and the majority of the world’s poor will live in rural areas for decades to come”**

(IFAD 2011)

Looking a little more in depth, there are stark rural-national differences with respect to average *income* in the different regions of the seven countries of the World Bank (Losch *et al* 2011) study. However, averages hide more than they reveal. Further examination of rural poverty for the different *wealth quintiles* shows that there is a more or less linear increase in incomes from quintile 1 to 4, while there is a sudden jump for the richest quintile (Figure 2). Likewise, within the richest quintile, a few better-off households raise the average. They benefit from specific social and economic conditions (e.g. remittances, rents, land).

With the exception of Mexico, the lowest income quintile always accounts for less than US\$ 1 per day (Losch *et al* 2011). In some areas of Kenya, Senegal and Mali, the incomes per person are barely imaginable, at US\$30 to US\$50 per year. IFAD (2012) notes that until farm gate prices for agricultural produce actually rise significantly, rural *poverty* will remain a pernicious reality. However, if higher farm gate prices lead to higher food prices for consumers, then it is the urban poor who will suffer.

**Figure 2: Income disparities in Senegal (\$ PPP)** (Losch *et al* 2011)



Key: ————— \$2 PPP poverty line  
 - - - - - \$1 PPP poverty line

One of the key aspects of poverty is that it is dynamic (CPRC 2009). People move in and out of poverty. Individuals may suffer from shocks (such as loss of earnings due to poor health, or a very bad harvest) from which they fall into poverty, or deeper poverty, and from which they may only gradually recover, if at all. Despite the trends in poverty reduction as a whole, a large number of people remain abjectly poor, among them almost half a billion people who are poor over long periods of time, their entire lives, and who may pass poverty to their children. The Chronic Poverty Research Centre (CPRC) is mindful of the omission of almost a billion people from the 2015 poverty target of the Millennium Development Goals. CPRC (2009) argues that if these people are to escape poverty after 2015, additional policies and political commitment are urgently required. It calls for *social protection*, human development, economic growth and progressive social change. Once again it is worth reminding ourselves that this needs to be balanced with environmental sustainability.

At a more practical level, income poverty and poverty dynamics together with inequity are serious issues that need to be fully considered when planning for household contributions to the capital, recurrent and replacement costs of rural water supply services. Data on income, expenditure and deprivation are available in many countries. Although the level of detail varies considerably, research techniques continue to evolve.

Perhaps more comprehensive solutions for the rural poor, involving service provision coupled with social protection, or building on the support mechanisms that already exist within communities, can offer viable ways out of poverty (IFAD 2010). What needs to be worked out is who picks up the bill for those who cannot afford to pay. Alas, today, such approaches appear to remain a dream for citizens and local leaders, together with under-resourced local governments and extension-staff in the rural areas of many low and middle income countries.

### 3 The Environment

#### 3.1 The Value of the Environment

The environment is a topic that, until relatively recently, did not appear much in literature on drinking water supply. This is strange because the two are bound together tightly. For water supplies to work, the water has to come from somewhere, and the source needs to be reliable and as good quality as possible. The environment has three values that need to be considered: the utilitarian, or economic value (Box 6), the intrinsic value in terms of biodiversity and natural beauty (Box 7) and the cultural value (Box 8).

**“The value was and is priceless”**

Laifungbam & Pinto (2006) referring to the value of the Imphal Valley, water system used by the Meitei nation in India.

Human activity has led to a dramatic degradation of habitats and loss of biodiversity worldwide (Rockström 2009). The immediate implications of this may not be apparent. However, a place that is degraded and has lost its natural integrity will harm health, quality of life and can lead to a loss of social cohesion of those living there. Ultimately, degradation negatively affects drinking water supplies.



The cultural value of the environment is difficult to quantify but poor environmental quality can cause mental and spiritual poverty. If improvements to rural water supply are to be made in an equitable, environmentally aware and long-lasting manner, attention must be paid to the intrinsic and cultural values of the environment, not only its utilitarian, or economic value.

#### Box 6: Utilitarian (or Economic) Value of Ecosystem Services

All fresh water circulates through the environment in the hydrological, or water, cycle. We borrow water from this cycle by taking it either from a well, borehole, spring or surface water body. Once we have used it, the water returns to the environment in one way or the other. Various natural features perform functions that are critical to the working and sustainability of a water supply system, for example

- Soil and aquifers provide buffering storage so that the water that falls in a sudden rain shower is gradually released into streams and rivers. However, where there is deforestation and soil erosion, watercourses become more 'flashy'. This not only increases the risk of flooding and landslides, but also of water shortages during dry weather periods, along with adding stress to sensitive ecosystems.
- Groundwater is a store from which water can be pumped. It is a free natural service, which can be pumped at a cost. In areas without good aquifers, surface reservoirs have to be built at great expense, and are often not cost effective for small rural water supplies. In addition, many habitats, such as wetlands and forests, provide multiple ecosystem services by creating moderating micro-climates, regulating the local hydrological cycle, and supporting plants and animals that sustain rural livelihoods.



Figure (above): Using the water cycle for water supply ([www.sswm.info](http://www.sswm.info))

#### Box 7: Intrinsic Value: Biodiversity, Natural Beauty

The intrinsic value of nature is often forgotten or treated as irrelevant in a development context which focuses on the material aspects of poverty reduction. One aspect of intrinsic value is biodiversity, which is defined by the Convention on Biological Diversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (UN 1992).

#### Box 8: Cultural Values of the Environment and Indigenous Water Management Systems

There are many examples from communities where water holds spiritual and cultural significance and localised management strategies have developed reflecting this. These may not fit easily into national plans for water development. For many indigenous communities, water holds a strong cultural value which may not be fully considered (UNESCO 2006). Government-led policies and externally defined participation do not always allow for indigenous communities. The struggle for recognition and the integration of indigenous water rights and management strategies into national policies is ongoing (UNESCO, 2006). However, there are also questions as to the extent to which indigenous management practices can cope with higher population densities.

In Guatemala, the Totoncapá forests are natural ecosystems that "also constitute a cultural benefit, to such a degree that they strengthen the collective identity of the Maya-Quiché communities. These forests fulfil a transcendental hydrological function for the local and regional areas of Guatemala" (Norato 2006). In the Balinese 'subak' system for irrigation, water is managed through water temples with allocations determined by a priest. This system is threatened by expansion of rice farming and intensive agricultural techniques as well as tourism (Lansing 1996). These communities and others demonstrate the link between indigenous water management strategies and the spiritual value of water.

### 3.2 Managing Natural Resources

Three aspects of the environment need to be considered for rural water supplies:

1. The impact of water supply schemes on the environment
2. The impact of the environment (and other water and land users) on water supply schemes
3. Existing cultural values and attitudes towards the environment

This is a complex task. A rural water scheme should not be considered in isolation, but in combination with water activities in the river (or groundwater) catchment that it is in. A single borehole and handpump is unlikely to have much impact on local water resources, but hundreds of pumped supplies in a small area are likely to have a big impact (e.g. Box 9).

#### Box 9: Managing Natural Resources – example from India

Low investment and running costs of diesel and electric pumps have made it possible for smallholders to significantly tap aquifers for irrigation. Deeper wells have been constructed with greater volumes of water abstracted to grow higher-value crops.

"Nowhere in the world has this been as striking as in India", where it is estimated that more than a million tubewells are sunk every year (CGIAR 2012). The International Water Management Institute found that some parts of India are drier, and urgently need to regulate groundwater abstraction. In these areas, substantial depletion of groundwater has caused scarcity of drinking water. The enactment of groundwater legislation and promotion of rainwater harvesting measures are among the steps being taken by States to address this. (Meenakshisundaram 2011). However, in other, wetter areas more can be done to help poor farmers boost their incomes through improved irrigation with groundwater (CGIAR 2012).

### 3.3 Water Security

The term *sustainability* is used in water supply publications and discussions, but tends to limit itself to management and financial aspects, with the natural environment either ignored, or taken for granted. In contrast, the term *Water Security* brings environmental aspects into water supply. There are numerous definitions, many of which are listed in the WaterAid (2012) "*Water Security Framework*", which is essential reading for anyone wishing to understand more about this crucial topic (summarised in Box 10).

**Water security is "reliable access to water of sufficient quantity and quality for basic human needs, small-scale livelihoods and local ecosystem services, coupled with a well-managed risk of water-related disasters"**

(WaterAid 2012)

#### Box 10: Useful definitions from WaterAid (2012) *Water Security Framework*

The global water crisis is sometimes portrayed in terms of absolute scarcity with fresh water running out. **Water scarcity** refers to the relationship between the demand for water and its availability. A **physical scarcity** occurs when demand is higher than supply. In contrast, a **socio-economic scarcity** refers to the lack of skills, investment and political will to meet growing demands.

**Water security** is threatened by lack of political will, low institutional capacity, social and political exclusion, poverty, low community resilience, poor hygiene and sanitation, rapid population growth and urbanisation, climate variability and climate change, complex hydrogeology and challenging terrain as well as the poor siting, design and construction of source-water collection infrastructure.

**Water stress** is a result of water scarcity and can manifest itself as water insecurity, crop failure or conflict among others. The term **water stress** is also used to highlight the water crisis, usually at national or regional levels, but is often presented simply as the nation's annual renewable freshwater availability per person (i.e. the Falkenmark Water Stress Indicator). This does not provide a complete picture as it overlooks seasonal variations of the ability of a country to actually make use of its available water resources.

### 3.4 Climate change

Although climate change is a pretty well accepted phenomenon, in practice, it is not easy to distinguish between environmental changes that are caused by climate change and those caused by other drivers, such as poor agricultural practices.

Rural communities are likely to be the most deeply affected by impacts of climatic change and variability, given their reliance on the rural environment and agriculture for their livelihoods (FAO 2011). This will also have a knock-on effect for urban communities who rely on rural populations for their food security.

However, many rural communities are already struggling to cope with seasonal variability in rainfall. The variations between different climate models and lack of knowledge regarding the likely impacts of climate change in any given area mean that

adaptive measures that support the resilience of rural communities are needed. This calls for improvements in water storage, or more reliance on sustainable groundwater abstraction, as well as supporting agricultural extension and existing indigenous coping methods. The movement of nomadic pastoralists across the Sahel, for example, is a coping mechanism for climate variability and change (Brooks 2004).

Oxfam (2011) recommend a holistic view of environment and water development options in rural communities. Ringler (2008) points out the important link between farm-level adaptive strategies such as crop selection, cropping patterns and irrigation and national agricultural policies such as the water tariffs, investment subsidies and taxation.

## 4 Politics

### 4.1 Power, wealth and income

If there is to be any large-scale effort to really address poverty, elites need to be convinced that poverty is not due to laziness, but rather a result of the social, economic and political situation that poor people find themselves in. These include constraints due to their location (CPRC 2011), such as living in remote rural areas. Elites also need to be willing to change something even if they benefit from existing asymmetries in wealth and income.

Power as well as *wealth* and *income* are not evenly distributed within society or between individuals and groups of people. As societies become more urbanised, political power invariably shifts to urban areas. However, both rural and urban societies also suffer from inequalities. Uneven distribution of power, *wealth* and *income* can affect financial resource allocation and even the management of water supply services. Particular parts of the country may be favoured politically, and receive better services than others. Poor and marginalised groups within a community may be excluded from services.

There are a number of ways of assessing changing wealth and inequality, such as the Gini Coefficient and the transition matrix (Box 11). Such tools can improve understanding, support decision-making and monitor changes at international, national and local level. Leading on from the GINI Coefficient and the transition matrix, assessment of vulnerability is the next step in trying to understand what affects the movement in and out of poverty. Vulnerability refers to economic instability and is the extent to which a household or individual is likely to become worse off.

Figure 2: Wall Painting



**Box 11: Two ways to assess inequality and changing wealth**

The **Gini Coefficient** measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Gini Coefficient of 0 represents perfect equality, while a coefficient of 1 implies perfect inequality.

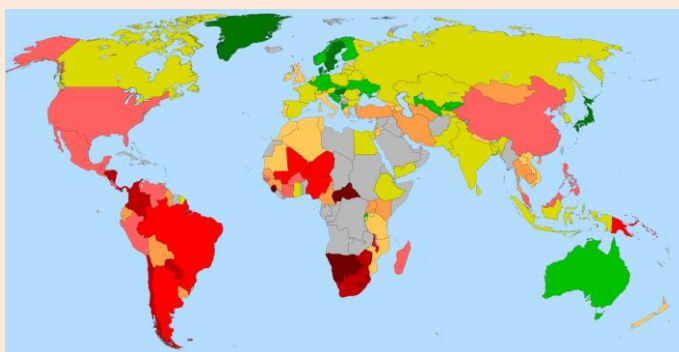
The **transition matrix** can be used to show changes in wealth over time demonstrating comparisons between years and movements in and out of poverty. The following example (Coudouel et al 2009) shows changes between the poor and non-poor in Ethiopia between 1989 and 1995. The percentage of poor dropped from 61% in 1989 to 46% in 1995; 31% of those poor in 1989 remained poor; 15% of the non-poor in 1989 dropped into poverty in 1995.

Status in 1989	Status in 1995		Total (1989)
	Poor	non-poor	
Poor	(↔)31%	(↓)30%	61%
Non-poor	(↓)15%	(↔)24%	39%
Total (1995)	46%	54%	100%

<b>Key</b>	
↔	Remained in the same category of poverty
↓	Dropped into poverty
↑	Came out of poverty

Table (above) Transition Matrix showing changes to the percentage of Ethiopia's population classified as poor and non-poor between 1989 and 1995



Color	Gini coefficient	Color	Gini coefficient
Green	< 0,25	Light Red	0,45 - 0,49
Dark Green	0,25 - 0,29	Red	0,50 - 0,54
Yellow	0,30 - 0,34	Dark Red	0,55 - 0,59
Orange	0,35 - 0,39	Dark Brown	> 0,60
Light Orange	0,40 - 0,44	Grey	NA

Figure (above) Gini Coefficient (Wikipedia, 2012)

**4.2 Relationships and Influence**

A key objective in the IFAD 2011 Strategic Framework is "Poor rural women and men and their organizations [to be] able to influence policies and institutions that affect their livelihoods". Meeting this objective is not an easy task and requires sound political understanding and a willingness to change.

In order to figure out the relationships between people and institutions, as well as how they change over time and can be influenced, *political economy* approaches can help (ODI 2011). The information generated can be used to try to democratise water service provision and improve services and funding for local water supply infrastructure.

*Political economy* analysis can provide details of the overarching situation. It can be used in practical ways such as:

- Analysing **power relations** within and beyond communities. A 'social map' can be used to identify the challenges and barriers as well as opportunities to improve and sustain water supply services. The net-map toolbox developed by the International Food Policy Research Institute (IFPRI 2007) is an example of a useful way to map the influence within social networks.
- Developing and using **advocacy and communications strategies** that target those who can and want to influence the local and national situation. However, as noted by Funder et al (2012), poor households are often "forced to abstain from defending their water resources in order to maintain socio-economic and political ties with the very same households that oppose them in water conflicts".
- **Organising information into narratives** and themes that give insights into the context for decision-makers, such as those used in the case studies from the IFAD's (2010) Rural Poverty report.
- **Sharing knowledge and reflecting upon experience** with local stakeholders or coordination mechanisms, such as through detailing the shared challenges and barriers to improving rural water supply and ways in which coordinated strategies can improve rural water development.

**4.3 Conflict Zones and Fragile States**

The need for sound and sensitive political analysis is particularly evident when considering conflict zones and fragile states. An understanding of the political context is vital to the success, sustainability and development of rural water supply services. This may need advocacy to minimise destruction of water infrastructure during conflict or to negotiate entrance of emergency water supply materials to an affected area or in order to generate the funds needed to rebuild damaged water infrastructure.

It is clear that global as well as national policies and practices affect what happens at a local level. For example, while clearly not the main driving force behind revolutions in the Arab world, it is worth noting that water has been part of the equation as citizens demand better provision of basic services and suffer the impacts of both physical and socio-economic water scarcity (defined in Box 10).

As UNICEF noted in their 2012 report on the Middle East and North Africa Region, political change was demanded as a result of increasing inequality and a perception of poor governance with "children and women [feeling] the adverse effects of record levels of unemployment, soaring food and fuel prices, severe water scarcity and the volatile political and security context."

#### 4.4 Politics and Advocacy

Five out of six people without access to an improved water supply live in rural areas. (JMP 2012) Box 12 provides information on the funding disparities for rural water supply. This may be a mere reflection of the fact that the potential for social unrest in rural areas is smaller than in urban centres. Many rural communities are already marginalised with tenuous land rights and virtually no political power. In fact 80% of hungry people live in rural areas (UNDP 2005). To date, there is no coordinated and politically visible advocacy at a global level demanding water for rural communities.

#### Actually, global attention to rural development and rural poverty remains incredibly low.

##### Box 12: Rural and urban water service provision funding

The disparity between funding for rural and urban water service provision is an example of a political barrier to widespread investment in rural areas. While there is insufficient information regarding spending for rural water supplies in relation to urban water, it is known that of the \$7.2 billion given in development assistance to water and sanitation in 2007-2008, \$1 billion was for the development of basic systems (OECD 2011b). These primarily serve rural communities in contrast to large systems which tend to serve urban areas and account for the majority of additional funds committed to the sector since 2001. The funding gap reflects a lack of political attention for rural water supplies and requires changes in how governments perceive rural communities, how development partners develop and fund projects and how rural communities communicate their needs.

Irrigation, despite being essential to support agriculture, is also low on the agenda of many international organisations (Brock & Paasch 2008). As noted by the Rural Water Supply Network, there is no global action plan for rural water although it is much needed to galvanise political attention and will (Danert 2012). There is need to identify key figures locally and internationally who can influence policy and practice and build momentum for the policies, institutions, finance, human resources and transparent reporting dedicated to rural communities. There is need for much more advocacy for rural areas alongside support to rural citizens to voice their concerns and connect them to the broader political environment.

There has been success at galvanising political attention for rural water supplies at local and national levels within certain countries. However, supporting development of water supplies in difficult to reach rural areas where provision may be more expensive remains a significant challenge. This involves not only dedicated programmes but also a long-term commitment, time and human resources.

#### 4.5 Human Right to Water and Sanitation

The UN General Assembly resolution (A/RES/64/292: UN 2010a) and UN Human Rights Council resolution (A/HRC/15/L.14: UN 2010b) of 2010 recognised water and sanitation as a human right. This paves the way for a new global legal framework for the progressive realisation of access to water and sanitation for all. It also opens new opportunities to link the international legal standards of human rights to national initiatives. For stakeholders who have been working to improve drinking water supplies and sanitation,

it introduces new terminology and new concepts. Some water supply professionals still remain very sceptical about whether human rights approaches will actually make a significant difference to drinking water supply access. Although the right to food is also a human right, there are critics that point out, with a few exceptions, “no complaint has ever been lodged, no government has ever been sued, no victim [of undernourishment] has ever obtained redress and compensation” (Golay and Öxden 2005).

At the core of the resolutions is the obligation of the State (national government) to protect, respect and fulfil all human rights. In the case of water, which is the focus of this publication, the human right means that Governments have an obligation to ensure water supply improvements for everybody, without discrimination and without retrogression. In other words: “everyone forever” (Water For People 2011). In order to achieve this, the term ‘progressive realisation’ is used. There is no timeframe for realisation of human rights. Different strategies and frameworks to realise the right to water and sanitation will be appropriate depending on the national context.

The standards (also referred to as the normative standards) of the right to water and sanitation are contained in General comment 15: The Right to Water (UN 2002) and the UN Sub-Commission on the Promotion and Protection of Human Rights Draft Guidelines for the realisation of the right to drinking water and sanitation (2005). They are explained in Box 13.

The human right to water and sanitation encourages consideration of the most marginalised and excluded groups through emphasis on non-discrimination. The standards (Box 13) are the obligation of governments. However, civil society can assist governments in meeting their obligations and in monitoring progress to ensure progressive realisation of the right. Private enterprise is also crucial as its actions should not hinder the right and should be consistent with the standards. Governments need to monitor to ensure that this is the case. Water users also have duties. For example, water user groups should manage their supplies in a non-discriminatory fashion.

##### Box 13: Normative Standards of the Right to Water and Sanitation (UN 2002 and RWSN 2012f)

The human right provides for a certain standard to be achieved **progressively and without discrimination**. This standard can be explained in terms of five essential components:

- **Availability:** the amount of water available and the number of sanitation facilities must be sufficient for personal and domestic uses (drinking, cooking and hygiene).
- **Quality:** water has to be safe to drink and use, for cleansing and for hand washing. Sanitation facilities must be hygienically and technically safe to us.
- **Acceptability:** Services, facilities and goods have to be culturally acceptable, and considerations about privacy and dignity incorporated.
- **Accessibility:** Water and sanitation facilities and services must be accessible in the household or its vicinity to everyone on a continuous and reliable basis and without security risks. Information about water and sanitation issues must also be accessible to all in adequate formats.
- **Affordability:** Water and sanitation must be affordable to all, which does not necessarily mean free.

Improving rural water supply for everyone over the long term rests upon all stakeholders knowing, and fulfilling their roles and responsibilities. The ways in which they are held accountable and can hold others to account for not performing their responsibilities is very important. Accountability mechanisms include national courts, national human rights institutions and informal justice systems, public expenditure reviews, national water supply service level reports, human rights impact assessments as well as international mechanisms such as United Nations treaty bodies and special procedures of the Human Rights Council. Citizen's physical audits and citizen score cards also have a role to play.

However, not all stakeholders are aware of water and sanitation policies and legislation. Many do not fully understand the content of the human right to water or how to influence and utilise relevant national and international mechanisms.

Human rights approaches are not new, and many existing approaches to rural water supply development are entirely consistent with the human right to water and sanitation. This is a message that comes out very strongly in the Compendium of good practices (Alberquque & Roaf 2012).

## 5 Rural Water Supplies – What is it?

The previous three chapters have provided insights into rural realities, the environment and politics and how they affect rural water supplies. This publication now moves on to describes what rural water supply or rural water services actually are. This will be fairly obvious to readers who already work on these issues, but for those of you coming to rural water supplies from agriculture, rural development, the environment or another sector, this chapter should help to raise your understanding significantly. It is intended to provide the basis for the subsequent four volumes of the series (RWSN 2012b; RWSN 2012c; RWSN 2012d and RWSN 2012e).

### 5.1 Drinking water

Rural people require water for drinking, cooking and hygiene, aspects which are referred to as domestic water needs. However, they will need it to water their gardens, fields and livestock, too. Water is also required in schools and at markets, as well as for running businesses from agro-processing to cottage industries. And water is needed to sustain nature. Rather than considering all of these needs holistically, professionals tend to be either drinking-water, agricultural water or environmental specialists. Line ministries and local government departments are similarly structured and tend to focus on the development of water for one particular use. This is called a *sectoral approach* and has shaped development practice since the establishment of the Millennium Development Goals in 2000.

Most people associate domestic water supplies with the physical infrastructure. Many NGOs use images of people with or without an improved well or tap to raise funds. Political leaders make pledges about safe (and often free) drinking water supplies. More often than not they will conjure up images of water flowing as a result of new infrastructure. Indeed, physical installation is important to enable everyone to access a safe drinking water supplies in rural areas.

However, the physical infrastructure is not everything. Ensuring sustainable rural water supply services is much broader. Volume 2 of this series (RWSN 2012b), entitled "A Virtuous Cycle for Rural Water Supplies" provides inspiration on how to improve rural water supplies.

### 5.2 Sustainability

For the last 40 years, much of rural water supply development for domestic use has focused on building the infrastructure, rather than on the provision of a sustainable service. Striking a balance between building and maintaining services is a particular challenge. For the 11 countries that responded to the GLAAS (2012), 31% of expenditure was directed to operation and maintenance, with the other 69% spent on capital expenditure. Data on the sustainability of rural water supplies infrastructure is scant and not well consolidated. The functionality of the scheme or service is often used as an indicator for sustainability. It has been estimated that one in three handpumps in Africa are not working at any given time (RWSN 2009).

In rural areas, community management has been the order of the day. It was introduced with very good intentions, i.e. to enable communities to manage and maintain their supplies, rather than rely on overstretched and underfunded Governments and NGOs. Systems are built and handed over to water users. On paper, community management usually includes training and the establishment of local committees. In reality, the training and handover may or may not be implemented. The funder, or government, which considers the project over once the infrastructure has been built, has tended to walk away.

In most cases, little attention has been placed on the financial sustainability of rural water supplies (e.g. balancing costs with tariffs), the availability of spares, long-term system maintenance and replacement. Asset management has not featured. However, it is now being recognised that build-and-forget approaches are flawed. Post-construction support to communities is coming back into fashion, and there is increased recognition of the need for cohesive policies (GLAAS 2012).

As already noted in Chapter 3, consideration of the sustainability of services should not take the natural environment for granted. Proper management of the catchment and the groundwater resource is also essential, but often overlooked in current rural water supply projects and programmes. These are some of the winds of change that need to blow stronger as this publication goes to press.

**Figure 3: Silt laden Water, near Arba Minch, Ethiopia**



### 5.3 Rural Water Supply Actors

Some countries, such as Uganda (RWSN 2012e) benefit from an institutional framework where the roles and divisions of responsibilities for rural water supplies are clearly defined. In such cases, a specific national institution or department has overall responsibility for rural water supplies. However, there are countries where overlapping rural water supply responsibilities are spread between different ministries. National government structures may or may not be mirrored at local government level. Whatever the clarity in terms of the institutional framework, coordination at national and local government level is very important to achieve coherence, particularly given the numerous funding organisations and projects for rural water supplies that exist in many low and middle income countries (RWSN 2012b).

Just as each country has its own institutional framework; it also has its own institutional realities with respect to rural water supplies. Considerable information on these exists, and Volume 4 of this series entitled "Finding Information on Rural Water Supplies" (RWSN 2012d) provides signposts on where it can be found. Government staffing structures in relation to rural water supply support, the extent to which they are filled and the skills, knowledge and confidence of staff and management systems vary enormously from one country to the next (GLAAS 2012).

There may be a national programme for rural water supplies (often together with sanitation) in place. Alternatively, or additionally, there may be a series of regional, donor specific, and NGO-managed rural water supply projects. In fact, there can be dozens of projects peppered throughout a country, with tens (or even hundreds) of NGOs actively supporting rural water supply services. Finding out which organisation is doing what in rural water supplies can be a particular challenge if a national monitoring system with reliable reports is not in place. Volume 4 of this series (RWSN 2012d) provides some guidance on where to look for information on who is doing what.

In many countries, government reforms have been or are taking place, which have led to an increased emphasis on the role of local governments through decentralisation. Although local governments in many countries now have more responsibilities than in the past, this is not always accompanied by the financial and human resources to be able to fulfil their roles. The importance of local governments cannot be overemphasised. They should provide advice to rural dwellers on how existing water supplies can be improved (through self-help or with the assistance of government programmes) and provide long-term support for the management and maintenance of rural water supplies. Likewise, local governments have a key role with respect to coordination, planning and monitoring. Where finance is available, local governments may also construct, or contract out the construction of, rural water supplies infrastructure.

Other relevant reforms include the separation of setting policies, planning and regulatory roles from the construction and running of infrastructure for rural water supply. Government departments and state agencies in some countries construct water points and schemes and may even run them.

The most important actors on the stage of rural water supplies are the rural dwellers themselves. If they are particularly fortunate, they will use a safe drinking water supply that is close to their home, provides a reliable service, is affordable and can be managed and maintained. The supply may have been con-

structed through a government or NGO programme, or by the users themselves.

In rural areas, the reality is that spare parts may or may not be readily available, and the community may, or may not have the requisite skills and know-how for repair. If "community management" was the paradigm that was used at the time the water point or scheme was constructed, the community is most likely to be responsible for the management and maintenance of the water supply, usually through a committee. This may, or may not be working as it should, depending on the motivation, skills and social dynamics of the group as well as their ability to pay, collect and manage funds for the operation and maintenance of the scheme.

Depending on the management model that is used, as well as opportunities to make a reasonable profit, rural water supplies can also be run by private operators. The oversight and regulation of these operators varies considerably between and within countries, too.

### 5.4 Rural Water Supply Finance

There is need for a balance between the cost of rural water service provision and its finance. However desirable a particular technology, or level of service, is, if the capital costs cannot be paid, it will not be constructed according to design. If the costs of operation and maintenance cannot be met, then it will ultimately break down. If the price charged for the service is not affordable by users and there are no subsidies or other measures to ensure inclusion, they will not benefit from the clean water provided.

The Organisation for Economic Co-operation and Development (OECD) has developed a typology of the different sources of finance for Water, Sanitation and Hygiene (WASH), which it refers to as the 3T's (OECD 2009):

- Tariffs (and contributions) by water users for obtaining or building the services (includes payment for self-provided services)
- Taxes raised by governments and channelled into financing water services within a country
- Transfers of finance by international donors and charitable foundations (including NGOs and civil society organisations).

In addition, finance may be raised through commercial loans and bonds or be in the form of equity (OECD 2009). Trémolet and Rama (2012) point out that the current understanding of financial flows for WASH at national level is extremely limited. As in other development sectors with a variety of user finance, projects and programmes, finance for rural water supplies can flow in all sorts of ways.

**Figure 4: Children Fetch Water in Rural Malawi**



**Table 1: Technical Functions of Water Supplies (Adapted from Skat Foundation 2012)**

Technical Function	Technologies
tapping groundwater	Spring catchment, hand dug or drilled well (includes drilling technologies)
tapping rainwater	rooftop and rock catchment, sand dam, check dam, gully plug, surface or sub-surface recharge, fog collection
water lifting	manual pump – including hand and foot pumps, mechanised pump – including diesel, petrol, solar and wind pump
water distribution	pumped pipe supply and gravity fed piped supply
water storage	at household/community/institution level, such as rainwater tank/jar, as part of a piped distribution system (elevated or on-ground storage reservoir)
water treatment	at household level or as part of a distribution system
other	bottled water

## 5.5 Water Supply Technologies

Surface water (i.e. a lake, river or man-made reservoir), groundwater and precipitation are all sources for domestic use. Various technologies can tap, store, distribute and treat this water to make it more accessible and of a suitable quality. Surprisingly, categorising technologies or technical functions is not so straightforward.

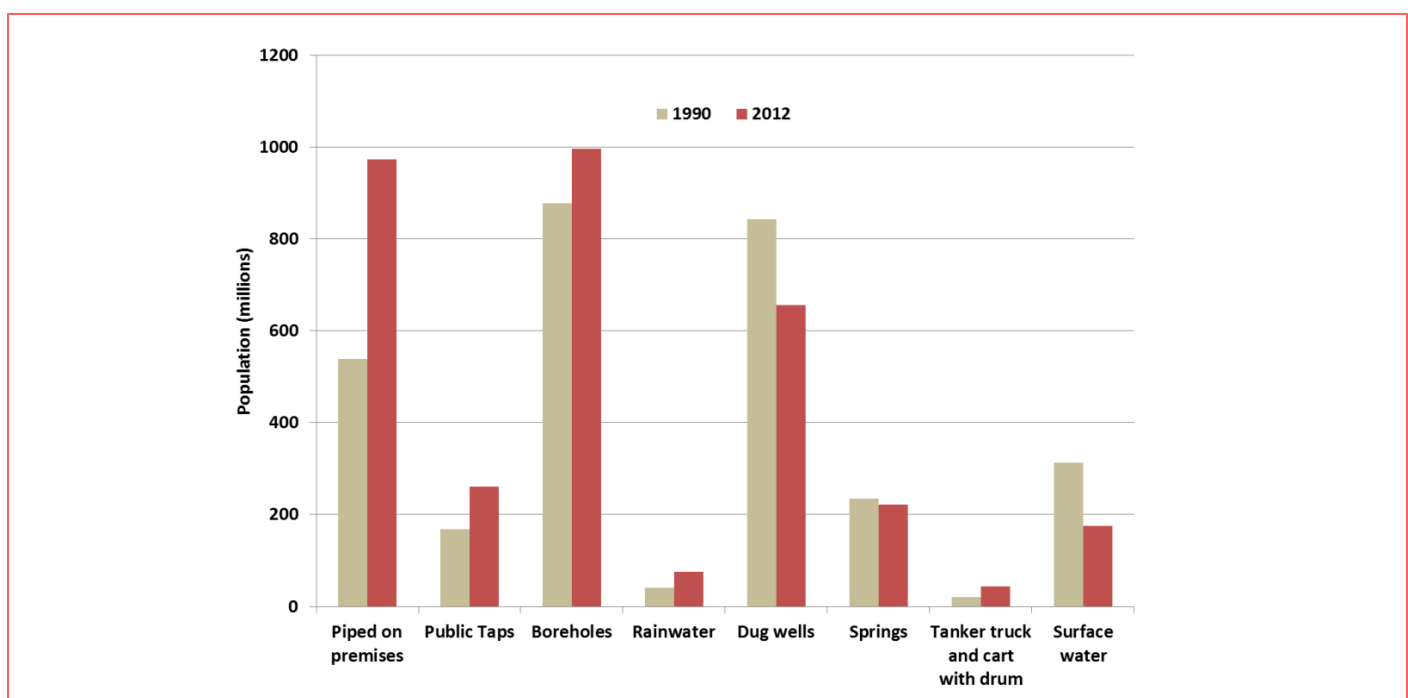
The Technology Assessment Framework (TAF) sets out seven technical functions of water supply technologies as given in Table 1 (Skat Foundation 2012). The Sustainable Sanitation and Water Management Toolbox (SSWM, 2012), Akvo (2012) and the Technology Information Packages (UNICEF, 2010) use slightly different classification. There are a tremendous number of books, manuals, technical notes and websites about rural water supply technologies. Key references are given in Volume

3 of this series (RWSN 2012c), and links are on the RWSN website [www.rural-water-supply.net](http://www.rural-water-supply.net).

## 5.6 Rural Water Supply Trends

Figure 5 sets out the global trends with respect to the use of different drinking water sources (JMP 2012). Whereas 538 million people benefited from piped services at the home in 1990, the figure now stands at 973 million. This increase has been driven by changes in South Eastern Asia, Eastern Asia, North Africa and Latin America between 1990 and 2010, and a slower growth in Africa.

Data for specific countries is available the JMP website <http://www.wssinfo.org>. RWSN (2012c) provides an overview of other data sources.

**Figure 5: World Rural Population by types of drinking water sources (JMP 2012)**

The focus by influential players on particular technologies for rural water supplies has changed over time (Box 14). Indeed, at the 2006 RWSN Forum, the session entitled “Does Technology Matter”, was a challenge to the apparent decline of interest by funding agencies in the research and development of rural water supply technologies that has taken place. There are essentially two schools of thought with respect to rural water supply technologies. One group favours low cost technologies (also referred to as SMART technologies), whereas the other is looking towards more sophisticated technologies and piped supplies in particular. Given the diversity within rural areas highlighted in Chapter 2, all of these technologies have their place.

#### Box 14: Rural Water Supply Technology Fashions

From the mid 1960's, UNICEF was one of the pioneers of borehole drilling for rural water supplies in India. Over a 25-year period, private sector rig manufacture and drilling capacity grew, with UNICEF India setting a benchmark for what could be achieved. However, what was a low cost solution (\$700 to \$1,500 per well) for India became a high cost solution for sub-Saharan Africa (\$3,000 to \$30,000 per well).

The 1980s witnessed considerable innovation and development with respect to handpump design, leading to the Village-Level Operation and Maintenance (VLOM) concept. The India Mark II (developed first) is not considered to be a VLOM pump, whereas the Afridev and India Mark III handpumps are. All of these pumps are in the public domain, and were developed with various supports from the World Bank, UNDP and UNICEF (Baumann and Furey, 2013). Several proprietary pumps have also come onto the market. From the 1990s, many countries have tried to standardise to a few pumps in order to make spare parts supply chains and maintenance more viable. The Handpump Technology Network (HTN), now RWSN, coordinated efforts and developed standards. Handpumps provide drinking water for about one billion rural dwellers (JMP 2012). Despite this reality, and concerns over manufacturing quality, research and development of handpumps has dwindled over the last 15 years.

Domestic roofwater harvesting has grown in popularity since the 1990s, with countries such as Thailand, Kenya and Uganda leading the way to demonstrate the technology and support its widespread uptake. Over the last ten years or so, there has been a particularly growing interest in Household Water Treatment and Safe Storage. The success of Potters for Peace with their ceramic filter technology as well as new commercial products entering the market and interest in solar disinfection (SODIS) are some recent examples of rural water technology trends. There has also been coordination of efforts by the Household Water Treatment and Safe Storage Network.

Piped Water Supplies, to standposts as well as to the home, are increasing in rural areas globally (Figure 5). Analysis of their management has grown, particularly in relation to private sector participation.

Agricultural water is beyond the scope of this document, but a number of technologies, such as the rope pump, sometimes serve multiple purposes. Water users may or may not use the same source for different needs. Innovative technologies for rural drinking water supply such as new water treatment techniques continue to be developed and tested. Unfortunately, independent evaluation and reliable documentation is often

lacking. Weak institutional arrangements and inadequate mechanisms in many countries mean that the validation and scaling up of promising solutions remains a challenge (Skat Foundation 2012).

## 5.7 Rural Water Supply Goals, Targets & Definitions

*“The eight Millennium Development Goals (MDGs), which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015 – form a blueprint agreed to by all the world's countries and all the world's leading development institutions”*

(<http://www.un.org/millenniumgoals>)

MDG Target 7c: *“reducing by half the proportion of people without sustainable access to safe drinking water and basic sanitation”* has shaped policy, finance and approaches to domestic water supply since 2000.

National governments in most countries (GLAAS 2012) have set targets for access to safe drinking water by 2015. In many countries, the targets set are higher than that of the MDG Target, with some even trying to reach 100% access.

The WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP 2012) reports on progress towards achieving the MDG Water and Sanitation Targets. In the case of water supply, the proxy indicator used to measure progress is *“the proportion of people that are using ‘improved’ drinking water sources, defined as those that, by the nature of their construction, are protected from outside contamination, particularly faecal matter”* (JMP, 2012).

The JMP provides a black and white distinction between an *‘improved’* and *‘unimproved’* water supply. Within the *‘improved’* category, there is a further distinction between piped water on premises and other improved sources. Treated, piped water into the home is often perceived as the ultimate drinking water supply. However, rural realities today are very far from this. Arguably, it is unlikely that the world's entire rural population will ever have access to a piped supply to the home unless there is a massive reduction in rural poverty or extensive long-term subsidies are provided.

The MDG water and sanitation target has been criticised for focusing attention on developing new schemes rather than maintaining existing ones (GLAAS, 2012). The fact is that that services which are regarded as *‘improved’* may not be adequately maintained, may not provide water in a continuous manner or be actually safe to drink. Lastly, the MDGs in general have come under fire for only halving poverty, rather than eliminating it all completely. Globally, the MDG target has been met, but not all countries have reached it (JMP 2012). A country can satisfy its MDG target by focusing on the easier to serve populations and not worrying too much about the others.

Another criticism of the JMP data is that it does not always match the data published by line ministries. There are a number of reasons for this: for one, the definitions of what is *‘improved’* may differ. Secondly, while the JMP data is based on household surveys, ministry data tends to be based on the infrastructure, with an assumed number of users for each type of water supply.

The MDG target also has a heavy focus on water supply technology. An alternative idea that is emerging is to consider the



satisfaction of the user with water supply services, which may come from many sources. In India, piped water and handpumps sometimes exist side by side, with handpumps sometimes considered to be part of the water security of the village system to be used in an emergency (IRC, 2011).

New targets and in fact a new development framework will be set after 2015. New standards and targets may be set for drinking water. Further, the world is now considering universal access to safe drinking water.

As this paper goes to press, we await with interest to see what goals, targets and indicators will be defined at international level, and how these will support and influence national policies as well as practices on the ground.

## 6 Closing Words

The gap between access to improved water supplies for people living in rural and for those in urban areas is striking. However, this is a reflection of a wider picture of poverty and lack of access to basic services in many rural areas of middle and low income countries. In turn, this picture is underpinned by the lack of political voice from diverse rural people. Improving access to safe drinking water supplies is one dimension of reducing rural poverty, albeit an important one. The type of services that are affordable depends on the technology and level of service, as well as other mechanisms such as subsidies or wider social protection programmes. Consideration of the water supply service, rather than focusing on the construction of capital works, is important. However, unless water resources and the wider environment are properly considered too, sustainable services are unlikely.

In writing and disseminating this publication, the authors sincerely hope that the readers will benefit from a more nuanced understanding of rural realities, the environment and politics and their importance for rural water supplies. Perhaps this improved understanding will help some professionals and practitioners working on different aspects of development to consider joining hands to support and effect change in rural areas.

## Glossary

**Development partner:** entity that contributes finance or other support to a project or programme. The term is now commonly used as an alternative to “donor” in order to articulate that the funding entity works in partnership with the national and local organisations that it supports.

**Earth Overshoot Day:** the Global Footprint Network calculates the date by which the earth’s population uses up its annual, sustainable allotment of resources. For 2011, Earth Overshoot Day arrived on September 27, meaning that earth’s inhabitants in that year eventually consumed about 135% of what we should have, resulting in accelerated natural resource depletion and waste products.

**Income** is the amount of money received over time, for example, salary, and sale of crops grown or rent income.

**Political economy:** several different approaches which analyse the political environment in order to investigate the relationships between political, social and financial networks.

**Poverty:** defined in Box 5.

**Power analysis:** an approach to understand power asymmetries, access to resources and influence over politics. It seeks to map the informal political landscape, including its rules and structures (ODI 2006).

**Purchasing power parity (PPP)** determines the relative value of currencies so that exchange is equivalent to (or on par with) each currency’s purchasing power. Using the PPP rate, an amount of money has the same purchasing power in different countries.

**Rights based approach:** an approach to programme and project design which recognises, as a starting point, the human rights of all people and actively works towards realisation of these within project and programme aims.

**Smallholder:** There is no single definition of a *smallholder*, although they are often measured in terms of the farm size. Households with less than a threshold size of two hectares may be classified as smallholders (FAO 2010a), but the national median farm size, farm yields or socio-economic factors can also be used.

**Social Protection:** Social protection involves cash transfers made by the State to the poor in the form of non-contributory old-age pensions, child grants, widows and disability grants for example. It is believed that such measures already reach around three quarters of a billion people in the South (CPRC, 2011, pp 26).

**Wealth** refers to what a person or family owns minus any debts that they have. Income is one aspect of wealth. However, a wealthy person or household can have low income but wealth in terms of assets (such as land, cows or buildings). Conversely, a household could have a high income but low wealth if they have a lot of debt to pay.

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