

THE PHILIPPINE WATER SITUATION

The Philippines is a 7000-island archipelago which is home to almost 90 million people.

Geology

Being an island arc, the country has volcanic and oceanic geology (basalt and derivatives, limestone). About a third of the 300 000km² land area is flat enough for agriculture while the rest are from hilly to mountainous uplands.

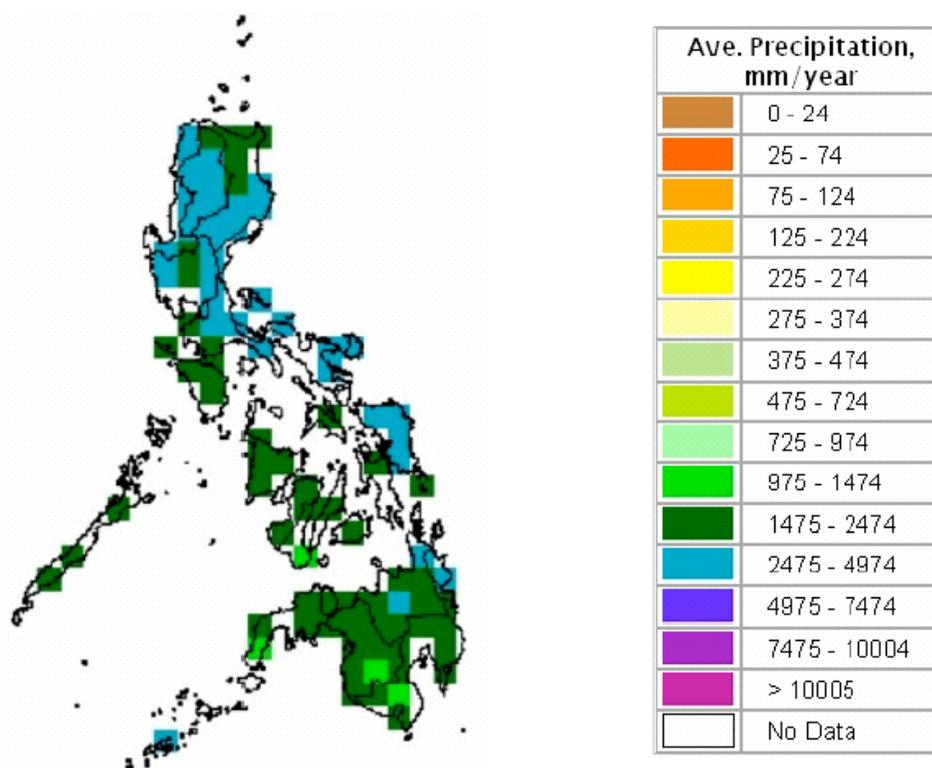


Figure 7. Average annual precipitation in the Philippines, mm/year (FAO, 2007)

The climate is tropical maritime. Country-wide rainfall average is 2360mm/yr, varying from place to place from 1500 to 5000mm (except for a few sheltered sites where rainfall is less than 1000mm).

More than a third of these rainfalls are due to tropical cyclones.

The dry season varies, also according to location from zero to six months annually.

There are 421 principal river basins, 19 of which are considered major with each draining watersheds of at least 1400km². This is aside from the thousands of small coastal basins with their own outlets to the sea.

There are 59 freshwater lakes, including some of Southeast Asia's biggest.

Groundwater resources are substantial along these rivers and lakes. Proven deposits alone are in the order of 50BCM and covers 50,000 km².

These water resources can supply 479BCM to the country annually (6000m³ per person) or seventeen times what is being actually used.

Cover and Agriculture

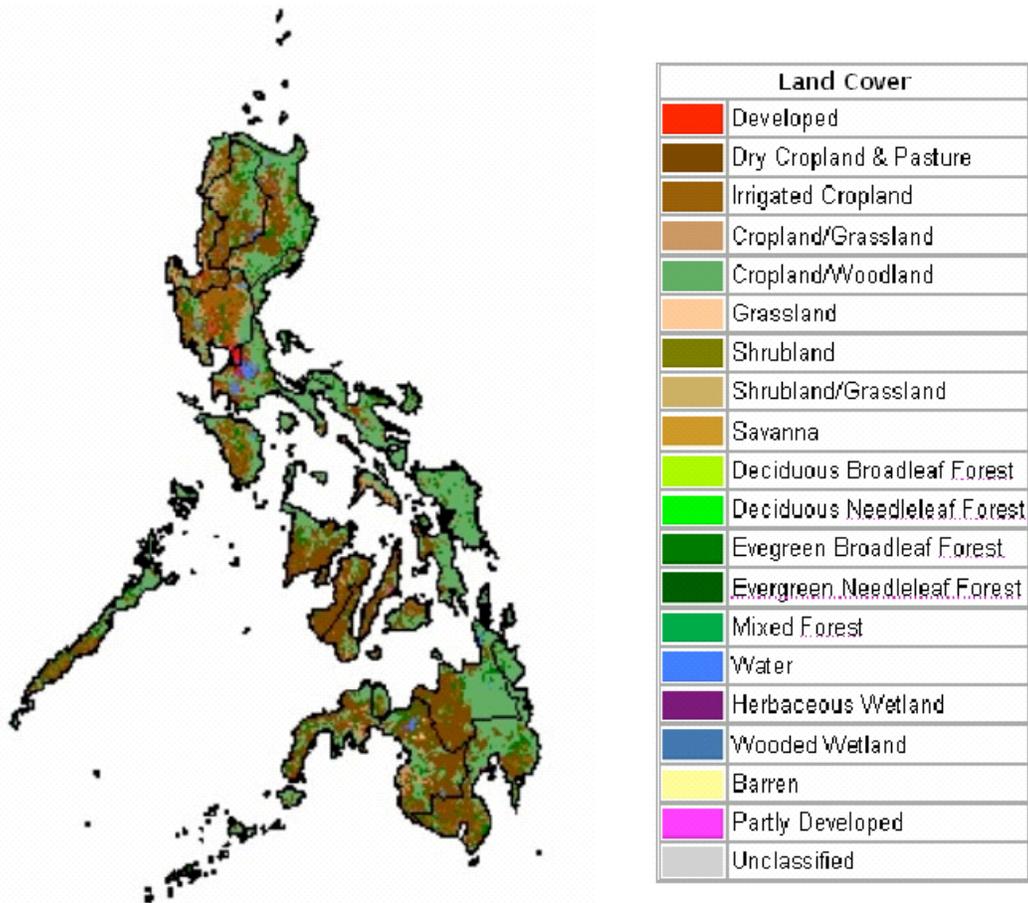


Figure 8. Land cover in the Philippines (FAO, 2007)

Once all rainforest, now the country has only 20% forest cover. However, including patches of orchards, 50% of the land area is under some kind of tree canopy cover.

Roads and buildings take up 0.1% of the land.

About a third of the land area, or 10M ha, is classified as cropland. Of this, 1.5M ha is irrigated.

The Philippines imports about a tenth of its main staple rice, or 284kg/person/year.

Economy

Philippine GDP in 2006 amounted to 6 trillion pesos, or about PHP 67,646 per capita. 53% of this was from the services sector, 31% from industry and 16% from agriculture.

A further 559B pesos were earned by OFW's that year.

However, the distribution of this wealth was significantly skewed (Gini coeff=0.46), with the richest 20% of the population earning 50% and the poorest 20% only 5%.

Poverty incidence is a little above 30%, with urban poverty being about 20%.

Net national savings is 22%.

Demography

About 60% of Filipinos already live in urban areas.

Projected long-term population growth is about 1.4%, but presently rates are 4.5% for urban and 0.2% for rural communities.

37% of the population are younger than 15 years, and 5% are 65 years or older.

Infant and under-five mortality rates are 2.9 and 4%, respectively.

Life expectancy is 68 years for males and 72 for females.

There is 95% literacy rate and 28% of college-age youth are enrolled in these institutions.

Energy

Excluding fuelwood, each Filipino consumes half a ton of oil energy equivalent annually. About half of this is produced locally from renewable sources while the other half imported in the form of fossil fuels. 85% of these fossil fuels is petroleum-based.

Transportation accounts for the bulk of petroleum-based fuels consumption and 33% of total fossil fuel consumption, industry 30% and residences 26%.

I. The present Water Supply Situation

85% of the country' water demand is for agriculture, with industry and the domestic sector sharing the balance.

A. Water Supply

80% of the population is covered by potable water service, broken down as far as can be ascertained as follows:

Coverage of the Philippine Population By Water Providers, %									
Agency	Level						Total		
	Urban			Rural					
	1	2	3	1	2	3			
			79			72			
		17	33		22	8			80
Water Districts			17						17
Big private optrs			8						8
Self-provision	3				5				9
Nat'l Gov't, NGO's, LGU's, Water Service Ass'n's, Coops			21			24			46
									80
"Unservd:"									
Supplied from unimproved water sources or with roofwater									15
SSIP (mostly truckers)-supplied			5						5

Per cent coverage has been static or even slipped since the year 2000, indicating that investments in this sector has barely kept up with population growth and with the replacement of aging water systems.

The above water providers are typified as follows:

- 1. Water districts.** While headed by autonomous boards, these are government-funded and hence government-controlled municipal entities. Numbering 574 as of 2003 (including 127 non-operational), they provide services to 15.3 million people in 700 cities and municipalities outside Manila.

Financing and technical support for water districts are administered by the government's Local Water Utilities Administration.

- 2. Big private operators.** These are corporations operating in Metro Manila and a few smaller cities. In the former, MWSI and MWCI are the concessionaires of MWSS and are pledged to extend and improve the latter's coverage to more of the metropolis as part of the government's thrust to privatize basic services.
- 3. Local Government Units (LGUs).** In the Philippines, there are about 45,000 villages, under 1,628 towns and cities (the towns are also under the jurisdiction of 81 provinces). Each of these has an LGU.

Water supply is one of the many basic services devolved into LGU's, and some have availed of the LWUA program to acquire water district-run systems.

However, as many LGU's have negligible incomes from local fees and taxes, and despite the allotment from the national government of their share of the national internal revenue, surplus funds for major infrastructure such as water supply are otherwise rare.

Most of the water systems which upkeep has fallen into LGU responsibility were therefore funded and built either by the national government, congressional pork barrel funds, or more rarely, charitable NGO's.

Currently, there are 1,000 LGU-run utilities at the provincial, municipal and barangay levels.

4. **Community based organizations such as the Barangay Water Services Associations (BWSAs), Rural Water Supply Associations (RWSAs) and Cooperatives.** Currently, there are 3,100 BWSAs, 500 RWSAs and 200 water cooperatives nationwide. Many operate systems built wholly or partially with government funds. Although they are supposed to be autonomous from government, most also rely on LGUs for the O&M expenses of their systems.
5. **NGO's:** These organizations arose during the financial crises of the late 80's and early 90's as an alternative to government in the provision of basic social services to communities. At their peak, there are said to have been 30,000 NGO's and PO's in the country.

Some NGO's have international funding for direct water project implementation : others involve themselves in government-funded projects.

There is little data on the quantitative and qualitative contribution of NGO's in delivering potable water services to Filipinos (guesses range from 5 to 25% of government investment). However, one such organization that specialized in water (Tulungan sa Tubigan) was able to improve water supply for 135,000 people nationwide from 1986 to 1992, at a financial cost of about PHP800 per capita in current prices. This it did by focusing on very needy communities, eliciting community participation, working with local partners, using simple appropriate technologies (manual- or gravity-powered systems), and enforcing corruption-free purchasing of the needed materials.

6. **Small-scale independent providers (SSIPs).** They range from real estate operators, homeowners' associations, and individual

entrepreneurs. Studies indicate that they may be providing water to up to 30 percent of the populations of Metro Manila and Cebu .

7. **Household self-providers.** Together with SSIPs, household self-providers constitute 20% of the supply market in urban areas and 25% in

There are five major financing and investment clusters in the WSS sector:

- a) national and local governments through annual budget allocations channeled via line agencies and specialized agencies;
- b) GFIs on lending to water districts through the LWUA;
- c) private foreign financing institutions on lending to big PSPs;
- d) international donor agencies or their financing arms providing support through national line agencies, LGUs and national specialized agencies; and,
- e) non-governmental foreign funding agencies providing support to community-based water supply projects through local partner NGOs.

A Typology of the 'Waterless'

The Philippine standard for access to potable water is a clean supply of at least 50 liters per capita daily (lcpd) available from waterpoints no more than 250m from the user's residence.

Others in the water sector would also add affordability (e.g., no more than 2-5% of the household income should go to water) and reliability standards (e.g., compliant for 90-95% of the year).

'Waterless' communities may be typified as follows:

1. Those supplied from unprotected or poor-quality sources.

Many water sources in the country, perhaps as much as two out three, are bacteriologically contaminated due to inadequate sanitation facilities. In addition, 12-25% of wells yield iron-laden water.

2. Communities which have outrun local water sources.

Densely-populated islets are an example. In a few rural villages, heavy groundwater use for irrigation has rendered its shallower handpump wells dry during the dry season.

3. Communities and households unable to access sufficient potable water due to:

- a. Governance issues

Examples are communities in conflict areas and those have abundant water resources which remain undeveloped due to poor governance.

b. Rights-of-way issues

These may be peri-urban communities which are low-priority for water supply development because of lack of tenure on their homelots.

Related to this, some 'water-less' urban households are renters who does not see the expense of a household connection as justifiable seeing as they consider themselves transients in their community. They may thus be content with purchasing water from their landlords or vendors

Another example are communities which cannot avail of piped water because adjacent one will not permit supply pipes to be laid through their areas..

c. Poverty

Some urban families, on the other hand cannot save enough for a household connection.

d. Supply distribution equitability issues.

These are households within a system's service area but which still have insufficient water due to profligate use by other households, and leakages and water pilferage.

4. Households that are too scattered or remote from each other for communal water systems, and are presently using unimproved household systems
5. Communities which already have basic point-source systems but aspire for household connections and therefore declare themselves 'waterless'.

How the 'Waterless' Cope

1. By Consuming Less

Vended water costs from 20 to 60 times utility water per liter, and in urban-poor areas supplied by it the daily per capita consumption can be as little as twelve liters.

2. By Getting Water From More Than One Source.

A water-poor household may reserve the highest quality water (such as vended supplies) available to it for drinking, lesser-quality supplies such as well- and surface water for other purposes, and store roofwater in household receptacles whenever possible.

3. By Household Scale Water Treatment

A few households may settle, filter or disinfect their water.

B. Sanitation

Philippine sanitation coverage is said to be about 74% (81% for urban and 61% for rural), but this probably does not include households with open-pit toilets or those with no toilets but which use the neighbors' or relatives'.

The typical sanitation facility is a pour-flush bowl connected to a wet pit or, in the urban areas a two-chambered septic tank. In the latter, the effluent flows into the nearest sewer canal or watercourse (only 4% of the population have their effluent undergo further treatment).

Sanitation is largely self-provided although DOH has toilet bowl programs. To a smaller scale, some NGO's also implement sanitation projects.

Sewerage is provided by MWSS through MWSI and MWCI in Metro Manila, or built as part of development in subdivisions and condominiums by their developers.

Septic tank desludging is provided free by MWSI or for a fee by private tankers, although where the latter disposes of the waste is questionable.

Drainage is built as part of road facilities by various agencies such as DPWH, LGU's and private developers.

A Typology of 'Toilet-less' Households

In addition to the above-mentioned situations other possibilities are:

Some households, being renters, are deferring construction of a toilet of their own for when they build their own home.

Others may be too poor to build one.

The rest, by force of habit and culture, may actually prefer open defecation instead of using enclosed toilets others have just used.

The cost of inadequate water supply and sanitation is considerable. Despite advances in water supply and sanitation coverage leading to decrease in the incidence of key waterborne diseases during the past two decades, 4000 Filipinos, many of them children, still die of these causes annually, while half-a-million get sick.

The World Bank estimates health care costs and productivity losses from the above amount to 6.7B pesos, fisheries losses due to water pollution 17B, and tourism potential losses 47B.

The Philippine Water Sector

Some 30 national agencies are involved in planning, regulating and implementing the delivery of water and sanitation services and the care of the country' water resources:

INSTITUTION	ENABLING LAW	MANDATE/FUNCTION
<i>National</i>		
DENR : Forest Management Bureau (FMB) and Environmental Mgt. Bureau (EMB)	E.O. 192 of 1987	Primarily responsible for the management, conservation, and development of forest lands and watersheds; and maintaining water quality
National Power Corporation (NPC)	R.A. 6395 [NPC Chapter];	Authority to take water from any public stream, river, creek, lake or waterfall for

INSTITUTION	ENABLING LAW	MANDATE/FUNCTION
	E.O. 224 of 1987	power generation; complete jurisdiction and control over watersheds surrounding the reservoirs of plants and/or projects
Philippine National Oil Company (PNOC)	E.O. 223 of 1997	Jurisdiction, control, management, protection, development and rehabilitation of watershed reserves
National Irrigation Administration (NIA)	R.A. 3601 of 1963	Improve, construct and administer all national irrigation systems of the country
Department of Energy (DOE)	R.A. 7638 [DoE Act of 1992]	Allocate reforestation, watershed management, health and/or environment enhancement fund
National Water Resources Board (NWRB)	P.D. 1067 – Water Code of 1976	Coordinate and regulate water resources management and development, and water uses
Joint Executive-Legislative Water Crisis Commission	R.A. 8041 [National Water Crisis Act of 1995]	Address the water crisis including supply, distribution, finance, privatization of state-run water facilities, protection and conservation of watersheds and the waste and pilferage of water
Department of Health (DOH)	IRR of NEDA Board Res. No. 4 of 1994	Set quality standards for water testing, treatment and surveillance and sanitary practices
Department of Public Work and Highways (DPWH)	IRR of NEDA Board Res. No. 4 of 1994	Set technical standards for engineering surveys, design and construction of Level I water systems
National Economic and Development Authority (NEDA)	Executive Order 230 of 1987	Policymaking and infrastructure, coordination of activities and various sectors
National Commission on Indigenous People (NCIP)	R.A. No. 8371 of 1997 [IPRA]	Formulates and implements policies for the protection of indigenous people, e.g., ancestral domain in critical watersheds
Local		
Local Government Units (LGUs)	R.A. 7160 of 1991 [Local Government Code (LGC)]	Implement community-based forestry projects and manage communal forest with an area not exceeding fifty (50) sq km, and enforce forestry laws, etc.
Local Water Utilities Administration (LWUA)	P.D. 198 of 1973 [Prov. Water Utilities Act]	Own and operate water supply and distribution systems for domestic, industrial, municipal and agricultural uses
Metropolitan Works and Sewerage System (MWSS)	R.A. No. 6234	Responsible for water supply in Metro Manila

This is in addition to area-specific agencies such as LLDA, MMDA, universities with watersheds in their campuses, and local governments:

Table 3. Roles of the different levels of LGUs on water and sanitation

TIER / LEVEL OF LGU	ROLES AND FUNCTIONS ON WATER AND SANITATION MANAGEMENT
Barangays	General sanitation and maintenance of water supply systems.
	Barangay Captain, Councilman and Zone Chairman deputized as peace officers to effect arrest of violators to enforce pollution control laws
Municipalities and Cities	Infrastructure facilities funded by municipal funds including water supply systems, drainage and sewerage;
	Research services and facilities related to agriculture and fisheries, including water utilization or conservation projects
	Services or facilities related to general hygiene and sanitation.
Provinces	Enforcement of pollution control and laws to protect the environment subject to DENR supervision, control and review;
	Infrastructure funded by provincial funds for inter-municipal waterworks, drainage and sewerage and similar facilities

Critics may deplore this complex and sometimes overlapping setup, but same is due at least in part to the fragmented geography of the country and its water resources, and to the multidimensional aspects of their use and management .

A raft of laws gives these various institutions their respective mandates. However, more recent legislation (e.g., the Solid Waste Management Act and the Clean Water Act) have been notable for having a low level of compliance. Lack of funds is cited as the cause.

C.

II. Projected Future Water Supply and Sanitation Requirements

JICA estimates that *with business-as-usual scenarios* and at current population and development growth rates, water demand in the country will increase from 30 BCM in 1996 to to 86.5 BCM in 2025, broken down as follows:

- **Domestic demand:** from 1.95 BCM/year in 1995 to 7.43 BCM/year by 2025 (or 3.8 times the 1995 level)
- **Agricultural demand:** from 25.53 BCM/year in 1995 to 72.97 BCM/year by 2025 (or 2.8 times the 1995 level).
- **Industrial demand:** from 2.23 BCM/year in 1995 to 4.99 BCM/year by 2025 (or 4.48 times the 1995 level under a high growth scenario of 8.7%)

or 3.31 BCM/year (or 2.4 times the 1995 level under a low growth scenario of 5.9%).

Industrial water consumption in cities alone is expected to rise seven times, and the agency identifies nine major cities (Metro Manila, Metro Cebu, Davao, Baguio, Bacolod, Iloilo, Cagayan de Oro and Zamboanga) that will outrun their existing water sources beginning as early as 2010.

NEDA estimates that the water resources sector will require 15% of the PhP 1.7 trillion investment requirement during the period 2006-2010.

NAPC projects that to serve the urban poor in Manila and the 400 most waterless towns in the country, PhP 2 billion and PhP 3.6 billion, respectively will be required.

The World Bank on the other hand estimates that the whole country will need PHP 25B and 211B, respectively, for full water and sanitation coverage of the present population. This probably includes wastewater treatment facilities for urban communities.

Despite these figures, actual government expenditures in say 2004 are about PHP 6.3B in the water sector, and this is including flood control.

In sanitation, the figure is even more dismal: PHP0.5 B (this probably includes drainage and sewerage).

III. The Many Ways Forward

The debate in the sector centers on these basic topics:

- a) where the resources will come from and how much;
- b) who shall lead and what approaches will be adopted.

Everybody agrees that the state has the main responsibility in seeing to the delivery of basic services such as water and sanitation to the people, but some would encourage more private investments, citing the speed, flexibility and innovativeness of private companies as opposed to the government in delivering results.

Others such as the Freedom From Debt Coalition and like-minded nationalist groups say that the government should and can invest more in this basic social service and part of this investment should be realigned from its annual debt service allocations of about PHP 300 B (30% of the national budget).

Another argument against multinational businesses getting a share of the Philippine water business is strategic: basic services and commodities should be the sole province of Filipino investors.

Further, privatization and semi-privatization (ala LWUA water districts and MWSS), while improving service coverage and increasing supplies, has been shown to result in several-fold increases in water tariffs.

One source which shall remain a major contributor to the sector is user-provided investments. This is the overwhelming case in sanitation and in 24% of the water scene (if the unserved is considered as self-provisioning). Enhancing it should therefore also be a strategy, and DOH and WHO WRPO for example are initiating a Water Safety Program for small community and household systems while exploring the promotion of household-scale water treatment.

Estimates of how much money is actually needed vary considerably. But some workers in the sector think that it can be much less than then estimates.

To start with, many present water systems can be made to serve more people through the promotion of lesser per capita water consumption (e.g., through judicious tariff table restructuring) and leakage control. The average Metro Manila resident connected to MWSS service , for example, consumes 130-200 liters per day. Bringing this down to say 60 lcpd will mean two to three times more people can be served even without developing new water sources or increasing system capacities.

Another approach is to tailor technology and management options to the typology of need of each 'waterless' community.

And with low-cost appropriate technologies (some already proven in the field, others under development), community participation, and conscientious and transparent procurement, financial costs could be as low as a sixth to a quarter of World Bank estimates for rural water supply and sanitation at least, and economic costs as little as a third to one-half.

On the downside, the craft of low-cost appropriate technologies in water supply is not widely disseminated in the sector. It is practiced in fragmentary form by a few NGO's, LGU's and the water and sanitation volunteers of agencies such as Plan International, Catholic Relief Services, US Peace Corps, VSO, and GTZ.

Some would endorse the formation of a single Water Resources Authority of the Philippines (WRAP) that would coordinate and regulate all sector activities. Others would suggest merely the strengthening of existing institutions (say NWRB for water resource allocation functions and the Environmental Management Bureau of the DENR as the enforcement and compliance authority ala US EPA).

By law and sector consensus, LGU's are the primary planning and implementing authority on water supply and sanitation in their respective jurisdictions. And a GTZ-assisted sector project, The Philippine Water and

Sanitation Sector Roadmap is identifying LWUA as the lead technical and financial support agency for the LGU's. A bill increasing LWUA capitalization by an order of magnitude is already under legislation.

However, vesting such a function in a single agency is seen by some to be unpracticable:

- a) LWUA, for example, would have to increase its capability by the same magnitude in a short period of time
- b) It would also have to learn other business models. Its water district concept seems to work only in urban areas of a certain minimum scale where users have regular employment and hence incomes and would be willing to pay tariffs for the convenience of a house connection. In rural areas where people's incomes are agricultural and hence low and irregular, and population densities are low, no water district is known to have survived.
- c) Of LWUA's hundreds of water districts, only fourteen are financially in the black.
- d) Even in service areas saturated by water district pipe networks, coverage is low (an average of about 40%) is increasing by only a couple of percentage points a year.
- e) LWUA is not known for low-cost appropriate technology approaches. Some LGU's actually avoid availing of LWUA financial and technical assistance because of the latter's high indicative project prices, which result in the aforementioned manifold increases in tariffs that can be political suicide (to be fair, some are on the other hand in favor of privatizing potable water because it would depoliticize this basic service).

The foregoing just goes to show the complexity of the Philippine water situation, with a multiplicity of sources, modes of delivery and the numerous agencies thereof, typology of 'waterlessness', and levels of willingness to pay, and schools of thought.

So whatever way forward an LGU, community or household will choose to go, what will be important at this stage is that the resources and approaches will be ready for them.