

## Briefing Note • Timor Leste

### Key points

- ▶ A cap on public services in Timor Leste has resulted in little expansion of government staffing in the Water, Sanitation and Hygiene (WASH) sector since independence in 2002. As a result, there is estimated to be only 235 staff with WASH-related skills, such as public health engineers, within relevant government agencies. Timor Leste has a low level of women participating in the workforce; only 14 women out of 235 work for government agencies, 4 out of 224 work in the private sector and 34 out of 184 work for NGOs.
- ▶ There are a number of WASH programmes supported by various donors, which are predominantly driven by international expertise. It is expected that foreign expertise will continue to be an important element in Timor Leste's response to meeting the Millennium Development Goals (MDGs) targets for water and sanitation.
- ▶ WASH-related skills can be acquired at four universities; two of which focus on civil engineering and the other two are public health oriented. Whilst the engineering schools offer some broader WASH-related training on their curricula, not all content required to train WASH engineers is covered and the courses provide low levels of practical training. As a consequence, one major donor-funded programme has arranged for senior government staff in the National Directorate for Water and Sanitation to upgrade their formal WASH training at an Indonesian university.
- ▶ If the MDG targets for water and sanitation are to be met there is a substantial shortage of WASH personnel in all four categories—engineers, professionals, technician and skilled workers. At the current rate of human resources (HR) supply, shortages will slowly decrease in all categories but remain throughout the period within which the MDG targets are to be met. The predicted HR shortage is particularly significant for engineers and other specialist professionals, where training and establishing experience requires at least five years. Although technicians and skilled workers represent the greatest deficit, these are the most easily trained and the shortage can be addressed most rapidly. But greater consideration is required to consider how they will be most effectively trained with the right set of WASH related skills.
- ▶ As there are very few Timorese private sector consultants currently available, one option is to develop local expertise for design and construction. The other option is to continue to rely on foreign expertise but this has implications for continuity and institutional memory, and most importantly for sustainability. Therefore, this approach is not recommended.
- ▶ If capacity for operation and maintenance (and community management) is not established, benefits related to coverage improvements to achieve the MDG targets will be short-lived and coverage rates will drop back rapidly as infrastructure falls into disrepair.
- ▶ Human resources in the sector are highly dependent upon funding to engage private contractors and NGOs. As funding fluctuates, so does HR capacity. Experience built up in the WASH sector is easily lost as funding and staff move to other sectors. A consistent level of funding would enable the development and retention of the HR capacity required to meet the MDG targets.
- ▶ Decentralisation increases managerial responsibility and the allocation of financial resources to the district level. Greater numbers of WASH-related staff should therefore be positioned to serve rural communities. This implies a need to ensure that the predominance of Dili-based WASH HR is redressed to ensure that there is sufficient capacity and expertise at the district level.

### 1 Background

This Briefing Note summarises the findings from a study in Timor Leste funded by the UK's Department for International Development (DFID) that

set out to assess human resource requirements for the provision of water and sanitation infrastructure in five countries: Bangladesh, Timor Leste, Mali, South Africa and Zambia. A standardised methodological



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framework was piloted in each country to collect relevant data and information using institutional surveys, semi-structured interviews and focus group discussions. The methodology used four broad categories to assess staffing requirements:

- a) **Engineer:** a person who is qualified or professionally engaged in any branch of engineering related to the provision of water and sanitation facilities or infrastructure.
- b) **Associated professional:** an occupation related to water, sanitation or hygiene promotion requiring further education (usually to degree level) in a non-engineering topic (e.g. geology or social sciences).
- c) **Technicians:** someone who has technical training, a practical understanding of general theoretical

principles (but not to graduate degree level), and experience in the application of technologies.

- c) **Skilled worker:** a worker who has acquired technical skills but lacks formal qualifications such as a plumber, mechanic, driller, mason or latrine caster.

The study focussed on identifying gaps where sector institutions or other organisations involved in service provision lack either sufficient number of qualified staff, either because their existing staff were insufficiently qualified or there were an insufficient number of staff in place (or both). The latter were based upon a quantitative estimate of staffing requirements to achieve the MDG targets relevant to water and sanitation coverage whereas gaps were based on a qualitative assessment.

In Timor Leste the study was conducted over a period of two months by two consultants and focussed primarily on Dili, the capital city and five other districts. The consultants based their calculations of HR shortages on construction of new infrastructure, excluding personnel needed for operation and maintenance. The approach adopted considered how services are currently delivered and then sought to estimate the required expansion of existing HR capacity to meet the MDG targets. Consequently, the results should therefore be viewed as a guide only to the magnitude of HR required—not a precise determination of numbers within each occupational category. Adopting a different strategy to service delivery, however, might be more effective and may require different levels of HR capacity—or a different combination of disciplines and skills..

Although, human resource requirements for hygiene promotion were not quantified, these were taken into consideration during the qualitative discussions with the relevant stakeholders. The focus on higher skilled and educated personnel meant that an assessment of semi-skilled and unskilled workers was not included in the study, nor was the voluntary labour and expertise within communities which are considered to be an important HR resource in the WASH sector.

## 2 Coverage and MDG deficit

Goal 7 MDG targets for Timor Leste are set out in Table 1 based on coverage figures at independence in 2002. There is however some discrepancies in the targets reported in the literature. For example, the 2006 Timor Leste Human Development Report (UNDP 2006) states a rural sanitation target of 41%

**Table 1.** Existing coverage and deficits in relation to MDG targets (in terms of population)

	Water		Sanitation	
	rural	urban	rural	urban
Population	898,900	283,900	898,900	283,900
2009 coverage (worse and best case)	45% - 58%	60% - 82%	20% - 39%	62% - 77%
MDG target	75%	86%	55%	64%
2015 coverage required	774,500	280,400	567,900	208,700
MDG deficit, best case	272,916	56,458	230,628	-
MDG deficit, worst case	385,340	116,400	394,940	39,700

rather than 55% reported elsewhere in the literature. Table 1 sets out the projected urban and rural populations for 2015 based on an annual population growth rate of 3.05% (World Bank 2008). Given the current trend towards urbanisation (UNDP 2006), these projections may overestimate the 2015 rural population and underestimate the urban populations. But due to the uncertainties involved, no attempt has been made to incorporate this factor into the analysis.

In addition, assessments of existing coverage of water and sanitation facilities vary depending on the definitions applied in different studies. The most recent estimates reported by the Government of Timor Leste and the UN (RDTL 2009) were drawn from the Timor Leste Survey of Living Standards (TL-SLS) (Direcção Nacional de Estatística 2007). The existing coverage figures based on the TL-SLS are likely to significantly overstate real access to improved water supplies and sanitation. For this reason the TL-SLS data presented in the 2009 MDG progress report represents a 'best-case' scenario. A more likely coverage deficit in 2015, based on other estimates for existing coverage is set out as the 'worst case' scenario.

The projected population figures and MDG targets provide the basis for estimating the 2015 coverage

requirements. These are shown in Table 1 alongside best estimates of the 2009 coverage figures. Comparing the 2009 and 2015 figures enables an estimate to be made of the number of additional staff required if the MDG targets are to be met.

Water supply and sanitation delivery in Timor Leste is currently characterised by low rates of access, particularly in rural areas. Additionally, poor design and construction of water systems, along with unrealistic expectations regarding community management and maintenance of water systems, has resulted in up to 30% of systems failing within the first year of use in some areas. As a result between 90 and 130 rural water supply systems per annum need to be constructed or rehabilitated.

Urban centres are served by piped water

supply systems run by government agencies. Urban coverage is much higher than in rural areas, but service is often intermittent and many households rely on other, unprotected water sources to supplement the piped supply. There are no sewerage systems in Timor Leste and therefore all sanitation in both urban and rural areas involves some form of onsite system to manage excreta.

The Government of Timor Leste is committed to improving access to water, sanitation and hygiene services. The National Development Plan prepared in 2002 set the ambitious objectives of providing 'safe' water to 100% of urban households and 80% of rural households by 2020 and for centralised sewage systems to be established in all urban areas (RDTL 2003). The National Development Plan also included hygiene promotion with an objective to 'inform the public of safe water and sanitation practices that systematically improve the environment and enhance human health and welfare' for 100% of the population'.

The National Development Plan aims to exceed the Millennium Development Goals targets which would result in an increase to 72% for potable water and 60% for improved sanitation (RDTL 2009). In 2006, the timeframe for achieving the goals of the National Development Plan was brought

**Table 2:** Infrastructure requirements to meet the MDG targets (2009 – 2015)

	Water		Sanitation	
	rural	Urban	rural	urban
Best case scenario				
Existing assets	1,000	39,300	59,200	36,900
Required additional assets	550	9,900	40,500	-
Annual increase required (over 6 years)	90	1,650	6,750	-
Worst case scenario				
Existing assets	780	28,800	30,300	29,600
Required additional assets	770	20,400	69,300	7,000
Annual increase required (over 6 years)	130	3,400	11,550	1,167



forward to 2015, in line with the MDG target, illustrating the importance the government placed on improving WASH services.

Based on the ranges detailed in the literature on existing coverage, it is possible to determine best-case and worst-case scenarios for meeting the urban and rural water and sanitation MDG targets (see Table 2). Using the deficits associated with these two scenarios, it is possible to estimate the approximate increases that will be required in rural and urban WASH infrastructure if the MDG targets are to be met.

Requirements for meeting the urban water targets are based on an estimate between 1600 and 3400 for additional households to be connected to piped water supply systems each year. It is noted, however, that whilst the number of additional connections is relatively small, the real issue for urban water is level of service and quality of water at point of consumption. The demand for sanitation is much higher especially in rural areas where between 7000 and 12,000 households require access to sanitation each year.

### 3 Sector context

#### Overview of institutional framework for service delivery

The National Directorate for Water and Sanitation Services (DNSAS), part of the Ministry of Infrastructure, bears responsibility for managing water supply systems. Various multi-lateral and bi-lateral donor agencies play a strong part in WASH funding to enable Government agencies to engage private sector firms and local NGOs to rehabilitate or construct new WASH infrastructure. But for large projects, construction contracts typically go to Indonesian companies. Promotion and support for onsite



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sanitation is provided by DNSAS and two departments within the Ministry of Health; namely the Environmental Health Department and Health Promotion Department. The Ministry of Health takes on responsibility for hygiene promotion at the community level through its network of health clinics and mobile health teams. Government legislation requires communities in rural areas to manage their own infrastructure and to establish their water user groups.

#### Current human resource capacity

Staffing records for government agencies were reviewed to determine the existing profile of WASH staff. Within DNSAS and relevant Ministry of Health departments there are approximately 235 staff with WASH-related skills. DNSAS has only three engineers and

a small number of other staff with tertiary qualifications working in senior management. A cap on the public service in Timor Leste has resulted in very little expansion of government staffing with WASH qualifications since independence in 2002. There is a low turnover of staff within the Ministry of Health and therefore it is not a major provider of HR capacity in the sector.

There are a number of WASH donor programmes operating in Timor Leste and findings from the study suggest that foreign expertise will continue to be an important element in Timor Leste's response to meeting the MDG targets. Some projects such as AusAID's Rural Water Supply and Sanitation Programme (RWSSP) are nearly 100% staffed by foreigners, as Timorese with appropriate

skills are not available outside of Government.

Private sector contractors also make an important contribution to WASH-sector HR capacity through the skilled workers they bring into Timor Leste from overseas. Foreign workers in particular play a significant role in meeting WASH-sector HR needs for contracting firms. Particularly with engineers and other professionals, where training and establishing experience requires at least five years, findings from the study suggest that foreign expertise will continue to be an important element in Timor Leste's response to meeting the MDG targets.

Currently, the private sector and NGOs employ a total of 224 and 184 WASH staff respectively. This consists of 82 engineers, 121 associated professionals, 152 technicians and 98 skilled workers. The total number of staff in firms that were identified to have WASH expertise is approximately equal to the number of government WASH staff. However, private contractors and NGOs have access to many more WASH engineers than the government agencies. Even so, most of the NGO or private sector staff with engineering qualifications and also many of the technicians and skilled workers are foreign personnel who typically do not speak Tetun, Bahasa Indonesia or Portuguese.

#### Gender participation

Timor Leste has quite a low level of women participation in the workforce, with 14 women out of 235 working in government, 4 out of 224 working in the private sector and 34 out of 184 working for NGOs. Of these none are technicians (e.g. masons, plumbers, lab technicians) and most are skilled workers (e.g. artisans, well builders and waterworks operators).

## 4 Capacity for human resource development

Donor agencies and INGOs are significant providers of WASH-related training, particularly in relation to rural programmes, but also for government staff working on urban systems in the national capital. Donor-funded programmes in Timor Leste including those by AusAID, USAID, ADB and Government of Japan - are a significant driver for development of HR capacity in the WASH sector. These programmes both design and deliver training courses and capacity building programmes and also fund the formal training sector to do the same. The programmes typically aim to build HR capacity in the following areas: leak detection, zone caretakers, customer service and meter testers. They are designed more to improve existing HR capacity in the WASH sector rather than increase the HR pool. Although private sector contractors do not operate programmes for training in the WASH-sector, it is evident that they may help national staff, both unskilled and semi-skilled, develop their skills on the job.

#### Universities and technical Institutions

Education levels are increasing steadily

but many entrants to the labour market have limited formal or vocational education. There are twelve technical secondary schools and nine vocational training centres which run construction training courses. These teach basic carpentry and construction skills relevant to the WASH sector. But none of these provide WASH-specific training. Consequently, school leavers require further vocational or university training to gain the necessary skills to work in the WASH sector at a skilled or professional level.

WASH-related skills can be acquired at four universities; two of which focus on civil engineering and the other two are public health oriented. Whilst the engineering schools offer some broader WASH-related training on their curricula, not all content required to train WASH engineers is covered and the courses provide low levels of practical training. As a consequence, one major donor-funded programme has arranged for senior government staff in the National Directorate for Water and Sanitation to upgrade their formal WASH training at an Indonesian university.

The National University of Timor Leste (UNTL) is a government funded university



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which provides Diploma courses in civil, mechanical, electrical engineering, containing limited training in broader WASH aspects. Out of the total of 30 students that complete an engineering diploma, approximately ten will have completed the WASH-relevant subjects. The Dili Institute of Technology (DIT) is a private university that offers a Bachelor of Engineering in Civil and Construction Engineering. Similar to UNTL, there is no opportunity to specialise in WASH but several subjects relevant to WASH are included in the course material. The engineering courses are not considered to be comprehensive enough to train WASH engineers.

There are two private universities (UNPAZ and UNDIL) with public health courses where WASH-related skills can be acquired. Enrolments range from 100-200 students per year, but graduating students only number on

average about 55 per year. A component of professional experience is required prior to graduation and is usually completed in government position such as district health centres. UNPAZ staff estimate that for recent graduates about half have been employed in government agencies and half in Timorese and international NGOs, with very few finding employment in the private sector.

Several scholarship programmes operate in Timor Leste providing the opportunity for study at foreign universities. The Ministry of Health provided funding for approximately 40 staff to complete a public health degree in Indonesia. It is reported that all these staff have returned from their study and are working in the Ministry. In addition, there are a considerable number of Timorese students studying abroad through independent means. There is anecdotal evidence to show that

return rates from overseas universities may be quite low, and the relevance of what people learned overseas (and locally) and actually ability to apply in institutional framework. Moreover, there is limited absorption capacity and/or job opportunities on return in the formal sector.

### Vocational training

There is only one course that has been designed specifically to train WASH technicians. This six month course run by Centro Nacional de Emprego e Formação Profissional (CNEFP) has only recently been developed and has produced two batches of 10-15 graduates. In addition to the training available in Timor Leste, there are a large number of students at foreign universities under scholarship arrangements, some of which are studying engineering, public health and water resource management.

There are also nine official training centres that provide courses relevant to the building and construction industry. The focus of the training is on electrical skills (6 institutions), welding (3), plumbing (3), masonry (5) and carpentry (9). Since 2007, the number of graduates with construction-related skills has increased from 344 to 809 in 2009. There is however significant variation in the qualifications and experience of staff and there are no official standard qualifications. Only 3% of all those trained at these institutions were women. It is not known what proportion of these has acquired a job in the WASH sector.

Most DNSAS staff acquires skills through on-the-job experience and by vocation training funded by donor partnership programmes. DNSAS is recruiting and training 80 Sub-District Facilitators (SDFs) to provide a link between communities and government WASH services.



**Table 3.** Estimated capacity shortage (best and worst case scenarios) by HR category needed to meet the MDG targets

	Currently available HR		Rural water target	Urban water target	Rural sanitation target	Urban sanitation target	Total	Increase on current availability
Engineers	82	Best case	20	0	5	0	25	28%
		Worst case	40	14	12	4	70	79%
Professionals	121	Best case	70	1	5	0	76	58%
		Worst case	140	3	12	4	159	121%
Technicians	152	Best case	70	4	50	0	124	72%
		Worst case	140	13	120	40	313	182%
Skilled	98	Best case	80	20	-	-	100	93%
		Worst case	150	60	-	-	210	196%

## 5

### Assessment of human resource needs to meet the MDGs

The data set out in Table 3 provides the basis upon which to consider the HR capacities in each occupational category required to meet the MDG targets. The best and worst case scenarios help provide a range within which HR demand may be assessed, but due to the inherent uncertainties in the methodology, these numbers should only be seen as being indicative of the magnitude of the HR shortage.

A wide range of factors, influence both the capacity of the existing pool of HR and the potential impact of future increased capacity, but clearly these values suggest that there is a significant short-fall in WASH HR capacity required to meet the MDG targets in Timor Leste. The need for technicians and skilled workers is evidently the greatest. However, it is observed that under the best-case scenario, the urban sanitation MDG target has already been met and would require no additional HR capacity. At the current rate of HR supply, shortages will slowly decrease in all categories but remain throughout the

period within which the MDGs are to be met. However, although technicians and skilled workers represent the greatest deficit, they are the most easily trained and the shortage can be addressed most rapidly. But greater consideration is required to consider how they will be most effectively trained with the right set of WASH related skills.

#### Rural WASH

Rural water supply has largely been addressed to date by the NGO sector. The estimate of the shortfall is based on an HR pool of NGO staff for installing and rehabilitating systems at two to three times the current rate. For rural sanitation, the staffing demand is based on 25 to 60 pairs of female/male sanitation mobilisers working in two to three communities a year. It is assumed that for each five pairs of sanitation mobilisers, there is a need for one additional health professional and one sanitation engineer.

#### Urban WASH

For urban water, the additional staffing is based on an increase of between 10%-30% of current government staff and additionally one WASH engineer for each district and two working in Dili. Urban sanitation projects are envisaged

to focus on the construction of reticulated sewerage systems in all population centres in accordance with the National Development Plan. As noted above, this type of construction requires the need of international expertise supported by the private sector in Timor Leste, which requires less capacity building of national staff. This accounts for the low HR requirements even in the best-case scenario. However, it is important to note this has implications for continuity and institutional memory, and most importantly for sustainability and therefore, this approach is not the recommended option. In addition, other forms of improvement of urban sanitation are possible which are less dependent upon sewerage. The human resource requirements for these options have not been evaluated.

#### Impact of operational sustainability on HR needs

Operational sustainability of infrastructure is a pivotal factor in the relationship between increased HR and changes in WASH coverage. For instance in two rural districts, Plan International found that if all the water supply systems built in districts since independence were still working, then the rural water MDG target for those



districts would already have been met.

Other studies by INGOs found similar failure rates. If the sector continues with this low rate of infrastructure sustainability then the HR capacity required to reach the MDGs will be two or three times greater than estimated above. Even with the current HR capacity, the annual increase of rural WASH coverage might be almost doubled if new systems were adequately sustained.

A similar concern arises for new urban infrastructure, for which the government bears maintenance responsibility. Increasing HR capacity without responding to sustainability concerns would be an inadequate response to the MDG challenges leading to poor system performance and failure of service delivery mechanism.

## 6 Recommendations for meeting human resource needs

In response to the above conclusions regarding HR capacity gaps, two sets

of issues require consideration. Firstly, what needs to be achieved to ensure that the HR currently being developed in Timor Leste is of a suitable standard; and secondly, what non-HR factors will influence whether additional HR results in increased WASH coverage. Bearing in mind the limitations and inherent assumptions in the research, the study identifies the following actions as having strong potential to contribute towards meeting the WASH-related MDG targets:

### In the short-term:

- ▶ Government and NGO sector develop training programmes for WASH sector community and sanitation mobilisers within existing training institutions and ensure that incentives are provided to ensure that private sector contractors attend.
- ▶ Ensure that CNEFP receives support to offer the rural WASH technician-level training programme biannually and consider replicating the course with other training institutions.
- ▶ Recognise the importance of foreign workers to meeting the WASH MDGs but seek ways in which to ensure better transfer of skills.
- ▶ Establish a scholarship scheme to identify and support promising WASH-related engineering students within UNTL and DIT.
- ▶ Through donor agencies and INGOs, develop mechanisms to provide practical WASH related work experience for Timorese graduate engineers.

### Over the medium-long term:

- ▶ Create the appropriate institutional structures to provide the means

towards promoting more effective asset management practices.

- ▶ Use the opportunities created by decentralisation to increase public sector WASH staffing levels at the district level.
- ▶ Increase linkages between training institutions and implementing agencies so that trainee's skills are better matched to workplace requirements.
- ▶ Develop capacity within the NGOs and/or private sector agencies to provide ongoing support to community management of infrastructure.
- ▶ Ensure that there is adequate HR amongst sector actors, particularly in government institutions, to maintain the expanded stock of WASH infrastructure.
- ▶ Evaluate the effectiveness of Institut Teknologi Sepuluh Nopember (ITS) in Surabaya in Indonesia for training of DNSAS staff and consider offering similar training opportunities for additional DNSAS staff.
- ▶ Establish a scholarship programme for WASH-specific engineering in overseas institutions, such as that being pursued by RWSSP with ITS in Indonesia.
- ▶ Through the Secretary of State for Vocational Education and Employment (SEFOPE) and the National Institute for Workforce Development (INDMO), develop national training and certification standards for WASH-sector qualifications.
- ▶ Donors accommodate longer time frames for water and sanitation projects to accommodate the low capacity in the sector as well as providing opportunities to train and build capacity on the job. ■