

Briefing Note • Bangladesh

Key points

- ▶ At the national level, there is a lack of clarity or fulfilment of the roles and responsibilities amongst the agencies involved in establishing and operating water and sanitation systems. As a result, the human resource (HR) capacity within the sector remains fragmented. There is a need for a single agency with a clear mandate to provide the strategic lead and co-ordinate activities within the sector.
- ▶ The total number of persons employed in the water and sanitation sector in Bangladesh is estimated to be approximately 41,000 in 2009. Approximately 83% of these are categorized as technically qualified and the remaining 17% are comprised of management support and administrative staff. Over 40% of the total work in rural areas is undertaken by associated professionals working for NGOs with a strong focus on health and hygiene promotion.
- ▶ Amongst the three broad sectors of employment, the private sector currently employs more than half of the total technical staff followed by the public sector (30%) and then the NGO sector (18%). The sector is dominated by men. Only 14% of the total persons engaged in the sector are women, many of whom are employed by NGOs.
- ▶ More than 2600 engineering students graduate with university degrees per year (22% from schools of civil engineering), but not all of these will be employed in the water supply and sanitation sector. In terms of the number of students qualifying with a diploma, the number has risen from 1833 in 2005 to 4079 in 2009 and the total number in 2010 is expected to be 4170. Out of these approximately one third are expected to qualify in civil engineering.
- ▶ Public sector agencies such as The Department of Public Health Engineering (DPHE) and the Water and Sewerage Authorities (WASAs) predominantly employ engineers and technicians, but many of these are not well-equipped with the range of skills required for ensuring sustainable and hygienic water and sanitation facilities. Many of the WASA workers are untrained and the level of supervision tends to be poor. This results in poor quality of work and unsatisfactory facilities.
- ▶ According to the current Government statistics, there is relatively little progress required to achieve the target coverage of water and sanitation facilities. Therefore, according to methodology piloted by the study, there is little shortage in numbers of staff to achieve the Millennium Development Goal (MDG) targets. However, this does not take into consideration the quality of service delivery or the need for human resources to operate and maintain water supply and sanitation systems.
- ▶ Therefore, based on expected investments and estimates of staff requirements provided by the various organisations and companies working in the sector, the study estimates that the future requirement of total workers in the sector will almost double by 2015 (from 40,708 to 80,554) which is 74% higher than the existing provision. The estimated increase in engineers is 2.5 and that of associated professionals is 4.7 times the respective current values.
- ▶ To achieve this goal, the WASH sector will need to offer more competitive employment packages and opportunities for career development. In addition, there is a need to attract professionals with a broader base of skills and attract specialists from the social sciences to work in the WASH sector for a more balanced HR composition.
- ▶ There is a need to improve standards of teaching in Bangladesh as part of continuing education of WASH professionals. Staff who have received training should be encouraged to share their new knowledge with their peers as part of in-house vocational training.

1 Background

This Briefing Note summarises the findings from a study in Bangladesh 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 framework was piloted in each country to collect relevant data and information



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Table 1: Coverage of improved water and sanitation facilities in relation to Government targets

		Base year 1991 ⁱ	Status (MICS 2006)	Current Status (MICS 2009)	Target at 2015
		%	%	%	%
Water supply	Rural	93.1	97.1	97.4	96.5
	Urban	98.8	99.2	99.5	100
	Total	89.0	97.8	97.8	100
Sanitation	Rural	15.3	31.9	78.9	100
	Urban	61.2	56.8	86.4	100
	Total	N.A.	39.2	80.4	100

Note i) Reference: Millennium Development Goals: Bangladesh Progress Report, Jointly prepared by GoB and UNCT.

using institutional surveys, semi-structured interviews and focus group discussions. The methodology used four broad categories to assess staffing requirements:

- 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.
- 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).
- 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.
- 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.

The study did not attempt to assess the number of semi-skilled and unskilled workers as there were considered to be too numerous and too complicated to identify and quantify. Human resource requirements for hygiene promotion were also not quantified; but were considered during qualitative discussions with the relevant stakeholders.

The study, which was undertaken by the Capacity Building Service Group (CBSG), covered one urban area and three rural areas. A total of thirty-three organisations were contacted during the research. Obtaining reliable data on which to make estimates on exiting numbers of workers proved to be problematic due the lack of a comprehensive data on the sector. Additionally, except for a few NGOs,

most organizations do not have any strategic plan or human resource plan on which to source data. In addition, the distinction between skilled and unskilled workers was considered to be simplistic because many employees perform a range of tasks – some of which require a specific skill whereas others require no specific training.

2 Existing coverage and MDG deficits

Table 1 summarizes the official coverage statistics according to the Multiple Indicator Cluster Survey (2009).

Bangladesh has set targets for access to safe water to be 100% in urban areas, 96.5% in rural areas, and 100% for sanitation in both rural and urban areas by 2015. As the current estimates for access to improved water and sanitation facilities are already much higher than in many other countries of a similar level of socio-economic development, it is questionable whether estimates of human resource requirements based upon the difference between current access and government targets is a good basis for calculating HR needs.

3 Sector context

Overview of institutional framework for service delivery

The Department of Public Health Engineering (DPHE) is the national government agency responsible for the provision of water and sanitation facilities in rural areas. The Water and Sanitation Authorities (WASAs) are responsible for the delivery of water and sewerage services in the larger cities, whereas local government authorities implement water supply projects in the 300 smaller municipalities (Pourashavas). The Local Government Engineering Department (LGED) is also involved in the construction of larger sanitation infrastructure – particularly sewerage and drainage systems in urban areas

that do not fall under the responsibility of the WASAs.

In general, there is a lack of clarity in terms of mandate between these agencies about their specific roles and responsibilities in the sector. As a result, different agencies perform similar functions and no single agency has developed sufficient competence for the sector as a whole. In addition, in the larger cities, coordination gaps are seen between the WASAs and the respective city corporations who, in most instances, would prefer municipal services to be brought under their administrative domain.

Current human resource capacity

The total number of persons employed in the water and sanitation sector in Bangladesh 2010 is estimated to be approximately 41,000 (see Table 2). Of these, approximately 83% are categorized as technically qualified and the remaining 17% are comprised of management support and administrative staff. Over 40% of the work in rural areas is undertaken by associated professionals working for NGOs with a strong focus on health and hygiene promotion.

Among the three broad sectors of employment, the private sector currently employs more than half of the total technical staff (including all four categories assessed in the study) followed by the public sector (30%) and then the NGO sector (18%). Most (above 95%) semi-skilled workers engaged in private sector are illiterate and many do not progress beyond this job category. They tend not to undertake formal training arrangement but acquire skills through working as assistants or apprentices.

The government sector employs the majority of engineers (73%), many of whom join private consultancy firms upon retirement. The NGO sector employs the vast majority of associated professionals, the bulk of who are women. The data shows that the NGO sector does not employ technicians or skilled/semi-skilled workers because these are contracted in from the private sector.

Qualified engineers are normally Diploma degree holders, followed by Bachelor degree and Masters graduates from civil engineering who dominate the staff pattern in public sector. In DPHE for example, the total number of graduate engineers is approximately 111, only

two of them graduated with mechanical engineering degrees.

Public sector agencies such as DPHE and WASAs predominantly employ engineers and technicians, but many of these are not well-equipped with the range of skills required for ensuring sustainable and hygienic water and sanitation facilities. Many of the WASA workers are untrained and the level of supervision tends to be poor. This results in poor quality of work and unsatisfactory facilities.

Recruitment is a tedious and lengthy process in public sector agencies. Compared with the public sector water utilities controlled by DPHE, Dhaka Water and Sanitation Authority (DWASA) has a high degree of functional autonomy for HR matters including recruitment of officers and staff. DWASA's corporate management structure, enacted by law in 1996, underpins good HR practices. However, even with this autonomy, the recruitment process can be prolonged. For instance the position of commercial manager and the recruitment of four training officers took about five months.

Career progression is also extremely limited in the public sector agencies.

Table 2: Summary of current HR situation (existing staff in 2010)

Staff category	Employment Sector			Total	Rural staff
	Government	NGO	Private		
1. Engineers	1,586	110	464	2,160 (5.4%)	27%
2. Associated Professionals	135	6,162	107	6,404 (66%)	98%
3. Technicians	6,300	-	1,361	7,661 (0.7%)	49%
4. Skilled and Semi-skilled workers	2,028	-	5,631	17,659 (0%)	35%
Sub Total: Technical Staff	10,049 (1.5%)	6,272 (67%)	17,563 (2.1%)	33,884 (12.9%)	47%
	30%	18%	52%		
5. Other Management Staff	4,464	631	1,729	6,824	15%
Grand Total	14,513 (1.6%)	6,903 (63%)	19,292 (3.8%)	40,708 (13.9%)	41%
	36%	17%	47%		

Note: i) Numbers in brackets indicate percentage of female staff in each category

ii) Values in the NGO employment sector for technicians and skilled/semi-skilled workers is due to outsourcing

Employees generally stay in the same position for many years. This has a negative impact on staff motivation and subsequent performance. In addition, DPHE has not been allowed to recruit staff for the last 18 years even though demand for the services has increased massively both in terms of quantity and quality. To overcome this, staff are employed on a contract basis both after retirement from the same organization and from outside. This situation also has a negative impact on the productivity of permanent staff.

Governmental organisations employ very few staff from a social sciences and communications background. This typically means that hygiene issues remain inadequately addressed. The NGO sector employs mainly 'associated professionals' such as hygiene promoters but relatively few technicians and other (semi) skilled persons. The majority of NGO staff are younger than their counterparts in the public and private sectors and have worked in the sector for less than 10 years; many with less than 5 years experience.

Various development agencies and international financing institutions also engage WASH sector professionals, but they mainly contract specialists for specific inputs for the programming, design and monitoring of projects with water supply and sanitation components. There are also many private agencies (contractors, consultancy firms and independents) that play an important role in different aspects of service delivery. These companies employ a large number of retired public sector engineers boosting the professional expertise in the private sector. Therefore, the capacity lost in the public sector due to retirement - and low level of fresh recruitment - is compensated by the growth of private sector.

A general problem is that careers in the water and sanitation sector are not generally the preferred choice of graduates from the technical universities and higher level training institutions. Graduates prefer to work on more prestigious structural and civil engineering projects such as infrastructure or to manage water resources, buildings and transport projects. In addition to these are the highly attractive offers from overseas that compete for the top graduates.

Most technicians and skilled workers have received some form of specialist or vocational training. In the private sector, the skill base of staff in these categories is either developed through structured on-the-job training, or more commonly through an unstructured apprenticeship from supervisors and peer workers.

Sector agencies are dominated by men

Institutionally, there are no policy incentives and preferences for the recruitment of women and, apart from the NGOs, most water and sanitation

sector agencies are not sufficiently aware of the important role to be played by women in the promotion of better water supply and sanitation systems. As a result, the number of women employed in the sector is very low. Out of the total, 14% of staff that are women, only 5% have engineering degrees, 0.6% are qualified technicians and 19% are administrative staff. The remaining associated professionals are virtually all employed by NGOs working on community level hygiene promotion activities.

The balance of women on engineering and technical courses is improving in higher education, but there is low enrolment of female students on water and sanitation sector specialist courses. Even though large numbers of women graduate from the social sciences, relatively few are employed by agencies responsible for water and sanitation. It is also rare to find women working in any organization either at the top management level or lower down as skilled and semi-skilled workers.



Credit: Essam al-Sudani

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Capacity for human resource development

Universities and technical Institutions

Under the Ministry of Education there are a total of eighteen technical universities (thirteen in public and five in private sectors), 154 Polytechnic Institutes (104 private and 50 public) and several vocational institutes. With a few exceptions, all graduate engineers, diploma holders and technicians are alumni of these institutions. Disciplines of civil, electrical, mechanical and chemical engineering are relevant to the water supply and sanitation, but the majority of them come from civil engineering departments. Of these four disciplines together, more than 2600 students graduate per year with university degrees per year (22% from schools of civil engineering), but not all of these will be employed in the water supply and sanitation sector. In terms of the number of students qualifying with a diploma, the number has risen from 1833 in 2005 to 4079 in 2009 and the total number in 2010 is expected to be 4170. Out of these approximately one third are expected to qualify in civil engineering.

There are four main universities that train graduates on a various subjects specifically related to the water and sanitation. As well as training civil and structural engineers, who are employed predominantly by the government agencies, these institutions also train in subjects such as water resource management, water quality, health promotion and social sciences. In addition there are numerous technical institutions and colleges - mainly public but also some private - from where many technical personnel are recruited.

The most well known training institute is the International Training Network (ITN) centre based at the Bangladesh

University of Engineering and Technology (BUET) which plays an important capacity building role in the water supply and sanitation sector with particular emphasis on human resources development. Among these sector-specific training facilities, the ITN concentrates on training of trainers, decision makers and faculty members from educational institutions. ITN also offers specialized needs-based training and issue-based short courses and workshops specific to problems such as arsenic in ground water. There is also an important role for the Institute of Engineers, Bangladesh and the Bangladesh Engineers Registration Board.

Other important training centres that cater specifically for the sector are the Bangladesh Institute of Management (BIM) and the National Institute of Local Government (NILG). Key participants of NILG which specializes in urban service provision are government officials and staff, local government representatives (chairpersons, members and officials of Union Parishads, Pourashavas and City Corporations).

Professional development and vocational training

The internal training centres of DPHE and DWASA provide relevant job-oriented training to staff. DWASA, with support from the Asian Development Bank (ADB), has provided training to mechanics/plumbers working across the city to improve the quality of work. DPHE also provides training to Pourashava staff on technical and managerial issues to equip them to maintain and operate water systems.

The NGO Forum is also actively involved in training of sector professions in the rural sector through its National Resource Centre and regional training centres. NGO forum provides essential

training (including training of trainers) with a specific focus on sanitation and hygiene promotion coupled with social and awareness issues to its partner agency staff, other NGOs and the private sector.

In addition, an estimated 21,000 students qualify per year from various vocational institutes in Bangladesh with skills related to civil engineering (10%), technical design and drafting (2%), general mechanical (27%) and electrical skills (61%), and plumbing and pipe fitting (< 1%). This has increased from less than 4000 in 2005 with a considerable leap in 2007 to over 1100 and another leap to over 17,000 in 2008. However, a significant proportion have not been successful in finding relevant work and are either unemployed, or working in a profession alien to their educational background. This indicates that there is a surplus of supply of human resources in the market place both for the water supply and sanitation sector as well as other sectors.

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Assessment of human resource needs to meet the MDGs

The average allocation in 2007-08 was between 2.5%-3% of total expenditure in the Government of Bangladesh's (GoB) Annual Development Plan (ADP). Increased allocations are observed in recent years to 3.6% in 2008-09 and 4.8% in 2009-10. The substantial increase in budget allocation reflects the government commitment to achieve 100% coverage of water and sanitation by 2011 and 2013 respectively. In addition to public investment, private investment in WASH related activities has also increased significantly. In the short-term, an investment plan is being prepared as part of the Sectoral Development Plan (SDP). There is envisaged to be a need for an

investment of USD 3.1 billion for the period 2010 – 2015. The increased trend in investment in the water and sanitation sector will result in an increased demand for trained professionals, particularly for urban projects.

A further increase in staff is expected as a result of the Sector Investment Plan (SIP) which estimates that a fund of US\$ 3076 million is required for the implementation of programs to achieve water and sanitation targets during 2010 –2015. This equates to an investment of approximately US\$ 615 m annually compared to the current ADP allocation of US\$ 215 m per annum. Of the total allocation, approximately 30% is assumed to be contributed by private users and only 1% by NGOs. With 30% of users' contribution on US\$ 215m of ADP allocation and around 85%

utilization rate of ADP in the country, the total fund to be utilized thus stands at US\$ 230m. On the basis of these findings, HR requirements are estimated to be 170.

In addition, a growth rate of 10% per year is observed in the real estate business in Bangladesh and around 700 companies are engaged in the sector for constructing medium to high rise buildings in the big cities of the country. With the increased activity in construction, the demand for technical and skilled personnel including those required for water and sanitation infrastructure and services is expected.

As part of ongoing restructuring in the public sector, both DPHE and DWASA have reconstituted their organizational structures. This is expected to require an

additional 4375 qualified staff in DWASA from the existing 3657 and from 4975 to 6931 at DPHE. Most of these increases are related to engineering and technical positions. In addition, the Government is making a move to enable DPHE to recruit for the vacant positions which have been 'frozen' for more than 18 years. It is therefore anticipated that a large number of recruitments will take place in both these organizations in the near future.

The GoB gives high priority to strengthening local government institutions (Union Parishads) to provide services to rural populations. To achieve this, the GoB is considering placing a technical person in each UP level to augment water and sanitation services to the rural area. This is envisaged to create a demand for an additional 4500 technicians.

Demand and supply of WASH professionals in next five years

The calculations of HR demand in the public sector up until 2015 summarized below are based upon estimates using data from DPHE and municipality data collected from 136 Pourashavas which was statistically interpolated to estimate the total for 309 Pourashavas. An annual attrition rate of staff was assumed which reduced the current ratio of 14.5 staff per 1000 household connections at urban level to 10 per 1000 connections.

Based on these calculations, it is estimated that the future requirement of total workers in the sector will almost double by 2015 (from 40,708 to 80,554) which is 74% higher than the existing provision. In the public sector there will be an additional requirement of around 900 staff, while a total of some 14,000 staff in technical disciplines, an increase of 2.4 times is expected. The estimated increase in engineers is 2.5 and that of associated professionals is 4.7 times the respective current values. Thus,



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Table 3: A comparative analysis of demand and supply of public sector staff

Type of employee	Existing HR in the WASH sector 2009	Projected HR demand 2010 - 2015	Potential need for additional HR 2010 - 2015	Projected supply in 5 years 2010 - 2015	Proportion of HR need to be absorbed in WASH (%)
Engineers	2160	5023	2863	11500 ¹	25%
Associated Professionals	6404	16438	10034	- ³	-
Technicians	7661	18359	10698	105900 ²	10%
Skilled workers	17659	30123	12464	- ³	-
Total	33884	69943	36059	-	-

Notes 1) Only the supply of BSc. and Diploma Civil Engineers is the considered
 2) Supply from relevant vocational disciplines are considered
 3) Estimates could not be made

3550 skilled workers are estimated to be required in 2015 against the present number of 2028.

In the NGO sector, there is an expected overall increase of 150% (from present 6903 to 17,446 persons), but the proportional increase in staff engaged in management activities is expected to be far higher than those required for technical activities. These estimates are mainly based on water and sanitation programme of BRAC (currently operating in 150 sub districts), but expected to extend to 450 areas in which other NGOs are working.

Engagement of technicians and skilled workers by NGOs from the private sector is also envisaged to continue in the future. It is estimated that there will be an increase of technical staff required by the private sector by a total of 70% (from 19,292 in 2009 to 29,857 in 2015). This estimate is based upon the assumption that cooperation with public and NGO sector will continue.

Table 3 summarises the demand and supply for the next five years (2010 – 2015) but these estimates are confined only to the demand and supply in public sector and are based on the number

of vacant positions and staffing. It is evident that the demand for human resources in the water and sanitation sector will rise considerably over this time frame. However, for civil engineers, assuming that a minimum of 10% of graduates are employed in the water and sanitation sector, the study concludes that there is currently an adequate supply graduating from the educational institutes.

Against the total requirement of 19,983 staff in 2009, for all categories and agencies, 14,513 positions were filled. This suggests a vacancy of approximately 5,470 employees (27%) in the public agencies involved in WASH sector. The highest number of vacant positions is in the category of technicians (2,424 staff), followed by engineers (1,412), skilled worker (624), associated professionals (147), total shortage in technical staff stands at 4,607. The shortage in the administrative and management category is estimated to be 863 staff.

It is difficult to assess the capacity of smaller, less well-recognized training institutes as well as the potential of on-the-job training and apprenticeships to meet the need. It was also not possible

to make an accurate estimate of the anticipated supply of human resources for the associated professional category. However, there are a number of public and private universities producing a large quantity of people with Masters Degrees that could potentially work as associated professions in the watsan sector.

6 Conclusions and recommendations for meeting human resource needs

At face value the number of technicians appears to be sufficient to meet expected demands, but the specific skills required for water and sanitation programming and the ability of existing human resources to face new challenges poses a big question. Many staff members who theoretically have the expertise may not have the ability to apply the skills and knowledge that they were taught, and therefore need to retrain to become competent and proficient. In addition, the more senior and experienced staff with greater knowledge and experience are often overloaded with routine administrative matters. Therefore they are not in a position to apply their skills – or more importantly to provide direct tuition of younger staff members.

Thus, although there appears to be no shortage of staff (in terms of quantity) in the NGO or private sectors at present, there are HR gaps in terms of the quality of service delivery in both rural and urban areas which is not considered to be satisfactory. Overall demands from the sector can only be met provided that staff are trained and supported by a capacity building programme. In addition, provided there is greater clarity on the institutional roles and responsibilities, the deployment of staff can be enacted more effectively and

efficiently so that the need for highly skilled human resources at the national level can be reduced. At other levels, existing human resources can also do their jobs more effectively without the need for extensive training and or resource intensive capacity building programmes.

Short term recommendations

1. At the national level, there is a lack of clarity amongst the agencies involved in establishing and operating water and sanitation systems. Therefore the HR capacity developed within these institutions remains fragmented and imbalanced. There is a need for a clearer definition and meeting of the roles and responsibility in the WASH sector and a sectoral agency with a clear mandate to lead on a comprehensive HR development strategy.
2. The WASH sector is not generally the preferred choice for new graduates from the technical universities and institutions. The WASH sector must offer more competitive employment packages and opportunities for career development.
3. International training is the main avenue for staff development at

the professional cadre – notably for high officials from both DPHE and WASA. These staff should be encouraged to share their new knowledge with their peers as part of in-house vocational training.

4. The traditional career path of the water and sanitation engineers in the public sector organizations is based on vertical promotion according to seniority. There is a need to allow for the promotion of staff on merit rather than length of service and lateral entry of suitably qualified staff into these organizations to stimulate innovation and allow for the introduction of new management practices.
5. The HR composition of government agencies is dominated by engineers and technicians – most of whom are men - which creates an imbalance situation in HR composition in the public health sector. Hygiene issues remain inadequately addressed as there are insufficient social scientists and communication specialists in the public sector agencies. Therefore, there is a need to attract specialists from these disciplines and ensure that there are more women working in the WASH sector for a more balanced HR composition.

Longer term recommendations

6. The country has a number of engineering universities, but none of them are offering Masters (or other post-graduate) courses specifically for the WASH sector. This indicates a serious limitation



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of the professional institutions in Bangladesh. There is a need to conduct research and set training standards for the Bangladesh context as part of continuing education of WASH professionals.

7. DPHE lacks the capacity to install and maintain the huge quantity of private tube wells that are required to serve rural communities. These installations should be managed by the private sector but regulated by DPHE who should provide certification to local mechanics, plumbers and masons after training to upgrade their skills. ■



Credit: WaterAid