

The prominence of health in donor policy for water supply and sanitation: a review

Rebecca Clark and Stephen W. Gundry

ABSTRACT

Improved water supply, sanitation and hygiene used in combination are effective at achieving better health for poor people in developing countries. However, donor policy has been dominated by interventions in water supply, at the expense of achieving the potential health benefits of improved sanitation and hygiene. Commitments recently made by the international community require greater emphasis on improved sanitation and hygiene and their impacts on health. This review assesses whether such a shift in emphasis is apparent in donor policy. It examines the prominence given to achieving better health in water supply and sanitation policies of three donors: the World Bank, the European Union and the Department for International Development of the British Government. It finds that health benefits are explicit and integral in recently updated policy documentation concerning water supply and sanitation. This has taken place in an environment focused on poverty reduction and demand-led, financially sustainable interventions. Mechanisms that have enabled donors to prioritise the health impacts in this environment are discussed, including adoption of an asset-based conceptualisation of poverty and a cross-sectoral approach.

Key words | developing countries, donor policy, health, hygiene, sanitation, water supply

Rebecca Clark (corresponding author)
International Development Centre,
University of Oxford,
Queen Elizabeth House,
21 St Giles,
Oxford OX1 3LA,
UK
Tel.: +44 (0)1865 273639
Fax: +44 (0)1865 273607
E-mail: rebecca.clark@qeh.ox.ac.uk

Stephen W. Gundry
Water and Environmental Management Research
Centre,
University of Bristol,
83 Woodland Road,
Bristol BS8 1US,
UK
Tel.: +44 (0)117 954 5294
Fax: +44 (0)117 954 5389
E-mail: stephen.gundry@bristol.ac.uk

INTRODUCTION

Inadequate water supply, sanitation and hygiene are major contributors to the burden of disease that is borne by poor people in developing countries (World Bank 2002b). Donors and government agencies intervene through the provision of improved water supply and sanitation services and promotion of hygiene. Interventions that include improvements in sanitation and hygiene have the greatest impacts on health (Esrey *et al.* 1991). However, donor interventions have tended to be dominated by improvements in water supply and pay less attention to improving sanitation and hygiene (Fang 1999) despite an underlying rationale of improved health. This has created a bias away from achieving the full potential health benefits of donor interventions in water supply and sanitation.

Commitments have been made at the international level that require realisation of these health benefits and,

consequently, the bias in donor interventions needs to be redressed. The review presented here assesses whether a shift to realisation of the potential health benefits of interventions in water supply and sanitation is apparent in donor policy. The prominence of improved health in current policy documentation for water supply and sanitation is examined for three donors: the World Bank, the European Union (EU) and the Department for International Development (DFID) of the British Government. The paper also discusses some of the mechanisms that the donors have employed to give greater prominence to health in the prevailing environment for interventions in water supply and sanitation. By way of an introduction, a brief description of donor interventions in water supply and sanitation is given, preceded by an overview of the nature and importance of their impacts on health.

Box 1 | Impacts on health of improved water supply, sanitation and hygiene promotion

Health impacts of improved water supply:

- Water is a fundamental resource required for human survival: to drink and to prepare food.
- Water is associated with human disease, both as a vector for disease and in the control of disease. Use of clean drinking water can reduce the incidence of waterborne diseases and exposure to contaminants and use of sufficient quantities of water can help to control the incidence of diseases associated with personal and domestic hygiene.
- Collection of domestic water from sources outside the home has a direct and indirect toll on the health of members of the household. Also, water collected outside the home is liable to contamination in transport and storage.

Health impacts of improved sanitation:

- Improved sanitation helps control transmission of faecal-oral diseases and various parasites and excreta-related vectors of disease.
- Improved sanitation can alleviate risks to women's health associated with social norms.

Health impacts of hygiene promotion:

- Hygiene promotion can help to control faecal-oral and other sanitation-related diseases through promoting use of improved sanitation and water supply facilities and improved personal and domestic hygiene.
- Hygiene promotion also impacts on health indirectly by creating demand for improved water supply and sanitation facilities and encouraging maintenance of facilities.

Source: Cairncross and Feachem (1993); DFID (1998); Gleick (1999); Rosen and Vincent (1999).

IMPACTS ON HEALTH

The burden of disease that is preventable by interventions in water supply, sanitation and hygiene has been conservatively estimated to account for 4% of all deaths and 5% of all disability-adjusted life years (DALYs, an index that combines the toll of both morbidity and mortality) on a global scale (Prüss *et al.* 2002). Diarrhoeal diseases, the most deadly of water and sanitation-related diseases, are a major cause of childhood mortality in developing countries (World Health Organization (WHO) 1998). In 2000, diarrhoea was the direct cause of 12% of deaths in under 5-year-olds, in addition to the contribution that it made to deaths caused by malnutrition (Murray *et al.* 2000). The burden of diarrhoeal diseases is borne particularly by children: in 1995, 80% of diarrhoeal deaths

were in under 5-year-olds (WHO 1996). Diarrhoea also results in significant morbidity and potential mortality in immuno-compromised adults (Mönkemüller & Wilcox 2000).

The mechanisms by which improved water supply and sanitation and the promotion of hygiene impact on health are summarised in Box 1. Impacts on health are greater for interventions that change people's behaviour than for those that provide improved facilities alone (Cairncross 1990). The most effective interventions at preventing diarrhoeal diseases are those that create barriers (e.g. safe disposal of faeces and adequate hand washing after contact with faeces) to the transmission of diarrhoeal pathogens from faeces into the domestic environment (Curtis *et al.* 2000). Improved sanitation can have direct and external benefits: with adequate availability and use, it can

confer health benefits not only on facility users but also on the rest of the community through reduced faecal contamination of the environment (Cairncross 1992). The availability of plentiful supplies of water that are easily accessible from the home can impact on health by enabling hygienic practices (Curtis *et al.* 2000). Improved treatment and storage of water in the home also have health benefits (Sobsey 2002): in a review of studies, Gundry *et al.* (2004) found that the incidence of diarrhoea and of cholera were reduced by improvements in water quality at the point of consumption. However, the health benefits of improvements in water quality at source alone can be relatively small or negligible in many situations (Cairncross 1990).

Empirical evidence of the health benefits of improved sanitation and hygiene is provided here from four review studies. Esrey *et al.* (1991) found that improved sanitation and better hygiene achieved greater reductions in morbidity (median reductions in morbidity of 36% and 33%, $n = 5$ and 6 studies, respectively) than improvements in the quantity and quality of water supplies at source (which achieved median reductions in morbidity of 20% and 15%, $n = 5$ and 4 studies, respectively). Huttly *et al.* (1997) found that interventions to promote hand washing reduced diarrhoeal morbidity in young children by 35% (median reduction in morbidity, $n = 5$ studies) and interventions to promote hand washing with soap were found by Curtis and Cairncross (2003) to reduce the risk of diarrhoeal morbidity by 47% (median, $n = 10$ studies). Finally, Esrey (1996) found that improved sanitation resulted in 'broader and larger' health benefits (in terms of child height and weight, as well as incidence of diarrhoea) than did improvements in water supply in a study of survey data (collected in 8 countries in a total of 3 subcontinents). Improved water supply, sanitation and hygiene are interrelated in achieving better health: for example, the adoption of hygienic practices requires a means for the safe disposal of faeces and access to adequate quantities of clean water.

In terms of interventions for achieving health benefits, donor investment in software, such as hygiene education, can prove more cost effective, as well as more sustainable, than treatment using oral rehydration therapy (assessed in terms of cost per DALY saved in under-5-year-olds, Varley *et al.* 1998). In contrast, donor investment in hardware,

i.e. new services for water supply and sanitation, is not cost-effective at achieving health benefits relative to oral rehydration therapy (Varley *et al.* 1998). However, there is more to the benefits of improved water supply and sanitation than better health; improved services confer other benefits on households such as time savings and status. Evidence suggests that the value of these combined benefits to poor households can be sufficiently high that households will fund appropriate improved service provision themselves (e.g. Water and Sanitation Program 2001).

DONOR INTERVENTIONS

Donor interventions in water supply and sanitation usually entail the provision of improved facilities and/or the promotion of hygiene. Improved facilities for water supply can, for example, take the form of communal wells or standpipes that are located closer to households than existing sources. These usually deliver improved water quality at source, though there is evidence that this is significantly degraded at the point of consumption (Wright *et al.* 2004). For sanitation, the facilities provided include latrines and drainage. Hygiene is promoted to potential users of facilities through exchange and dissemination of information and training. It aims to improve health through the adoption of critical behaviours that concern personal hygiene (such as hand washing with soap after defecation) and domestic hygiene (such as safe disposal of faeces, safe storage of drinking water and hand washing with soap prior to food preparation). Hygiene promotion can also inform potential users about the need for improved water supply and sanitation and encourage use of the facilities provided.

The emphasis in donor interventions has altered over the last few decades in response to changes in understanding of sustained service provision. In the early 1980s, the emphasis in interventions was on hardware, and a shift from use of high cost technology to low cost technology that could be produced locally and maintained by communities. However, it became apparent that use of appropriate technology was not sufficient to ensure that service provision was sustained. By the late 1980s, there was

greater recognition of the need for communities to participate in service development and management, and of the role of women in the management of water supply and sanitation. It also became apparent that cost-recovery was required if full service coverage was to be achieved. In response, the emphasis in donor interventions shifted from hardware to software: institution building and human resources development in communities, non-governmental organisations and government authorities.

In the 1990s, it was increasingly recognised that the success of community managed and financially sustainable service provision hinged on demand for the services provided. This was translated into donor interventions through greater use of demand creation (e.g. health and hygiene education and marketing of services) and development of demand-responsive approaches to service provision (e.g. provision based on communities' preferences and their willingness to pay) (Black 1998). There was also growing recognition of the opportunities offered by privatisation of services: provision of technical and managerial expertise, increased investment, and the provision of services that are more efficient and that respond to demand; though realisation of these is dependent on an enabling institutional environment and adequate regulation (Brook Cowen 1997). Successful transition to private or community management of services also requires a shift in the role of governments to that of facilitator, to create appropriate policy, legal, regulatory and institutional frameworks (Bosch *et al.* 2001).

Interventions have been dominated by improvements in water supplies (Water Supply and Sanitation Collaborative Council (WSSCC) Working Group on Promotion of Sanitation 1998). The relatively low priority that has been given to improved sanitation and hygiene promotion can be attributed to various factors. Public demand and political support for improved water supply typically outstrips that for improved sanitation and hygiene promotion (Cairncross 1992; Fang 1999). Communities and politicians tend to disregard sanitation and hygiene because of associated distaste, embarrassment and taboos (Tearfund and WaterAid 2002). The legacy of a sectoral approach has focused on the engineering aspects of service provision and the cure rather than prevention of health problems (WSSCC 2000). Finally, improved sanitation has tended to

be treated as an 'add-on' to interventions for improved water supply, and not allocated its own resources and time frame (White 1997, p. 6).

The domination of interventions by water supply can also be attributed to the prevailing environment of demand-led and financially sustainable intervention (discussed further below). Users' demand for improved water supply is largely based on the time demands and convenience of water collection (Briscoe & de Ferranti 1988; Black 1998). These non-health benefits can be substantial, as water collection is a time-consuming and arduous activity for many households (Churchill 1987). Demand for improved water supplies is associated with a willingness to pay because of these non-health benefits and also because many poor people pay for existing services, which enables financially sustainable service provision (e.g. Water and Sanitation Program 1999a, b).

Users' demand for improved sanitation facilities is usually based on privacy and convenience (Cairncross 1992). Demand for sanitation is associated with a willingness to pay and financially sustainable provision of improved facilities is undertaken (Samanta & van Wijk 1998). However, apparent demand is often low because sanitation is not prioritised owing to lack of information, and financial, social and political factors (WHO/UNICEF JMP 2000). For hygiene promotion, like sanitation, effective demand is low, though this may be overcome through demand creation (which is discussed later in the paper). Consequently, hygiene promotion tends not to be prioritised, not implemented or to be omitted in intervention design (Yacoob & Whiteford 1994). However, hygiene and improved sanitation are essential to achieving the potential health benefits of interventions. Given this domination of donor interventions by water supply, not sanitation and hygiene promotion, it is judicious to examine the emphasis placed in donor policy on achieving the health benefits of water supply and sanitation.

WORLD BANK, EU AND DFID POLICY

Donor policy for water supply and sanitation is examined here for the World Bank, EU and DFID. The policies of

each of the three donors build on an international consensus, but are distinct. An overview of the international consensus is presented, followed by a review of the prominence given to health in policies for water supply and sanitation of each of the donors.

International consensus in donor policy

There is an international consensus in donor policy for water supply and sanitation. This is founded on the perspective that emerged from the Water Decade and commitments that have been made by the international community concerning water supply, sanitation and health.

The Water Decade

The International Decade for Drinking Water and Sanitation (1981–1990) represented a turning point in donor policy for water supply and sanitation. Prior to the Decade, donors viewed water supply and sanitation as public services that were provided (without charge to users) by government agencies in the interests of public health. On the ground, this was associated with low coverage by services, skewed provision towards the non-poor, associated failure to meet the basic needs of poor people, and inadequate service maintenance and repair. In response to concerns regarding low service coverage and resultant impacts on health, the International Decade for Drinking Water and Sanitation was declared by the United Nations (UN), with an objective of improved water supply and sanitation for all. Though the objective was not achieved, concerted efforts during the Decade did reveal factors that were important in provision of services for poor people, and in determining service use and sustainability.

Governments and donors developed a new perspective on water supply and sanitation that incorporated factors revealed by the Decade (Black 1998). This change in perspective was formalised in the New Delhi Statement (UN 1990) and later in the Dublin Principles (International Conference on Water and the Environment 1992), which provide the basis for the current international

consensus in policy for water supply and sanitation. The consensus is translated into policy through the promotion of demand-led and financially sustainable services, adoption of measures that enable poor people to access services (e.g. through cross subsidies), participation of users (including women) in planning and management, and the transfer of service provision to autonomous agencies.

International commitments

Consensus in donor policy is also influenced by commitments made by the international community. These include targets for access to water supply and sanitation. A target to ‘halve the proportion of people who are unable to reach or to afford safe drinking water’ by the year 2015 was set in the UN Millennium Declaration (UN 2000a, paragraph 19) and a target ‘to halve, by the year 2015, . . . the proportion of people who do not have access to basic sanitation’ was set at the World Summit on Sustainable Development (UN 2002, paragraph 7). A target has not been set that concerns hygiene, but reference is made to the promotion of ‘safe hygiene practices’ as an action for achieving the sanitation target (UN 2002, Plan of Implementation, paragraph 7).

Water supply and sanitation are also included in human rights agreements. The right to clean drinking water is protected in the Convention on the Rights of the Child (UN 1989, Article 24). The rights to both adequate water supply and sanitation are protected in the Convention on the Elimination of All Forms of Discrimination against Women (UN 1979, Article 14) and as a component of the right to health in the International Covenant on Economic, Social and Cultural Rights (UN 1966, Article 12, as clarified in UN 2000b, paragraph 11). The protection offered by human rights agreements enables improved targeting of poor people; it empowers communities to participate in decision-making, creates a legal entitlement to water supply and sanitation, and is based on a principle of non-discrimination (WHO 2003). Under the agreements, signatory states have an immediate obligation to attain essential minimum levels of human rights and a duty to work towards full realisation.

The international community has also made commitments concerning health that relate to water supply and

sanitation. A target to reduce the death rate for under 5-year-olds 'in each developing country by two-thirds the 1990 level by 2015' was reaffirmed in the Millennium Declaration (Organisation for Economic Co-operation and Development (OECD) 1996, and UN 2000a, Section 19). Commitments were also made at the World Summit for Sustainable Development to reduce environmental threats to health (specifically through improved water supply and sanitation and hygiene promotion) (UN 2002, Sections 6.13 and 6.27), and at the World Summit for Social Development, to attain 'access of all to primary health care' (including drinking water and sanitation) (UN 1995, pp. 20 and 22). Protection of the right to health is also provided by human rights agreements: in the Convention on the Rights of the Child (UN 1989, Articles 6 and 24), the International Covenant on Economic, Social and Cultural Rights (UN 1966, Article 12) and the Universal Declaration of Human Rights (UN 1948, Article 25).

The three donors examined in this paper, the World Bank, EU and DFID, are committed to meeting the above targets and commitments agreed by the international community. However, they differ in their treatment of human rights. DFID has fully integrated a human rights perspective into its development policy (DFID 2000d, Section 5.3). The EU views promotion and protection of human rights as a 'cornerstone' of its cooperation policy (European Commission (EC) 1991, paragraph 1) but, relative to civil and political rights, it places low emphasis on rights to basic needs (e.g. EC 1991, paragraph 4). The World Bank is unable to explicitly incorporate human rights into its policies because of its remit, but does undertake to show consideration towards them in its operations (World Bank 1998).

The key features of the water supply and sanitation policies of each of the three donors and the prominence given to achieving health benefits are examined below (summarised in Box 2).

World Bank

The overarching objective of the World Bank is to reduce poverty by supporting the efforts of countries to promote

'equitable, efficient and sustainable development' (World Bank 1993, p. 21). Water supply and sanitation feature in the Bank's strategies for water resources and the environment. The content of each of these and the policy for the health sector are examined in turn below. The Water and Sanitation Program is not examined here as it is an independent unit: an external partnership of the World Bank that provides a field-based, independent source of knowledge, advice and support. The Water and Sanitation Program is administered by the World Bank but is funded separately, by various bilateral donors, the United Nations Development Programme, and the World Bank (Water and Sanitation Program 2003).

World Bank policy documentation for the **water resources** sector has not been revised since 1993, though an updated strategy has recently been produced (World Bank 2003). The Bank's work in water supply and sanitation is focused on ensuring that 'the poor gain access to safe, affordable . . . services' (World Bank 2003, paragraph 49): 'special efforts' are to be directed to meeting the water needs of the poor, and improved sanitation will also become more prominent in the Bank's work (World Bank 2003, paragraph 53). The priority given to services for the poor is such that lending for water supply and sanitation provision persists even if the Bank suspends lending for water resources management (World Bank 1993, p. 77, 2000, paragraph 4). Safe drinking water is viewed as 'critical' to maintaining and improving human health (World Bank 1993, p. 16) and it is recognised that emphasis on hygiene is required to realise the health benefits of improved water supplies (World Bank 1993, p. 72).

The main objective of the Bank's strategy for the **environment** is to improve health outcomes, and thereby avoid human suffering and reduce public health costs of curative treatment (World Bank 2001, p. 48). Inadequate water supply and sanitation are viewed as the 'largest threat to human health' in most of the Bank's client countries (World Bank 2001, p. 148). Improved service provision, as a means for reducing exposure to waterborne diseases, is a focal area of the strategy (World Bank 2001, p. 48).

The Bank's policy for the **health, nutrition and population** sector recognises that a healthy population is essential to secure sustainable economic growth and poverty

Box 2 | Summary of key features of World Bank, EU and DFID policy

Donor:	World Bank	EU	DFID
Mission statement:			
	Sustainable poverty reduction (World Bank 1991, paragraph 6)	To reduce and, eventually, eradicate poverty (EC 2000c, paragraph 7)	The elimination of poverty in poorer countries (DFID 1997, p. 19)
Policy for water supply and sanitation:			
	<ul style="list-style-type: none"> ● Ensure access to safe affordable services for the poor ● Improved sanitation is gaining prominence in operations ● Interdependence between water and other sectors 	<ul style="list-style-type: none"> ● Expand water service provision to the under-served ● Improve living conditions for the poor ● Water supply and sanitation are cross-sectoral 	<ul style="list-style-type: none"> ● Enable improved health and livelihoods for poor people ● Water supply and sanitation are key environmental determinants of health, particularly child survival
Health in water supply and sanitation policy:			
	<ul style="list-style-type: none"> ● Health is not a strong theme in current policy documentation, but is highlighted in other Bank publications ● Views the provision of safe drinking water to be critical to health ● Recommends that emphasis is placed on hygiene promotion ● Focuses on water quality and pollution abatement (including sanitation), based on their importance to health 	<ul style="list-style-type: none"> ● Health is a stated objective and is integral to the policy ● Emphasis is placed on improved sanitation and hygiene promotion 	<ul style="list-style-type: none"> ● Health is integral to the inter-sectoral nature of the policy ● Emphasis is placed on improved sanitation and hygiene promotion ● Recommends that improved sanitation and hygiene promotion are considered as coherent with improved water supply ● Recommends that improved sanitation forms an essential component of water interventions for the poor
Relevant aspects of health policy:			
	<ul style="list-style-type: none"> ● Investment in people (including health) is central to overall development strategy ● Priorities include support for improvements in health and protection from illness 	<ul style="list-style-type: none"> ● Health is a priority in overall policy ● Adopts a multi-sectoral approach, which recognises that poor health is related to poverty and the environment 	<ul style="list-style-type: none"> ● Health is an important contributor to poverty elimination (the overarching policy goal) ● Inter-sectoral programme that places emphasis on environmental determinants of health

reduction (World Bank 1997, p. 10). Improved health for the poor and protection from illness is a sectoral priority (World Bank 1997, p. 17), to be addressed by targeting poverty-related diseases and services used by the poor, amongst other mechanisms (World Bank 1997, p. 84), though water supply and sanitation are not specified priorities. However, greater prominence is given to the health benefits of water supply, sanitation and hygiene in a recent sector fact sheet (World Bank 2002b). It asserts, based on empirical evidence, that improved hygiene and sanitation have more of an impact on health than improved source

water quality and that, in order to improve health, 'key human behaviours' (such as hand washing, safe disposal of faeces) must accompany improved water supply and sanitation facilities (World Bank 2002b). The roles of sanitation and hygiene in achieving health benefits are also recognised in the Bank's Poverty Reduction Strategy Sourcebook (Bojöö *et al.* 2001). In short, the health benefits of water supply, sanitation and hygiene promotion are recognised in recent World Bank documents, but are not strong themes in the less recent documents, notably the policy for water resources and the health sector.

EU

EU development cooperation aims to achieve poverty reduction through sustainable development (EC 1997, Article 177; EC 2000a, Section 3.2) and is grounded on a principle of 'sustainable, equitable and participatory human and social development' (EC 2000c, paragraph 6). Water management is treated as a 'cross-sectoral' issue, to be '*mainstreamed*' in poverty reduction policy (EC 2002, Section 2.2) and health is a priority in overall development cooperation policy (EC 2000a, Section 3.2). The discussion here refers to the EU's general policy statements; differences in emphasis occur in the EU's regional policies (e.g. for Africa-Caribbean-Pacific nations; Asia; Latin America). Water supply and sanitation appears in EU policy for water management, poverty reduction, rural development, human and social development, and health, which are examined here in turn.

Starting with policy for **water management**, improved health is among the objectives of the EU's efforts to ensure adequate water supply and sanitation for all, especially the poor (EC 2002, Section 4.1). Increased coverage by improved sanitation and hygiene promotion are identified as urgent priorities and 'critical ingredients' of public health programmes (EC 2002, Section 4.3). The policy also advocates adequate integration of water supply and sanitation with other basic public services, i.e. health and education (EC 2002, Section 5).

Expansion of water supply to the under-served lies at the 'heart' of EU policy for **poverty reduction** (EC 2002, Section 2.2); improved living conditions for poor people is among the key policy objectives (EC 1993, paragraph 4.1). In **rural development** policy, water supply and sanitation are addressed as part of the policy pillar titled 'strengthening the assets of the rural poor', on grounds that the health benefits improve quality of life and enhance labour productivity (EC 2000b, Section 4). In **human and social development** policy, increased effectiveness of investment in water and sanitation is supported because of its contribution to health (EC 1996, Section 2c).

Improved water supply and sanitation fall under the priority objective of creating an environment 'favourable to health' (EC 1994b, paragraph 16) in the EU's **health** policy. Poor living conditions and hygiene, linked with poverty, are identified as prime causes of bad health (EC

1994a). Adoption of a 'multi-sectoral' approach is promoted, which places emphasis on primary prevention, improved living conditions and hygiene (EC 1994b, Section 14). In summary, water supply and sanitation are addressed as cross-sectoral issues in EU policy and their impacts on health play a prominent role.

DFID

DFID aims to eliminate poverty and to encourage pro-poor economic growth through policies that 'create sustainable livelihoods for poor people, promote human development and conserve the environment' (DFID 1997, p. 8). Water supply and sanitation are covered by DFID's strategy papers for water, health, the environment and poverty reduction. They are also priority areas for inter-sectoral action, as major determinants of child survival (DFID 2000b, Section 5.2).

In its strategy for **water**, DFID gives priority to activities that contribute most directly to its goal of eliminating poverty (DFID 2001a, paragraph 2.1.2). Efforts in water supply and sanitation are concentrated on enabling poor people to 'lead healthier and more productive lives' (DFID 2001a, Section 5.2.1); the fulfilment of poor people's water-related needs is viewed as 'fundamental' to poverty elimination (DFID 2001a, Section 2.1.1). Water supply and sanitation play a prominent role in the strategy for **health**, in the 'creation of environments to improve health' and in addressing 'priority health problems of poor people' (DFID 2000b, Sections 5.1 and 5.2b). The strategy recognises improved water supply and sanitation as major determinants of child health (DFID 2000b, Section 5.2b). Integration of hygiene promotion into water and sanitation interventions is identified as a priority (DFID 2000b, Section 5.2), based on the role of hygiene in diarrhoeal disease control and creation of demand for improved water supply and sanitation (DFID 2000b, Section 5.2). The strategy for the **environment** (DFID 2000a) states that improved access to clean water and sanitation are 'the most significant environmental priority' for poor people in developing countries (DFID 2000a, Section 2.3) because of the environmental hazards posed to both the health and the livelihoods of poor people. Finally, water supply and sanitation feature in the strategy for **poverty reduction**, in

relation to the strengthening of assets of poor people, which is viewed as critical to sustainable long-term poverty reduction (DFID 2000c, Section 2.33).

DFID's guidance manual on water supply and sanitation states that sanitation requires 'priority attention' and recommends that improved sanitation is included in poverty-focused water supply interventions, even in the absence of strong demand, because of the risks of faecal-oral disease transmission (DFID 1998, p. 29). A recent guidance note on environmental health raises the importance of contextual factors in determining the health impacts of interventions, such as the distance of water supplies from the home and the extent of sanitation provision and use within a community (Cairncross *et al.* 2003, Section 3.4). The guidance note also presents the consensus that promotion of improved hygiene and sanitation is required for interventions in water supply to realise their full public health potential (Cairncross *et al.* 2003, Section 3.4). In summary, health is integral to DFID's policy for water supply and sanitation. This is achieved through adoption of a cross-sectoral approach and emphasis on the environment as a determinant of health.

The above review indicates that recent commitments made at the international level in the Millennium Declaration and at the World Summit for Sustainable Development (UN 2000a, 2002) have raised the profile of water supply and sanitation and their associated impacts on health. This has been incorporated into current donor policy documentation (summarised in Box 2). In recently updated EU and DFID policies for water (EC 2002 and DFID 2001a, respectively), water supply and sanitation are addressed as cross-sectoral issues, they are prominent in policy for the health sector and health benefits are an integral component. Sanitation and hygiene promotion are identified as priorities and the integration of improved water supply, sanitation and hygiene promotion in interventions is recommended. World Bank policy documentation is less explicit on these issues, but policy for the water sector has not been revised since 1993, though an updated statement of priorities is forthcoming (in a Water and Sanitation Business Strategy (World Bank 2003, paragraph 48)). The following section discusses some of the

mechanisms that donors have used to enable them to raise the prominence of health in the prevailing environment for policy and interventions.

RAISING THE PROFILE OF HEALTH IN THE PREVAILING ENVIRONMENT FOR INTERVENTION

Given the international consensus in policy, the health benefits of improved water supply and sanitation have to be realised in an environment that is oriented towards poverty reduction and demand-led, financially sustainable service provision. Donors have employed various mechanisms to raise the prominence of health within this policy environment. The discussion here focuses on three of these: the use of an asset-based conceptualisation of poverty, adoption of a cross sectoral approach in policy, and in interventions, the use of demand creation and adoption of behavioural change as an outcome.

Asset-based conceptualisation of poverty

Asset-based conceptualisation of poverty (such as that provided by DFID's sustainable livelihoods framework) formalises the role of improved water supply and sanitation in achieving better health and embeds this in policy for poverty reduction. Ill health is presented as a dimension of poverty and a constraint; good health is described as both an asset and an outcome of people's livelihoods and of development. For example, DFID's sustainable livelihoods framework (DFID 2001b) conceptualises health as human capital, one of five categories of assets that provide the building blocks for people's livelihoods. Water supply and sanitation (which are essential infrastructure for livelihoods) are conceptualised as another category of asset: physical capital. Inadequate provision of water supply and sanitation are a dimension of poverty and the framework highlights their links with other aspects of poverty; e.g. with ill health, unproductive use of labour, and barriers to education and income generation.

The sustainable livelihoods framework indicates that improved service provision can contribute not only

towards better health and well being for poor people, but also towards economic, social and human development. It also reveals the role of adverse structures and processes (e.g. bias towards the provision of health care and infrastructure for the non-poor) in preventing poor people's access to services. Asset-based conceptualisation highlights linkages between poverty, health, access to services and contextual factors, and promotes an integrated approach to improved water supply, sanitation, hygiene promotion and health. An asset-based approach is apparent in the latest water supply and sanitation policies of the EU and DFID. In World Bank documentation, it is less explicit though an asset-based approach has been adopted in recent publications (e.g. Bosch *et al.* 2001; World Bank 2002a).

Cross-sectoral approach

The adoption of a cross-sectoral approach enables donors to overcome the sectoral and occupational divisions that are typically associated with water supply and sanitation (which are typically the domain of engineers) and health (traditionally the domain of medical practitioners). Such an approach enables policy to address the causes of ill health as well as the symptoms. It prevents issues that concern environmental health from falling 'through the cracks' between sectors (World Bank 2001, p. 150) and 'ratchets up' the impact that can be achieved by single sectors (DFID 2000b, Section 5.1). The World Bank advocates use of a cross-sectoral approach in various discussion and working papers on environmental health. The rationale for this is that 'most causes of disease, injury and death in developing countries—inadequate sanitation, poor personal hygiene, road accidents, tobacco smoke, pollution—lie outside the control of the health sector' (Listorti 1996, p. 1). Also, sectors that cause negative health impacts (e.g. infrastructure) offer great potential for improvements in health, but have policies that usually are not based on health criteria.

A cross-sectoral approach to environmental health offers the potential to both reduce exposure to adverse environmental factors and promote behavioural change (Listorti & Doumani 2001). Adoption of a cross-sectoral

approach is apparent in the recently updated policies of DFID and the EU, but has not as yet been incorporated into World Bank policy documentation for water supply and sanitation. It offers the opportunity to 'mainstream' and integrate improved water supply, sanitation and hygiene promotion and thereby realise the full potential benefits of interventions. However, it requires adaptation by governments and donors in terms of their structure and modes of operation.

Demand creation and behavioural change

A key mechanism for achieving the potential health benefits of interventions is the creation of effective demand for improved sanitation and hygiene promotion. In an environment of demand-led financially sustainable service provision, interventions are reliant on potential users' appreciation of the value of improved water supply, sanitation and hygiene, in terms of health as well as non-health benefits, such as quality of life and convenience. Demand can be created through programmes of information dissemination and marketing of potential improvements. This poses a particular challenge to governments and donors, which usually have had little involvement in marketing (Black 1998). Successful demand creation usually involves community participation and understanding of local knowledge, perceptions and practices, so that messages can be developed that are relevant to the community (WHO/UNICEF JMP 2000). Examples of such approaches include social marketing (e.g. DFID 1998) and the Participatory Hygiene and Sanitation Transformation (PHAST) Initiative (Simpson-Hébert *et al.* 1997) undertaken by the World Health Organization and the Water and Sanitation Program.

Turning to the use of behavioural change as an intervention outcome, this can be employed to increase emphasis on the health benefits of water supply, sanitation and hygiene interventions. It entails a shift away from the physical targets of service provision, prevalent in the past, to behavioural targets such as use and maintenance of services and the adoption of hygienic practices (Yacoob & Whiteford 1994; Bosch *et al.* 2001). Interventions can be evaluated in terms of, for example, the volume of

water consumed by a household, or hand washing after defecation and before food preparation.

CONCLUSIONS

The review presented in this paper reveals that health benefits of water supply and sanitation are prominent in recent water policies of the EU and DFID, but are less explicit in policy documentation of the World Bank, which is yet to be updated. This reflects commitments made by the international community over the last 4 years, which have raised the profile of water supply, sanitation and their impacts on health. The challenge is to translate the policies into sustained provision of improved services and adoption of key behaviours, and ultimately the realisation, in the long term, of better health for poor people.

The translation is reliant on increased prioritisation of improved sanitation and hygiene promotion coupled with raised awareness of their associated health benefits in government and donor agencies. It also requires continued improvement in intervention design and implementation. Acceptance and use of improved services is reliant on the design of services that are socially and culturally suitable and appropriate for potential users (Appleton & van Wijk 2003). The changes in behaviour that are involved may be achieved by building on other driving forces and motivating factors that are important in the lives of potential users (such as social status and convenience) rather than a focus solely on health (Appleton & van Wijk 2003). Development of interventions that build on such local knowledge and that are appropriate can be enabled through sharing of knowledge, information and experiences between the implementing agency and community (House *et al.* 1999) and participation of all groups in the local community in planning and design. After all, the impact on health achieved by donors is ultimately reliant on continued use and maintenance of improved services and widespread sustained adoption of key behaviours by individual communities.

ACKNOWLEDGEMENTS

The research presented in this paper was conducted as part of the AQUAPOL Project: The policy implications of

contamination of rural water between source and point-of-use in Kenya, South Africa and Zimbabwe (www.fen.bris.ac.uk/engmt/swg/research/aquapol/index.html), coordinated by the Engineering Management Group, University of Bristol, and funded by the European Union INCO-DEV research programme: International cooperation with developing countries. The authors would like to thank James Wright (Water and Environmental Management Research Centre, University of Bristol, UK) and anonymous referees for their comments on earlier versions of the paper.

REFERENCES

- Appleton, B. & van Wijk, C. 2003 *Hygiene promotion. Thematic overview paper*. IRC International Water and Sanitation Centre, Delft.
- Black, M. 1998 *1978–1998 Learning What Works: A 20 year Retrospective View on International Water and Sanitation Cooperation*. UNDP-World Bank Water and Sanitation Program, Washington, DC.
- Böjo, J., Bucknall, J., Hamilton, K., Kishor, N., Kraus, C. & Pillai, P. 2001 *Environment—Draft for Comments, Poverty Reduction Strategy Sourcebook*. The World Bank, Washington, DC.
- Bosch, C., Hommann, K., Rubio, G. M., Sadoff, C. & Travers, L. 2001 *Water Sanitation and Poverty—Draft for Comments, Poverty Reduction Strategy Sourcebook*. The World Bank, Washington, DC.
- Briscoe, J. & de Ferranti, D. 1988 *Water for Rural Communities. Helping People Help Themselves*. The World Bank, Washington, DC.
- Brook Cowen, P. J. 1997 *The Private Sector in Water and Sanitation—How To Get Started*. Public Policy for the Private Sector Note No. 126. Finance, Private Sector and Infrastructure Network, The World Bank, Washington, DC.
- Cairncross, A. M. 1990 Health impacts in developing countries: new evidence and new prospects. *J. Instn Wat. Environ. Managmt* **4**, 571–577.
- Cairncross, S. 1992 *Sanitation and Water Supply: Practical Lessons from the Decade*. Water and Sanitation Discussion Paper Series No. 9, UNDP-World Bank Water and Sanitation Program, The World Bank, Washington, DC.
- Cairncross, S. & Feachem, R. G. 1993 *Environmental Health Engineering in the Tropics. An Introductory Text*. John Wiley & Sons, Chichester.
- Cairncross, S., O'Neill, D., McCoy, A. & Sethi, D. 2003 *Health, Environment and the Burden of Disease; a Guidance Note*. DFID, London.
- Churchill, A. 1987 *Rural Water Supply and Sanitation. Time for a Change*. World Bank Discussion Papers No. 18, The World Bank, Washington, DC.

- Curtis, V. & Cairncross, S. 2003 Effect of washing hands with soap on diarrhoea risk in the community: a systematic review. *The Lancet, Infectious Dis.* **3**, 275–281.
- Curtis, V., Cairncross, S. & Yonli, R. 2000 Domestic hygiene and diarrhoea—pinpointing the problem. *Trop. Med. Int. Health* **5**(1), 22–32.
- DFID 1997 *Eliminating World Poverty: A Challenge for the 21st Century. White Paper on International Development.* The Stationery Office Limited, London.
- DFID 1998 *Guidance Manual on Water Supply and Sanitation Programmes.* Water, Engineering and Development Centre, Loughborough University.
- DFID 2000a *Achieving Sustainability—Poverty Elimination and the Environment. Strategies for Achieving the International Development Targets.* DFID, London.
- DFID 2000b *Better Health for Poor People. Strategies for Achieving the International Development Targets.* DFID, London.
- DFID 2000c *Halving World Poverty by 2015—Economic Growth, Equity and Security. Strategies for Achieving the International Development Targets.* DFID, London.
- DFID 2000d *Realising Human Rights for Poor People. Strategies for Achieving the International Development Targets.* DFID, London.
- DFID 2001a *Addressing the Water Crisis, Healthier and More Productive Lives for People. Strategies for Achieving the International Development Targets.* DFID, London.
- DFID 2001b *Sustainable Livelihoods Guidance Sheets.* DFID, London.
- EC 1991 *Resolution of the Council and of the Member States Meeting in the Council on Human Rights, Democracy and Development, 28 November 1991.* EC, Brussels.
- EC 1993 *Campaign against Poverty. Communication from the Commission of 16 November 1993.* COM(93)5181. EC, Brussels.
- EC 1994a *Communication from the Commission of 24 March 1994.* COM(94)77. EC, Brussels.
- EC 1994b *Council Resolution on Cooperation with Developing Countries in the Field of Health, 6/5/94.* EC, Brussels.
- EC 1996 *Human and Social Development, Council Resolution of 22 November 1996.* EC, Brussels.
- EC 1997 *Consolidated Version of the Treaty Establishing the European Community.* EC, Brussels.
- EC 2000a *Communication from the Commission to the Council of the European Parliament—The European Community's Development Policy (COM(2000) 0212 final).* EC, Brussels.
- EC 2000b *European Policy to Support Rural Development. Policy Orientation Paper.* DG Development—Rural Development and Food Security. EC, Brussels.
- EC 2000c *The European Community's Development Policy—Statement by the Council and the Commission, 10 November 2000.* EC, Brussels.
- EC 2002 *Communication from the Commission to the Council and the European Parliament. Water Management in Developing Countries—Policy and Priorities for EU Development Cooperation.* COM (2002) 132 final. EC, Brussels.
- Esrey, S. A. 1996 Water, waste and well-being: a multi-country study. *Am. J. Epidemiol.* **143**(6), 608–623.
- Esrey, S. A., Potash, J. B., Roberts, L. & Shiff, C. 1991 Effects of improved water supply and sanitation on ascariasis, diarrhea, dracunculiasis, hookworm infection, schistosomiasis, and trachoma. *Bull. Wld Health Orgn* **69**(5), 609–621.
- Fang, A. 1999 *On-site Sanitation. An International Review of World Bank Experience.* UNDP-World Bank Water and Sanitation Program—South Asia, New Delhi.
- Gleick, P. 1999 The human right to water. *Wat. Policy* **1**(5), 487–503.
- Gundry, S. W., Wright, J. A. & Conroy, R. 2004 A systematic review of the health outcomes related to household water quality in developing countries. *J. Wat. Health* **2**(1), 1–14.
- House, S., Ince, M. & Shaw, R. 1999 Water sanitation and hygiene understanding. Technical Brief No. 51. In *Running Water: More Technical Briefs on Health, Water and Sanitation* (ed. R. Shaw), pp. 73–76. ITDG and WELL, Loughborough.
- Huttly, S. R. A., Morris, S. S. & Pisani, V. 1997 Prevention of diarrhoea in young children in developing countries. *Bull. Wld Health Orgn* **75**(2), 163–174.
- International Conference on Water and the Environment 1992 *The Dublin Statement on Water and Sustainable Development.* Hydrology and Water Resources Department, World Meteorological Organisation, Geneva.
- Listorti, J. A. 1996 *Bridging Environmental Health Gaps. Recommendations for Sub-Saharan Africa and the rest of the Bank.* Volume III. AFTES Working Paper No. 22, Africa Technical Department, The World Bank, Washington, DC.
- Listorti, J. A. & Doumani, F. D. 2001 *Environmental Health. Bridging the Gaps.* World Bank Discussion Paper No. 422. The World Bank, Washington, DC.
- Mönkemüller, K. E. & Wilcox, C. M. 2000 Investigation of diarrhea in AIDS. *Can. J. Gastroenterol.* **14**(11), 933–940.
- Murray, C. J. L., Lopez, A. D., Mathers, C. D. & Stein, C. 2000 *The Global Burden of Disease Project: Aims, Methods and Data Source.* WHO, Geneva.
- OECD 1996 *Shaping the 21st Century: the Contribution of Development Co-operation.* Development Assistance Committee, OECD, Paris.
- Prüss, A., Kay, D., Fewtrell, L. & Bartram, J. 2002 Estimating the burden of disease from water, sanitation and hygiene at a global level. *Environ. Health Perspectives* **110**(5), 537–542.
- Rosen, S. & Vincent, J. R. 1999 *Household Water Resources and Rural Productivity in Sub-Saharan Africa: A Review of the Evidence.* Development Discussion Paper No. 673. Harvard Institute for International Development, Cambridge, MA.
- Samanta, B. B. & van Wijk, C. A. 1998 Criteria for successful sanitation programmes in low income countries. *Health Policy & Plann.* **13**(1), 78–86.
- Simpson-Hébert, M., Sawyer, R. & Clarke, L. 1997 *The PHAST Initiative. Participatory Hygiene and Sanitation Transformation. A New Approach to Working with Communities.* WHO, Geneva.
- Sobsey, M. D. 2002 *Managing Water in the Home: Accelerated Health Gains from Improved Water Supply.* Report WHO/SDE/WSH/02.07, World Health Organisation, Geneva.

- Tearfund and WaterAid 2002 *The Human Waste*. Tearfund, Teddington and WaterAid, London.
- UN (United Nations) 1948 *Universal Declaration of Human Rights*. UN, Geneva.
- UN 1966 *International Covenant on Economic, Social and Cultural Rights*. UN, Geneva.
- UN 1979 *Convention on the Elimination of All Forms of Discrimination against Women*. UN, Geneva.
- UN 1989 *Convention on the Rights of the Child*. UN, Geneva.
- UN 1990 *New Delhi Statement*. UN, Geneva
- UN 1995 *Report of the World Summit for Social Development*. UN, Geneva.
- UN 2000a *Resolution adopted by the General Assembly 55/2 United Nations Millennium Declaration*. UN, Geneva.
- UN 2000b *Substantive Issues Arising in the Implementation of the International Covenant on Economic, Social and Cultural Rights. General Comment No. 14 (2000)*. UN, Geneva.
- UN 2002 *World Summit on Sustainable Development. Plan of Implementation* (advance unedited text 4/9/02). UN, Geneva.
- Varley, R. C. G., Tarvid, J. & Chao, D. N. W. 1998 A reassessment of the cost-effectiveness of water and sanitation interventions in programmes for controlling childhood diarrhoea. *Bull. Wld Health Orgn* 76(6), 617–631.
- Water and Sanitation Program 1999a *Villagers Treat Water as an Economic Good, Olavanna, Kerala, India*. Water and Sanitation Program—South Asia Region, New Delhi.
- Water and Sanitation Program 1999b *Water for India's Poor. Who Pays the Price for Broken Promises?* Water and Sanitation Program—South Asia Region, New Delhi.
- Water and Sanitation Program 2001 *Lower Costs with Higher Benefits—Water and Sewerage Services to Low Income Households*. Water and Sanitation Program—Andean region, Lima.
- Water and Sanitation Program 2003 *Annual Report 2001–2002*. The World Bank Group, Washington, DC.
- White, J. 1997 *Evaluation Synthesis of Rural Water and Sanitation Projects*. Evaluation Report EV:596. DFID, London.
- WHO 1996 *The World Health Report 1996*. WHO, Geneva
- WHO 1998 *Reducing Mortality from Major Killers of Children*. Fact Sheet No. 178. WHO, Geneva.
- WHO 2003 *The Right to Water*. WHO, Geneva.
- WHO/UNICEF JMP (Joint Monitoring Plan for Water Supply and Sanitation) 2000 *Global Water Supply and Sanitation Assessment 2000 Report*. WHO, Geneva and UNICEF, New York.
- World Bank 1991 *The World Bank Operational Manual—Operational Directives*. OD 4.15, December 1991. *Poverty Reduction*. The World Bank, Washington, DC.
- World Bank 1993 *Water Resources Management. A World Bank Policy Paper*. The World Bank, Washington, DC.
- World Bank 1997 *Health, Nutrition and Population Sector Strategy*. The World Bank, Washington, DC.
- World Bank 1998 *Development and Human Rights: The Role of the World Bank*. The World Bank, Washington, DC.
- World Bank 2000 *The World Bank Operational Manual—Operational Policies*. Op 4.07, February 2000. *Water Resources Management*. The World Bank, Washington, DC.
- World Bank 2001 *Making Sustainable Commitments. An Environment Strategy for the World Bank*. The World Bank, Washington, DC.
- World Bank 2002a *Sustainable Development in a Dynamic World. Transforming Institutions, Growth and Quality of Life. World Development Report 2003*. The World Bank, Washington, DC and Oxford University Press, New York.
- World Bank 2002b *Water, Sanitation and Hygiene at a Glance*. Health, Nutrition and Population Sector Fact Sheet. The World Bank, Washington, DC.
- World Bank 2003 *Water Resources Sector Strategy: Strategic Directions for World Bank Engagement*. World Bank, Washington, DC.
- Wright, J. A., Gundry, S. W. & Conroy, R. 2004 Household drinking water in developing countries: a systematic review of microbiological contamination between source and point-of-use. *Trop. Med. Int. Health* 9(1), 106–117.
- WSSCC 2000 *Vision 21: A Shared Vision for Hygiene, Sanitation and Water Supply and a Framework for Action*. WSSCC, Geneva.
- WSSCC Working Group on Promotion of Sanitation 1998 The problem of sanitation. In *Sanitation Promotion* (ed. M. Simpson-Hébert & S. Wood). World Health Organization, Geneva.
- Yacob, M. & Whiteford, L. M. 1994 Behaviour in water supply and sanitation. *Human Organization* 53(4), 330–335.