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SUSTAINABLE DEVELOPMENT OF WATER RESOURCES, WATER SUPPLY AND ENVIRONMENTAL SANITATION

Review of Decision Tools and Trends for Water and Sanitation Development Projects

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Premature failure or abandonment of water and sanitation development interventions is a common phenomenon and one which is preventing potential benefits from being fully realised. An examination of common failure mechanisms reveals that most could have been prevented by the consideration of human health, environmental, economic, social and technical criteria during the initial decision-making process. Many tools have been proposed to support identification of a 'most sustainable option'. However, they have not been, and often cannot be, adopted by development agencies. Strategies for improved planning need to incorporate the five criteria above in a manner practical in a developing region context. This is not a simple task. The relationships between technology choice and human health need to be better understood. Development agencies must also realise that the extra cost in time and effort of such planning is a small price to pay for projects which bring sustained benefit.

Introduction: Implementation failure

Unsustainable water and sanitation projects

The infamous statistics reported by WHO and UNICEF (2004) declare 1.1 billion people to be without an improved water supply, 2.6 billion people to be lacking improved sanitation and 2.2 million people to be dying annually of resultant diarrhoeal diseases. Whilst the problem appears overwhelming, it is not an inability to address the issues in the short term that has given rise to these statistics. There is evidence that our inability to implement projects which give sustained benefit is a more significant contributor. Dunmade (2002) reports that "the success rate of most projects is quite low", with many development initiatives even being abandoned prior to completion. It has been estimated that 30-60% of existing rural water-supply systems are inoperative at any given time (Brikke and Bredero 2003). India is a case in point. Despite being a country synonymous with water and sanitation-related poverty, it is actually 95% covered with infrastructure that, were it in use, could deliver more than 40 litres per capita per day (pers. comm. Ellery 2005). The globe is indeed "littered with failed water and sanitation projects" (Moe and Rheingans 2006).

The "implementation gap"

The large number of failed water and sanitation projects is not a product of insufficient technical knowledge. Over thirty years ago, engineers were already claiming that the technology with which to solve the world's water problems already existed (Smith 1975), and that any failure to provide such solutions would be "a failure of management, and of management alone" (Overman 1968, p186). Since then, we have added to both our technical expertise and knowledge of appropriate management practices. 'Sustainability' has been central to policy discussions since the early 1990's (Dunmade 2002) and the need for, and methods to achieve, sustainable solutions are by no means new to development literature. Participatory decision-making, which seeks to involve beneficiaries in planning processes, has been stressed in the literature for decades. At least among theorists and researchers, there is an increasing awareness of the inadequacy of 'conventional approaches' to water and sanitation for making a significant dent in the current service backlog and thought is being given to more sustainable, innovative solutions. With respect to sanitation, Kalbermatten *et al.* (1999) argue that "a great deal is known today about ways to overcome most of the existing obstacles…not only about technologies, but also about the methods of community participation essential to create sustainable solutions". In theory, effective solutions "can be implemented now".

However, although we know the importance of including socio-cultural factors in development decision-making processes, the developed Western world is still guilty of failing to consider human behaviour, attitudes, knowledge and practices in water decision-making and management (Sobsey 2006). Although we know that a 'one-size-fits-all' solution does not exist, it is common to "apply conventional water and sanitation interventions, without community involvement, over and over again even when they are inappropriate for the specific environment and community needs". Although we know that conventional approaches and technologies will not solve the problem, the Millennium Development Goal Task

Force on Water and Sanitation has nevertheless set targets of 'improved' sanitation using conventional approaches, exhibiting "very little innovative thinking" (Rosemarin 2005). In short, the policies of water supply and sanitation for many developing countries "often seem good on paper, but in practice are not effectively implemented" (Johansson and Kvarnstrom 2005).

Pearce (2002) critiques the divide between theory and practice in his article *Despite all the talk, real change is as elusive as ever*. The situation may not be as stagnant as Pearce claims, but there is evidently a 'gap' between good practice as described in literature and its implementation on the ground. Utting (2000b) asks: "How real has the shift in approach been in terms of substantive environmental, developmental and political changes at national and local levels, and how much remains at the level of policy guidelines and rhetoric or piecemeal interventions?" (p3). The global statistics reported by WHO and UNICEF validate his question.

Planning: The underlying problem

Examination of common failure mechanisms gives an indication of the underlying cause of, and hence the solution to, unsustainable development interventions. The following comment by Moe and Rheingans (2006) on failed attempts at water and sanitation provision hints at the root of the problem:

> There are many examples of broken water pumps where necessary parts for repair can not be obtained in the country, gasoline powered pumps where the cost of gasoline is prohibitive, flush toilets that discharge into cesspools in the back yard, and composting latrines used as chicken coops.

Lack of sustainability criteria

The quote describes four situations in which key criteria have not been considered. A need for unavailable parts can be traced to insufficient initial consideration of technical criteria. Prohibitive gasoline costs should have been identified by economic criteria during decision-making. Flush toilets disposing into cesspools fail to meet environmental and human health criteria, and inappropriate use of composting toilets may have been avoided by careful consideration of social criteria. According to Malmqvist and Palmquist (2005), these five categories (human health, environmental, economic, social and technical) form the five pillars of sustainability. Other attempts to define the components of sustainability have settled on a similar set of primary criteria (Dunmade 2002; Brikke and Bredero 2003). The root of the 'development implementation gap' is the failure of planners to consider all aspects of sustainability in the initial decision-making process.

Kalbermatten *et al.* (1999) list many reasons for our failure to implement available solutions, but claim that the most significant one, perhaps underlying the others, is planning which fails to take into account all potential impacts. Brikke and Bredero (2003) identify poor decision-making which fails to consider all facets of sustainability as one of three common barriers to sustainable services in developing regions. Dunmade (2002) agrees that "failures can be attributed, at least in part, to decision makers who were unwilling to perform adequate pre-investment evaluations of the sustainability of proposed technologies within the local society". The first recommendation of a recent OECD workshop was to develop decision support tools that integrate the 'cause-effect linkages' necessary for sustainable service planning (OECD 2006a). It is "by identifying and examining sustainability factors…and by considering such factors in the decision-making process" that the "enormous waste of economic resources can be avoided" (Dunmade 2002).

Historical development of sustainability criteria

In the late 19th and early 20th centuries, great progress occurred in sanitation technology in urban areas of America and Europe. One important precursor was John Snow's 1854 discovery that cholera is a waterborne disease and that the epidemic of 1853-1854 was connected with the consumption of faecally contaminated water (Hamlin 2001). Consequently, technologies implemented in this era were usually directed towards improving the health of urban residents. However, while human health may have been the initial motivation for the implementation of new urban water and sewerage systems, issues of disease were at this time irrelevant to the question of design. Most engineers, for instance, agreed that both combined and separate sewer systems were equally sanitary if they were properly maintained (Smith 1999). For this reason, human health criteria did not have a part to play in design decisions. Environmental considerations were also absent and decisions tended to be made on the basis of technical and economic criteria alone (Smith 1999).

The lack of environmental considerations in decision-making in the late 19th and early 20th centuries meant that the possibility of environmental degradation by unlimited water harvesting and pollutant discharge into waterways and coastal environments was largely ignored (Melosi 2000). Supply management, rather than demand management, was the emphasis (Drangert and Cronin 2004). However, increased irrigation and farming in India led to massive population growth in the early 20th century and a greater demand for water. A series of dams and barrages along the Nile River in Egypt and Sudan was simultaneously having the same effect – a quintupling of the population between 1870 and 1970 (Smith 1975). It became apparent that supply management alone could not be sustained and that environmental factors had to be considered in water-related decisions.

The change was a product of societal beliefs as much as necessity. The years after World War II saw a shift "beyond the utilitarianism of the Progressive Era to a view much more amenable to a preservation policy based on ecology" (Melosi 2000, p291). The traditional notions of economic growth and progress were questioned and new public interest conservation groups were appearing in great numbers. By the

1960's, ecology had become as much a popular principle as a scientific one. In addition, the "infrastructure crisis" after 1970 suggested massive physical deterioration of public works and was associated with increasing awareness of the environmental implications of pollution, shrinking resources, potential breakdown of sanitation technologies, and non-point sources of pollution (Melosi 2000). It became clear that past decision-making failures to plan for growth and to anticipate environmental problems were responsible for crumbling infrastructure and threatened living conditions.

Decision-making for services in developing regions underwent the same learning curve, albeit more recently. Whilst human health was the motivation for water and sanitation interventions, technology choice was governed by technical criteria and initial investments for many years. Environmental and social factors which "are also germane for ensuring the sustainability of services" (Brikke and Bredero 2003) were often neglected. It was not until 1980 that the International Union for the Conservation of Nature (IUCN) introduced the well-known triptych of economic, social and environmental sustainability. The Brundtland Report, Our Common Future (1987), released by the World Commission on Environment and Development then successfully linked the environmental issue with global development. From that point onwards, the UN General Assembly began discussing environment and development as a single issue (Söderberg and Kärrman 2003). The understanding that human communities are intimately tied to the ecological world is now publicised as a necessary premise for water and sanitation decision-making (Millennium Ecosystem Assessment 2005), particularly in developing regions, in which inhabitants are most reliant on the environment and most affected by environmental degradation (OECD 2006b). In practice, this emerging view of community development is resulting in the introduction of reuse management (Drangert and Cronin 2004) and technologies such as 'EcoSan' (ecological sanitation), which 'close the nutrient loop' (SWH 2006).

Short-term planning

The progress of the 19th and 20th centuries involved the development of centralised wastewater systems. Technology choice was characterised by an emphasis on short-term goals and a failure to address long-term implications such as the capacity of the system to adapt to the pressures of growth. According to historian Joseph Konvitz, new urban infrastructure after 1880 was "treated as if the social, economic and technological conditions to which it corresponded were permanent and so could be fixed into permanent form" (quoted in Melosi 2000, p11). This tended to 'lock in' specific technologies and limit choices for future generations.

An emphasis on short-term goals to the detriment of long-term sustainability has also been a failing of many water and sanitation development projects. Population growth is highest in developing regions of the world and inadequate consideration of urban growth in decision processes has led to centralised sanitary and water services that now do not reach the periphery of over-populated city slums. Agency-managed water and sanitation provision in rural areas has also suffered from a focus on short-term planning. This has taken the form of brevity of contact between the supplier and recipient community (Choguill 1996), inadequate investment (Moe and Rheingans 2006), failure to plan for operation and maintenance (Cairncross and Feacham 1993; Brikke and Bredero 2003), and lack of post-implementation project evaluations (Moe and Rheingans 2006). For example, it is reported that most tubewells constructed by the Bangladeshi government for villages affected by arsenic-contaminated water are broken or inadequately maintained. The phenomenon has been traced to a failure to plan for long-term operation and maintenance (Biswas and Merson 2005).

De-linking water and sanitation

The separate consideration of water supply and sewerage systems was characteristic of industrialisation in the 19th century (Smith 1999; Melosi 2000). In the first three quarters of the century, hundreds of American towns installed waterworks while "no city simultaneously constructed a sewer system to remove the water" (Smith 1999, p291). Decisions made without consideration of the human health and environmental implications of wastewater resulted in poor urban sanitary conditions, catalysing the sanitary revolution of the late 19th century.

A similar phenomenon has been occurring far more recently in service provision in developing regions. It is common to treat water supply in isolation (Carr 2001) and to ignore the fact that "water quality and sanitation are irrevocably intertwined" (Moe and Rheingans 2006). Sanitation has been neglected, "even though 'water supply and sanitation improvements' are often mentioned together in project documents" (Brikke and Bredero 2003). According to Franklin Bailey Green of the Environmental Energy Technologies Divisions of Lawrence Berkeley National Laboratory, "our more single-minded focus upon water supply without equal attention to sanitation, as was done beginning with the first UN Water Decade of the 1980's, has back fired. Such an approach does indeed lead to 'larger than initial' public health risks and environmental degradation as evidenced in part by WHO international health statistics" (pers. comm. 2006). Evidently, this lesson was not fully learned at the end of the 19th century. Holistic decision-making, which takes into account the implications of sanitary practices and surface-groundwater links on water quality, is still required to improve the sustainability of water and sanitation services for the poor.

Current tools and solutions

Decision tools for developed regions

Our understanding of the implications and necessary considerations of water-related decisions has grown over the last few centuries. As a result, so too has the complexity of the decision-making process. In the 1950s and 1960s, problem solving methods began to be dominated by 'systems thinking'; that is, the conceptualisation of a problem area as a system by which the emergent properties of various solutions can be determined (Söderberg and Kärrman 2003). Single-objective optimisation and simple decision tools were no longer considered satisfactory, at least in theory and literature. In the 1970s, multiple criteria were included in the decision-making process, and trade-offs between criteria began to be considered. Recent decades have seen a proliferation of methods designed to incorporate multiple objectives and criteria into a decision, particularly for decisions involving something as complex as a natural system (Despic and Simonovic 2000).

'Cost-benefit analysis' (CBA) is one such method employed in the water sector, in which the benefits and costs of possible solutions are given a monetary valuation. 'Multi-criteria analysis' (MCA) has also become a popular approach in the sector over the last decade. MCA, unlike CBA, does not require the monetary valuation of benefits. Life Cycle Analysis (LCA), Materials Flux Analysis (MFA) and Environmental Impact Assessments (EIA), whilst not decision tools in their own right, have been developed as inputs to other strategies for making decisions involving complex systems. Decision Support Systems (DSS) emerged in the 1970s as computerized methods for solving structured and unstructured problems. Their capacity and use has since expanded to include multi-criteria analysis. DSS have been recommended for environmental decision-making by initiatives such as *Agenda 21* (Mysiak *et al.* 2005).

Such methods have brought with them a host of new problems. Firstly, they often assume a 'one best way' – a 'technological fix' – to exist. They also assume the problem domain to be fixed, without disturbances from other humans. These inherent assumptions have resulted in frequent failures (Söderberg and Kärrman 2003). Processing qualitative criteria using quantitative methods has been difficult (Despic and Simonovic 2000), particularly in MCA. A wide range of algorithms and methods have been developed for solving multi-criteria problems as a result of the ambiguity and flexibility of the MCA approach (Mysiak *et al.* 2005). Dealing with uncertainty has been another difficulty. Although many attempts have been made to quantify or formalise uncertainty for the purposes of decision-making, "as the uncertainties become more remote from classical probabilities, the methodological difficulties in such programmes become more severe" (Funtowicz and Ravetz 1994). It is not surprising that the failure rate of DSS is reported to be high, particularly when dealing with complex problems (Mysiak *et al.* 2005). It has become evident that traditional decision-making, which assumes "nature to be simple, and capable of reductionist mathematical explanations" (Funtowicz and Ravetz 1994), is not always adequate in the water sector.

Recently suggested decision techniques have their roots in the understanding that planning is a complex process, uncertainty is great and values are in dispute. Goals tend to be established as part of the decision process, rather than being fixed from the start, and dialogue with all stakeholders rather than only certified experts is essential (Söderberg and Kärrman 2003). Funtowicz and Ravetz (1994) use the term 'post-normal science', as opposed to 'traditional science', to describe the art of complex decision-making. Multi-Criteria Decision Aiding (MCDA) falls into this category. As opposed to MCA, which aims to find a fixed solution based on several conflicting criteria, MCDA aims to help actors in a decision process to shape their preferences to be in conformity with their goals and values. Some claim that MCDA is more appropriate to decisions involving uncertainty and ambiguity (Roy 1990), such as those encountered in the water sector. A decision-aiding framework specific to the urban water sector has recently been developed (Lundie *et al.* 2005).

Barriers for developing regions

Internationally recognised decision-making and decision-aiding techniques are generally designed for use in developed regions and tend to be limited to developed regions in their application. Participatory development is certainly an accepted principle in community development and, in theory, the adequate consideration of multiple sustainability criteria should enhance the longevity of services. However, decision techniques designed in and for developed regions have not proven transferable. Development agencies are "still having problems, 40 years after their first entry into the water and wastes sector, in finding planning tools to meet the needs of the developing countries" (Kalbermatten *et al.* 1999).

There are a number of explanations for this phenomenon. Many of the frameworks are simply unrealistic and impractical in a developing setting. 'Strategic Sanitation Planning' is a decision tool for developing communities, which is intended to match user's needs with affordable, appropriate technology. Like many other frameworks, it is impractical because it "requires a 'planning culture', which is often missing in developing countries" (Kalbermatten *et al.* 1999). Early feedback from the AusAID *Safe Water Guide* (2005), a recently-published framework for designing, implementing and monitoring water supply systems for developing communities, indicates that *The Guide* must be shorter and simpler in order to be more usable in its intended context (pers. comm. Buckley 2005).

Failure to recognise a need for better planning contributes to its absence. Early failure or abandonment of projects often goes unnoticed due to the fact that aid programs tend to be conducted in a short time frame (Butters 2004). Longer-term evaluation or revisitation of projects, which might reveal the need for more forethought and better decision-making methods, is not a popular practice among donor agencies (Howard 2003; Butters 2004; Moe and Rheingans 2006). Furthermore, it is often perceived in retrospect that the historical development of industrialised nations was a simple matter of implementing straightforward, technical solutions and did not require any careful decision-making (Hamlin 2001).

Planning water and sanitation projects in such a way as to ensure sustainability increases the length of the decision-making phase (Brikke and Bredero 2003). Temporally expensive planning tools are unlikely to be adopted by development organisations, especially when the benefits are not immediately obvious. It must also be considered that most major international assistance agencies require a complex set of procedures for project planning, preparation and feasibility analysis to be undertaken by a development organisation before support is offered (Rondinelli 1976; Fraser *et al.* 2006). An organisation is unlikely to adopt a data-demanding or time-demanding decision tool in addition to these requirements.

Perhaps the most fundamental reason for the development sector's rejection of modern decision techniques, particularly those involving the use of multiple sustainability criteria, is that their designers looked at 'sustainability' through glasses coloured by their own culture and thinking. The call for countries to pursue policies of 'sustainable development' was made with the Brundtland Report in 1987, the Earth Summit in 1992 and the World Summit in 2002. Since then, 'sustainability' has become such a common term that it is easy to assume its meaning to be the same in every culture and language, and its components to be self-evident. It may not be so. The principles of inter-generational and intra-generational equity, and the definition offered by the Brundtland Report (WCED 1987, p43) do not necessarily create a uniform understanding of, or exposure to, sustainability theory. Pearce *et al.* (2006) state that "formidable challenges confront policy-makers who have publicly stated their commitment to the goal of sustainable development; not least in determining what exactly it is they have signed up to". An understanding of sustainability that differs from culture to culture can be expected to impede the cross-cultural transfer of decision tools which profess to enhance sustainability, particularly if the user is a local organisation.

Decision tools for developing regions

While many attest to the urgent need to consider all facets of sustainability in development decision-making (Kalbermatten *et al.* 1999; Dunmade 2002; Brikke and Bredero 2003), how this is best achieved is not as obvious. Perhaps more importantly, it is unclear how that achievement, once realised, can bridge the current 'implementation gap' to become common practice.

Integrated criteria

The five key components of sustainability in the water sector (human health, economic, environmental, social and technical) proposed by Malmqvist and Palmquist (2005) have been used in various decision techniques (Bracken *et al.* 2005; Lundie *et al.* 2005) and yet their application in developing regions is controversial. Bracken *et al.* (2005) suggest that sustainability criteria bring increased objectivity to decision-making, whereas Acholo *et al.* (2001) argue that their use in cross-cultural situations quickly loses its intended objectivity and "becomes subsumed into subjectivity and qualitativity". Others maintain that 'subjectivity and qualitativity', when guided by community values, are advantageous and necessary aspects of development decision-making and that "the results of decision processes which rely solely on formal assessment techniques…raise issues such as equity, trust and representativeness" (Antunes *et al.* 2006). Nevertheless, Acholo *et al.* correctly point out that the relative importance, integration, and proper determination of sustainability criteria are not yet well established.

The philosophical and methodological difficulties of sustainability criteria can be evidenced by an examination of human health criteria. Disagreement exists regarding the significance of health considerations in technology choice. Fewtrell *et al.* (2005) conducted a review of water and sanitation services in rural, developing communities and found every sanitation, hygiene and water intervention to be effective with respect to human health to some extent. They argue that human health considerations are therefore insignificant in technology choice and that decisions for a given setting can be based on local desirability, feasibility and cost-effectiveness. Esrey (1996) performed an earlier review using a large quantity of community health and anthropometric data from water supply and sanitation projects in eight Sub-Saharan African nations. His findings were considerably different to Fewtrell's. (It is possible that the number of studies used may have affected the results of Fewtrell's research – only two studies were used in the meta-analysis for sanitation.) According to Esrey, the type of sanitation provided was strongly linked to the resultant health benefits, suggesting that human health ought to be a significant element of technical decisions in the sector.

Not only is there an ill-defined link between health and technology choice, the relative importance of human health benefits arising from service provision is also under contention and has implications for criteria weighting during decision-making. Many studies, by their conclusions based on health-related data, imply community health to be the primary goal in water and sanitation provision (Esrey *et al.* 1991; Esrey *et al.* 1992; Esrey 1996), yet they attract criticism. Cairncross and Kolsky (1997) argued that "most investments by government and aid donors in water and sanitation are fully justified irrespective of their health benefits; because they save drudgery and expense, contribute to human dignity and the emancipation of women, and offer many other benefits". Hutton (2001) uses a water and sanitation project in Guinea to argue the significance of non-health benefits.

Community participation

The importance of involving beneficiaries in the decision process was formalised in Principle 10 of the Rio Declaration of 1992, which stated that environmental decisions are best handled with the participation of all concerned citizens. In recent decades, a number of scholars have argued that environmental decisions must be grounded both in science and in fair public discourse (van den Belt 2004; Antunes *et al.* 2006). Broader participation, whilst more expensive initially, makes the overall decision-making process "more effective and less expensive at the implementation end" (van den Belt 2004, p7).

In community development planning, it is generally agreed that familiarity with social norms is essential for community uptake of the system (Alcacer 2005; Batchelor *et al.* 2005) and should be sought throughout the decision phase (Cairncross and Feacham 1993; Choguill 1996; Parikh and Parikh 2004). However, "there is less agreement about what to do with that familiarity" (Hamlin 2001). Participatory approaches do not automatically produce sustainable solutions, because "the decisions taken by a community are influenced by its knowledge base" (International Environmental Technology Centre 2002). For example, among beneficiaries there is a "general lack of consumer awareness of the health hazards associated with poor water quality and inadequate sanitation" (Moe and Rheingans 2006). Social status, convenience, comfort and dignity are often greater motivations for improved water and sanitation than human health (Jenkins and Curtis 2005; Moe and Rheingans 2006). There is therefore a tension between the use of decision-making criteria directed by community preferences, and those chosen by the planning organisation. Each option has implications for the transparency, validity and, of course, outcomes of the decision process. Botchway (2001) reports on a water supply project in northern Ghana in which participatory processes were impaired by language and by ignorance of the socioeconomic processes *within* villages that required modifying. He is a critic of the 'inherent goodness' of the participatory approach and claims that low-level participatory processes allow the state to evade its duty to provide for community development.

Utting (2000a) supports the theory of participatory development, but points to an inherent difficulty in actually operationalising the approach. The difficulty, he claims, may explain the tendency to continue making decisions "for the people without the people" (Alcacer 2005), even after many years of mistakes in this area. Differences in technical competence, language barriers, socio-economic status, and beliefs and attitudes make effective community participation and education difficult, and close to impossible without an individual or organisation who can bridge the gap between cultures (Nomura *et al.* 2003). While the theory of community participation is a good one, we must pay attention to what it means in practice if it is to result in sustainable change.

Conclusions

This paper identifies key problems with the implementation of projects in developing countries, as a prelude to a more involved study which will identify workable solutions. Premature failure or abandonment of water and sanitation services in rural, developing communities is still a significant contributor to global poverty and can usually be traced to inadequacy in the project planning phase. Mistakes made by industrialized nations in planning for water and sanitation services are being repeated in developing regions. Whilst many decision tools have been proposed to support identification of a 'most sustainable' option for a given context, community development agencies are still having trouble finding tools that are suitable for decision-making in the development sector.

The solution is not simple. It is clear that decision-making that considers all components of sustainability is needed to decrease the incidence of early system failure and prolong the benefits of water and sanitation services. However, it is not clear how this is best achieved. For example, the relationship between technology choice and human health needs to be better understood. Meanwhile, the appropriate use of participatory processes for determining social criteria remains controversial, even though means of consultation and power-sharing will undoubtedly be at the centre of successful decision-making practice.

The institutional and cultural contexts into which improved decision methods are to be planted must be considered. The understanding of 'sustainability' held by members of the development agency and the beneficiary community will affect the applicability of any decision strategy. Awareness of the need for improved planning is essential, particularly since proper decision-making will inevitably require an investment of time and energy. Decision strategies that can incorporate all aspects of sustainability in a manner appropriate to the specific cultural and organisational context for which they are intended, will allow the potential benefits of development work to be fully realised.

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