

Water resource management



This document sets out a guideline for adopting water resource management initiatives while delivering water, sanitation and hygiene education services in both rural and urban contexts. It is intended to guide WaterAid's partners in Nepal in the delivery of appropriate services and technologies to fit the needs of different users. It is also hoped that this guideline will be of value to other organisations and sector stakeholders. This guideline discusses how best to deliver water, sanitation and hygiene education services while keeping water resource management at the heart of service provision.

The guideline was updated by Kabir Das Rajbhandari from WaterAid in Nepal . WaterAid's partners in Nepal, colleagues from WaterAid South Asia region and Vincent Casey from the Technical Support Unit in WaterAid's office in London provided valuable technical input, and colleagues from the Advocacy team in Nepal also reviewed the document. This guideline is fully consistent with, and builds on, WaterAid's Water Resource Management Policy (March 2008) which was initially developed at an international workshop held in Abuja in 2005.

This document should be cited as WaterAid in Nepal (2011) *Policy guidelines - Water resource management*.

The document can be found in the documents section of the WaterAid in Nepal country programme website– www.nepal.wateraid.org

A WaterAid in Nepal publication

September 2011



WaterAid transforms lives by improving access to safe water, hygiene and sanitation in the world's poorest communities. We work with partners and influence decision makers to maximise our impact.

Cover picture:

Top: Geeta Dhakal, Chairperson, Khadipakha squatter settlement.

Middle: Manju Rajbahak from Tigni.

Bottom: Krishna Patiyar, Chairperson, Resident of Eco Community in Kirtipur Housing Project.

WaterAid/Marco Betti

Contents

Abbreviation	iii
1. Background	1
1.1. Introduction	1
1.2. Current issues around WRM	2
1.2.1. Scarcity and water resource development	2
1.2.2. Conflicts and water resource protection	3
1.2.3. Institutions and water governance	3
1.2.4. Financial sustainability	4
1.2.5. Legislative and regulatory framework for allocation of the water resources	4
1.2.6. Information management	5
1.2.7. Capacity building	5
1.3. Current challenges around WRM	5
1.3.1. Effectiveness of WaterAid in its poverty reduction approach	5
1.3.2. Securing groundwater resources for human basic needs	6
1.3.3. Holistic approach to sustainable development	6
1.3.4. Successful community management of water	6
1.3.5. Effective water governance	7
2. Policy framework	9
2.1. Conceptual framework for WRM	9
2.1.1. Initial mandate from the programming review framework	10
2.1.2. Foundations laid by WaterAid's country strategy 2005 – 2010 for Nepal	12
2.1.3. WaterAid' position on WRM in Nepal: Defining the scope and boundaries	12
3. Policy objectives	17

4. Policy and operational strategy (guiding principles)	21
4.1. Policy strategy	21
4.1.1. Strengthening institutions	21
4.1.2. Understanding technical measures: water resource protection	23
4.1.3. Capacity building	23
4.1.4. Better financing mechanisms	24
4.1.5. Information management	25
4.1.6. Water resource management issues in urban settings	25
4.2. Operational strategies: guiding principles (practical measures)	25
4.2.1. Project proposals	26
4.2.2. Water resource management (conservation) at different levels	26
4.2.3. Water quality assurance	29
4.2.4. Pollution control measures	30
4.2.5. WaterAid and its implementing partners in Nepal	30
5. Implications for WaterAid in Nepal	31
5.1. Staffing	31
5.2. Capacity building	31
5.3. Planning	32
5.4. Information	33
5.5. Other resources	33
Chapter six: Conclusion	35
ANNEXES	
Annex 1: Implications of IWRM at national and international level	37
Annex 2: WaterAid’s approach on CWRM in Nepal (May 2006)	38
Annex 3: Conceptual framework for WaterAid’s engagement on CWRM	44

Abbreviation

CBOs	-	Community Based Organisations
CPs	-	Country Programmes
CSOs	-	Civil Society Organisations
CSP	-	Country Strategy Paper
CWRM	-	Community Water Resources Management
GWP	-	Global Water Partnership
IMS	-	Information Management Systems
IWRM	-	Integrated Water Resources Management
NDWQS	-	National Drinking Water Quality Standards
NGOs	-	Non Governmental Organisations
PoU	-	Point of Use
WACP	-	WaterAid Country Programme
WATSAN	-	Water and Sanitation
WESI	-	Water and Environmental Sanitation Improvement
WQ	-	Water Quality
WQSTP	-	Water Quality Standards and Testing Policy
WRM	-	Water Resource Management
WTP	-	Willingness to Pay
WUMP	-	Water Use Master Plan



Background

1.1 Introduction

Access to water is fundamental to human survival, health and productivity. So it is necessary to ensure the sustainability of people's access to water, and to the environment which is dependent upon it. As pressures and demands on this limited resource increase, the need to find new and innovative approaches to providing it becomes more apparent, and more urgent.

Water Resource Management (WRM) has emerged as a means to move away from a traditional sub-sector approach to water provision, to a more holistic or integrated approach to water management.

The purpose of this policy is to provide practical guidance on global strategic goal of WaterAid in general and country strategy of WaterAid in Nepal in particular to *“ensure all future water supply and sanitation projects supported by WaterAid address the issues of water depletion and contamination through appropriate integrated water resource management”*.

Three principles: Putting Integrated Water Resource Management (IWRM)¹ in context.

- ◆ **The water and sanitation sector is affected by water use in other sectors**
- ◆ **There are potential negative and positive impacts of all water uses, due to the interconnectedness among all uses of the resources, particularly at catchments scale**
- ◆ **There is a need for a holistic view, to ensure equitable and efficient use of water**

“IWRM is a process, which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystem”. Global Water Partnership (GWP) Definition, 2000

¹ WaterAid in Nepal interprets IWRM as a WRM in its entire area of work and thus uses WRM interchangeably with IWRM.

This paper draws on WaterAid's strategic shift towards WRM in Nepal. This paper highlights key WRM issues to be addressed by WaterAid in Nepal for putting it into practice. As most of WaterAid's work in Nepal is achieved at grass root level, it outlines the key approach WaterAid will use to WRM in Nepal, which is Community Water Resources Management (CWRM). This Paper also incorporates the discussions in the workshops organised by WaterAid at a CWRM Inception Workshop in Abuja, April 2005 and at WRM workshop in Ethiopia, March 2007 respectively together with the Dublin Principles of IWRM, 1992.

It may be noted from the outset that this paper aims to highlight minimum common understandings considering the local context and the natural preferences of the programmes being implemented together with WaterAid's implementing partners in Nepal.

The paper is divided into six chapters. The next chapter ie Chapter - 2 focuses on policy framework. Chapter - 3 defines the key policy objectives and Chapter – 4 provides policy and operational strategy (guiding principles). Chapter – 5 identifies the possible areas of concerns and implications for WaterAid while promoting this WRM policy to mainstream within WaterAid and its partners while delivering water and sanitation facilities to the poor. The chapter - 6 provides conclusion over the WaterAid's policy on WRM.

1.2 Current issues around WRM

Falling water tables, ground water pollution, serious problems of water quality (microbiological and physio-chemical) and growing competing demands for water by

different water sector and sub sector will pose a challenge to effectively provide drinking water and sanitation services to poor people in urban and rural parts of Nepal. The Water and Sanitation (WATSAN) sector is thus affected by water use in other sectors, including agriculture, fisheries, industry and mining. Indeed, all water uses have potential negative and positive impacts on one another. This is because natural water resource systems are interconnected, particularly at the catchment level. Therefore, in order to ensure an equitable and efficient use of water, it is necessary to consider all the different uses of water together, rather than each one in isolation.

A better understanding of WRM and its approach to be adopted is thus necessary, and therefore WaterAid is placing an increased emphasis on the concept, tools and techniques of WRM while designing water, sanitation and hygiene projects.

Following seven potential issues relating to WRM were identified by WaterAid with reference to the country scoping studies, and a mapping exercise carried out by WaterAid in global context where we work (see Annex 1).

1.2.1 Scarcity and water resource development

Water stress is emerging as a serious problem in many countries around Asia and Africa. In short, water demand exceeds available resources.

Nepal, as many countries in Asia, also experiences water scarcity issues, including its use, quantity and quality. Many communities of Nepal, where WaterAid is working, are also facing serious problem of water stress. Moreover,

the proportion of the population living in communities of significant water stress is set to increase into the future. As such, those living in the poorer section of the country, with low and unreliable rainfall and high levels of water use, will be most at risk of water stress impacting severely on lives and livelihoods.

Over much of Tarai regions of Nepal, groundwater offers the mostly realistic water supply option, for agencies working in Water Sector in general and WaterAid and its partners in particular, to meet demand. Alternative resources can be unreliable, difficult and expensive to develop: surface water is prone to contamination, often seasonal, and needs to be piped to the point of need; rainwater harvesting is expensive and requires good rainfall throughout the year. The characteristic of groundwater makes it well suited to the more demand responsive and participatory approaches of water and sanitation programmes.

Understanding hydrogeology can help predict in which areas there may be a problem and allow for alterations in design, mitigation, or improved groundwater management strategies. With the current focus on increasing access to sanitation, urgent research is required to ensure that this is done without comprising the quality of groundwater resources on which community water supplies depend.

1.2.2 Conflicts and water resource protection

Pollution and contamination of water bodies by untreated or partially treated effluents, including pollution from agriculture and small scale industry, can

render them unsuitable for use as water sources by domestic water users, and can also damage aquatic ecosystems. This has obvious implications for health, treatment costs, resource protection and conservation. It can also exacerbate conflict over the quantity and quality of water required to meet domestic water needs, in the face of other competing uses such as agricultural and industrial abstractions. Even at a community level, these conflicts manifest themselves in competition between use for human consumption and use for livestock.

In addition, the mismanagement of watersheds and water catchments has implications for the entire water course. It touches on all spheres of life; domestic, agriculture and livestock activities. Although groundwater is generally well protected, increased development can threaten the quality of groundwater. So can on-site sanitation, which although critical to the success of water projects and health of communities, contaminate local groundwater resources.

It also emerges that communities are playing a poor role and taking poor responsibility for protecting their water resources. The response should be to offer a range of opportunities for community action to protect water sources, such as preventing direct sunshine on immediate watershed, hygiene education, and adopting tools that can enhance the preservation of the water sources.

1.2.3 Institutions and water governance

The instability of institutions, or a lack of existing institutional or social structures, makes implementing an integrated approach to water resource management

difficult. Approaches are often uncoordinated, and lack transparency and accountability.

In the programmes of WaterAid, organisations are being made responsible for working with stakeholders to ensure that institutions are able to carry out their statutory functions, and to ensure organisations and donors are working together. Equally important is WaterAid's role in influencing good implementation of WATSAN services, ensuring they have a rights-based approach. At the same time, it is important that citizens themselves need to be made aware of their own responsibilities towards efficient, equitable, and sustainable use of water resources.

Working with registered water user associations, and working with Citizen's forums, it can be demonstrated that how communities can be involved in carrying out their roles and responsibilities in water governance. WaterAid's Citizen Action Projects could also assume a critical role in this context. By implementing successful models, which demonstrate self-governance by communities, political will among institutions for accepting a rights based approach to water resources management, is fostered.

1.2.4 Financial sustainability

In most communities of Nepal, people do not always appreciate the economic value of water, in all its various dimensions. Mechanism for financing WATSAN which include the participation of various user groups is also lacking. Often, the financial needs required to ensure sustainability are so huge that the sole joint actions of stakeholders are not sufficient. Thus, there is a need for contributions from direct and

indirect users and as well as from operators. This is not always the case. Moreover, funds raised for the purpose of financial sustainability of the water resource are often poorly managed or allocated.

The need remains to invest in WRM, in a way which recognises water as a social and economic good, indeed as a human right. Financial sustainability allows for optimal investments, replacement of equipment, and increase of the water resource. It contributes to poverty reduction, and the improvement of community's living conditions.

1.2.5 Legislative and regulatory framework for allocation of the water resources

Individual abstractions may be small, but collective impacts can be significant. Larger abstractions for settlements may incur large losses through leakage and affect water recharge. Large dam water allocation has proven problematic in several instances where electricity generation, irrigation or livestock needs have been prized over domestic needs.

IWRM scoping studies conducted by WaterAid in all the countries (including Nepal) where WaterAid works have revealed conflicting roles and responsibilities amongst institutions, a lack of regulation of abstraction and pollution, and a lack of awareness amongst users. All of these impact on water resource management.

In general, national water policies and regulations are not disseminated. Legislation exists in some of WaterAid countries, but often it is weak, unenforceable, uncoordinated, conflicting and is not pro-poor focused. Nepal is not an exception to this.

1.2.6 Information management

Experiences in many countries show that there is a distinct lack of information available on surface and ground water quality, as well as quantity, scale of pollution of sources, needs and demands for water, technical or socio-economic data. Where information does exist, it is often inaccessible to the audience to which it is aimed.

Establishing appropriate Information Management systems (IMS) is an integral component of sustainable water resources management. It helps to enable:

- ◆ WaterAid and partners in Nepal to understand issues at different levels, from community to national,
- ◆ Decision making about water allocation and/or abstraction
- ◆ Us to attempt to influence policy and practice appropriately.

In addition, WaterAid will also emphasise the need for mapping of resources, resources uses, existing schemes and provisions, gaps/limitations in actual implementation of schemes, and alternative approaches for resource use at different levels.

1.2.7 Capacity building

An analysis of the issues surrounding water resources management has revealed capacity gaps at various levels in Nepal in general and WaterAid and its implementing partners in particular. It is therefore important to explore the required human, technical, financial and institutional capacities at all levels, from community to national, where WaterAid and partners work. For example, the communities lack the capacity and awareness to implement

water resources management tools such as rain water harvesting, source protection and allocation, community management structures, etc. In this context the important emerging features to include creating testing facilities and skills for water quality, organising campaigns, and institutional capacities are far beyond the existent capacities.

There is ample scope and opportunity for cross learning from other community based natural resource management programmes. The need is to widen networking and experience sharing, particularly with initiatives that directly deal with natural resource management and participatory institutions.

1.3 Current challenges around WRM

From the seven thematic issues discussed above, it is clear that WaterAid faces serious development challenges that will need to be addressed both in short, medium and long term. The followings are the seven challenges that need to be faced or addressed:

1.3.1 Effectiveness of WaterAid in its poverty reduction approach

WaterAid's strategy for poverty reduction in Nepal cannot be effective or equitable unless greater efficiency (quality and quantity) in water uses, shared water resources management, the protection of water resources and the development of sustainable water management strategies at the local, regional and national levels to promote both equitable access and adequate supplies as designed in all their dimensions, are brought within its compass.

An integrated approach that includes the management of the resources in a holistic way needs to be adopted to afford socio-economic development. Fair and transparent allocation between users needs to be promoted. Experience shows that in any competition for access to resources those living in poverty are less successful unless they, or agents acting on their behalf, manage to secure their relative interests. Currently, fair and transparent allocation between users is yet to be promoted. The challenge is, therefore, to take an integrated approach, which incorporates social-economic development.

1.3.2 Securing groundwater resources for human basic needs

The impact of pollution, climatic changes, drought and other pressures on water resources have led to a decline in water table levels, depletion in quantity, and increased deterioration in the quality of surface and ground water resources. Little attention has been paid to aquifer recharge to counteract extraction rates. The balance between the multiple uses of water needs to be addressed. There is a strong need to think of water use and allocation within the context of ecosystems in which poor people are living. There is also need to emphasise the protection of both surface and ground water resources.

WaterAid 's work prioritises the provision of safe drinking water to poor people. The challenge is to provide a sustainable method of abstracting water (Surface/ Ground) resources, by supporting the development of water management strategies at national and local levels. This includes promoting re-use of water

resources, as well as their conservation. These strategies promote equitable access and adequate supplies.

1.3.3 Holistic approach to sustainable development

Usually communities demand water to fulfil a set of domestic needs. The multiple uses of water are essential to the communities' lives and livelihoods. At household and community level people in marginal environments view water holistically. In many places they already apply the principles of WRM. In contrast, WaterAid's current priority is the provision of safe drinking water to the poorest people.

IWRM, which WaterAid normally considers under its shift towards WRM in Nepal, offers the opportunity to move away from this traditional sectoral and fragmented approach to water supply, towards a greater holistic vision of sustainable development through shared, equitable and sustainable access to water resources.

1.3.4 Successful community management of water

IWRM encourages and allows for policies to decentralise responsibility and ownership of water-related institutions, and as such contributes to poverty reduction. WaterAid promotes the management of water systems by communities, and a clear division of roles and responsibilities of the various users at community management level. For example, we know functioning water and sanitation committees can guarantee the sustainability of these services.

The key challenge is to provide opportunities for more ownership and management of services, to integrate demand and supply and to promote technologies that

are economically and environmentally appropriate, and sustainable. WRM at large provides this opportunity.

IWRM principles also call for governments' increased responsibility in the allocation and regulation of water resources, and for them to be made more accountable to local groups and communities. WaterAid's work through its advocacy is advocating governments to have demonstrated commitments to carry out necessary reforms under WRM so that it provides opportunity for WaterAid and its partners to promote a better balance between centralised and decentralised management for successfully managing water resources within the community.

1.3.5 Effective water governance

There are a range of social, economic and administrative systems in place to develop and manage water resources, and the delivery of water services at different levels. The whole WRM approach implies that a water resource management agenda must be integrated with other agenda related to economic, sectoral and sub-sectoral development. This provides an opportunity for WaterAid to support in the design of sound public policies and institutional frameworks, and to mobilise the required human and material resources at the local level. Moreover, making efforts by listening to, and respecting the desperate voices of the poor, can water resources be fairly and efficiently allocated and managed.



Policy framework

2.1 Conceptual framework for WRM

Issues such as scarcity, conflict over water resources, water allocation, pollution, water quality and watershed management have an impact on WaterAid (WaterAid) and its country programmes like WaterAid and its partners' future work in the WATSAN sector in Nepal. In order to develop a comprehensive understanding to address them, it is necessary for WaterAid and its partners to refer to a universal framework, which lays common ground for any WRM related works.

The International Conference on Water and Environment held in Dublin on January 1992 rose to four principles that have been the basis for much of WaterAid's subsequent work on water sector reform. The Dublin Principles are commonly agreed norms in managing water through the participation of all relevant stakeholders.

- ◆ Freshwater is a finite and vulnerable resource, essential to sustain life, development and the environment.
- ◆ Water development and management should be based on a participatory approach, involving users, planners, and policy makers at all levels play a central role in the provision, management and safeguarding of water.
- ◆ Water has an economic value in all its competing uses and should be recognised as an economic good.
- ◆ Women play a central role in the provision, management and safeguarding of water.

Source: The International Conference on water and environment, Dublin, Germany, 1992

WRM can be seen as the process of implementing these Dublin Principles. At a glance, WaterAid's current work complies with the principles, albeit with slight differences in approaches, particular to the country context of specific programmes. To define the scope and commitment of WaterAid to engage in WRM, the framework has been outlined below considering the following foundations:

- ◆ Dublin Principles, as the commonly agreed principles in managing the water resources;
- ◆ Abuja Principles, which derive from the WaterAid Global Inception Workshop to define its specific principles for guiding its work in engaging in IWRM;
- ◆ WaterAid recognises the need to adopt an WRM approach and thus strategic goals are set in its Global Strategy (2005–2010) accordingly;
- ◆ Minimum commitments on WRM which WaterAid made towards contributing to WaterAid’s overall strategic goals.

2.1.1 Initial mandate from the programming review framework

Source sustainability is posing a grave threat. Huge water supply systems with high investments face the threat of becoming obsolete. There is a need to look for an alternative system to assure adequate water supply. This also raises strong concerns over water stress, falling water tables, groundwater pollution and water quality in those areas where WaterAid is working.

A global IWRM inception workshop was held in Abuja in April 2005 to assess the common emerging issues, across WaterAid Country Programmes (WACPs). The ‘Abuja Principles’, offer WaterAid guidance in putting IWRM issues into practice in future work.

Most of the Dublin Principles apply to WaterAid’s work. But the Abuja Principles were devised to better link WaterAid’s specific approach to them. They offer practical guidance in different geographic and socioeconomic settings, around Africa and South Asia:

- i) Given that fresh water is a finite and vulnerable resource, WaterAid and its CPs will work with communities through their respective implementing partners to ensure that water sources are protected to provide adequate, safe water, now and in the future. It will also ensure that water and sanitation interventions consider the needs of other water users including the environment. In addition, WaterAid and CPs through partners will:
 - ◆ Work towards minimising wastage of water at community level, including waste water,
 - ◆ Recognise that catchment scale is the most appropriate management unit for water resource management,
 - ◆ Recognise the importance of good quality data collection and dissemination and use in achieving the above,
 - ◆ Design and promote sanitation technologies which prevent pollution of both the water points and water table.
 - ◆ Establish mechanisms to protect water points at the community level.
 - ◆ Promote and spread, at community level, good practices regarding the safe water transport and conservation
 - ◆ Establish operational policies for water quality.
- ii) WaterAid and its CPs continue to advocate for stakeholder participation, particularly the participation of poor and vulnerable groups, throughout the project cycle, in order to underpin sustainable development. WaterAid and CPs will actively promote and advocate for open, transparent, inclusive and accountable water resource management at all levels. In

addition, WaterAid and CPs through partners will:

- ◆ Encourage beneficiaries to develop appropriate operation and management systems, using participatory approaches,
- ◆ Build beneficiaries' capacities to effectively get involved in the various stages of water supply for the purpose of sustainability of the resource,
- ◆ Design advocacy strategies at all levels to ensure that the needs of the poor and vulnerable are taken into account,
- ◆ Build the capacity of various stakeholders, in order to ensure transparent and accountable management,
- ◆ Build institutional links to encourage information sharing, particularly the passing of decisions making to all levels, as well as providing opportunities for communities to feel part of management and responsible for protecting their water resources.

- iii) WaterAid will inform and empower women to be involved in the management, problem analysis and the decision making process related to water resources. As women and young girls are mainly responsible for water collection, they should be associated and involved in activities relating to the water resources.

The nature of the gender and equity issues in water resource management is not much different from that in other environmental and natural resources management settings. The experience of WaterAid Nepal and other countries reinforces the notion that without full and persistent attention directed to

gender issues, it will be more difficult to achieve successful and sustainable implementation of water and sanitation projects.

- iv) Water has an economic value, but it must also be seen as a human right to be conserved and preserved. WaterAid believes that efforts should be put in place to ensure that the pricing of water takes into account the poorest people the one hand, and on the other the sustainability of both the resource and the service provision.

More than financial sustainability, a key emerging issue is the enhancing budgetary allocation to partners. This is particularly the case because several of the activities relating to IWRM, go beyond traditional supply and delivery mechanisms. Moreover, some activities may have to be carried out on a fairly large scale if they are to affect capacity building, policy formulation and access to access to WATSAN services among the poor.

There appears to be substantial scope for working out the pricing of water for productive and domestic uses, by incorporating the criteria of 'ability to pay' rather than 'willingness to pay' (WTP). The former, unlike WTP, will not only improve the poor's access to water, but will help foster the idea of water as an economic and social good, a resource to be valued and protected. In the process it may help evade the distressing situation where the poor in the un-served areas, end up paying more, than the non-poor in the areas with better water supply.

In addition, the possibility of cross subsidisation between use and users within a community, catchment areas and compensation for downstream users need to be assessed, explored, and advocated for.

2.1.2 Foundations laid by WaterAid's country strategy 2005–2010 for Nepal

WaterAid recognises in its 2005–2010 country strategy that water resources must be properly managed to ensure that there is equity in access, and that water supplies are safe and sustainable in Nepal. Greater emphasis will therefore be placed on water security through water resource management, specifically:

- ◆ WaterAid and its partners will continue to investigate the likely sustainability of water sources before project work begins, and will ensure that water quality is maintained over time.
- ◆ Where poor people's access to drinking water is adversely affected by competing water needs, WaterAid will lobby for the voices of the poor to be heard in decisions on water resources allocation.

Given the relatively limited reach of WaterAid Programmes, WRM in the context of Nepal offers the needed important links that have been identified between WRM and WATSAN:

- ◆ Water security to the poor through improved augmentation and management;
- ◆ Socially efficient (as against economically efficient) water use leading to better allocation across sectors;
- ◆ Co-ordinated efforts for waste water management;

- ◆ Incorporating drinking water supply as part of irrigation/watershed management projects;
- ◆ Recognising women as primary stakeholders and at the centre of community based water governance.

2.1.3. WaterAid's position on WRM in Nepal: Defining the scope and boundaries

WRM is reflected in the three major strategic goals of the WaterAid's global strategy, since its last strategic period 2005-2010. Therefore, WRM components will be built into all the activities relating to institutions and water governance, and sustainable financing. WaterAid also made a strategic shift to this direction of WRM and clearly reflected as a shift in its Country Strategy Paper.

WaterAid is dedicated to provide access of everyone, particularly poor and vulnerable communities, to safe water and sanitation. WaterAid actively promotes technology choices. However, we must also consider which options are appropriate to WRM. To ensure that its work remains focused and proven, WaterAid is taking further steps to mainstream its WRM approach.

Different models of incorporating WRM, such as pilot projects and peer review, must be considered in order to adopt best practice. WaterAid will use its unique position to collate information on what communities are already doing to successfully manage water resources, and to share and promote this learning to empower communities to protect the quality and quantity of the water they use.

WaterAid will encourage participation and collaboration between government, Community Based Organisations (CBOs), private sector, Non Government Organisations

(NGOs), universities/academia and donors. It will also facilitate for mainstreaming gender and equity in WRM when piloting and planning for future WRM works.

The purpose of this policy paper is to assist WaterAid's implementing partners to make decisions, or adopt positions, on contentious issues relating to water resources management. Such issues include: multipurpose uses of water resources; water contamination and pollution; the economic dimension of water; watershed protection and regeneration; etc. This WRM policy paper of WaterAid undertakes all the aspects of IWRM and thus interprets IWRM as WRM in WaterAid's entire area of work and thus uses both interchangeably.

WaterAid is already addressing many WRM issues, including the promotion of appropriate technologies for the optimal extraction of water resources; water management structures for ownership and long term sustainability; water quality promotion and protection of sources including hygiene promotion a household level; community participation, and gender mainstreaming.

However, this is not necessarily done in a structured and conscious manner. In order for WaterAid to have an impact in this area, more needs to be done to improving understanding and applying the WRM approach at community and local level. Particular attention needs to be paid to how communities can play a positive role in sustainable water resource management. Hence, the term CWRM has been developed to describe this latter process and better reflects WaterAid's work within the communities wherever it works.

Towards achieving this, efforts will be made to ensure that all WaterAid 's future water supply and sanitation projects will address the issue of water depletion and contamination through appropriate water resource management in an integrated and holistic manner. This in turn implies that the strategy would limit its WRM activities to its expertise to those pertaining to WATSAN, and gradually move toward a livelihood approach in collaboration with

Definition of CWRM

CWRM is a participatory process of community engagement in integrated water resources development, which ensures the sustainability of eco-systems and socio-economic development. WaterAid will engage in CWRM to guarantee poor people access to safe domestic water among other competing needs.'

To a large extent, the transition from IWRM to CWRM is influenced by the concern for:

- a) Operational requirement especially, in the context of WaterAid's Guiding Principles; and**
- b) Participation and empowerment of the local communities to access manage and regulate WATSAN services.**

An emphasis on community-based decision making and implementation of IWRM could potentially be constraining on WaterAid projects. One challenge is the difficulty some communities may have in understanding the concept in the first place; another is overcoming traditional mindsets of those who – for a long time – have been influenced by a supply-side approach to water resource management.

In this sense, both CWRM and IWRM face the same in-built constraints of going beyond traditional and current practices.

The constraints are particularly reflected in terms of the scale at which CWRM is to operate. The broad understanding is that 'whereas IWRM is an ideal concept, CWRM is an operational approach for intervention at grass root level'. This 'practical' approach to the complex task of IWRM is somewhat problematic. It overlooks some of the basic elements of IWRM such as:



- ▶ ◆ **The inadequacy of ‘local’ water resources to meet the needs of different users/uses,**
- ◆ **The issue of conflict between upstream and downstream users, and the issue of chemical contamination by the agriculture sector, which is the largest user of water,**
- ◆ **Treating water as an economic good versus a basic good; identification of ideal combination of the two,**
- ◆ **Heterogeneity within local communities,**
- ◆ **Feasibility of institutional water governance in the midst of private ownership to water.**

Above all, the community based approach, in isolation of a framework which considers the larger context in which it must operate, is likely to result in an approach that puts the ‘use’ or ‘user’ first, rather than considering the resource itself.

It is thus essential to recognise that by stressing the participation of local communities, one may get away from centralised decision making and governance. But a decentralised approach will not, by itself, be able to address the wider range of policy issues adequately. This is the key challenge WaterAid is facing while moving towards implementing IWRM/CWRM.

WaterAid’s focus is to financial support (funding) to local partner organisations to help communities set up and maintain water, sanitation and hygiene activities. CWRM can act as a catalyst for communities to carry out further development work themselves, enabling them to address the issues of water depletion and contamination, and work towards better and more sustainable futures. We believe the scaling up of such activities and lessons, combined with policy advocacy, would have the necessary impact on actors and decision makers at a national level. Thus it is necessary for WaterAid to pursue a double-pronged approach to their work:

- 1. Realising WaterAid’s commitments to sustainability, equity, quality- through programmatic interventions at micro level.**
- 2. Advocating larger issues of IWRM through policy engagements, at national and sub-national levels.**

WaterAid thus in Nepal:

- ◆ **Recognises that access to and use of water is fundamental to human survival, health and productivity**
- ◆ **Recognises that the uses and functions of water are indivisible lead to a holistic view of the resource, and one which strengthens the need to ensure its sustainability for present and future generations**
- ◆ **Believes that its interventions must have at their heart the connection between poverty and access to, and/or use of water.**

relevant stake-holders. Given the fact that WaterAid has already supported policies such as Water Resource Strategy, National Water Plan and Plan for Environmental Management etc., therefore, it is recommended that a flexible and gradual approach from CWRM towards WRM will be taken, rather than implementing big steps towards IWRM.

Multipurpose uses of water: WaterAid’s mandate has evolved from safe drinking water, to encompass domestic water. It is clear that to achieve water security, it is critical to balance two core issues: (i) sustainability of resource; (ii) refocusing of investment.

WaterAid recognises that poor people’s demand for domestic water is essential to both their health and livelihood. WaterAid reiterates its existing focus on domestic water supply, particularly emphasising how people use water in their domestic environment.

It is important to understand the nature of WaterAid’s funding and investment, in the context of WRM. WaterAid seeks to emphasise on the sustainability of the water resources in order to secure safe water supplies and to improve the livelihoods of poor communities. All WaterAid funded projects will demonstrate how access to domestic water supplies is improved - even when the project covers wider needs (eg water for animals in pastoral areas).

WaterAid will make efforts to work with bilateral/multilateral agencies, private sector, and commercial organisations etc. in partnerships to reduce poverty in a more complementary and holistic manner.

Watershed protection and regeneration:

WaterAid recognises that the onset of water scarcity in most parts of the country, due to pollution of water sources and depletion of groundwater, must be met by a range of community led solutions, including regenerating watersheds and building aquifers. They will require the use of both adapted traditional technologies and new ones. Local people have long had to cope with changing patterns of rainfall, coupled with other pressures on the natural resources of their rangelands, including pollution.

WaterAid believes that its comparative advantage lies in a focus on catchment-management at the community, level rather than the river basin level. A meaningful impact in this particular area depends on the nature of WaterAid's implementing partners. However, WaterAid will make efforts to engage with the partners building their capacities and working with the specialised agencies having specific useful knowledge.

Economic dimension of water resource:

WaterAid recognises that water is a human right, but also that it has an economic value, as per the Dublin Principles. However, in most of the communities where WaterAid works, people do not appreciate the economic value of water. As an economic good, water should be paid for by the user in order to cut down on waste. But as a social good, there is a need to provide for those who cannot afford to pay. WaterAid and partners will, therefore, try to seek to establish mechanisms for pro-poor financing, which should include the participation of various user groups.

There appears to be substantial scope for working out pricing of water for productive (economic) and domestic (basic) uses, especially by incorporating the criteria of 'ability to pay' rather than WTP. The former (ability to pay), unlike WTP, not only accounts for the true value of water as a social good, but also improves poor people's access to water. In the process it may help evading a situation of distress where poor among the un-served areas end up paying more than the non-poor in the areas with better water supply. The possibility of cross subsidisation between use and users within a community, and compensation for downstream users need to be assessed, explored, and advocated for.

It has been concluded that equating willingness to pay with the value people and communities attach to water is problematic. Treating water as an economic good does not necessarily mean that people pay a price that reflects its full value to them.

While evaluating the full economic cost of water used in the domestic sector, it becomes necessary to estimate value in the best alternative. It is believed that the following should be taken into account when estimating the value of water: the costs that need to be covered by users; the cost recovery mechanisms of having or not having water; and policy issues of equity to access. All cost-recovery discussions should include consideration of environmental dimensions as well.

Pollution and contamination: WaterAid had already placed its comprehensive Water Quality Standards and Testing

Policy (Water Quality Protocol) so that the supply of water to deprived communities, by WaterAid's implementing partners, for drinking are safe and that quality of drinking water;

- ◆ Should not possess any significant health risk to the populations who use it.
- ◆ Should conform to at least the broadly accepted technical quality standards prescribed either by WaterAid's Water Quality Standards and Testing Policy (WQSTP) or National Drinking Water Quality Standards (NDWQS) of Nepal (or be better if this can be achieved at reasonable cost and effort).

- ◆ Should be acceptable in appearance, taste and other local aesthetic values by the people for whom the facility is expected to benefit.

Where necessary, WaterAid will engage in lobbying to address water contamination and depletion of upstream resources; unsustainable abstraction of the water resources; and regulation issues around quantitative and qualitative condition of the resource over time. This remains WaterAid's concern (and so of WaterAid's concerns globally) and will be an integral part of its water resource management approach.



Policy objectives

“IWRM can only be built on experimentation. There are no blue prints, regionally, nationally, or even sub-nationally. People must be given the freedom to experiment and find solutions that suit them and their environment” – GWP 2004

In recognition of the necessary shift towards IWRM, and based on its own experience at programme level, WaterAid will improve operational links between water and sanitation service delivery and its WRM programmes with the following key objectives.

Objective 1: WaterAid and its partners will continue to investigate the likely sustainability of water sources before project work is started, and ensure that water quality is maintained over time in Nepal

A majority of water supply projects funded by WaterAid rely on either using surface water or groundwater. But many do so with little regard to water resources. Tube-wells and hand dug well are sited at random, or by socio-economic criteria alone. Water supplies are assumed to be safe and sustainable, with no water quality testing or understanding of the nature of the resource. Long term sustainability monitoring conducted by WaterAid revealed a high failure rate from such an approach, and this not only has high cost implications, but leads to a community’s expectations being raised but not met.

The nature of surface and ground water resources changes from place to place. To avoid installing failing sources, appropriate technology and socioeconomic approaches must be pursued. For example, in some areas only tube-wells/hand-pumps will be the most appropriate source. In some environments, they can be sited anywhere and drilled by hand; in other areas, sophisticated geophysical techniques are the most cost effective method to site successful water points. Similarly, in some ecological regions like in hilly regions of Nepal, only gravity fed systems depending upon the surface water sources are suited.

Knowledge about the hydro geological environment is, therefore, vital for assessing the likelihood of the sustainability of water resources. There are many opportunities to benefit from the experience and knowledge of communities. Local communities are likely to know their environment well, and can provide full involvement in developing the resources, particularly groundwater resources. Therefore, WaterAid will work towards a better planned nurturing of surface water and groundwater resources, based on community knowledge, in order for the resources to be sustainable.

Communities' roles and responsibilities in CWRM need to be agreed under broad theme of WaterAid's WRM. WaterAid will, therefore, promote pro-poor mechanisms for water allocation and facilitate the community's role in water resource protection. For instance, in rural Nepal, WaterAid is undertaking a Water Use Master Plan approach including water source protection, multi-use of water sources and conservation and micro-irrigation.

The long term sustainability of water resources is linked to the adherence of the construction standards before establishing the water point or abstracting the resources. Where needed, aquifer recharge will be an integral part of WaterAid's work for water resource development to maximise the long term sustainability of the infrastructures.

The afore mentioned objectives in this paper can thus be considered as minimum requirements (as mentioned below) for WaterAid's engagement in WRM to address falling water tables, ground water pollution, serious problems of water quality (microbiological and arsenic) and competing demands of water for various sector and sub

sector needs which is gradually placing a challenge to effectively provide drinking water and sanitation services to poor people in urban and rural parts of Nepal.

Minimum requirements:

- ◆ That all project proposals include an assessment of the sustainability of the water sources and either a description of the actions to be taken to safeguard or enhance that sustainability or reasons why no actions are required.
- ◆ That water quality policies are enacted in country programme and that all sanitation project proposals include as assessment of the risk of pollution of drinking water sources and actions to prevent the same, if necessary.

Objective 2: Where people's access to drinking water is adversely affected by competing water needs, WaterAid will lobby for the voices of the poor to be heard in the decisions affecting water resources allocation in Nepal.

The process of managing information and knowledge is a key issue for water resource management and allocation. It may involve organising the voiceless so they can use their own words to engage in influencing the process. In WaterAid funded projects, the various user categories, especially the poor, will have access irrespective of competing needs.

Action in this field will mainly focus on:

- ◆ Dissemination of water policy at all levels where they exist, and raising awareness of the issues around water abstraction, source contamination and

water allocation.

- ◆ Lobby for the implementation of, and adherence to, national regulations and rule that ensures access to water resources is allocated fairly and efficiently. More equal access to drinking water can be influenced by strengthening legislation, ensuring it is better coordinated and pro-poor focused.
- ◆ Facilitating community voices into solidarity groups, registered associations, CBOs and Civil Society Organisations (CSOs), women groups, youth associations. For example, WaterAid plans to engage in dialogue to ensure due recognition is provided to domestic water users in WRM at catchment level when it is competing with irrigation and others.
- ◆ Empowering the above-stated groups to lobby decision makers at different levels.
- ◆ Creating shared platforms for consultation between actors at all levels. This would result in a clear definition and delineation of roles and responsibilities, providing and promoting good leadership;
- ◆ Organising sensitisation, awareness raising, and campaigning to ensure that everyone has the same information.
- ◆ Encouraging institutional linkages, commitments to and advocates for effective leadership
- ◆ Identifying CWRM champions



Policy and operational strategy (guiding principles)

4.1 Policy strategy

WaterAid has three key roles to play in WRM/ CWRM:

1. To share evidence of best practice by funding partners where the likely sustainability of water sources has been investigated before project work is started to ensure that water quality is maintained over time;
2. To act as a facilitator of joint, i.e. integrated effort, and lobby for voices of the poor to be heard in decisions affecting water resource allocation;
3. To act as a catalyst for information gathering and sharing and make any relevant hydro-geological data about water resources that they or partners have access to available to others.

This section suggests approaches on how WaterAid can address the key issues and challenges highlighted in **Chapter -1**.

4.1.1 Strengthening institutions

In the organisations with which WaterAid works, there is often little separation between operational and regulatory functions. The instability of institutions or the lack of existing institutional structures and capacity makes implementing an integrated approach to water resource management difficult. Fragmented sectoral approaches, poor coordination amongst stakeholders and an overlap of responsibilities in water resource management contribute to a distinct lack of clarity on roles and responsibilities for those working in this area. The capacity of institutions to carry out their mandated functions is often so low that approaches and implementing plans become unclear, uncoordinated and lack transparency and accountability.

WaterAid will, therefore, work with stakeholders to ensure that institutions are able to carry out their statutory functions; sectoral approaches are harmonised; and donors are working together. Working with registered water user associations, as WaterAid can demonstrate how communities can be involved in carrying out their roles and responsibilities in water resource management.

Hence, in order to strengthen institutions, while implementing WRM strategy, WaterAid programmes will pursue the following:

Lobbying and building political will

- ◆ Promote coordinated plan concept among the local governance and sector stakeholders to address not only the issues WATSAN but also the associated and apparently the important issues of WRM to manage their own resources and effectively sustain water resources at community level (eg Water Environmental and Sanitation Improvement (WESI) Plan, Water Use Master Plan (WUMP).
- ◆ Carry out studies on communities to bring out the negative impact that the lack of appropriate structures and reforms has on them,
- ◆ Disseminate best practice to show decision makers how things could have improved had they put in place appropriate infrastructures,
- ◆ Bring decision makers, donors and key sector players together to discuss the need for reforms and changes to sector laws and policies, and to establish appropriate structures to meet communities' needs,
- ◆ Disseminate those policies at all levels,
- ◆ Organise sensitisation campaigns for both decision makers and communities emphasising the importance and benefit of complying with those policies.

Encouraging institutional collaboration linkages and commitments

Water resources can be managed better only by involving all the sectors. WaterAid will play a crucial role for coordinating

and promoting collaborative programme/project amongst its partners and other relevant sectors stakeholders for holistic programme planning and implementation. It will also support and encourage partners to establish linkage with other support agencies including private sector to help implement activities identified in the plan so as to

- ◆ Create shared platforms for more consultation between actors at all levels, this would result in a clear definition of roles and responsibilities, promoting good leadership,
- ◆ Run sensitisation and awareness raising campaigns, to ensure that everyone is provided with the same information.

Approach: In addition, WaterAid will also adopt the following approach to strengthen institutions, while implementing WRM strategy:

- ◆ To facilitate the process for filling the capacity gaps;
- ◆ To lobby and generate the political will to define and establish necessary structures and reforms and to advocate for enforcement and compliance policies;
- ◆ To encourage institutional linkages and commitments and to advocate for effective leadership;
- ◆ To promote the definition and allocation of roles and responsibilities in a decentralised structure;
- ◆ To advocate for transparency and accountability and to monitor activities;
- ◆ To establish and promote productive partnerships;
- ◆ To strengthen community institutions and their role of protecting, developing and allocating resources.

4.1.2 Understanding technical measures: water resource protection

When it comes to catchment management it is difficult to delineate the boundaries of communities. Communities' roles and responsibilities in WRM in general and CWRM in particular need to be agreed and understood to ensure the quantity and quality of both ground and surface water. WaterAid must promote pro-poor mechanisms for water allocation and facilitate the community role in water resource protection.

The technical intervention is required for ensuring sustainability of water sources (such as ponds and catchments) by conserving and protecting them for increasing ground water recharge, reduction of surface runoff and pollution control.

Rain water management: Proper management of rainfall is crucial in WRM approach as two-third of rainwater enters into the water cycle (i.e. rainfall – evaporation – runoff). This will be done by promoting rain water harvesting, soil management and water reuse technologies at the household, community and catchments level.

Pollution control: Reducing water pollution essentially means increasing available water resources. Some measures include: formulation of water quality policy for testing and mitigation measures, promotion of Eco-friendly toilets and water treatment units to reduce ground water pollution, fixing water points and constructing proper apron to avoid water contamination from infiltration, carrying sanitary surveillance and promoting water safety plan to prevent contamination

and improve quality of water minimising the possibilities of contamination during planning, implementation and then afterwards.

Approach: WaterAid will also adopt the following approach to strengthen institutions, while implementing WRM strategy:

- ◆ To advocate for a clear definition of community (roles and responsibilities) in WRM/ CWRM;
- ◆ To advocate for WRM (CWRM and IWRM) tools for equitable, efficient and sustainable water allocation (economic, legal, traditional, etc);
- ◆ To advocate for the transparent allocation of resources and to understand the basis of allocation;
- ◆ To advocate for sustainable use (conservation and efficient usage) of water sources and the effective management, pollution control, conjunctive use of surface, groundwater resources;
- ◆ To develop, encourage and promote best practice standards.

4.1.3 Capacity building

A systematic approach for implementing WRM is new to WaterAid and the required capacities have not yet been developed. Capacity gaps exist at various levels surrounding CWRM/WRM. Building capacity of WaterAid and its partners in implementing WRM will ensure there is equity in access and that water supplies are sustainable.

An assessment of existing and planned capacity must include the types of capacities desired, eg human, financial, technical, institutional, policy and at which level these capacities are needed

(eg community/water point, local/district, national).

Capacity building mechanisms will include the creation and/or strengthening of structures at various levels (local, district, national). WaterAid will therefore enhance the capacity on WRM through training in mainstreaming WRM processes and appropriate ways of promoting WRM such as WRM approach, preparation of participatory plans (such as WESI and WUMP etc). Capacity building may also include exposure visits, CWRM awareness creation, training of trainers on different WRM tools and techniques (rain water harvesting, value based water education, ground water recharge, source protection, water-bodies rehabilitation, sanitary surveillance, water safety plan, liquid waste management and treatment technologies etc), resource mobilization, piloting and learning from experiences, and scaling up.

Approach: WaterAid will also adopt the following approach to enhance the capacity of the WaterAid and partners while implementing WRM strategy:

- ◆ To initiate small schemes or WRM pilot projects;
- ◆ To train staff of WaterAid and its partners in WRM processes;
- ◆ To support community actions in water resource management;
- ◆ To build new partnerships and encourage better participation;
- ◆ To share WRM experiences more widely.

4.1.4 Better financing mechanisms

There are different and competing needs for water resources. WaterAid and partners will make efforts to establish

a mechanism for financing water, which should include the participation of various user groups. It has been realised that equating willingness to pay with value is problematic and thus treating water as an economic good does not necessarily mean that people pay a price which reflects its full value to them.

WaterAid will, therefore, try to review existing sources of financing at community, district and national levels and will also need to establish a mechanism for financing which should include the participation of various user groups. The mechanisms to ensure financial sustainability of schemes may also include tariff setting, subsidies, micro-financing, and allocation for abstraction and charges for discharges.

Abuja principles state that **“water holds an economic value and is a human right to be protected and secured while ensuring to collect the operational costs”**. Therefore, the following actions are required:

- ◆ Value water (development of economic uses of the water resource);
- ◆ Sensitise communities on water tariffs;
- ◆ Promote specific consumption of safe water (litre/capita/day);

Approach: While undertaking the aforementioned actions, WaterAid will also adopt the following approach to ensure better financing for implementing WRM in an integrated and holistic manner:

- ◆ To lobby government (central and local) and donors for increased financing for WRM in particular to finance more WRM projects;
- ◆ To facilitate the implementation of pro-poor policies at community level and to take on a capacity building role;

- ◆ To enter into funding partnerships to finance WRM;
- ◆ To advocate for the better protection of the interests of the poor in WRM.

4.1.5 Information management

The importance of information management is to understand the issues at different levels (community, local, district, national), facilitate decision making to address key issues and affect policy and practice appropriately. Information management covers the collection, analysis and sharing of data/information in the following areas at local authority and community/ catchment levels:

- ◆ Surface and ground water quality and quantity
- ◆ Needs/demands for water
- ◆ Socio-economic structure/pattern
- ◆ Policies and practice

Approach: WaterAid will also adopt the following approach to ensure effective management of information flow is in place while implementing WRM strategy:

- ◆ To promote the development of information management systems;
- ◆ To share relevant hydro-geological data and make available to others;
- ◆ To collect and document best practice and to share lessons;
- ◆ To influence policy and to advocate our approach.

4.1.6 Water resource management issues in urban settings

WRM in urban areas is a process which ensures water resources are sustainable, but which also accounts for pollution from sanitation activities and competing between industry and domestic needs. In

harmonising with the WaterAid's urban work, any implementation approaches will consider the following aspects:

- ◆ Water resources are becoming rarer and rarer;
- ◆ Most sanitation facilities do not comply with the technical standards required by the urban setting and this leads to pollution of the water table;
- ◆ Poor management of rubbish and waste water, leading to pollution;
- ◆ Water wastage by some users.

The need for WRM in urban settings is the result of a number of factors, including population growth, increases in pollution, global warming, climate change, encroachment, the need to protect water resources from human pollution, and the need to regulate water resources. The strategic objective of WRM in urban areas is to ensure that all urban people are provided with quality and quantity of water that is sustainable.

4.2 Operational strategies: guiding principles (practical measures)

WaterAid will encourage participation and collaboration between government, CBOs, private sector, NGOs, universities/ academia and donors. WaterAid will also facilitate mainstreaming gender and equity in WRM when piloting and planning future WRM works. Besides, WaterAid will also try to integrate WRM in all its programmes and projects and build capacity of its implementing partners accordingly to make them prepared to 'phase in' in this discourse of WRM and its process as appropriate to the various contexts.

Approach:

- ◆ To fund partner organisations to implement pilot projects, taking on a facilitation and capacity building role;
- ◆ To facilitate the linkage and maximise the participation of stakeholders particularly government, taking on a capacity building and facilitating role;
- ◆ To educate and facilitate gender integration and equity in all projects and decisions thereby taking on an advocacy and lobbying role;
- ◆ To be innovative and to take on a facilitating role.

4.2.1 Project proposals

Project proposals either of WaterAid or of Partners to WaterAid are expected to address adequately for ensuring conservation of and control of water resources contamination. In practical terms, this means WaterAid and partners will do the following to ensure water conservation and water pollution control:

- ◆ Assess the availability and likely sustainability of the surface and ground water sources, eg ground slope direction, geophysical investigation, review of hydro geological data;
- ◆ Conduct yield testing to ascertain the yield of the well to guarantee that water can be available in several years' time;
- ◆ Monitor the water table on a regular basis to avoid depletion and make informed decisions on required corrective actions;
- ◆ Carry out regular actions to ensure a constant yield of the resource, eg stone fencing of the catchment area, casing, deepening the well, small dams;
- ◆ Put in place a rationing system, in a worst case scenario, where the time

of fetching water is regulated by the community itself eg opening at specific time of the day, fetching per section of the community, etc.

There are different water sources such as rivers, streams, springs/kuwas, ponds, groundwater (tube-wells, hand-pumps, rope pumps etc) at community level. Conservation of and prevention from contamination to these water sources at the community level could include following measures:

4.2.2 Water resource management (conservation) at different levels

Water resources can be managed at different levels such as household level, community/village level and watershed level. The following sections provide basic guiding measures for managing water resources at different levels as mentioned below:

i) At household level: Water management always starts from household level. Wise use of water for household purpose helps to minimise the problem of water scarcity. There are four ways to manage /conserve water at household level.

a. Behavioural change:

- ◆ Use water as per necessity only; do not waste it.
- ◆ Turn off the tap while brushing, washing clothes and dishes and bathing.
- ◆ Maintain the leakage in the taps if there is any
- ◆ Collect rainwater during rainfall. It can be used in kitchen, bathroom, and toilets and to wash clothes.

b. Reuse:

Larger amount of water is used for washing, bathing and gardening. According to a data, only 5% of total supply is used for drinking and cooking, 52% is used for sanitation and hygienic activities such as bathing, washing clothes and dishes and remaining 43% is used in toilet flushing, gardening and other sanitation activities. In this way, more than 40% of water is used for activities other than drinking and cooking. Such activities need not have to have high quality water. Grey water from kitchen and bathroom could be treated and reused.

c. Rainwater harvesting:

90% rainfall occurs during monsoon. This is the time to conserve and prevent water induced damages caused by rainfall. Following activities could be done.

- ◆ Firstly, allow maximum seepage of rainwater in kitchen garden. For this;
 - ◆ Plant trees and shrubs along the slopes
 - ◆ Create small ponds in order to minimise the velocity of surface run-off.
 - ◆ Create pond of diameter 1 to 2 meters in order to collect surface run off wherever appropriate.
 - ◆ Level the land - This will help in maximum recharge and controls soil erosion.
- ◆ Construct proper storm water drainage around the houses. This will help to minimise the damages caused by surface run off.
 - ◆ Do not stay confident that flooding never occurs in my land; take precautionary measures.
 - ◆ Locate flood prone areas
 - ◆ Construction activities in dry season

can block the outlets without knowledge. Sometimes, blockage of outlets could occur due to small and local land slides. This would enhance flooding during monsoon.

- ◆ Make outlets for excessive water from land
- ◆ Presence of boulders in the outlets too, can block water. If it cannot block the bigger floods then, a pond can be created in order to prevent floods. This does not mean that all the flowing water should be accumulated in the pond; breaking water velocity for sometime would also control the flood.
- ◆ Do not create pond in fragile landscape or in landslide prone zone.
- ◆ It is not that water should stay stagnant in the pond all the time. Drying up of pond signifies that the water has been seeped to the underground, which will help to sustain the water sources.

d. Pollution Control:

- ◆ There might be sufficient water in the wet season but do not misuse this water.
- ◆ Generally, lack of sanitation around the house premises pollutes water source. Sanitation activities not only help to keep the water source safe but also help family to live a healthy life.
- ◆ Use sanitary toilet for defecation.
- ◆ Construction of toilets should be done considering its distance from the nearest water sources.
- ◆ Compost pit should be constructed considering water sources preventing leachate flow
- ◆ Create compost pit for kitchen wastes
- ◆ Prevent water sources and reservoir from animal wastes.

ii) At community level: There are different water sources such as kuwas (springs), stream, ponds at community level. Conservation of these sources and prevention of contamination from different activities are terms as water resource management at community level.

Water resource management at the community level includes following points.

a. Conservation of water sources

- ◆ Separate surface run-off drainage of the community and its safe disposal.
- ◆ Avoid run-off along the road to control erosion, construct drainage appropriately.
- ◆ Collect water flow through the drain in community ponds. Many small ponds are better than a single pond in a community. However, one or two ponds could also do a good job when there is not sufficient space.
- ◆ Construction of small ponds along the grassland would enhance soil moisture content.
- ◆ Conserve drinking water sources by plantation around the water sources.
- ◆ Cover the drinking water pipeline with sufficient soil in order to protect it under-cutting.
- ◆ Collect waste water from water points in a cattle-trough.
- ◆ Promote porous surface pavement (brick instead of stone) to allow rain water percolation.
- ◆ Do not tap spring source and ground water more than required. This will help to conserve groundwater and surface water sources.

b. Pollution control

- ◆ Avoid sewerage discharging into the pond or any water body.

- ◆ Keep the water sources and its surrounding clean
- ◆ Washing clothes, bathing, defecation along the water sources should be controlled
- ◆ Fence the water sources in order to avoid animal and human encroachment
- ◆ Keep the contamination source safely away from water points
- ◆ Promote Ecological toilets to prevent ground water pollution.
- ◆ Solid waste disposal sites/compost pit should be constructed at safe distance considering contamination from leachate flow.

c. Other measures

Apart from that there are other measures which contribute to water conservation indirectly and should be considered.

- ◆ Use of appropriate technology such as Drip irrigation
- ◆ Construction of micro-hydro power projects at the community level would provide simple and easy fuel for household use. This would lessen the community to depend on traditional sources of fuel-wood thus conserving forests consequently it will help conserve water.
- ◆ Use of biogas can also help to protect and conserve water sources in many ways. It will reduce the fuel wood consumption for cooking, economise water for cleaning utensils and avoids ground water pollution from human and animal excreta.

iii) At Watershed level: Distribution, conservation, storage and water resource generation occurs in the watershed during the monsoon. Nature of the watershed ensures the availability of water. Water scarcity during dry season prevails when

watershed area cannot absorb rainwater. Watershed area that can store enough underground water can cater water all the year round. Characteristic of watershed area is defined by the geographical condition.

Water sources management at the watershed level is more significant in mid-hills and 'Chure' the boulder zone area. Following activities are recommended within the watershed area.

- ◆ Locate the flood prone area
- ◆ Locate land slide prone area and prevent it from floods
- ◆ Identify newly formed and permanent gullies and prevent such gullies from floods
- ◆ Identify the major water sources in order to conserve it
- ◆ Keep record of water sources that has been dried out and newly originated sources. This would help to understand the movement of underground water.
- ◆ Construct the rain water harvesting pond to collect water at the large scale.
- ◆ Identify the pond that has been dried out since years and investigate its role on flood control.
- ◆ Explore possibility for recharge of water bodies from waste water such as waste water from stone spouts.

4.2.3 Water quality assurance

In the area of water quality, WaterAid Nepal will give particular attention to the following three levels of intervention i.e.

a. Initial source, b. water point, and c. household level.

a. Initial source level - implies the quality of water should be considered at the environment level, at water facility and at community level:

- ◆ Desk review to determine the

mineralogical composition of ground on which the facility will sit;

- ◆ Comply with the standards for putting in sanitation facilities and ensure good management of waste water in order to avoid pollution of the resource;
- ◆ Ensure that the facility meets technical standards necessary to avoid the pollution of the water resource;
- ◆ Initial test following construction of water source, water points, and other associated structures before they are used;
- ◆ Conduct water quality test, frequency of which should be based on the number of users, in line with the approved WaterAid's Water Quality Standards and Testing Policy (WQSTP);
- ◆ Sensitise communities on hygiene and water quality issues;
- ◆ Appoint a focal point within each partner organisation to ensure that their responsibilities for water quality stay in contact with the water users' management committees;
- ◆ Find means to ensure that water users' management committees have a funding source (tax/levy on water, community contributions, operation and maintenance fund etc.), which account for the necessary support costs of the point, of water analysis and treatment.

b. At water point level

- ◆ Good maintenance of the water facilities following some given periods;
- ◆ Regular clean up the water point area;
- ◆ Ensure more empowerment to the water point management committees.

c. At household level

- ◆ Train volunteers to promote hygiene within households for better water handling;

- ◆ Sensitise communities on the storage and use of drinking water;
- ◆ Train health clubs on water hygiene issues at schools.
- ◆ Promote Point of Use (PoU) household treatment options for preliminary measures, if found deviation in water quality from adopted standards

4.2.4 Pollution control measures

Following points could be considered for the pollution control at watershed area.

- ◆ Prevent water sources from industrial effluent
- ◆ Monitor effects of excessive use of pesticides in water sources

Approach: The practical approach should be the following:

- ◆ Prior to starting any sanitation project, an environmental assessment should be carried out to identify pollution risks related to its implementation,
- ◆ Respect the standard distance required between latrines and water points,
- ◆ Take into account the nature of the soil to choose appropriate latrine technology,
- ◆ Avoid building water points in former graveyards/landfill sites,
- ◆ Construct a protection device/wall for all water points,
- ◆ Avoid having rubbish dump near water points,
- ◆ Build public sanitation facilities (eg a main sewer).

Overall, there is a need to design according to, and comply with, technical standards when putting in facilities, as well as to sensitise communities and to involve them in the project implementation, while monitoring the quality of water on a regular basis.

4.2.5 WaterAid and its implementing partners in Nepal

- ◆ Will conduct social mobilisation, to sensitise communities on the issues of benefits, commitments, responsibilities for community participation and proper management of the resources;
- ◆ Will Promote construction norms that provide a sustainable resource eg diameter of the well, construction season, static water level, etc. (note: any water points fail within a few years because of a range of engineering related factors.)
- ◆ Will construct aprons connected to a trough for draining of waste water;
- ◆ Will prevent stagnant water around the site by always constructing soak behind the trough;
- ◆ Will promote alternative existing water sources to limit the use of the improved source for drinking water and cooking, while the traditional sources continue to be used for others such as washing;
- ◆ Will advocate for sustainable use (conservation and efficient usage) of water sources and the effective management, pollution control, conjunctive use of surface, groundwater resources;
- ◆ Will regulate water uses and actions which are likely to harm or affect water resources; protect particularly the water catchments areas (wells, boreholes, dams, etc.) and water courses;
- ◆ Will plan development activities and actions taking into account sustainability issues;
- ◆ Will balance demand for water with available water resources, to ensure the needs of future generations can be met. For instance, promoting the development of the water resource by building small dams (eg check dams) which help to recharge of the water table.



Implications for WaterAid in Nepal

Adopting a WRM approach calls for new ways of working and this will definitely require a thorough consultation with staff and partners. This section considers the implications of adopting an WRM approach, both in terms of human and financial resources to WaterAid. It focuses particularly on the following areas:

5.1. Staffing

The thematic focus discussed above may appear somewhat extensive in its coverage, and perhaps beyond what WaterAid - with its clear mandate for WATSAN - may be able to address. This is exacerbated by the constraints and challenges which country partners face.

Alternatively, however, one may look at it as a gradual process, by which the sectoral mandate, as well as its mindset, may undergo transformation towards a broader, integrated and synergised water resource management expertise. Given this backdrop, it may be useful to present a staffing framework for forging towards the larger goal of IWRM.

Adopting an WRM approach will increase the work load for existing staff. Job descriptions and individual work plans should be reviewed to reflect new assignments required, particularly for programme staff. Additional staff should be hired where needed.

Alternatively, new specialist staff (eg hydro geologists, civil engineers, water quality specialists etc.) could be hired in order to give better understanding of this area of work.

5.2. Capacity building

Despite the importance of hydrogeology, water quality and civil engineering to successfully developing rural water supplies, expertise in Nepal has declined in recent years. Various factors have contributed to this:

- ◆ Water and sanitation experts are not promoted to address the significant issues related to pollution, contamination of water resources particularly surface water and environmental degradation.
- ◆ Groundwater expertise is often undervalued in water supply programmes. This underlies many of the other reasons why expertise has declined,
- ◆ Funding for research of surface and ground water resources is at an all time low,
- ◆ Hydro geologists are in demand for other issues, such as anthropology, management etc.

WaterAid requires enhanced capacities for implementing WRM and thus capacity building of WaterAid staff and that of partners' in implementing WRM ensures equity in access and that water supplies are sustainable. An assessment of existing and planned capacity must include the types of capacities desired (eg human, financial, technical, institutional) and at which level these capacities are needed. The capacity building approach will include:

- ◆ Initiation of small schemes or WRM pilot projects,
- ◆ Training staff of WaterAid and its partners in WRM processes eg water resource development, water quality assessment and surveillance, supervision knowledge in construction work, etc,
- ◆ Organising global learning seminars and training on a yearly basis to equip WaterAid staff with basic knowledge, and to share experiences across countries,
- ◆ Supporting community actions in water resource management,

- ◆ Building new partnerships for learning and information sharing,
- ◆ Sharing IWRM experiences more widely.

All staff and partners (where applicable) will need a better understanding of WRM and in-house training will become essential. Building the capacity of the sector at national level must also be considered. In particular, staff and partners will need to be trained in the area of data management and its effective use.

As the capacity building element of our work grows, projects will take longer to implement and financial resources will need to be increased. Funding should be made available to capture and disseminate best practice.

5.3. Planning

WaterAid and partners recognised that there will be a shift from a project to programme approach. As IWRM is mainstreamed, there will be a move towards more complex project planning, higher costs and longer-term support to partners and communities. All projects will include the minimum WRM commitment with its related budget.

As a result, the cost per beneficiary will increase and capacity building will become a core element of WaterAid's work. This needs to be reflected in the planning document for its approval. The related budget should include the field work eg water resource investigation, sanitation risk assessment, staff training and resource for carrying out supervision work.

5.4. Information

Management of information is critical, so more human and financial resources will be required for data management; data sharing and coordination with other sector stakeholders. WaterAid will establish, or support, water resources information management to have systematic collection and generation of information from WRM works. This will require WaterAid to become more strategic in advocacy and communication, in order to create more awareness and lobby successfully for an WRM approach, as well as for the voices of the poor in cases where their access to drinking water is affected by competing needs.

To support decision-making at different levels, there will be a need again for a system that produces organisation-wide feedback on our progress in relation to the WRM work.

Selected indicators will be used to produce information that can be consolidated to provide an overview of all country programmes. These data will help to establish whether work is on-track to meet the set objectives, and to take early corrective action if required.

5.5. Other resources

WaterAid will focus on building alliances and networks, and forming strategic partnerships for this area of work. As such, there will be an increased need for funding. WaterAid aims to work with the partners having specialised expertise and experience in WRM so that WaterAid's WRM initiative could be scaled up through existing partnerships.



Conclusion

WaterAid is addressing some of the issues of WRM through an approach termed as CWRM, but in an uncoordinated fashion. However, in order for the organisation to be effective and have a direct impact in this area and to ensure its work is really sustainable, much more needs to be done on understanding and applying the WRM approach successfully. Organisationally, WaterAid in general and WaterAid in particular requires a better understanding of how WRM can be applied successfully.

WaterAid's work prioritises the provision of safe drinking water to poor people. No strategy for poverty reduction can be effective unless greater efficiency (quality and quantity) in water uses, shared water resources management, the protection of water resources and the development of sustainable water management strategies at the local, regional and national levels to promote both equitable access and adequate supplies as designed in all their dimensions, are brought within its compass.

Financial resources are needed to address several additional costs, including capital costs to establish construction standards; operation and maintenance costs at the community level; the costs of creating a positive enabling environment, and for providing capacity building; and the costs of creating and sustaining the required institutional support mechanisms at intermediate levels which can provide indefinite back-up support to communities.

WRM also offers WaterAid and its partners the opportunity to move away from the traditional sectoral and fragmented approach to water supply towards a greater holistic vision of sustainable development through shared, equitable and sustainable access to water resources. WaterAid will play a more significant role in ensuring that water resources for poor households and communities, are more sustainable. This policy paper has mapped the direction the organisation must take in order to achieve this.

It provides WaterAid and its partners with a sustainable method of abstracting ground and surface water. It supports the development of water management strategies at national and local levels. It offers tools for the promotion of the re-use as well as conservation of water resources. These strategies promote both equitable accesses, safe and adequate water supplies for the benefit of poor people.

Annex: 1

Implications of IWRM at national and international level

National level

<p>Strengths</p> <ul style="list-style-type: none"> ◆ Sector analysis-water specific focus ◆ Voice of the poor at decision making ◆ Decentralised approach 	<p>Article I. Opportunities</p> <ul style="list-style-type: none"> ◆ Ongoing sector reforms that WaterAid can key into GWP ◆ National poverty Reduction strategy concepts in place 	<p>Resources needed and key links</p> <ul style="list-style-type: none"> ◆ Key actors in IWRM sector ◆ Research ◆ Networking ◆ Dedicated staff in country level ◆ Data collection monitoring (special equipment- water quality hydrometric kits ◆ Piloting of CWRM (Methods, research) ◆ Advocacy/Collaboration/ Networking ◆ Country specific needs will depend on Country Programme capacity
<p>Weaknesses</p> <ul style="list-style-type: none"> ◆ Inadequate capacity ◆ Poor data to base decisions ◆ “Crowded market”- multiple players ◆ New concept 	<p>Article II. Threats</p> <ul style="list-style-type: none"> ◆ credibility and limited results 	

International level

<p>Strengths</p> <ul style="list-style-type: none"> ◆ Clear corporate strategy ◆ Multi-country programme sharing and learning recognition network 	<p>Article I. Opportunities</p> <ul style="list-style-type: none"> ◆ WaterAid is the only player to give grass roots community needs at international level ◆ MDG ◆ GWP ◆ Networking issues are crisis governance not water scarcity ◆ Models /cases from all over the world ◆ New access to funders 	<p>Resources needed and key links:</p> <ul style="list-style-type: none"> ◆ Coordination ◆ Partnership ◆ Research ◆ Material support ◆ IMWI (International Water Management Institute), WB, DFID, EU,EA ◆ Extra staff : 1 person Head Office rather than people in the regions to support on policy, funding, networking, documenting, monitoring, research, developing, sharing tools ◆ Support at regional level ◆ Technical support
<p>Weaknesses</p> <ul style="list-style-type: none"> ◆ Resource constraints ◆ Reliance on donors funding 	<p>Article II. Threats</p> <ul style="list-style-type: none"> ◆ Losses focus on core businesses ◆ Capacity of non NGO players 	

Annex: 2

WaterAid's approach on CWRM in Nepal

1. Background

Falling water tables, ground water pollution, serious problems of water quality (microbiological and arsenic) and growing and competing demands for drinking water and sanitation, agriculture, natural ecosystems, industries and hydropower will pose a challenge to effectively provide drinking water and sanitation services to poor people in urban and rural parts of Nepal. A better understanding of CWRM approach is necessary, and WaterAid will therefore place an increased emphasis on the concept, tools and techniques of CWRM while designing water, sanitation and hygiene projects to ensure:

2. Minimum requirements

- ◆ That all project proposals include an assessment of the sustainability of the water sources and either a description of the actions to be taken to safeguard or enhance that sustainability or reasons why no actions are required.
- ◆ That water quality policies are enacted in country programme and that all sanitation project proposals include as assessment of the risk of pollution of drinking water sources and actions to prevent the same, if necessary.

3. Three measures

WaterAid will undertake technical, institutional and capacity building measures as follows:

3.1 Technical

The technical intervention is required for ensuring sustainability of water sources (such as ponds and catchments) by conserving and protecting them for increasing ground water recharge, reduction of surface runoff and pollution control.

Rain water management: Proper management of rainfall is crucial in CWRM approach as two-third of rainwater enters into the water cycle of rainfall – evaporation – runoff. This will be done by promoting rain water harvesting, soil management and water reuse technologies at the household, community and catchments level.

Pollution control: Reducing water pollution essentially means increasing available water resources. Some measures include: formulation of water quality policy for testing and mitigation measures, promotion of Eco-friendly toilets and water treatment units to reduce ground water pollution, fixing water points and constructing proper apron to avoid water contamination from

infiltration, carrying sanitary surveillance to prevent contamination during planning, implementation and afterwards.

3.2 Institutional collaboration and linkages

Water resources can be managed better only by involving all the sectors. WaterAid will play a crucial role for coordinating and promoting collaborative programme/project amongst its partners and other relevant sectors stakeholders for holistic programme planning and implementation. It will also support and encourage partners to establish linkage with other support agencies including private sector to help implement activities identified in the plan.

3.3 Capacity building

Capacity gaps exist at various levels surrounding CWRM. WaterAid will therefore enhance the capacity on CWRM through training, exposure visits and other appropriate ways on: CWRM approach, preparation of participatory water and environmental sanitation plan, training of trainers on different CWRM tools and techniques (rain water harvesting, value based education, ground water recharge, source protection, water bodies rehabilitation, sanitary surveillance, liquid waste management and treatment technologies etc).

4. Guidelines for meeting minimum requirements

Project proposals are expected to address adequately for ensuring conservation of and control of water resources contamination. There are different water sources such as kuwas (springs), stream, ponds at community level.

This guideline of WaterAid provides following measures for ensuring conservation/protection of water sources from contamination and their thoughtless exploitation and for controlling water pollution.

4.1 Conservation of water sources

- ◆ Separate surface run-off drainage and its safe disposal.
- ◆ Avoid run-off along the road to control erosion, construct drainage appropriately.
- ◆ Collect the water draining in community ponds. Many small ponds are better than a single pond in a community. However, one or two ponds could also do a good job when there is not sufficient space.
- ◆ Construction of small ponds along the grassland would enhance soil moisture content.
- ◆ Conserve drinking water sources by plantation around the water sources.
- ◆ Cover the drinking water pipeline with sufficient soil in order to protect it under-cutting.
- ◆ Collect waste water from water points in a cattle-trough.
- ◆ Promote porous surface pavement (brick instead of stone) to allow rain water percolation.
- ◆ Do not tap spring source and ground water more than required. This will help to conserve groundwater and surface water sources.
- ◆ Promote waste water treatment technologies for reuse.

4.2 Pollution control

- ◆ Avoid direct sewerage discharging into the pond or any water body.
- ◆ Keep the water sources and its surrounding clean

- ◆ Washing clothes, bathing, defecation along the water sources should be controlled
- ◆ Fence the water sources in order to avoid animal and human encroachment
- ◆ Keep the contamination source within safe distance from water points
- ◆ Promote Ecological toilets to prevent ground water pollution
- ◆ Solid waste disposal sites / compost pit should be constructed at safe distance considering contamination from leachate flow

4.3 Other measures

Apart from that there are other measures which contribute to water conservation indirectly and should be considered.

- ◆ Use of appropriate technology such as Drip irrigation
- ◆ Construction of micro-hydro power projects at the community level would provide simple and easy fuel for household use. This would lessen the community to depend on traditional sources of fuel-wood thus conserving forests consequently it will help conserve water.
- ◆ Use of biogas can also help to protect and conserve water sources in many ways. It will reduce the fuel wood consumption for cooking, economise water for cleaning utensils and avoids ground water pollution from human and animal excreta.

5. Guiding measures for managing/conserving water resources at different levels

Water resources can be managed / conserved at different levels such as household level, community level/village and watershed level.

5.1 WRM at household level

Water management always starts from household level. Wise use of water for household purpose helps to minimise the problem of water scarcity. There are four ways to manage /conserve water at household level.

a. Behavioural change:

- ◆ Use water as per necessity only; do not waste it.
- ◆ Turn off the tap while brushing, washing clothes and dishes and bathing.
- ◆ Maintain the leakage in the taps if there is any
- ◆ Collect rainwater during rainfall. It can be used in kitchen, bathroom, and toilets and to wash clothes.

b. Reuse:

Larger amount of water is used for washing, bathing and gardening. According to a data, only 5% of total supply is used for drinking and cooking, 52% is used for sanitation and hygienic activities such as bathing, washing clothes and dishes and remaining 43% is used in toilet flushing, gardening and other sanitation activities. In this way, more than 40% of water is used for activities other than drinking and cooking. Such activities need not have to have high quality water. Grey water from kitchen and bathroom could be treated and reused.

c. Rainwater harvesting:

90% rainfall occurs during monsoon. This is the time to conserve and prevent water induced damages caused by rainfall. Following activities could be done.

- ◆ Firstly, allow maximum seepage of rainwater in kitchen garden. For this;

- ◆ Plant trees and shrubs along the slopes
- ◆ Create small ponds in order to minimise the velocity of surface run-off.
- ◆ Create pond of diameter 1 to 2 meters in order to collect surface run off wherever appropriate.
- ◆ Level the land. This will help in maximum recharge and controls soil erosion.
- ◆ Construct proper storm water drainage around the houses. This will help to minimise the damages caused by surface run off.
 - ◆ Do not stay confident that flooding never occurs in my land; take precautionary measures.
 - ◆ Locate flood prone areas
 - ◆ Construction activities in dry season can block the outlets without knowledge. Sometimes, blockage of outlets could occur due to small and local land slides. This would enhance flooding during monsoon.
 - ◆ Make outlets for excessive water from land
 - ◆ Presence of boulders in the outlets too, can block water. If it cannot block the bigger floods then, a pond can be created in order to prevent floods. This does not mean that all the flowing water should be accumulated in the pond; breaking water velocity for sometime would also control the flood.
 - ◆ Do not create pond in fragile landscape or in landslide prone zone.
 - ◆ It is not that water should stay stagnant in the pond all the time. Drying up of pond signifies that the water has been seeped to the underground, which will help to sustain the water sources.

d. Pollution control:

- ◆ There might be sufficient water in the wet season but do not misuse this water.
- ◆ Generally, lack of sanitation around the house premises pollutes water source. Sanitation activities not only help to keep the water source safe but also help family to live a healthy life.
- ◆ Use sanitary toilet for defecation.
- ◆ Construction of toilets should be done considering its distance from the nearest water sources.
- ◆ Compost pit should be constructed considering water sources preventing leachet flow
- ◆ Create compost pit for kitchen wastes

5.2 WRM at community level

There are different water sources such as kuwas (springs), stream, ponds at community level. Conservation of these sources and prevention of contamination from different activities are terms as water resource management at community level.

Water resource management at the community level includes following points.

a. Conservation of water sources

- ◆ Separate surface run-off drainage of the community and its safe disposal.
- ◆ Avoid run-off along the road to control erosion, construct drainage appropriately.
- ◆ Collect water flown through the drain in community ponds. Many small ponds are better than a single pond in a community. However, one or two ponds could also do a good job when there is not sufficient space.
- ◆ Construction of small ponds along the grassland would enhance soil moisture content.

- ◆ Conserve drinking water sources by plantation around the water sources.
- ◆ Cover the drinking water pipeline with sufficient soil in order to protect it under-cutting.
- ◆ Collect waste water from water points in a cattle-trough.
- ◆ Promote porous surface pavement (brick instead of stone) to allow rain water percolation.
- ◆ Do not tap spring source and ground water more than required. This will help to conserve groundwater and surface water sources.

b. Pollution control

- ◆ Avoid sewerage discharging into the pond or any water body.
- ◆ Keep the water sources and its surrounding clean
- ◆ Washing clothes, bathing, defecation along the water sources should be controlled
- ◆ Fence the water sources in order to avoid animal and human encroachment
- ◆ Keep the contamination source safely away from water points
- ◆ Promote Ecological toilets to prevent ground water pollution

c. Other measures

Apart from that there are other measures which contribute to water conservation indirectly and should be considered.

- ◆ Use of appropriate technology such as Drip irrigation
- ◆ Construction of micro-hydro power projects at the community level would provide simple and easy fuel for household use. This would lessen the community to depend on traditional

sources of fuelwood thus conserving forests consequently it will help conserve water.

- ◆ Use of biogas can also help to protect and conserve water sources in many ways. It will reduce the fuel wood consumption for cooking, economise water for cleaning utensils and avoids ground water pollution from human and animal excreta..

5.3 WRM at watershed level

Distribution, conservation, storage and water resource generation occurs in the watershed during the monsoon. Nature of the watershed ensures the availability of water. Water scarcity during dry season prevails when watershed area cannot absorb rainwater. Watershed area that can store enough underground water, can cater water all the year round. Characteristic of watershed area is defined by the geographical condition.

Water sources management at the watershed level is more significant in mid-hills and ‘Chure’ the boulder zone area. Following activities are recommended within the watershed area.

- ◆ Locate the flood prone area
- ◆ Locate land slide prone area and prevent it from floods
- ◆ Identify newly formed and permanent gullies and prevent such gullies from floods
- ◆ Identify the major water sources in order to conserve it
- ◆ Keep record of water sources that has been dried out and newly originated sources. This would help to understand the movement of underground water.

- ◆ Construct the rain water harvesting pond to collect water at the large scale.
- ◆ Identify the pond that has been dried out since years and investigate its role on flood control.
- ◆ Explore possibility for recharge of water bodies from waste water such as waste water from stone spouts.

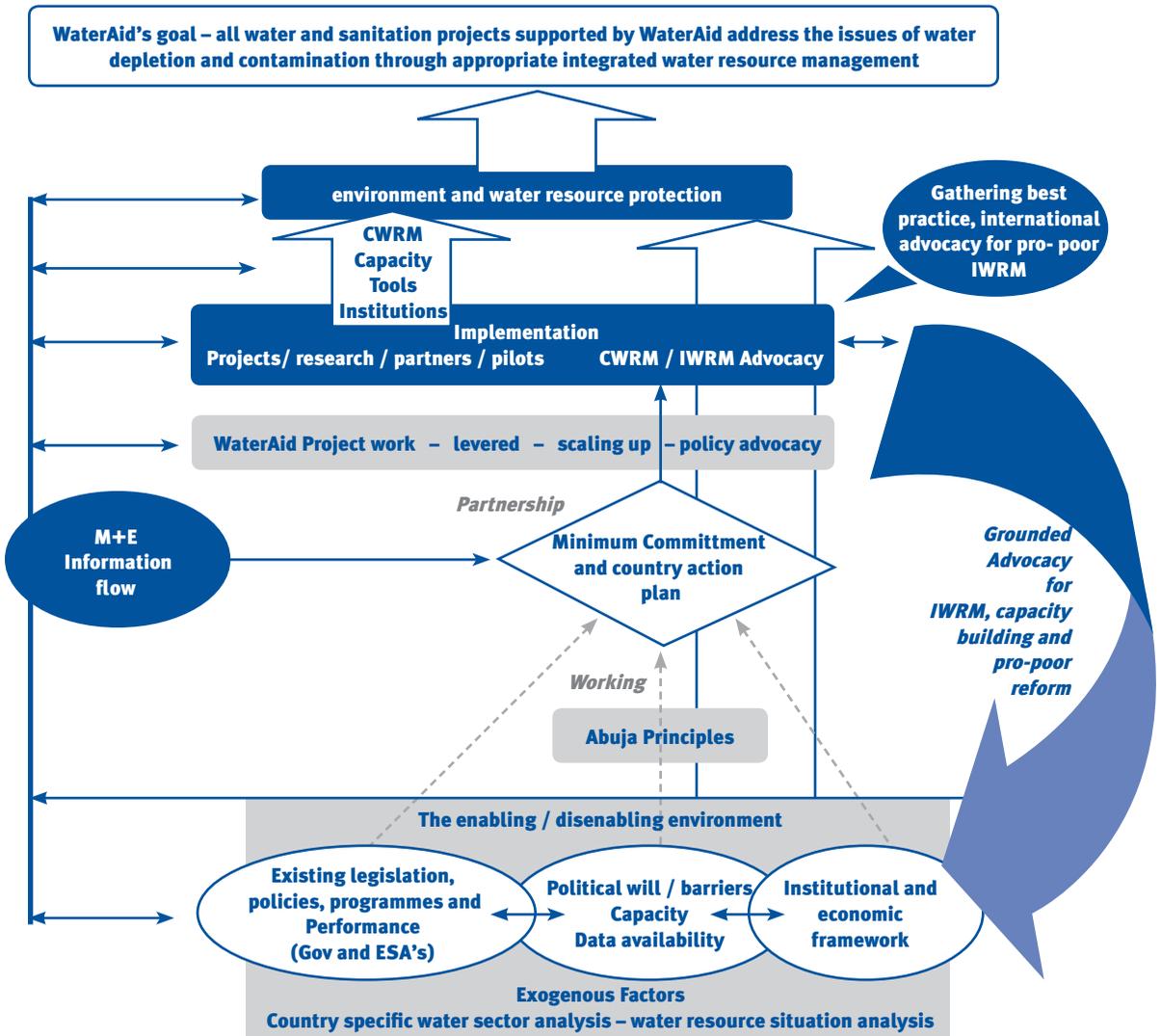
6. Pollution control measures

Following points could be considered for the pollution control at watershed area.

- ◆ Prevent water sources from industrial effluent
- ◆ Monitor effects of excessive use of pesticides in water sources

Note: This approach paper was conceptualised in 2006 to initiate CWRM in WaterAid's projects and programmes in Nepal. The approach has now been revised and updated as a WRM policy guidelines.

Annex: 3 Conceptual framework for WaterAid’s engagement in CWRM



Note: This conceptual framework was presented in WRM Wrokshop held in Addis Ababa, Ethiopia on March 2007. The framework has been referred preparing this policy guidelines



WaterAid transforms lives by improving access to safe water, hygiene and sanitation in the world's poorest communities. We work with partners and influence decision-makers to maximise our impact.

For more information, please contact:

WaterAid in Nepal

Kupondole, Lalitpur, Nepal

GPO Box: 20214, Kathmandu, Nepal

Telephone: + 977 1 5552764/ 5552765/ 5011625

Fax: + 977 1 5547420

Email: wateraidnepal@wateraid.org

www.nepal.wateraid.org