Community-based water resources management

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In arid environments community water management often still focuses exclusively on management of water assets. Watsan practitioners do not often consider the importance of providing communities with information concerning their available water resources. Consequently the association between water resource availability, groundwater recharge and sound stewardship is often missing, to the detriment of end water users. This article describes an eight-stage process to build a framework for managing water resources which is being implemented in Darfur. It involves end-users in assessing water use, the risks to water quantity and quality, and in prioritizing the use of water to meet the needs of all stakeholders.

Keywords: Community-based IWRM, traditional water resources management, groundwater monitoring.

THE OUTPUT CONSTRUCTION TARGETS of many relief and development projects have often dominated water supply programmes. Even with more recent renewed emphasis on community management of rural water supply systems, little provision is actually made for assessing the sustainability of water resources. Invariably community water management still focuses exclusively on management of water assets. Water assets may include the management, operation and maintenance of infrastructure such as handpumps and boreholes in addition to the financial assets that may be used to pay for a water supply system's installation and operational costs.

Responsible planning for drought mitigation at community level is often omitted

In arid and drought-prone regions, vulnerable groundwater sources and seasonal surface water ponds may be the only viable option for water supply. However, responsible planning for drought mitigation at community level is often omitted. Communities frequently remain excluded from any basic capacity building, centred on water resource management, as part of a localized Integrated Water Resources Management (IWRM) programme.

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Traditional community water management approaches

Since the International Drinking Water Supply and Sanitation Decade (IDWSSD), between 1981 and 1990, greater recognition and emphasis on community management of rural water supply schemes is often made when referring to 'sustainability'. Improved approaches towards community water management can be broken down into a number of components, the best of which will include (Wood, 1994):

- ensuring democratically elected decision-making responsibility amongst the community for the day-to-day running of the water supply system;
- providing training, operation and maintenance responsibility to the community, including purchasing spare parts;
- assisting in setting appropriate tariff systems, as well as maintaining simple but effective financial records;
- ensuring water points are maintained and kept clean;
- providing communities with access to local NGOs or water authorities as a 'back-stop' during times of hardship.

The current emphasis potentially limits communities' ability to assess appropriate water abstraction levels

The current emphasis of traditional community water management remains centred on management of water assets. This potentially limits both practitioners' and communities' ability to assess safe or appropriate water abstraction levels and may actually reduce the need for watsan practitioners to have a well-rounded contextual understanding of inherent problems. This may inadvertently lead to neglect in planning for drought or when designing the most appropriate water supply systems.

Despite sparse rural population densities and relatively low abstraction rates from individual water sources across sub-Saharan Africa, rural communities remain vulnerable to water depletion. Mitigating water resource depletion remains a pre-requisite for poverty alleviation.

Darfur exemplifies how interference from central authorities, poor natural resources governance, combined with low rainfall can destabilize rural communities

The potential implications of excluding resource management are significant. Large-scale conflicts such as those in Darfur and Chad are often simplified and categorized as conflicts over natural resources (fertile land, wood and water). In reality drought and ecological degradation have not directly created conflict in Darfur and Chad, but when these factors are combined with mismanagement and poor planning of water resources, under-investment in commercial agriculture and the collapse or politicization of traditional systems of governance, the links become vivid. Darfur in particular exemplifies how interference from central authorities, poor governance over natural resources and environmental degradation, combined with low and variable rainfall patterns, can destabilize rural communities.

Integrated water resource management

The concept of integrated water resource management (IWRM) emerged from the Dublin Principles in 1992. IWRM practices encourage decentralization of water resource management and the process has been viewed as a vehicle for reforming management of both land and water resources. One criticism levelled at this broad and often theoretical process, however, is that 'water reformers' have often tended to ignore or even erode community-based water management and customary water law as they have pushed forward broader concepts that often remain too large to either manage or implement. This is striking because many water resource management reform programmes in developing countries, financed by international donors, have the specific aim of improving the use of water for these informal and often marginalized water users.

Water reformers have tended to ignore community-based water management

Various models or frameworks for IWRM exist. The three pillars 'concept' as described by the Global Water Partnership (GWP) is detailed below and highlights the complexity of many current IWRM models. The three pillars model promotes:

- moving towards an enabling environment of appropriate strategies, policies for sustainable water resource development and management;
- putting in place the institutional framework through which strategies, policies and legislation can be implemented;
- setting up the management instruments required by the institutions to do their job (Figure 1).

Although conceptually and theoretically sound, such a multifaceted model often remains impractical to implement, not least because broad philosophical IWRM concepts remain too complex and too large for watsan agencies and practitioners to manage. Consequently a broad framework presents too many obstacles to be overcome during implementation. One of the major criticisms applied to 'water reformers' adopting these intricate models is that traditional IWRM approaches often neglect stakeholders at local authority or local district level and a process of decentralization is needed to effect better water management at a local level.

A broad framework presents too many obstacles to be overcome during implementation

To become effective, IWRM needs to be separated into specific components, moving from national level policies to regional and state level decentralization. This is required to reduce the overall scale of complex frameworks, which in turn will minimize potential obstacles during implementation. The establishment of distinct but integral 'components' helps respective relief agencies (INGOs), water authorities and civil society groups to identify where their skills and resources

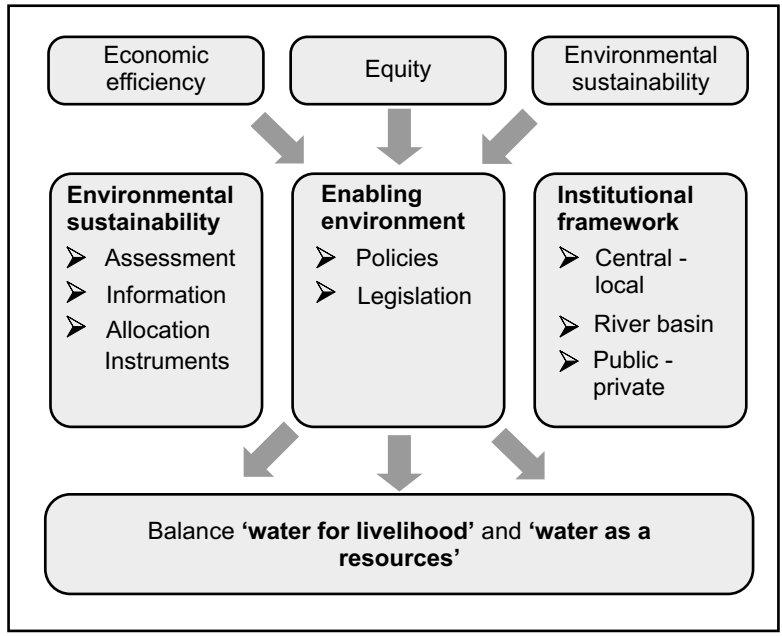

Figure 1. Three pillars concept for IWRM

are best placed. It is simply not viable for individual groups to adopt a broad and theoretical IWRM framework. This understanding is often missing; watsan practitioners may refer to IWRM without ever actually being able to quantify 'how' and 'where' they can meaningfully engage, based upon their own capacity, resources and skills.

A key consideration for INGOs and those organizations that consider themselves to be working at the 'coal face' is to understand how water fits into people's lives and how they prioritize its usage. Eventually the 'philosophy' of IWRM needs to translate into practical actions in which water users can engage. Community-based WRM should form one component of a broader IWRM initiative. Naturally, working at such an intimate level may not allow for wider decisions related to water resources to be made, but it does provide a useful first step for improved stewardship of water resources at a local level.

'Light IWRM' encourages the application of IWRM principles at a local level

Light integrated water resource management

Practical attempts to decentralize IWRM have been made, which has led to use of the term 'light IWRM' (Moriarty et al., 2004). This process encourages the application of IWRM principles at a local level, invariably through either local water authorities or civil society

groups and the approach is best suited where decentralization is lacking and water legislation is weak. It is often most applicable in developing countries where the development of institutional frameworks for water catchment management is either less viable or perhaps even non-existent. This local-level approach is also likely to be far more viable within sub-Saharan Africa where aquifer systems may effectively localize water supply systems into micro watersheds, which serve a smaller number of often isolated rural community villages.

Where potential conflict over water resources exist, communities will have greater vested interest in practical IWRM

Ideally the framework of light IWRM should provide a support buffer for community-based water resource management initiatives, which focus on equitable water supply and appropriate abstraction by key water users including agro-pastoralists (farmers) and pastoralists. It is worth noting also that, where potential conflict over water resources exist, communities will have much greater vested interest in practical engagement, because their subsistence-based livelihoods and their own survival is so integrally linked to accessing safe water resources.

Community-based water resource management

There is a frequent misapprehension that community-based water resources management and communal water law is 'small scale', confined to restricted territories. This is not the case, as can be testified in the Sahel where water management practices and communal water law between agro-pastoralists and nomadic pastoralists cover large areas and cross international boundaries (Van Koppen et al., 2008). It is predominantly at local or village level that the most pressing water needs occur.

Little is done to monitor groundwater fluctuations, prioritize water usage during periods of hardship or assist communities to develop basic contingency plans

This is significant because in drought-prone environments little attempt is made to inform communities about their available groundwater resources and there is minimal emphasis or preparation for monitoring groundwater fluctuations, prioritizing water usage during periods of hardship or assisting communities to develop basic contingency plans with relief agencies or local authorities acting as a back-stop to provide support during periods of acute hardship. When describing community water projects, 'sustainability' is often referred to. In reality the immediate challenge is to introduce sound stewardship of water resources to assist communities to resist and recover from drought or low and variable rainfall periods.

There are a number of distinct advantages of engaging in community-based water resource management (Bruns, 2008). These include the following:

- Local water users often possess detailed indigenous knowledge related to water resources, water needs and historical change that has occurred related to water use.
- Water users recognize that water is a fundamental component of their subsistence-based livelihoods, which helps to weave relationships between water users.
- Communities are able to monitor agreed water usage on a daily basis, as part of their daily activities.
- Communities often have historical mechanisms for conflict and dispute resolution related to water resource management, which may require continued support and assistance to evolve and adapt to global challenges.
- Effective water management requires community participation; this principle is well understood in development literature.

The inevitable challenge of community-based water resource management is to bring together heterogeneous community groups to agree on sharing available water resources for the benefit of all. This requires an agreement on water prioritization during times of acute drought and a common shared agreement to prevent water resource contamination, as well as mitigating over-abstraction.

Limitations of community-based water resource management inevitably exist, not least where migration or displacement has occurred, resulting in the establishment of a large-scale internally displaced person (IDP) or relief camp. These include the following:

Communities may not always represent a homogeneous, consenting group

- Communities may not always represent a homogeneous, consenting group and in reality there may be inequality in knowledge, wealth and power.
- Community members will have different interests, which may differ from watsan practitioners' views of best practice: for example rigidly defining that water supplied should be used for health and domestic purposes may not fit with communities' overall water usage needs.
- Watsan practitioners may impose unrealistic targets on communities: for example requesting communities to undertake substantial data collection, effectively trying to transfer responsibility to communities, which may not reflect their own priorities.
- Access to water and pasture may be politically contested and traditional systems of conflict resolution may be undermined by external interference.

- Communities will have their own hierarchal systems of management, which may not reflect watsan practitioners views of 'best practice or gender equity' and watsan agencies risk imposing their own external views on communities.

Darfur: The role of sheikhs as water managers

Rural communities are acutely aware that water sources sustain both their health and livelihoods and any water source failure may result in increased vulnerability and even enforced migration. Within Darfur many IDPs were previously agro-pastoralists or nomadic pastoralists who practised subsistence-based livelihoods.

Applied research is ongoing in both Darfur and Niger to assess the ability for both rural and displaced communities to engage in water resource management. Research is being undertaken as part of a practical component within humanitarian relief and development programmes. The objectives of the research are:

- to identify practical, appropriate and relevant water resource management activities in which community partners can engage;
- to identify an appropriate level for community partners to manage water resources as part of a broader IWRM framework;
- to identify how communities can have influential access to local water authorities;
- to develop a framework for watsan practitioners to implement community-based water resource management.

The methodology being adopted is borne out of recognition for the need to have much closer alignment between academic research and practical field conditions. Quantitative and qualitative assessments are being undertaken within 'live' field programmes, which are designed specifically to enhance community-based WRM to identify and demonstrate the potential for practical resource management to be conducted at community level.

Existing contemporary literature frequently refers to IWRM initiatives such as the Dublin Principles and Agenda 21, borne out of the Rio Summit in 1992. Research frequently identifies that greater commitment is needed to bring about improved water resource management at a local level, through more effective decentralization, financing and capacity building of local water authorities, as well as recognition of communal water laws. However, at practitioner level, community management of water supply systems frequently excludes resource management.

Community management of water supply systems frequently excludes resource management

Interviews in Darfur highlighted that communities have always maintained responsibility for managing village-level water facilities

Research interviews conducted in rural Darfur highlight that communities have in fact always maintained responsibility for managing village-level water facilities, while local water authorities have maintained responsibility for development and management of larger water infrastructure (hafirs or sand storage dams) at catchment or watershed level.

Community leaders displaced as a result of conflict in Darfur, interviewed in Kebkabiya, report, as expected, that management of water resources within such a vulnerable environment 'is not easy'. Management responsibility encompasses both land and water resources, it requires cooperation between different user groups and if issues or disputes are unresolved there can be direct problems, even violence and hostility between users. Within Darfur protection of communal assets has taken precedence over management of the available resource and the avoidance of over-abstraction. On occasions, assets are even destroyed if the community deem them liable to increase their vulnerability to hostility or violence by rebel groups.

Sheikhs are frequently responsible for managing water resources

Within traditional communal systems of governance, sheikhs (community leaders) are frequently responsible for managing water resources. This is determined on the basis of hierarchal systems of governance, because they are the most senior community members who remain habitually within villages. This is significant because overall management of water resources, although supported by indigenous knowledge, is not predominantly based upon technical expertise or understanding.

Research undertaken shows that rural communities have historically adopted informal observation techniques for monitoring groundwater resources, which are often overlooked by relief agencies implementing water supply programmes. The following are examples of traditional community-based monitoring activities:

- Undertaking casual observation of water levels in open wells based on the number or length of coils of rope left in their hand when hauling water. Although this technique may seem basic, it highlights how communities require and acquire information for the management of their water resources.
- Marking inside 'brick lined' wells to compare water levels between dry and rainy seasons. According to sheikhs displaced to Abu Shouk camp near El Fasher (North Darfur), this approach was previously undertaken in Tawilla (North Darfur).
- Organizing or overseeing new construction works at a community level, with work being conducted by community members. For example this may include deepening of open wells if groundwater levels were observed to have declined.

- Supporting the formation of water management committees, which may decide on 'prioritization' of water usage during drought periods or bad rainfall years. This demonstrates decision-making ability at community level.
- Communities also previously observed rainfall periods referring to them as 'good' or 'bad' rainfall years. If rainfall was perceived as bad, action may include deepening open dug wells. Rainfall observation was not based on actual rainfall measurement (mm), but in terms of period of time, i.e. number of weeks or months that rainfall occurred.
- In contrast, to determine variations in groundwater levels using handpumps, communities refer to assessing the 'ease' with which water can be pumped. Consequently they may only detect the acute variations between dry and rainy seasons once depletion or recharge have occurred. Communities also recognize and describe that handpumps remain liable to depletion or low yields during dry seasons and consequently they may be forced to return to collecting water from more distant, unprotected sources. This is significant because standard handpump designs remove any possibility for communities to observe groundwater fluctuations, which therefore actually limits communities' overall decision-making ability.

Standard handpump designs prevent communities observing groundwater fluctuations

Strikingly, the traditional influence of sheikhs in water management does not, however, extend to supervision of private wells or boreholes operated by farmers or individual landowners. Sheikhs only manage communal wells, and individual owners (farmers or pastoralists) remain responsible for management of their private wells. Therefore if a neighbouring private farmer was abstracting large volumes of groundwater, the implications of and effects upon adjacent localized communal wells are unlikely to be recognized and therefore addressed. This implies that any planned watershed development projects, even at micro-level, may lead to over-abstraction unless water resource management initiatives are included. Indeed this can be compared to the 'green revolution' in India, which encouraged wide-scale groundwater development, but maintained minimal emphasis on monitoring groundwater fluctuations and the risk of over-abstraction, which duly occurred.

Surprisingly, sheikhs only manage communal, not private, wells

Community-based solutions for water resource depletion or water stress often revolve around increasing the number of available wells or deepening existing wells wherever possible. The 'prioritization' of water use in rural areas may be given less prominence unless open wells are considered to be at a maximum safe construction depth and additional excavation is ruled out; however at critical times community practices do include prioritization of water usage.

Darfur's large IDP camps still maintain a very service-orientated approach towards water supply. This implies that those displaced are still viewed as beneficiaries rather than community partners who may take greater responsibility for management and decision making within water supply systems. Five years into the conflict water supply is still viewed as being the preserve of international relief agencies, despite many IDP camps resembling 'mud walled' annexes to adjacent towns. This 'misperception' is reflected in Al Salaam and Abu Shouk IDP camps, near El Fasher, where community leaders request the development of new groundwater sources, despite known water stress occurring within the IDP camp due to limited available groundwater resources. Communities' overall water usage needs are also driven by scarce alternative livelihood opportunities and a basic need to improve shelter. This means that water usage within these vast camps has become multipurpose way beyond health and domestic use, which has effectively led to water inequity and a doubling in consumption by some water users above the recommended Sphere standard of 15 litres per person per day (l/p/d). This is significant because with the population densities experienced within these enormous camps demand for water supply is more akin to a city than to a rural setting. An IDP or refugee camp designed to Sphere standards may equate to a population density of more than 22,000 people per km^2 and a daily water demand of 330 m^3 per km^2 surface area, assuming consumption of 15 l/p/d is being achieved (Carter, 2007).

Communities' overall water usage needs in these camps includes livelihoods

Darfur's vast IDP camps are likely to remain for the foreseeable future. The immediate challenge is to evolve the relief effort, recognizing that those whom we claim to serve must become 'community partners' rather than 'beneficiaries'. Service orientated approaches are therefore liable to become less effective over time and the emphasis must be to build upon communities' own resilience and initiative, which is in abundance. Community partnerships must be established that engage more meaningfully to include the recognition of water usage, water prioritization and water resource vulnerability as a first level of any 'contingency planning', should these camps be subject to successive years of low rainfall and insufficient groundwater recharge.

Service-orientated approaches are liable to become less effective

Water safety plans

A practical component of IWRM requires the planned development of water resources at watershed or catchment level. However, uncontrolled or poorly coordinated development activities may only serve to increase water usage and exacerbate competition for scarce water and land resources further. Watershed development initiatives must include water resource management with the intention of improving local water supply needs. Without improvements in rural water

supply, watershed development projects are unlikely to improve the health or livelihoods of the poor. Consequently any proposed watershed or water catchment development initiatives must also make provision to avoid widespread over-abstraction.

Over-abstraction and groundwater depletion are seldom considered within current communal management systems

The propensity to manage water assets rather than resources is exemplified in many water supply programmes, where over-abstraction and groundwater depletion are seldom considered within current communal management systems. Consequently local-level risk to village-level water resources is rarely assessed. Community-based initiatives should therefore include identifying risks to local water resources and assets and managing any identified or perceived risk at an appropriate level within the community. Therefore stewardship of local waters should form one component of any larger IWRM initiative that may include watershed development.

Risk identification and risk management reflect new thinking within water safety plans

The process of risk identification and risk management reflects new thinking within water safety plans (WSPs), which have initially been developed to better safeguard water quality at catchment level as part of improving and ensuring food security. A WSP is designed to ensure the safety of drinking water through the use of a comprehensive risk assessment and risk management approach from catchment through to consumption and usage. Significantly it is a process that encourages end user participation.

There are three key elements to any WSP:

- identification of credible risks to water supply systems;
- prioritization of risks;
- establishment of controls to manage identified risks.

At a community level WRM 'credible risks' and 'prioritization areas' for water supply may be grouped under the following considerations:

- ensuring sufficient water quantity for domestic and productive water usage, which includes the assessment of water recharge;
- ensuring appropriate and realistic water quality for domestic and multipurpose usage;
- improving equitable access to water sources and reducing time spent hauling water daily;
- ensuring that protection and safety considerations have been considered for water users when siting water points;
- ensuring that longer-term water management (including resource management) practices have been developed to help communities manage resources to resist and recover during periods of acute drought or low and variable rainfall;

- establishment or recognition of communal water law, which has established links to wider water policy decision makers (local water authorities).

Naturally this ability will be dependent upon skills, capacity and degree of vulnerability that exist amongst community partners. Inevitably, operating at such an intimate level it is unlikely that wider decisions for water resource management will be made, but it will provide a first step to better local-level water management and improved stewardship of the environment. This process is also significant because it requires relief agencies to become 'facilitators' rather than direct implementers. This facilitative or third-party role is an approach that is often much-maligned by relief agencies as a consequence of frequent, direct humanitarian interventions but may be extremely important within conflict-sensitive environments, where the onus is on dialogue between different water users.

Relief agencies need to become facilitators rather than direct implementers

The three WSP 'risk' elements are significant because the overwhelming approach within humanitarian relief programmes remains focused upon quantitative output monitoring. This implies that watsan sector coordination mechanisms and indeed individual agency implementation plans are still driven by quantitative targets rather than a longer-term assessment to determine whether the water supply systems delivered actually function as intended. The adoption of quantitative targets is entirely understandable during an emergency response when the focus must be on providing 'life-saving' facilities; however this must also be coupled with sound contextual analysis, ideally during initial site selection for camps and settlements or at the earliest opportunity when the camp is being established. What is required 'longer term' is greater output monitoring that demonstrates that the water supply systems established function as planned.

Quantitative targets should be coupled with sound contextual analysis

Community water resource management framework

One initiative currently being trialled in Darfur is to utilize a water resource management framework to encourage wider community participation in managing both water resources and water assets. The framework is derived from water safety plans but includes a number of key elements not traditionally adopted within community water management schemes. The approach is designed to encourage communities to become 'partners' for managing water supply, rather then remaining passive beneficiaries.

The process consists of eight key stages all of which are designed to be 'common sense' approaches for watsan practitioners that encourage end user participation from the very beginning (see Figure 2).

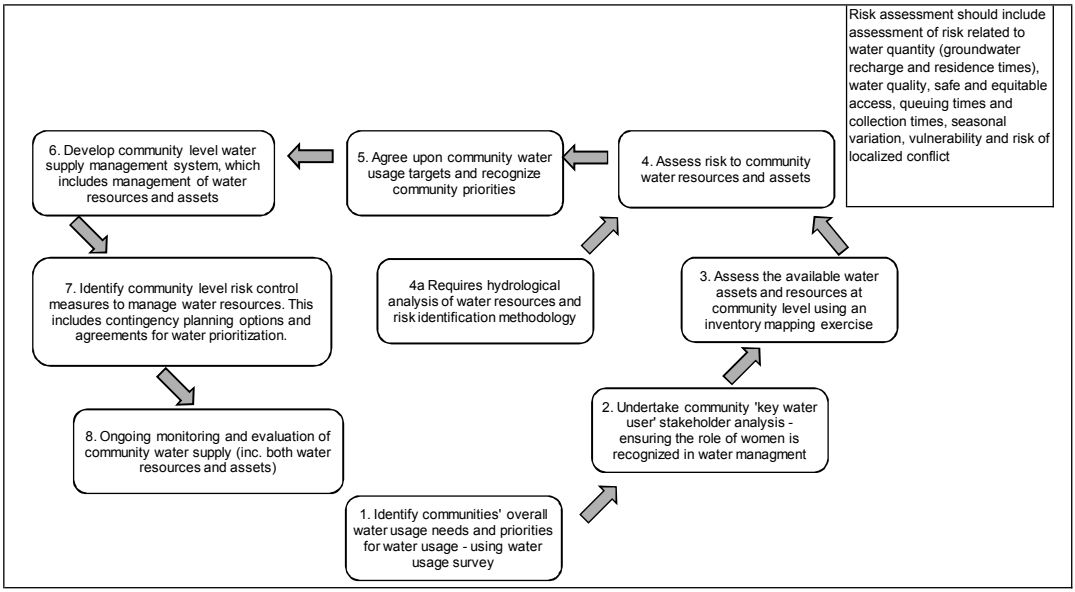

Figure 2. Community-based water resource management framework

The survey identifies communities' seasonal water usage

- Stage 1 recommends undertaking a 'water usage' survey with community members. This is designed to help watsan practitioners and communities to identify current water usage trends and priorities. The survey process identifies how communities prioritize their water usage seasonally and identifies any inequity within the water supply system. This process is designed to be undertaken entirely with community partners.
- Stage 2 encourages the identification and participation of key water users, which, depending upon the context, typically may include farmers, pastoralists, brick makers, community leaders and women. Women are an integral part of any water management structure and the benefit of their inclusion should be highlighted and demonstrated within male-dominated hierarchical systems of management.
- Stage 3 requires the identification and assessment of both existing community water assets and the potential for expanding and developing additional water resources to increase diversity within drought-prone or water-stressed environments. Typically a 'water mapping' exercise could be undertaken with the community and local water authorities to identify options for diversity of contingency planning.

- Stage 4 requires the joint assessment of risk associated with each water asset or resource. This should be undertaken by engaging with communities to identify risk associated with sustainable groundwater abstraction, recharge, water quality, access, security, equity and technology choice related to longer-term operation and maintenance. The fundamental aspect here is to assess risk, with communities having the opportunity to demonstrate what is important to them.

The agreement encourages community-level self-regulation of water usage and management

- Stage 5 recommends an agreement between all users on water prioritization, abstraction and management based on the risk analysis conducted earlier. The process encourages multilateral agreement between water users to better ensure improved equity and access for all. This encourages community-level self-regulation of water usage and management.
- Stages 6 recommends the establishment of a community-level water management plan that significantly includes management of water resources, in addition to management of water assets. The key aspect here is to identify how water usage fits into people's lives, rather than imposing a series of management or monitoring duties, which are not realistic in terms of communities' daily lives or interests.

Communities may conduct their own basic level of groundwater monitoring and rainfall measurement

- Stage 7 is a further key component of the water management framework because it encourages contingency planning for drought, which is rarely adopted within watsan programmes. Initiatives could involve water security mapping designed to identify the most vulnerable water sources (based on earlier exercises in Stage 4) and early warning monitoring systems, in which communities conduct their own basic level of groundwater monitoring and rainfall measurement. The aim should also be to improve access to alternative water sources during acute dry spells, which could include the establishment of alternative relief boreholes as a contingency. Practical water resource management activities implemented by relief agencies must also be coupled with the development of sound advocacy policies, which aim to ensure that community leaders have access and influence to the wider water policy decision makers. This is a fundamental role that many relief agencies should be well suited to undertake – which ultimately should facilitate community-led advocacy at the level of the broader decision makers.
- Stage 8 requires continual monitoring and evaluation shared and agreed by communities and watsan practitioners.

Darfur's densely populated IDP camps have high water demands which may remain for the foreseeable future. Consequently they may be vulnerable to groundwater depletion if prolonged periods of low and variable rainfall and limited groundwater recharge occur. Engagement with communities by following these stages is ongoing as part of a contingency plan for drought mitigation.

Conclusion

Community-based WRM often remains the backbone of many rural water-supply systems across sub-Saharan Africa and indeed in rural locations globally. While it may not be a panacea, it should form a substantial component of broader IWRM initiatives at the lowest, most appropriate level where agencies and local water authorities engage. However traditional views of community-based water management must also evolve to include recognition of resource management and must evolve beyond just asset management. Greater consideration and hard-headed reality for adding variation and recognizing contextual challenges should also be included when designing water supply projects in arid environments. This should include developing community-level contingency plans for drought mitigation, developing artificial recharge mechanisms or siting additional relief boreholes in larger, more productive aquifers. The risk of water depletion needs to be considered and where possible quantified when designing community water supply systems.

Watsan practitioners risk eroding traditional community resource monitoring mechanisms

If communities are excluded from having any ability or capacity building related to management of their water resources, watsan practitioners risk undermining communities' decision-making ability and even eroding traditional community monitoring mechanisms.

Key principles for arid land community-based water resource management

- Plan and design water supply interventions recognizing that drought is very likely to occur.
- Provide capacity building for end user stakeholders, centred on both resource and asset management.
- Ensure information is available to communities and that they have the ability to use it to plan contingencies and advocate support from local authorities and NGOs.
- Encourage communities to fulfil a partnership role rather than a beneficiary role.

Water is an economic good for key water user groups

- Ensure equitable allocation and prioritization of water resources from the beginning using water usage surveys.
- Recognize water as an economic good for key water user groups.
- Strengthen the role of women in water management.

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