RiPPLE

# Water in food security assessment and drought early warning:

## *experience from sub-Saharan Africa with a special focus on Ethiopia*

*Josephine Tucker, Leulseged Yirgu*

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**Research-inspired Policy and Practice Learning in Ethiopia and the Nile Region**

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**Research-inspired Policy and Practice Learning in Ethiopia and the Nile Region (RiPPLE)** is a 5-year Research Programme Consortium funded by UKaid from the Department for International Development aiming to advance evidence-based learning on water supply and sanitation (WSS). The RiPPLE Consortium is led by the Overseas Development Institute (ODI), working with the College of Development Studies at Addis Ababa University; the Ethiopian Catholic Church Social and Development Coordination Office of Harar (ECC-SDCOH), International Water and Sanitation Centre (IRC) and WaterAid-Ethiopia.

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## List of Acronyms

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| CFSVA | Comprehensive Food Security and Vulnerability Analysis |
| CILSS | Permanent Interstate Committee for Drought Control in the Sahel |
| DRM | Disaster risk management |
| DRMFSS | Disaster Risk Management and Food Security Sector (Ethiopia) |
| ETF | Emergency Task Force (Ethiopia) |
| EWS | Early warning system |
| FANR | Food, Agriculture and Natural Resources Directorate (SADC) |
| FAO | Food and Agriculture Organisation |
| FEWS NET | Famine Early Warning Systems Network |
| GIEWS | Global Information and Early Warning System on Food and Agriculture |
| HEA | Household Economy Approach |
| ICPAC | IGAD Climate Prediction and Applications Centre |
| IFRC | International Federation of Red Cross and Red Crescent Societies |
| IGAD | Intergovernmental Authority on Development |
| IPC | Integrated Food Security Phase Classification |
| LEGS | Livestock Emergency Guidelines and Standards |
| LZ | Livelihood Zone |
| MoWE | Ministry of Water and Energy (Ethiopia) |
| NVAC | National Vulnerability Assessment Committee |
| PSNP | Productive Safety Net Programme |
| PVA | Participatory Vulnerability Analysis |
| RVAC | Regional Vulnerability Analysis |
| SADC | Southern African Development Community |
| VAC | Vulnerability Assessment Committee |
| VAM | Vulnerability Analysis and Mapping |
| VCA | Vulnerability and Capacity Assessment |
| WASH | Water, sanitation and health |
| WELS | Water Economy for Livelihoods |
| WFP | World Food Programme |

# Executive summary

This paper is based on a literature review on the role of water in drought preparedness, early warning systems and responses. Literature reviewed includes vulnerability assessment reports and evaluations of drought responses from sub-Saharan Africa over the last ten years, as well as insights gathered from interviews and a workshop with relevant stakeholders in Ethiopia in the form of a country case study.

Food security is intimately linked to water availability and access, especially in sub-Saharan Africa where rural livelihoods centre on agriculture and livestock production. Food security is an outcome of people's ability to securely access and utilise adequate quantities of food from either their own production or purchase, and these opportunities are influenced by access to water. Water has an impact on food security through three main pathways, which interconnect and thus contribute to cycles of poverty, ill health and food insecurity.

1. Lack of access to an adequate quantity and quality of water for domestic use (particularly for hygiene) is a leading cause of water-related disease, which is a major driver of malnutrition as it reduces the body's absorption of nutrients.
2. Lack of access to the necessary water for livestock watering, irrigation and small-scale productive purposes (for which 'domestic' water supply is often used) reduces the opportunities for own food production and/or income generation.
3. Lack of adequate nearby water sources results in a long time being spent in daily water collection, principally by women and girls, which reduces the time available for work or education and can also negatively affect health.

These effects are most pronounced in drought situations, as water supplies are reduced as a direct result of drought. Lack of adequate water supply – a situation common in rural Africa – is closely correlated with the incidence of malnutrition, and lack of water has been shown to undermine other efforts to protect health and livelihoods in a drought. Drought is a frequent occurrence in many parts of sub-Saharan Africa (including the Horn) and may intensify or become even more frequent under climate change. This demands that drought preparedness efforts, early warning systems and emergency responses become more effective at protecting livelihoods from the damaging effect of successive droughts. Historically drought responses have centred on food aid, which has helped to save lives but has not prevented asset losses resulting from the direct effect of drought itself or the adoption of last resort coping strategies, both of which undermine livelihoods in the short and long-term. In the last decade or so a livelihoods-based approach has increasingly been adopted, which aims to understand the sources of vulnerability of different groups in the population, and target interventions to prevent the worst impacts of drought on their livelihood (e.g. prevent distress sale of livestock or other productive assets), and/or to support the rebuilding of livelihoods after a crisis. This means increasing attention to understanding how non-food aspects, such as agriculture, markets, health and – critically – water supply, contribute to food insecurity, and developing responses beyond the provision of food or cash.

Information on water supply and access is increasingly collected as part of vulnerability assessments and food security monitoring, but the picture is still very patchy and there is no clear method in use for analysing water needs in relation to food security. Evaluations of drought responses in sub-Saharan Africa over the last decade show that most involve water sector responses (typically,

rehabilitation of schemes and emergency supply through tankering or source development) and that these are very important components of the response. However, responses in the water sector (and indeed in many of the non-food sectors) are often late and poorly coordinated with the food aid response. Delays occur because some remain sceptical of the importance of non-food responses, and also because of difficulties in analysing non-food needs and targeting responses appropriately. The food security community is in need of robust and practical tools and indicators for non-food needs.

There are a number of promising developments and innovations which should be learned from. The Water Economy for Livelihoods (WELS) assessment is one such innovation – a methodology for obtaining detailed information on water access and use and linking this quantitatively with food security. Remote sensing also offers new possibilities such as monitoring of water sources used by livestock in remote pastoral areas, in near-real time. New tools should build on these, but also focus on identifying the critical questions and thresholds, to avoid overloading systems for data collection, processing and analysis.

As well as the development of new methods, tools and indicators for linking water and food security, however, a change in practice is required to fully integrate water and other non-food responses into historically food-centric systems. This means the establishment of better links between those responsible for service delivery as a development activity and those responsible for disaster preparedness or risk management, early warning and emergency response. Where droughts and food insecurity are chronic occurrences, and underlying levels of service delivery are low, it makes little sense to view service delivery and disaster risk management as separate; improved, and well targeted, service delivery is a crucial component of vulnerability reduction. However, these are frequently handled by different people and agencies, which operate entirely independently. Better sharing of information and skills, and even joint programming, will improve the targeting of both development and emergency-oriented investments in water, ultimately generating a more effective response to food insecurity and livelihoods protection.

# 1 Introduction: why water should be part of food security and early warning systems

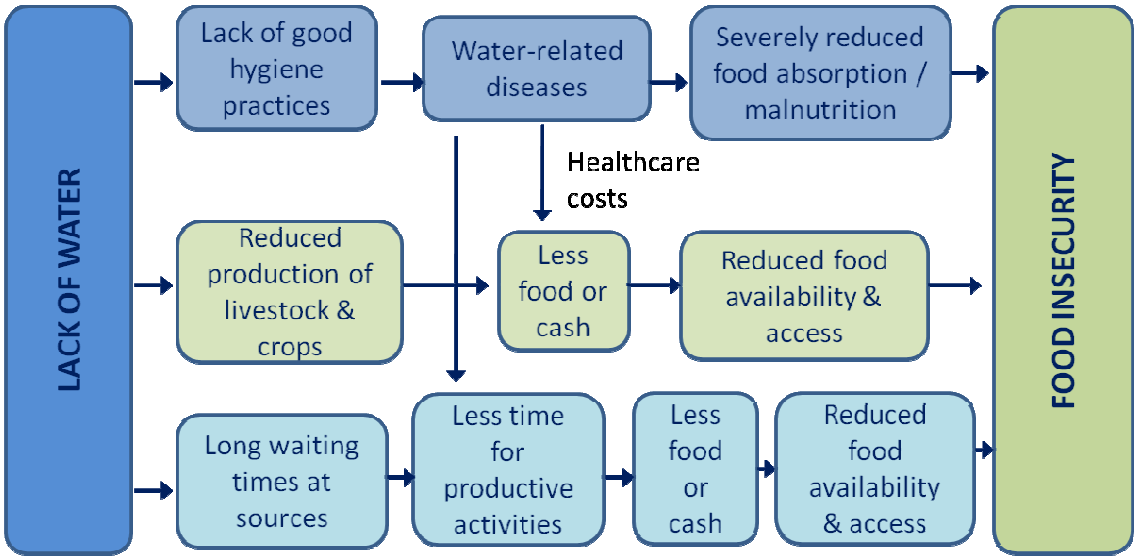
Food security is intimately linked to water availability and access, especially in sub-Saharan Africa where rural livelihoods centre on agriculture and livestock production. Food security is an outcome of people's ability to securely access and utilise adequate quantities of food from either their own production or purchase, and these opportunities are influenced by access to water (Ludi, 2009). Water has an impact on food security through three distinct pathways (Calow et al, 2010):

1. Lack of access to an adequate quantity and quality of water for domestic use (particularly for hygiene) is a leading cause of water-related disease, which is a major driver of malnutrition as it reduces the body's absorption of nutrients.
2. Lack of access to the necessary water for livestock watering, irrigation and small-scale productive purposes (for which 'domestic' water supply is often used) reduces the opportunities for own food production and/or income generation.
3. Lack of adequate nearby water sources results in a long time being spent in daily water collection, principally by women and girls, which reduces the time available for work or education, and can also negatively affect health.

These pathways are presented visually in figure 1. These relationships are further interconnected. Poor nutritional status increases vulnerability to disease (Save The Children, 2008), while lack of adequate food is likely to reduce health and energy status leading to lower ability to work on the farm or in paid labour. Poor health resulting from inadequate water access leads not only to poorer nutritional status but also to time costs (when unable to work or attend school) and financial costs of healthcare. These destructive cycles may represent a chronic situation for households faced with constant water shortage or they may be a regular or occasional seasonal occurrence during the dry season. Drought exacerbates the situation by intensifying and extending periods of water shortage. Water shortage is an important mediator of drought and food security, although it is often neglected while attention focuses on the direct impacts of drought on food production.

Drought is the leading proximate cause of food insecurity in sub-Saharan Africa (underlying causes relate to the structural factors which maintain high levels of poverty and vulnerability), and in addition to causing food shortages due to decreased rainfed production, drought usually causes pronounced water shortages which exacerbate food insecurity through the three pathways described above. Furthermore, levels of access to improved water supply in sub-Saharan Africa are already low, and thus poor water access is a contributing factor to the underlying vulnerabilities which make drought impacts so severe. Overall water is the major mediator between climate and rural livelihoods.

Figure 1-1: Causal pathways from lack of water to food insecurity




For these reasons, water shortages can be a good indicator of potential food insecurity, as recognised by evaluators of the emergency response to the 2002-3 drought in Ethiopia:

> 'A key indicator of stress and threat to health and livelihoods is the availability and conditions of community access to water' (Simkin et al, 2004. p.33)

Ensuring secure water access should be a critical part of efforts to protect livelihoods for drought preparedness. Acute malnutrition – the outward sign of severe levels of food insecurity – is not only an indicator of a food crisis but of a crisis in public health and access to water and sanitation (ProVention Consortium and ALNAP, n. d.). There is a close correlation in sub-Saharan Africa between lack of access to water and acute malnutrition, and communities frequently place water among their top priorities for investment (Devereux et al, 2004; Poulsen et al, 2007). Water is also an essential component of responses to emergencies, both to save lives and to rebuild livelihoods. Without adequate access to water, other efforts to tackle malnutrition may be ineffective. In Ethiopia in the 2002-3 drought, for example, evaluators commented that:

> 'the incomplete food basket early in the crisis was exacerbated by outbreaks of diarrhoea and malaria which exacerbate child malnutrition'. (Simkin et al, 2004, p. 27).

In spite of this knowledge, most systems for early warning, food security assessment and emergency response pay limited attention to shortfalls in water availability and access, either as an indicator of crisis or a critical underlying cause of vulnerability. Evaluations of drought responses in different parts of Africa show that water responses (such as rehabilitating wells, drilling for new supplies, distributing treatment kits or tankering water, for example) are increasingly present but have often been limited and late, to the detriment of efforts to alleviate food insecurity and protect or restore livelihoods. These evaluations also note that there is rarely a clear framework for collecting, analysing and using data related to water supply. In particular the water needs of livestock are often neglected (which are generally very serious during a drought) even though livestock are an essential component of livelihoods, both for pastoralists and for many agricultural households for whom they are an

important form of saving and insurance. This reflects the widely reported failure of emergency responses to adequately address the needs of pastoralist communities in many cases (see section 5).

Most responses to food insecurity prioritise provision of food aid (or, increasingly, cash) over meeting non-food needs in health, water, agriculture, infrastructure or other sectors. There is an growing recognition of the importance of non-food responses, and assessments are increasingly taking a livelihoods focus, but responding adequately to livelihood needs remains a major challenge.

Climate change is expected to have a net negative effect on the cereal production potential of sub-Saharan Africa, with losses of up to 12% in some places (Ludi, 2009), and to increase the frequency of floods and droughts (Bates et al, 2008). This makes the need for effective early warning systems for droughts and floods even more critical, and demands that responses to food insecurity build resilience, rather than just saving lives while damaging asset losses continue to undermine livelihoods. Climate change impacts will largely be felt through impacts on water availability and access, so these must be core components of improved assessments of, and responses to vulnerability and food insecurity.

There are various existing standards and guidelines for water, sanitation and hygiene provision in emergencies. For example, the Sphere minimum standards include a detailed set of standards, indicators and guidelines for domestic water supply, sanitation, hygiene, drainage and control of vectors of water-related disease (Sphere Project, 2010). These aim to set out the core service levels which must be maintained during emergencies to ensure health and survival and are very valuable in terms of defining minimum standards for disease prevention and basic water needs (for drinking, cooking and hygiene) and providing tools to assess needs. However there is no analytical link with food security, and water for production (a critical part of livelihoods) is not included, though there is a minimum standard for protection of primary production to prevent food insecurity. Other publications and toolkits focus on emergency provision of safe water for populations displaced by emergencies, in refugee camps and similar situations (e.g. Chalinder, 1994). This paper does not deal with refugee situations, although it is recognised that this is an important component of emergency response where people have been displaced.

Section 2 introduces current approaches to food security assessment and drought response in sub-Saharan Africa. Sections 3 and 4 deal with two critical stages, vulnerability assessment and early warning systems/monitoring, and discuss what water-related information is currently collected and how it is used. Section 5 discusses emergency responses themselves, focusing on what evaluations of major drought responses in the last decade tell us about the effectiveness of current approaches: are water-related interventions typically part of emergency response, what do they look like, and are they adequate? Section 6 presents a case study from Ethiopia, where the government is looking to improve the non-food components of its emergency response system and move towards a more prospective risk management approach. In section 7, overall conclusions are drawn as to how far existing systems for food security assessment and drought response take account of water-food links, and possible ways forward are identified.

# 2 Current approaches to food security assessment and early warning

National and regional food early warning systems (EWS) came into existence across sub-Saharan Africa following the devastating famines of the 1970s and 80s (Tefft et al, 2006). The first systems used the national cereal balance (national staple food supply/demand) to warn of food crises, and responses were mainly in the form of food aid to fill the gap. While these systems have helped to alert governments and the international community to crises and prevent catastrophe, they have largely proved ineffective at protecting livelihoods and reducing the vulnerability of affected populations to future droughts (e.g. Provention Consortium and ALNAP, n. d.; Levine and Castre; 2004). They also offer little understanding of the needs of different areas or groups during a crisis, as the calculations are made at national level and take no account of the distribution of food or people's ability to access it.

More recently, EWS have shifted towards a broader understanding of food security which includes (i) food availability, (ii) the stability of food supplies, (iii) access to food (physical, financial and social), and (iv) biological utilisation of food (which depends on health). Reflecting these four dimensions of food security, more effective EWS are organised around four main pillars (FAO, 2000):

- Agricultural production monitoring, of crops and sometimes livestock products
- Market information systems, for domestic and sometimes international trade
- Social monitoring of the most vulnerable groups
- Nutritional surveillance

However the main focus of many EWS is still crop production and food market trends, with much more limited attention to social monitoring and nutritional surveillance. Food balance estimates are now usually based on a combination of rainfall data, satellite imagery and field assessments of crop growth.

Effectively responding to a food security emergency requires more than just an early warning system to raise the alarm and indicate that a problem is emerging. Baseline vulnerability assessment, early warning, needs assessments and programme monitoring and evaluation are all recognised as important stages of an effective food security (or broader humanitarian) information system (see table 1). Vulnerability assessments provide a baseline of information on how people access food in a normal year, their sources of vulnerability and the coping strategies available to them, which helps to identify vulnerable groups and develop appropriate responses. Needs assessments take place in affected areas once a current or potential problem has been identified through an EWS, and aim to determine requirements for food aid and other interventions in detail. Monitoring and evaluation are important both during emergency responses, in order to check the effectiveness of interventions and make any necessary adjustments, and periodically to reflect on the effectiveness of the system as a whole.

Table 2-1: Components of a humanitarian information system

| Component | Frequency of analysis | Questions addressed? |
|---|---|---|
| 1. Baseline vulnerability and poverty assessment | Infrequent (every 5 years, or when conditions change) | What are the basic livelihoods of different groups?<br>What are the known or likely hazards: natural, environmental, social, economic, political?<br>What coping strategies do people have?<br>What indicators should be monitored?<br>Who are the most vulnerable groups? |
| 2. Early warning | Continuous | Forecasting: is a problem predicted?<br>Indicator trend analysis: is there a problem developing?<br>Where and how quickly is it developing?<br>What are its geographic dimensions?<br>Where should an in-depth assessment be conducted? |
| 3. Emergency food security / needs assessment | As needed (regular and/or ad hoc) | What is the nature and what are the dimensions of the problem?<br>How long is it going to last?<br>Who are the most vulnerable groups?<br>What, and how much, is needed? What is the best response? |
| Interventions take place based on information generated. | | |
| 4. Impact evaluation | Regular while intervention is ongoing | Is the intervention achieving the intended result?<br>What adjustments are necessary (response, quantity, targeting)? |
| 5. Context monitoring | Continuous | What are the possibilities for exit, recovery or transition to longer-term responses? |
| 6. Programme evaluation and lessons learned | Periodic | How can the overall programme (information system, preparedness, response) be improved? |

Source: adapted from Maxwell and Watkins, 2003

A survey by the UN reports that the majority of national systems still focus predominantly on early warning and do not yet include vulnerability assessments (UN, 2006), however there are increasing trends in this direction, seen for example in the establishment of the southern Africa Vulnerability Assessment Committees (VACs). Vulnerability assessments have gained ground as part of a growing trend towards livelihoods-based approaches to forecasting and responding to food insecurity. Livelihoods-based approaches recognise that food insecurity is driven by a much broader set of factors than production or market shocks alone, and that food crises usually occur when drought interacts with other stressors in situations of severe underlying vulnerability. A single drought event does not usually cause a food crisis unless people's livelihoods and coping abilities have been undermined by a combination of other stresses or by successive droughts which allow no time for recovery, as has happened in many of the chronically-insecure parts of sub-Saharan Africa. Maxwell et al (2008) argue that 'in many ways... an "emergency" should be seen as an outcome of underlying processes, rather than an "event"'. In order to understand the likely impact of shocks on people's food security, a livelihoods-based approach first seeks to understand how they usually access food, their existing level of vulnerability to different kinds of shock and stress and the coping strategies which they are able to employ, through a baseline vulnerability assessment.

As well as allowing more targeted estimation of food gaps during a drought, a livelihoods approach seeks to understand people's sources of vulnerability and to identify appropriate interventions in other sectors to reduce the vulnerability of affected groups, support their coping strategies and

prevent the worst impacts of drought on their health and livelihoods. It can also identify ways to help people rebuild lost assets after a crisis. It is increasingly recognised that merely meeting people's survival needs following a crisis is likely to leave people highly vulnerable to future shocks. Drought itself, and the coping strategies which people employ to survive, can undermine livelihoods and leave people less resilient to future shocks. Drought impacts may include livestock death, loss of income due to crop losses, and declining health caused by poor nutrition and lack of adequate water, and in order to survive such impacts households may be forced to sell important assets (e.g. livestock and farm or household equipment), to enter into debt, migrate or to revert to unsustainable practices that in the long term undermine the natural asset base on which food production depends (e.g. charcoal production). This leaves them more vulnerable to subsequent shocks.

In reality, however, food-based responses still dominate the field, and the focus of emergency responses remains more on saving lives than protecting livelihoods. Protecting and rebuilding assets are increasingly agreed to be important, but there is often a lack of clarity over how to do this, debate over to what extent such interventions are a 'development' rather than a 'humanitarian' responsibility (even in situations where episodes of food insecurity are the norm rather than the exception and the line between transitory and chronic need is blurred), and a tendency for responses to kick in only once a crisis has been reached. Non-food responses which could help to alleviate immediate problems of malnutrition are often neglected in favour of food aid. Water-related diarrhoeal diseases increase during drought due to the lack of water for hygiene purposes, and are a major contributor to malnutrition as they prevent absorption of food, yet emergency water provision receives very little attention compared with food aid.

Evaluations of recent emergency responses to drought in sub-Saharan Africa emphasise the value of non-food responses (in water, sanitation, health, education, markets and agriculture among others), but highlight that these responses are often inadequate and come too late, due to the dominance of food aid and the lack of a clear method for identifying other needs. Evaluations show that there is not yet sufficient understanding of how drought interacts with existing vulnerability to create food insecurity, or of how to link baseline vulnerability assessments with early warning and monitoring data to identify appropriate non-food responses for both survival and livelihood protection (see section 5 for more details).

Devereux et al (2004) observe that while the strength of livelihoods-based approaches lies in their multi-disciplinarity, this also makes them complex and more difficult to integrate into government, and much stronger analytical links need to be developed between different methods to achieve a coherent, effective livelihoods approach. In countries which regularly face food security crises and receive large volumes of emergency aid (such as Ethiopia), there is usually a large cast of actors involved in food security assessments, early warning and emergency response, using different and in some cases competing methods.

The following sections outline current approaches in sub-Saharan Africa being used for (i) vulnerability analysis, (ii) early warning systems and (iii) emergency responses, highlighting in particular the way in which water-related information is collected and used in different systems, and drawing on evaluations of recent major drought responses to assess the adequacy of water sector responses to date. These systems and methods found on paper are almost certainly inconsistently applied, however. Maxwell et al (2008) note that 'food security interventions in emergencies are often based on no analysis whatsoever' (p.39).

# 3 Water in baseline vulnerability assessments

Where they are carried out, vulnerability assessments collect information on, at minimum, availability of and access to food in a normal year. This provides a baseline against which seasonal or annual monitoring data and forecasts can be compared, to identify emerging problems, and highlights areas or groups likely to be particularly at risk. In some countries nutritional and health information is also included as a measure of food absorption, although the subsequent use of such data has been said to be weak (Frankenberger et al, 2005). Some take a more livelihoods-based approach, in order to understand the underlying drivers of food insecurity and thus obtain a more sophisticated picture of at-risk areas and groups. A livelihoods-based vulnerability assessment collects information on, for example:

- Population density and structure
- Household size
- Asset holdings or access
- Access to services (health, education, water, other)
- Levels of savings or debt
- Sanitation and hygiene practices
- Dependence on, and status of, natural resources (water, forest, grazing, other)
- Infrastructure
- Institutions and social networks
- HIV/AIDS

Major systems in use in Africa include the FAO/WFP Comprehensive Food Security and Vulnerability Analysis (CFSVA) and the Household Economy Approach (HEA) which includes regular baseline assessments. Few examples can be found of baseline food security / vulnerability assessments in Africa which are not based on one or other of these approaches. It also appears that many countries do not conduct any regular baseline analysis.

A CFSVA, as the name suggests, aims to comprehensively assess livelihoods and causes of vulnerability. A CFSVA uses a household survey (random cluster sampled by administrative or livelihood zone), focus group discussions and nutritional survey. It then develops livelihood vulnerability profiles for regions/administrative clusters (or in some cases livelihood zones) and for livelihood groups (e.g. agriculturalists, pastoralists, fishermen, labourers), and examines the different vulnerabilities of different wealth quintiles. Usually, a seasonal calendar of rainfall and agricultural production is constructed; in some countries this is developed to include information on other economic activities, seasonal market dependence, disease periods and water shortages.

A review of 9 recent CFSVA reports from Africa shows that the information collected varies between countries. In all cases some water-related information was collected – at minimum household water sources and sanitation facilities, and mothers' handwashing practices. In some countries more detailed information is collected on wet and dry season sources, distance to water sources, volume of water used and months in which a shortfall occurs. In only two countries was any

information collected on irrigation. Data is also not systematically collected on water for livestock, although in one country a seasonal shortage of water for livestock was noted as part of the seasonal calendar in one area. Data is typically presented in terms of % coverage by region, and in some cases also by livelihood groupings and wealth quintiles.

The degree to which the information on water is analysed in terms of its relationship to food security – rather than just taken as a component of underlying vulnerability – varies between countries. In most cases there is some statistical analysis of factors associated with food insecurity and malnutrition; the findings as to the significance of water and sanitation are mixed. All but one report subsequently make recommendations that include interventions in the water and sanitation sector. The majority of these are very broad, however, and simply recommend improving services in areas with low coverage. In other cases they are more linked to irrigation or agricultural water development, but are still quite broad in nature and do not specify in detail when, where or for whom the interventions are recommended. Table 2 summarises the water-related content of the 9 reports reviewed.

Table 3-1: Water data in WFP CFSVA assessments

| CFSVAs | Water-related data collected | Analysis | Recommendations |
|---|---|---|---|
| **Tanzania** 2010 | **WASH**<br>HH water source in rainy and dry seasons<br>Collection time and distance in rainy and dry seasons<br>HH sanitation facility<br>HH expenditure on water<br>Women's handwashing practices.<br>Boiling of water for children | Causal analysis of factors affecting malnutrition, finding that:<br>- Children who have been given boiled water are less stunted (significant)<br>- Children given boiled water show a tendency to be less wasted (non-significant) | Improvements in water and sanitation generally recommended, with a note of regions with particular problems.<br>Hygiene/handwashing promotion |
| **Malawi** 2010 | **WASH**<br>HH water source<br>HH sanitation facilities<br>Handwashing practices of women<br>HH expenditure on water<br>**Agricultural water**<br>% of HH's land under irrigation | Tested for factors associated with food insecurity and malnutrition, finding that:<br>– Food insecurity is associated with absence of irrigation<br>– Malnutrition is associated with diarrhoea, which in turn is associated with a lack of improved water and sanitation facilities. | More reservoirs, irrigation expansion and cultivation of moisture-retaining fields to reduce vulnerability of production to drought.<br>Sanitation and hygiene promotion for women.<br>Expand water and sanitation coverage. |
| **Ghana** 2009 | **WASH**<br>HH water source<br>HH sanitation facility<br>**Agricultural water**<br>HH use of irrigation | Tested the association of access to an improved water source and safe sanitation with malnutrition for each livelihood zone: found to be significant in some zones but not others. | Support to irrigation and sustainable land management.<br>Improved watershed management and water harvesting.<br>Campaigns on hygiene and safe water use. |
| **Rwanda** 2009 | **WASH**<br>HH water source (primary and secondary)<br>Cost of water<br>HH water treatment practices<br>HH sanitation facilities and use of hygienic items<br>Women's handwashing practices | Tested the for an association between access to improved water and sanitation and food consumption or children's health: no significant relationships were found. | None related to water. |

| | | | |
|---|---|---|---|
| **Uganda**<br>2009 | **WASH**<br>HH water sources<br>Collection time and distance to source.<br>Consumption per day (litres)<br>HH water treatment and storage practices<br>Changes in water sources in the last 2 years (and why)<br>Reliability of water sources<br>HH sanitation facilities<br>Handwashing practices<br>Limiting factors preventing latrine construction. | Tested effect of distance to water collection or time taken on volume used: found no effect. Tested the correlation of different variables with food security status, in this case: no effect of water source, but having improved sanitation was significantly related. Correlation of variables with nutritional status: children with no access to improved toilets were more likely to be underweight and to have acute malnutrition; also those who experienced diarrhoea. | Greater advocacy for improved access and quality of water, and promoting the use and construction of latrines. |
| **Burundi**<br>2008 | **WASH**<br>HH sanitation facilities<br>HH water sources<br>HH water treatment<br>Payment for water (and in which seasons)<br>Time taken to reach source.<br>HH members responsible for collecting water.<br>Months with water shortage and coping strategies adopted | Tested relationship between water and sanitation and wealth: wealthier were more likely to have safe water, more likely to have toilet facilities, and strongly more likely to have a nearer water source.<br>Relationship between water and food consumption score: HHs with poor consumption more frequently have to pay for water, are more likely to lack water for part of the year and are more likely to spend over an hour to travel to the source.<br>Tested association of water and sanitation with malnutrition: the use of unsafe sources of water was significantly related to children's' wasting. | Improvement in sanitation services to tackle malnutrition. |
| **Sudan**<br>2007 | **WASH**<br>HH access to 'good water'<br>**Water resources**<br>Note of conflicts over water resources which have undermined food security in some areas | Discussion of the timing of the malnutrition peak and what this indicates about causes: adequate water access is central. But not a robust analysis. | None related to water. |
| **Madaga-scar**<br>2006 | **WASH**<br>HH drinking water sources in dry and rainy seasons.<br>Period of difficult access to water<br>HH sanitation facilities<br>Expenditure on water<br>Boiling of children's water<br>Handwashing practices of women caring for children<br>**Agricultural water**<br>Presence of irrigation at village level<br>Wetland ownership<br>**Water resources**<br>Existence of water management associations | | Water and sanitation recommended as non-food interventions where access is low. |
| **Angola**<br>2005 | **WASH**<br>HH drinking water source<br>Sharing of sources with animals<br>Walking time from home to water source<br>HH sanitation facility<br>**Livestock water**<br>Note of dry season water shortages in one region (but not systematically asked) | None specifically reported. | Safe water recommended in areas where coverage is low. |

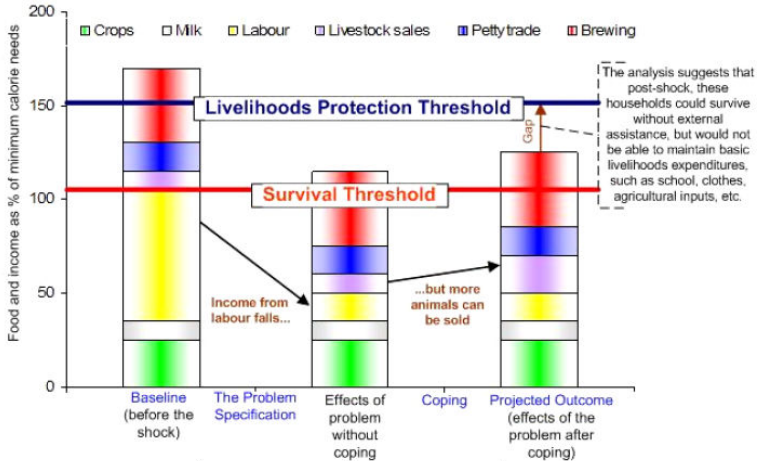
Sources: WFP 2010a, b; 2009a,b,c; 2008; 2007; 2006; 2005

HEA in contrast focuses on obtaining 'typical' information for wealth groups in different livelihood zones rather than statistically representative household-level data, and relies on focus groups and key informant interviews rather than surveys. A weakness of the HEA is that it remains primarily focused on food access and neglects both food absorption (health and nutritional information) and broader dimensions of vulnerability such as access to water and other resources and assets. However, HEA seems to be unique in offering a clear analytical approach to link the findings of the baseline assessment with monitoring information to predict quantitative impacts, by livelihood zone and by wealth group (see Box 1).

**Box 1. Household Economy Approach (HEA)**

HEA was developed by Save the Children-UK in the early 1990s, with the aim of improving the ability to predict short-term changes in access to food following a hazard. It is based on the recognition that people generally use multiple strategies to access food (not just their own production) and that predicting food insecurity requires an understanding of these strategies and 'mapping [of] the links between people and supplies of food'. HEA identifies when and where people have inadequate access to food, quantifies the shortfall in access and suggests possible interventions. Most importantly, it is predictive; it makes it possible to model the impact of events such as drought or rising food prices on households' ability to access food and income.

The following illustration shows the HEA analytical approach. Food and income obtained from different activities (e.g. crop production, labour) are determined for a baseline year; the impact of a hazard (e.g. drought) on the food/income profile, and the degree to which households can redress these impacts through coping strategies, are then determined through primary data collection. Food and income access are quantified, converted into calories and compared with thresholds for livelihoods protection and human survival, to quantify the food gap in the event of a hazard (or for the chronically food-insecure, in a normal year).




Once these relationships are understood, analysts can model the effect of changes in production, food prices, labour opportunities or other drivers. The effects of planned interventions can be modelled in a similar way. An HEA analysis is carried out in pre-identified livelihood zones, and for locally-classified wealth groups in each zone, as both geography and wealth place constraints on the livelihood options and coping strategies available to people.

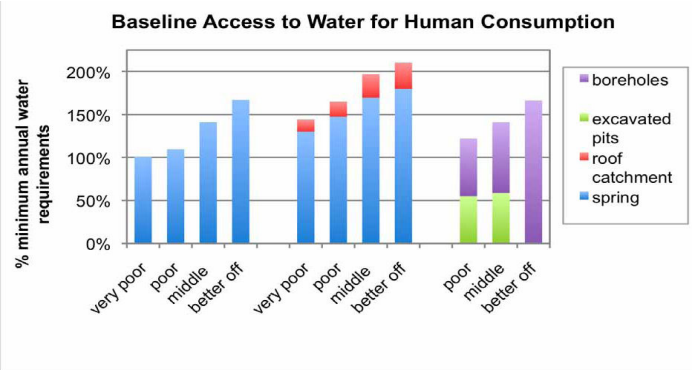
*Source: FEG Consulting and Save the Children (2008)*

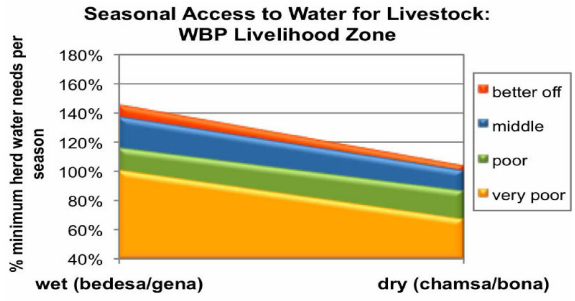
In most other systems there is no clear method to analyse the data generated by vulnerability assessments and no quantitative framework with which to link it with early warning information for better targeting and design of responses. As a result, the wealth of information which vulnerability assessments can generate is often under-used. A framework to incorporate water into HEA (Water Economy for Livelihoods, or WELS) has recently been piloted in a number of regions in Ethiopia (see Box 2). The pilots have been successful in terms of the value of data generated, but the methodology is time-consuming and requires streamlining to be practically applicable.

**Box 2. Water Economy for Livelihoods (WELS) Assessment**

A central aim of WELS is to link household economy with access to water at household level – and strengthen understandings of livelihoods and responses to threats to livelihoods. The WELS approach has three components:

**a) Water Baselines**, which address both water availability and water access within each livelihood zone. Water access baselines capture quantified data on access to sources of water by different wealth groups, across seasons, and across uses (e.g. domestic and productive), for a specific *reference year* considered 'normal' (neither particularly good nor bad) for household livelihoods security. Detailed hydrogeological data and mapping enables characterisation of groundwater potential in specific geographic areas, as well as identification of areas vulnerable to groundwater drought. Data on water point coverage adds information on local water availability.




**b) Hazards Analysis**, which is based on seasonal or other assessments and which quantifies shocks or hazards and translates them into quantified economic and water access consequences at household level.

**c) Outcome Analysis,** which projects the impact of the hazards against the baseline in relation to survival and livelihoods protection needs, or thresholds.

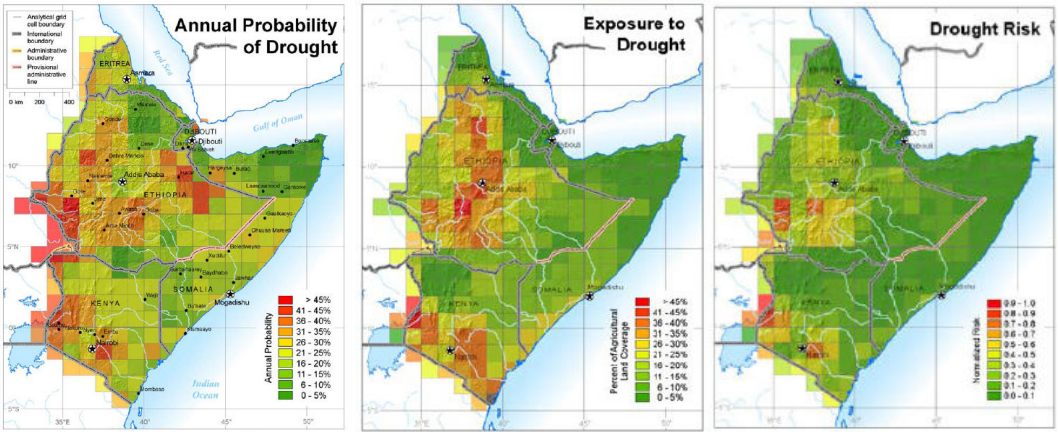
*Source: Coulter et al, 2010*

Vulnerability assessments at local level identify the underlying sources of vulnerability (those related to community and household characteristics, and also structural and institutional factors) and may also ask questions about common hazards and how people cope. By linking these with a national risk map for drought (see Box 3) and national level information on food production and markets, a fuller picture of local vulnerabilities can be developed. Oxfam also recommend a political economy assessment be carried out to understand the drivers of food insecurity and the likely viability of possible responses (Oxfam website, no date).

**Box 3. Hazard risk mapping**

Hazard risk maps are generally constructed at regional or national level, and classify areas according to their level of risk for different hazards, e.g. drought, generally using historical data.

This drought risk map for the Horn of Africa was developed by USAID using the Standardised Precipitation Index to statistically characterise anomalies in historical rainfall data and map the past occurrence of drought in each grid cell (first image). Only droughts during agriculturally important rainy seasons were included, with rainy seasons defined for each cell. Such maps can be combined with exposure maps (see second image) to assist prioritisation and calculate indices of risk. Exposure – the impact of a hazard on lives and assets - can be estimated using data from vulnerability assessments or previous drought needs assessments. In the absence of such data, population density or extent of land under cultivation (if possible distinguishing rainfed from irrigated production) give a coarse measure of exposure. These are combined to develop a drought risk map (third image).




*Source: Bartel and Muller, 2007*

Assessments may be organised around administrative zones for the sake of ease and integration with existing monitoring arrangements and response systems, or around agro-ecological or livelihood zones (LZs) on the grounds that communities and households within these zones rely on similar resources, and have similar livelihoods and vulnerabilities. It is often stated that basing assessment on LZs generates more meaningful findings and allows better targeting as livelihoods often vary considerably within administrative districts. However, LZs are seldom rigorously tested to ascertain whether variation within a LZ is in fact less than that between LZs or within administrative areas, and the use of LZs as the unit of analysis presents a practical challenge for local governments in using the data (Frankenberger et al, 2005). LZs are probably less useful where livelihoods are highly diversified

with low dependence on natural resources. It is not clear to what extent livelihood zones correspond to zones of water availability or access.

Various NGOs and relief agencies have their own methods to assess vulnerability at community level, which have been developed to inform their disaster-preparedness and resilience building activities. These do not necessarily form part of a national system (they may take place only in areas where these agencies work) and may not be linked to national food security information systems, although they should be linked to risk maps if these exist. Two examples are given in Box 4. Such assessments do not offer a framework to quantify or predict impacts, but they provide a wealth of information that could be used to guide interventions to build resilience as well as inform emergency responses, if data were incorporated into the food security information system.

**Box 4. Participatory vulnerability assessments**

The **International Federation of Red Cross and Red Crescent Societies** (IFRC) has issued guidance for its national societies on participatory Vulnerability and Capacity Assessments (VCAs). VCAs *'assess the risks that people face in their locality, their different levels of vulnerability to those risks, and the capacities they possess to cope with a hazard and recover from it when it strikes'*. They aim is both to provide baseline information for emergency needs assessments following disasters, and to help communities and local authorities identify actions to reduce risks and increase resilience. VCAs use participatory methods such as transect walks, seasonal calendars, focus group discussions, problem tree development, coping strategies analysis and institutional/social networking analysis, in addition to interviews. Topics are shared among appropriate focus groups, for example the elderly might develop a historical timeline while women draw up a seasonal calendar of agricultural work. Following the assessment, the IFRC aims to identify interventions to reduce vulnerability and gain the agreement of communities and local authorities.

The international NGO **ActionAid** conducts Participatory Vulnerability Analysis (PVA) at district and project level in countries where it works. PVA involves community members in a discussion with district level stakeholders about sources of vulnerability, hazards, decision-making processes and possible interventions. A PVA uses participatory rapid appraisal (PRA) techniques such as focus group discussions, historical timelines, problem trees and seasonal calendars, and works with the community to think of actions to reduce vulnerability. While one aim of PVAs is to inform ActionAid's programming for vulnerability reduction, they are also intended to empower communities to take charge of efforts to address their vulnerability.

Guidelines for these two approaches do not mention specific questions to be asked about water. However, the examples they cite show that water often emerges during the discussions, and then forms part of the NGO response for disaster risk reduction at community level.

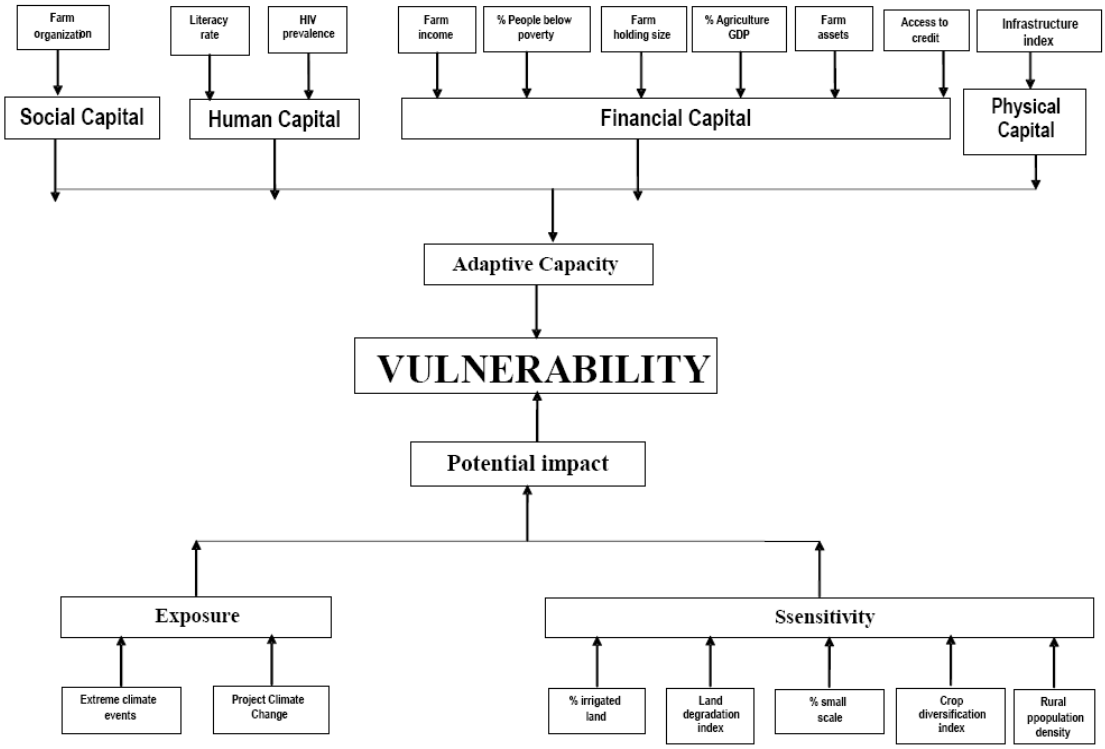
Sources: IFRC, 2006; Chiwaka and Yates (no date)

Climate vulnerability assessments are increasingly being undertaken as part of the development of climate change adaptation strategies, often using an indicator-based approach to identify the most vulnerable countries and subnational regions (an example from South Africa is given in Box 5). These assessments are not currently well integrated into information systems for food security and early warning and are not discussed in detail here, but there is potential for considerable synergy. Indicator-based approaches to vulnerability assessment are also applied to food security, often using

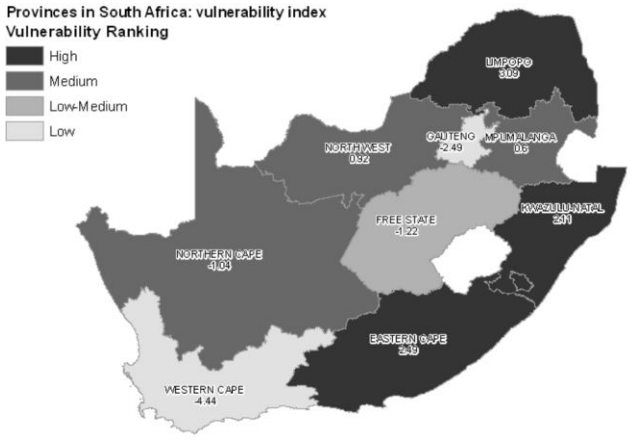
a simpler formula based on crop yield, income and nutritional status for example (Ziervogel and Downing, no date).

**Box 5. Indicator-based assessment of climate change vulnerability in South Africa**

Gbetibuou and Ringler assessed the vulnerability of South Africa's nine provinces to climate change using the following set of indicators, based on the concept of vulnerability as comprising exposure to hazards, sensitivity to hazards and adaptive capacity.




In this example, the only water-related indicator is the % of irrigated land, which is considered a component of sensitivity to climate change. Scores for the 17 indicators were then combined into a vulnerability index used to produce a national vulnerability map ranking each province as high, medium, low-medium or low in vulnerability.




*Source: Gbetibuou and Ringler, 2009*

# 4 Water in early warning systems

An early warning system tracks key indicators for changes which signal an emerging food security problem. A good monitoring system should 'sound the alarm' and also generate basic information on the type of crisis, possible impacts and areas and people likely to be affected (FAO, 2000). However it is more important that an EWS provides timely warning than that it generates detailed information on the nature and impacts of emerging problems, as these can be determined in a subsequent needs assessment.

Most EWS still use the cereal balance as the main indicator of a forthcoming food problem, and work by monitoring and forecasting climate and predicting the impact of climatic variation on seasonal production (Tefft et al, 2006). Production is usually estimated based on the water balance for different crops in the growing season, which is determined using a combination of meteorological analysis, crop simulation models, satellite images and field studies. This approach is effective in semi-arid conditions with fairly homogeneous cropping where water is the main factor limiting crop growth, but less accurate where production is heterogeneous and there are other major limiting factors e.g. excess water, sunlight, pests or diseases (FAO, 2000).

The majority of food security monitoring systems also include a market information system to monitor price trends, imports and exports, and some include nutritional surveillance and social monitoring of vulnerable groups (typically focusing on food intake, income, employment and access to resources and basic services (FAO, 2000). The adoption of coping strategies by vulnerable groups can be an important indicator of emerging problems.

In most systems, field-based seasonal assessments of food availability and access are conducted to verify and complement the production estimates. More livelihoods-based approaches also assess economic conditions and health/nutritional status, and sometimes other factors such as access to services and the presence of other stressors e.g. disease or floods. Field assessments help to flag up at-risk areas and locally emerging problems. These assessments often rely on experts to identify a problem by comparing the current situation with past years, rather than using pre-set quantitative triggers, and may be carried out by local government staff from relevant sectors (as in Ethiopia) or by decentralised, independent EWS personnel – the 'local expert method' (as in Chad, Madagascar, Mali and Mozambique) (Tefft et al, 2006). In most cases these assessments involve a large number of different agencies from government, donors (including UN agencies) and major NGOs.

Nine examples of nationally-led seasonal/annual assessment reports from different regions of Africa were reviewed (plus interviews in Ethiopia).[1] Only four of these (Ethiopia, Kenya, Swaziland and Mozambique) included any information on water:

The report from Kenya presents a map of the rainfall deficit during the preceding season (as a % of normal rain), and discusses the effect of deficits in different areas on waterborne diseases, water shortages, livestock migration, crop failure, price of water and purchasing capacity.

The report from Swaziland records coverage of improved water and sanitation by region in rainy and dry seasons, average distances to water sources in the rainy and dry seasons, handwashing practices and the presence of any environmental hazards near water sources. It notes that as well as identifying

[1] Kenya, Malawi, Swaziland, Namibia, Zimbabwe, Mozambique, Liberia, Sudan (Darfur)

the share of households with inadequate food by region and livelihood zone and understanding the distribution of vulnerabilities, the assessments seek to *'identify the share of the population with regular access to water from improved sources by seasons and by regions in all livelihoods/food economy zones [and] ...to assess the status of services provided to the regional populace'* (Swaziland VAC, 2009).

In Mozambique, data is collected on water and sanitation access as part of the investigation into health and nutrition. The report also makes various qualitative observations which relate to water: that many water points are damaged or provide bad quality water; that many natural watercourses are dry leading to animal-human water conflicts; and that drought causes frequent school absenteeism or lack of diligence because children are required to fetch water and move animals to water or pasture (SETSAN, 2006).

In Ethiopia, data is collected on water availability for human and livestock (qualitative assessment through interviews and observation). Drying of water sources is one of the nine main early warning indicators (others relate to prices of crops and cattle, the adoption of coping strategies, school dropouts, cattle condition, disease outbreaks and malnutrition). A pilot project is also monitoring water levels in waterholes for livestock in the pastoral areas of southern Ethiopia using satellite data and hydrological modelling (see Box 6). For more detail on the Ethiopian system see section 6.

**Box 6. Waterhole level monitoring using remote sensing**

Nomadic pastoral communities in East Africa depend heavily on small water bodies and artificial waterholes of less than a hectare across, for both livestock and domestic use. However these water bodies often become depleted during drought, reducing water availability and causing conflicts between communities. Water availability in these waterholes is difficult to monitor, especially in remote areas, so the use of remotely sensed data offers a considerable advantage.

A pilot project led by the US Geological Survey (USGS) and Texas A&M University uses satellite images to identify 41 small water bodies in southern Ethiopia and northern Kenya and to delineate their watersheds. Near real-time rainfall monitoring using satellite data is combined with modelling of evapotranspiration and runoff to estimate daily variations in waterhole depth. This provides extremely valuable early warning information on the condition of waterholes, as well as potential herd migration and livestock losses.

*Source: http://watermon.tamu.edu/technologies.html*

These reports show that a wealth of valuable data is collected across sectors and recommendations are often made for interventions in several sectors to reduce vulnerability and risk, but that water is often a gap. Even where information related to WASH is collected, there is little mention of water for production (irrigation or livestock) and no analysis of the effect of time spent collecting water on food insecurity. However, adding further questions for data collection in itself might not lead to improved responses, as there is not always a clear system for making use of the large amounts of monitoring data already collected, or for prioritising responses. The reports make recommendations relating to the water sector for the short, medium and long term, based on the information collected and the assessors' knowledge, but these are among a large number of recommendations in many sectors and it is not always clear how these are to be implemented or prioritised, or by whom.

Early warning monitoring data is generally used to construct maps showing the level or risk of food insecurity in regions or livelihood zones based on national food security indicators, HEA food deficit

figures or other measures. In none of the reports which collected water-related information was water (apart from rainfall) part of the risk calculation – it is based on projected food or food/income deficits calculated using only production and market trends.

The Integrated Food Security Phase Classification (IPC) system, initially used in Somalia, is increasingly used to classify zones into five phases, from 'generally food secure' to 'famine/humanitarian catastrophe', using the following indicators which do include water access:

- Crude mortality rate (mortality per 10,000 per day)
- Acute malnutrition (% incidence)
- Stunting (% incidence)
- Food access / availability (kcal per person per day)
- Dietary diversity
- Water access / availability (litres per person per day, access for non-human usage)
- Hazards (probability and vulnerability)
- Destitution / displacement (concentration and trends)
- Civil security (qualitative, from prevailing and structural peace to widespread high intensity conflict)
- Livelihood assets (qualitative, from sustainable use to collapse)

The inclusion of water access as an indicator is due to its important effects on health and nutrition, and also because of the recognition that costs of accessing water can undermine livelihoods: at intermediate levels of classification it is noted that access to water may be maintained only through asset stripping, with potential negative impacts on both immediate food security and long term resilience.

Various regional and international organisations provide data and analysis as inputs to EWS, e.g. analysis of satellite imagery and market trends, and support early warning data collection and analysis in country. In the Horn of Africa, the IGAD (Intergovernmental Authority on Development) Climate Prediction and Applications Centre[2] (ICPAC) provides ten-day, monthly and seasonal climate bulletins, drought and flood risk maps, climate forecasts and early warning information on hazards (mainly drought and flood) and their expected impacts for countries in the region[3]. A key early warning indicator used is the drought severity index (rainfall compared with the long term seasonal mean). Together with other agencies[4], ICPAC develops rainfall maps based on climate forecasts for 'best case', 'worst case' and 'most likely' scenarios. These are interpreted with expert knowledge of local conditions to predict impacts in different areas and to develop a Regional Food Security Outlook Map. This information is disseminated to national meteorological and hydrological agencies

[2] http://www.icpac.net/

[3] Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Somalia, Tanzania and Uganda.

[4] World Food Program (WFP), Famine Early Warning Systems Network (FEWS NET), U. S. Geological Survey (USGS), International Research Institute for Climate and Society (IRI)

in participating countries. ICPAC also aims to build capacity for climate information production and use in the region, and to improve understanding of climate risks to allow more informed decision making.

In Southern Africa, the SADC Food Agriculture and Natural Resources (FANR) Directorate[5] supports a Regional Early Warning System providing advance information on crop yields and food supplies and requirements, a Regional Remote Sensing Unit, providing data on rainfall trends, vegetation condition and crop growth, and the Regional Vulnerability Assessment and Analysis Programme. This is implemented by the Regional Vulnerability Assessment Committee (RVAC), which spearheads improvements in food security and vulnerability analysis in the region, and National committees (NVACs) in member countries which coordinate national vulnerability assessments. In West Africa, the AGRHYMET Regional Centre[6] (part of the Permanent Interstate Committee for Drought Control in the Sahel – CILSS in its French acronym) provides seasonal rainfall and hydrological forecasts, monitors rainfall, crop water satisfaction and pasture status using remotely sensed date, forecasts crop and biomass yields and brings this information together to identify zones at risk in advance of the harvest season. CILSS takes part in joint pre-harvest assessment missions (with government, FEWS NET, FAO, WFP and others) and supports the targeting of responses.

At the international level, the Global Information and Early Warning System on Food and Agriculture (GIEWS), based in the Commodities and Trade Division of FAO, monitors food supply and demand in all countries worldwide and compiles and analyses information on global food production, stocks, trade and food aid which is made available to governments, NGOs and others involved in early warning. It also sends rapid evaluation missions to disaster-affected areas, often jointly with WFP, and is involved in the approval of government requests for food aid. GIEWS works closely with WFP's Vulnerability Analysis and Mapping (VAM) unit, which takes part in food security analyses at national level both before and during emergencies (including CFSVAs, described earlier, as well as emergency food security assessments, crop and food supply missions, food security monitoring and market analysis), and provides technical guidance and support to national food security information systems. The Famine Early Warning System Network (FEWS NET), supported by USAID, provides early warning information to assist national response efforts. It provides information in three main areas: agro-climatic monitoring; markets and trade; and livelihoods (see Box 6 on p.20). It also supports the development of early warning and food security systems and networks. FEWS NET has three regional centres in East, West and Southern Africa, and 24 national centres, mostly in Africa but also in Latin America, Caribbean, Central Asia and the Middle East.

[5] http://www.sadc.int/fanr/

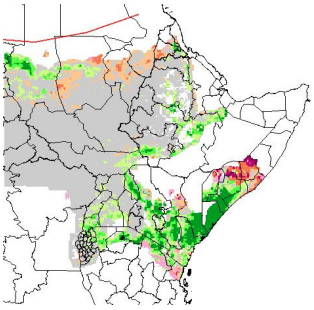
[6] http://www.agrhymet.ne/eng/index.html

**Box 7. FEWS NET**

FEWS NET provides information and analysis in the following areas to national governments and other agencies involved in food security monitoring and early warning in 18 countries in Africa, through its country offices and remote monitoring initiative:

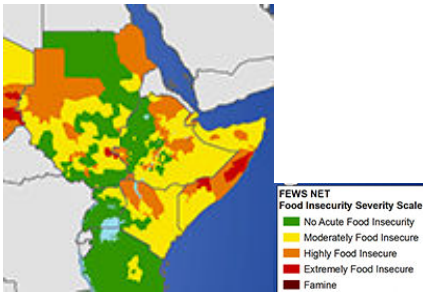
*Agro-climatic monitoring*

FEWS NET analyses rainfall and other climatic trends, vegetation status and the water requirements satisfaction of crops using meteorological data and satellite imagery. These trends are combined with the monitoring of weather hazards to develop near-term and medium-term food security outlooks:



**1. Water Requirements Satisfaction Index map**

**2. Weather hazard mapping**




**3. Food security outlook**

*Markets and trade*

FEWS NET monitors food prices and market flows in major food commodities and provides this information in the form of price bulletins, price graphs and market flow maps. It also provides detailed guidance notes on the use of market analysis for early warning.

*Livelihoods*

FEWS NET provides livelihood analysis based on the HEA approach (see Box 1). Products include livelihood zone maps and profiles, baseline analyses, attribute maps and seasonal monitoring calendars. These 'provide analysts with a means to predict and judge the impact of a shock on household income and food access'.

*Source: www.fews.net*

Overall, there are many different organisations involved in EWS, and a variety of systems are in use to monitor food availability trends at national and regional level. This information is made available to national governments and agencies involved in early warning and response. In most cases climate information or forecasts are included, as these are critical indicators of crop production. At national level, many countries in sub-Saharan Africa conduct seasonal or annual food security monitoring assessments. In some cases these include data on water access and availability, but the picture is patchy. Even where data on water access are included, however, it is not clear how this information is subsequently analysed and used to inform emergency responses (see section 5).

# 5 Water in emergency responses

This section draws mainly on the findings of evaluations of drought responses in sub-Saharan Africa from 2002 onwards, and literature reviewing wider experiences of response to slow-onset disasters worldwide.

The evaluations show that humanitarian interventions have increasingly aimed to protect livelihoods as well as save lives, and that early warning assessments are increasingly livelihoods-based. For example, the Emergency Operation responding to the Southern Africa crisis in 2002-3 had the following stated aims (Bennett et al, 2003):

- Prevent severe household food shortages that could lead to deteriorating nutritional status and starvation
- Safeguard the nutritional wellbeing of vulnerable groups
- Preserve productive and human assets
- Prevent distress migration to towns and neighbouring countries.

Responses also recognise that food insecurity is driven by multiple factors, not only production failure, and all of the interventions reviewed included non-food responses. Evaluations noted that non-food responses were given greater priority than in previous emergencies. The majority of responses included water responses, including some or all of:

- scheme rehabilitation
- emergency water provision (e.g. new schemes, tankering)
- water provision at schools
- support to small-scale irrigation
- emergency water supply for livestock.

Other key sectors for non-food intervention are hygiene and sanitation, health, support for agriculture and marketing, and livestock health.

Evaluations agree on the immense importance of non-food interventions, in particular water:

> 'Non-food responses were extremely useful' (Horn of Africa drought response 2005-6 (Grünewald et al, 2006a)).
>
> 'Work in health, nutrition and water supply helped to avert a major catastrophe' (Ethiopia drought response, 2002-3 (Simkin et al, 2004)).
>
> 'Water was a need strongly expressed by communities' (Oxfam's emergency response in Mauritania 2002-3 (Acacia Consultants, 2004)).

Water responses made a substantial contribution to saving lives, and knock-on benefits of improved access to water were also seen. For example in Kenya in the 2004-5 drought, the following was observed after hand pump installation and provision of water in schools:

- The time spent fetching water decreased
- More water was fetched to be used for washing and cleaning clothes

- Conflicts at water points were reduced
- Children spent more time in school (Acacia Consultants, 2005).

However, in many cases non-food responses, including water, were found to be somewhat ad hoc and insufficient to effectively protect livelihoods, undermining the effectiveness of the response. It is clear that a strong preference remains for food aid (a 'food first culture'), and that both governments and donors have been slow to recognise the urgency of need for non-food interventions in disaster situations and to disburse funds far enough in advance of the crisis. In some cases it was not appreciated early enough that the emergency was more complex than food availability alone, delaying critical non-food responses. The evaluation of the response to the Ethiopia drought of 2006 reports that six months after a humanitarian appeal had been issued, food needs were met at 70% while non-food responses were only funded at 33% (Grünewald et al, 2006b).

Three criticisms of water sector responses in particular are that – in some cases at least – these have been:

a) *Ad hoc and poorly coordinated with other interventions*, in particular nutritional support, meaning that a lack of water and continued water-related disease undermined efforts to improve nutrition, even though available guidance materials on emergency nutritional assessments and interventions clearly show the importance of safe water and hygienic practices (e.g. Save The Children, 2008; UN-IASC, 2008; Grünewald et al, 2006a).

b) *Of variable quality* due to a shortage of skilled technicians, weak methods for needs assessment and implementation, and a lack of community participation in design (Provention Consortium and ALNAP, n. d.).

c) *Not given adequate priority* at local level even though strong needs were expressed by communities, undermining other livelihoods protection activities.

Box 7 gives an example from Mauritania, illustrating that lack of access to water can undermine other activities aimed at improving food security.

**Box 7. Lack of water undermines livelihood promotion effort in Mauritania**

Responses to the 2002-3 drought in Mauritania included support to vegetable gardening through provision of seeds, fencing and training, an intervention intended to improve food security. However, vegetable gardening requires a good supply of water and women were already struggling to collect enough water for domestic use as they were forced to use distant sources due to the drought. They were therefore unable to take advantage of the opportunity to grow vegetables, and money that could have been spent on more effective drought response was wasted.

Source: Acacia Consultants (2004)

With some exceptions, water for livestock is a serious gap in emergency responses This reflects a broader problem that assessments are geared towards identifying the problems and needs of agricultural populations and responses tend to focus on these. During the 2002-3 drought in Ethiopia only 13.5% of funding needs for livestock were met, resulting in heavy losses (Simkin et al, 2004). The Livestock Emergency Guidelines and Standards (LEGS) have been developed in an effort to address this gap and training is now being rolled out across the Horn of Africa (see LEGS Project, 2009). The

guidelines include details of appropriate water provision for livestock alongside other interventions such as commercial offtake, destocking, supplementary feeding and veterinary care.

Pastoral areas have particular early warning needs because absence of rainfall affects livestock, particularly milk production, more quickly than it affects most crops, while remote sensing of vegetation condition relevant for livestock provides information on rainfall but with a long lag time of about two weeks. Milk is usually a critical source of nutrition for pastoral communities and livestock condition is central to their livelihood. It has therefore been suggested that real time analysis of rainfall should be the critical early warning indicator for livestock, alongside remote sensing of rangeland conditions (Zwaagstra et al, 2010). Pastoral areas also present particular challenges for water responses in emergencies, due to growing populations and a shortage of appropriate reliable water sources. An assessment of drought responses in pastoral areas of Kenya in 2008–9, where a concerted effort was made to support pastoral communities, highlighted concern about the 'exponential growing demand of water trucking' (ibid p.42-3). Trucking is cheap, however, compared with borehole drilling, and the same evaluation found that community-managed water points were prone to 'massive mismanagement' and 'fraud' in the drought situation (ibid p.43).

Urban populations are also generally neglected, even though these may face food shortages at market, deterioration of water availability and quality, disease outbreaks and additional pressures due to inward migration by rural populations. Very little is known about the effect of deteriorating water security on the food security of urban dwellers (Poulsen et al, 2007).

Two major reasons are identified for the inadequacy of responses in non-food sectors, in particular water. Firstly, inadequate resources are provided for the sector, reflecting the level of priority attached to it by both government and donors. In some cases this is due to lack of understanding and donor scepticism about the importance of non-food interventions. Raising funds for timely livelihood protection interventions before a full-scale emergency develops is also much more difficult than once a crisis has set in; horrific images of mass malnutrition (the 'CNN effect') attract much more attention than preventative efforts. During the 2006 drought in Ethiopia, the fastest non-food responses came from agencies that were not dependent on funding from the humanitarian appeal but could access alternative sources (Grünewald et al, 2006b). It is also important to note that many of the interventions made in the water sector during drought (such as source rehabilitation, provision of water in schools, borehole drilling and support to community water management) should in fact be routine activities rather than emergency responses, and could probably be undertaken more easily and cheaply in a non-emergency situation. The serious need for water interventions during drought is in large part due to low underlying levels of access and scheme functionality in much of sub-Saharan Africa, though additional needs are always likely to arise in a drought.

A second reason cited by several evaluations is the lack of clear and agreed methods for assessing and responding to non-food needs. A focus on livelihoods and the multiple drivers of food insecurity (including among others: food production, markets, access to basic services, credit facilities, environmental degradation and land tenure) makes problem definition much more complex than simply measuring shortfalls in food production. Over the last few decades, systems for assessment and delivery of food aid have been tested, refined and improved, at least in places which regularly deal with food emergencies, though there are still questions about the effectiveness of targeting (Maxwell et al, 2008; Grünewald et al, 2006a). In contrast, recognition of the importance of non-food interventions is relatively recent, and good methods for assessing needs and organising large scale

responses have not yet been developed. Integrating different assessment methods is also a challenge; the evaluation of the 2006 Horn of Africa drought response found, for example, that there was poor agreement between nutritional data and livelihood-based analysis in terms of identifying those most in need (Grünewald et al, 2006a).

In the case of water, assessments usually focus on identifying communities lacking good water access, but do not analytically link access to water with food security and broader livelihood needs in order to target interventions in a coordinated way. The WELS approach (outlined in Box 2) is an innovative and sophisticated approach for identifying and quantifying the water needs of different wealth and livelihood groups, but it must be refined and simplified if it is to become a practical tool for widespread use. Other than this, there have been few systematic efforts to develop new assessment methodologies, and assessments have been ad hoc. A sophisticated standalone methodology is not necessarily the answer – key indicators attached to existing early warning and needs assessments may be sufficient, but these have to be tested and accepted as valid by assessment teams and donors. Indeed it is critical to avoid an overload of data collection where there is not the capacity to process, analyse and use the data in a timely fashion to inform responses. In the case of the 2002-3 drought in Southern Africa, according to evaluators, many of the data collected had not yet been processed when the emergency ended (Bennett et al, 2003). This means that focusing on timely early warning and a few key indicators of need will be essential.

Effective early warning for non-food needs may well be more difficult than for food needs (Simkin et al, 2004) because of the increased complexity of developing thresholds for livelihood protection, and in some cases because of difficulties in forecasting (though this should be possible for water availability given the right meteorological and hydrological data and adequate information on water points, livelihoods and patterns of use).

Several evaluations emphasise that more attention should be given to the voices, priorities and feedback of communities and local actors during emergency response, and that there should be more opportunity for testing local solutions (Grünewald et al, 2006a; Simkin et al, 2004). Currently, responses are generally top-down in nature and information on how events are unfolding at local level is not always gathered or may not be well used due to pressure on time and resources. Communities frequently place water among their top priorities and arguably best know their own livelihood needs. However, at the same time there is a need to improve analytical approaches for more fair and effective targeting of resources and identification of at-risk communities. An appropriate balance of approaches must be reached to ensure objectivity and fairness in targeting while maintaining the flexibility to respond to emerging local needs and problems.

Livelihood-focused needs assessments are particularly challenging in a wider sense because, compared with simply quantifying a food gap, they must consider the role of multiple stressors on livelihoods – not water alone, but water, health, nutrition, markets and income among others – and must generate a set of responses which is appropriately coordinated among a number of sectors. To give an example of this complexity which relates to water, in Kenya agricultural communities which share water for free with nomadic herders in normal times sometimes start to charge them for water during drought, placing additional stress on herding communities and causing conflict between the two groups. Responses can also have unexpected impacts, for example water interventions for livestock can lead to high concentrations of herds around water points which damage the local environment, and conflict over the resource itself (Maxwell et al, 2008).

A critical challenge as emergency responses evolve to take more account of livelihood needs will be to develop much better links with ongoing development and vulnerability reduction. It has already been noted that many water responses in emergencies are activities which should in fact be routine, such as source repair and watershed protection. Evaluators of Oxfam's drought response in Mauritania in 2002-3 observed that local NGOs' 'ongoing livelihood support activities such as loans to small enterprise inadvertently provided the most effective drought relief in many villages', a lesson which should be remembered (Acacia Consultants Ltd, 2004, p. 41). Effective responses to emergencies, and ensuring that emergency responses contribute to building resilience to climate variability, require an understanding of livelihoods. Therefore the food security and humanitarian community must work with those government agencies, donors or NGOs who already have a good understanding of livelihoods on the ground, and not work in isolation because of debates about what constitutes humanitarian versus development assistance (ProVention Consortium and ALNAP, n. d.).

# 6 Case study of Ethiopia

Food insecurity is endemic in much of Ethiopia, related to high levels of poverty, weak rural markets, the small size of most landholdings and the progressive degradation of natural resources on which food production depends. Frequent droughts exacerbate the problem. As evaluators of the response to the 2002-3 drought observed, 'drought is no longer a natural disaster event in Ethiopia but rather it has become an on-going process related to the loss of the natural resource base' (Simkin et al, 2004).

Ethiopia has been using the HEA method to monitor food security and assess deficits since 2006. Food security assessment and response is led and coordinated by the Disaster Risk Management and Food Security Sector (DRMFSS) of the Ministry of Agriculture, but involves a wide range of other line ministries, international agencies (including WFP and FEWS NET) and NGO partners at national, regional and local level who provide information, support development of tools and participate in field assessments and analysis. (See Annex 1 for an overview of the main actors involved at each level and their roles.) HEA baseline assessments have been conducted for all livelihood zones in the country, and detailed livelihood zone and *woreda* profiles describe how people access food and cash in a normal year, and whether they face a survival or livelihoods protection deficit. Biannual seasonal assessments (pre- and post-harvest) form the hazard analysis component of HEA, aiming to identify emerging problems and predict and quantify need for aid based on deficits in food or income. These assessments take place in the *woredas* (districts) considered to be disaster-prone based on past experience. In addition to seasonal assessments, monthly monitoring of crop conditions and three-monthly detailed crop assessment missions allow emerging problems to be identified more quickly. *Kebeles* (the lowest administrative level) report regularly to *woredas* on their food security situation either through taskforces (which exist in chronically food-insecure *kebeles)*, or through the local cabinet.

Meteological data (from the National Meterological Agency) is used to detect rainfall deficits and predict impacts on crop growth. These sources of information are combined to identify 'hotspots' where there is a convergence of evidence indicating a food security problem. Four main indicators are used in addition to the HEA thresholds:

- Agro-meteorological data (rainfall compared with a normal year)
- Change in water availability for humans and livestock and change in the status of water sources
- Status of human health and nutrition
- Coping mechanisms being adopted (e.g. increased migration for labour)

Over recent years, the Ethiopian Government has sought to shift from crisis relief towards prospective disaster risk management. This has brought increasing focus on protecting livelihoods (the major intervention here is the Productive Safety Net Programme (PSNP), a public works programme providing food or cash for work for nearly 5 million food-insecure households every year), and also on assessing non-food needs at times of crisis. It is increasingly recognised that water is a critical non-food need during droughts (and also floods, to which parts of Ethiopia are very prone) and a central component of rural livelihoods which must be protected. Information on water and other non-food or income needs such as health are not part of an HEA analysis, but these data

are collected as part of regular seasonal assessments and should be analysed alongside the HEA data to inform targeting of food insecure areas and identify particular needs.

Information on water is collected, collated and analysed as part of the seasonal assessments by WASH Emergency Task Forces (ETFs) at different levels. The WASH ETF structure is led by the Ministry of Water and Energy (MoWE) and line offices, with membership of UNICEF and NGOs. The stated aim of the WASH assessment is to contribute to humanitarian responses to 'reduce morbidity and mortality due to WASH-related emergencies'. Within this, it has two objectives:

- 'To assess types, magnitude and likelihood of different hazards (drought, epidemics, floods, etc.) and risks to most vulnerable and recommend intervention'
- 'To assess the coverage, functionality and management of community and institutional WASH schemes in WASH hotspot areas' (WASH ETF Guideline, 2010)

*Woreda* level ETFs are responsible for collecting data from secondary sources, interviews with trusted informants and observation, to identify water-related problems faced by communities. Water points are also visited to measure discharge and observe access constraints. Key questions asked are (WASH Seasonal Assessment Format, n.d.):

- What is the status of water sources compared with a normal year?
- Where schemes are broken, how many people are affected?
- What is the level of coverage of improved water supply and latrines, and how long is spent collecting water?
- Is there adequate supply for the demand of the community?
- What alternative sources can the community access, and how far away are these?
- What coping strategies do people have available?
- What types of hazard have been encountered and which water sources have been affected?
- Have there been any outbreaks of water-related diseases?
- What is the status of WASH in schools and health institutions? Are any at risk from hazards?
- Has there been an increase in school drop outs?
- What problems are there in maintenance of WASH schemes?
- What are the gaps in responses to localised emergencies?
- What waste disposal facilities are available?
- Are hygiene promotion activities taking place? What and by who?
- Which actors are involved in WASH services in the *woreda*?

These data are used alongside rainfall and agro-meteorological information to assess which *woredas*, *kebeles* (neighbourhoods or communities) and sites/schemes are in need of emergency WASH interventions, the number of people likely to be affected, and the type and number of interventions required. The assessment also considers whether adequate resources to fund interventions are available at *woreda* level, and recommends appropriate responses at *woreda*, zone, regional and

federal level (WASH ETF Guideline, 2010). Regional governments reportedly analyse and store data disaggregated to *kebele* level, and the ETF at regional level is responsible for developing both preventative measures and emergency responses (Draft Terms of Reference for Regional Emergency Coordination Taskforce, n.d.), while national level analysis is aggregated to *woreda* level. Teams from higher levels of government visit the most seriously affected sites to assess needs.

Requests for assistance for both food and non-food assistance are sent first from *kebele* to *woreda* level. Reports are then collated and sent up to the zone and regional level, with an additional request for assistance if the needs cannot be met from *woreda* budgets, and subsequently regional reports are submitted to the federal level. At times of crisis, this information forms the basis of the humanitarian request document issued by the national government. This document includes a WASH humanitarian appeal for the water sector based on a contingency plan drawn up by the ETF. In the example from 2010, the plan included: emergency water trucking, rehabilitation and maintenance of defunct water supply schemes, expansion of water supply schemes, community water storage tankers, and onsite water treatment with emergency water treatment kits and distribution of water treatment chemicals and hygiene materials (Humanitarian Requirements Document, 2010). Capacity building activities were also undertaken through training, supply of different types of equipment (such as pumps, generators, and different types of WASH kits), and operational and technical support to regions, particularly by UNICEF through field offices and deployment of WASH consultants. Efforts were also made to strengthen existing coordination forums at different levels.

The MoWE leads the response to emergency WASH needs. However, it is not clear how far the findings of WASH ETF seasonal assessments are fed into wider sectoral investment planning by the MoWE, in spite of the fact that many of the problems identified by the WASH assessments reflect a lack service provision rather than a drought impact per se. Regional and National WASH Taskforces exist to oversee and coordinate the work of *woreda* taskforces, and are expected to 'consider how to link up with the development sector and to share experiences from the emergency responses as lessons for development activities' (Draft Terms of Reference for Regional Emergency Coordination Taskforce, n.d.). Capacity for integrated planning between the emergency unit and other departments within the MoWE may need to be supported. More effective DRM will require greater investment in water services, and lack of access is currently a major challenge to effective vulnerability reduction, so better links between development planning and emergency response will be important in future. This already happens to an extent in relation to the PSNP; if an area is regularly affected by water shortages, the PSNP coordinators will be informed in order to plan public works in the area. And at local level, NGOs attempting to respond to critical needs are some of the main users of data from the seasonal assessments as they routinely combine development, vulnerability reduction and emergency response activities.

The description above reflects the current government-led system in Ethiopia. However, this sector is characterised by frequent changes of approach, driven in part by the large number of external agencies involved in early warning and drought response, but also by a desire to learn and improve, and to reduce dependence on food aid. Currently, *woreda risk profiling* is being piloted by WFP as a new approach which may replace the HEA system. *Woreda* risk profiling aims to identify all the major risks in every *woreda* (not just from drought but all hazards), and to collect baseline data on vulnerability to enable appropriate preventative activities and contingency plans to be put in place. This new approach is still in a pilot phase, but the future of the current system based on seasonal assessments and HEA-based analysis is uncertain. However, it will not be possible to eradicate the

risk of food insecurity altogether, and there will remain a need for regular monitoring assessments of some sort to identify emerging food security problems, assess needs and plan responses. The current HEA-based approach was in itself brought in and rolled out in an attempt to standardise the approaches of different agencies with a single methodology, and it would be sensible to build on this. Prior to this, there was less clarity on the assessment process and planning was reportedly uncoordinated, leading to frequent duplication of efforts.

It is a positive sign that the Government of Ethiopia is willing to learn and test new approaches, but it will be important not to abandon existing systems where capacity has already been built, if these could instead be strengthened, adapted or combined with new systems. Interviews conducted in Ethiopia in June 2010 and a RiPPLE-organised workshop in September 2010 therefore focused on how the current system could be strengthened, in particular how the assessment of water access and needs could be improved. Interviewees and workshop participants from government (DRMFSS and MoWE), NGOs and development partners identified a number of areas with room for improvement in the current system.

These mainly related to the consistency and quality of data, noting that relatively few *kebeles* are sampled and there is high dependence on extrapolation and historical data, which leaves room for political negotiation and under-/over-reporting of beneficiary numbers. The capacity of staff responsible for field assessments was questioned, as turnover in local government offices is high. With respect to WASH needs assessment, it was highlighted that there is heavy reliance on information from a few local informants, partly because of a lack of capacity and resources on the ground following decentralisation of the seasonal assessments, and partly because there is no clear methodology or indicator set for assessing water needs and triggering responses. There is also no baseline data or regular monitoring of water access, and a dearth of information on groundwater availability. The national WASH inventory currently being rolled out will help to improve the information baseline on schemes and functionality, and to identify broken down/failing sources. Means to share information with this will have to be developed. However, the inventory does not collect actual data on the number of users per scheme. In theory this information should be available from local WASH Committees (WASHCos) where these exist, as they are responsible for collecting and recording payments for water services from communities. However the accuracy of documentation varies greatly.

Participants also commented that the timing of seasonal assessments, while suitable for crop assessment, is not appropriate for assessing water shortages. Assessments are typically in November and June/July (with some variation according to the timing of the rainy seasons in each livelihood zone), while the months of greatest water shortage are usually December and January. Finally, there is clearly an important gap in terms of linking emergency non-food responses and DRM with the broader development agenda. Although the two are complementary and should be mutually supporting, there is ongoing debate about how far non-food interventions aimed at livelihood protection fall within the remit of DRM rather than development, and therefore which department has responsibility for these.

Some of these points mirror the recommendations of the evaluation of the 2002-3 drought response in Ethiopia (Simkin et al, 2004) when high levels of water-related diarrhoeal disease were seen among drought-affected populations due to inadequate provision of WASH services. The evaluation team recommended: establishment of baseline data on WASH access; regular surveillance of WASH

access; institutional capacity building on WASH assessments and responses; and clarifying and improving links between emergency and development approaches.

It has also been argued that, in the spirit of learning and improving approaches, there is a need for much better monitoring and evaluation of the effectiveness of emergency responses. The WASH ETF has the goal of contributing to this by documenting good practices for sharing and contributing to overall sector monitoring and evaluation, yet some questions remain how far this has happened to date, perhaps due to capacity constraints.

# 7 Conclusions

It is clear that early warning systems, drought preparedness and emergency responses are increasingly taking account of the importance of water, alongside other non-food needs. However, the effectiveness of responses is often limited by the lack of clear assessment methods for water needs, and a failure to fully integrate water into existing food-based systems. Where water is a core part of food security assessments and responses, the focus is generally on identifying areas where water supply is inadequate and responding with emergency scheme repair or water provision. This generally seems to be a separate activity from other interventions aimed at improving food security. Provision of adequate, safe water to populations in need is in itself very important, but responses will be more powerful if the role of water access (and lack of access) in food insecurity is examined and, based on this analysis, packages of food and non-food interventions developed which are appropriate to the needs of different groups.

There is evidence of interest in this approach, as seen in vulnerability assessments which include statistical testing of links between water shortage and food insecurity, and evaluations reveal the multiple livelihood protection benefits of investing in water provision as a drought response. The growing interest in livelihoods-based approaches is likely to lead towards more integrated assessment and responses, but this will require both improved tools and the will to truly integrate activities which may be handled by different actors.

Key recommendations for governments and international agencies involved in food security assessment and early warning therefore include:

1. Pay more attention to learning from past experience, which emphasises the importance of water in drought preparedness and responses, and explore the underlying reasons for problems experienced in the coordination, targeting and timeliness of water-based responses (which may be political as well as methodological or capacity-related).
2. Build on and learn from innovations such as WELS and new remote monitoring techniques to develop practical tools to assess water needs and provide early warning on water shortages. The focus must be on core questions and indicators that can be applied without overloading national systems for data collection, processing and analysis.
3. Build core capacities for data processing and analysis, and seek ways to streamline assessments to focus on critical thresholds and data requirements.
4. Establish far stronger links between those working on water service delivery as a development activity, and those involved in emergency preparedness and response. The goal is to establish the following as routine activities:
    - sharing of information on gaps in service provision and areas at high risk of scheme drying or breakdown during droughts, to improve targeting of both development investments and emergency responses;
    - joint analysis of water-food security linkages leading to joint agendas to improve water supply in areas where food security is constrained by poor access to water *before* a drought sets in; and

- improved technical skills brought to bear during emergency water sector responses such as scheme construction.

5. Recognise that pastoral areas have specific needs and may require different early warning indicators, among which water is critical. Water services for pastoralists need to take account of their way of living, and must be integrated into sustainable rangeland management to avoid negative environmental impacts which can result from overconcentration of livestock. Water solutions appropriate for settled populations may not be suitable.

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# Annex 1. The Ethiopian early warning system: actors and roles from *woreda* to national level

N.B. This information is based on scoping interviews and document analysis conducted in Ethiopia during 2010 in Addis Ababa (federal level), Oromia regional level, East Hararghe zone and Goro-Gutu *woreda*. There may be differences between regions which are not captured here. As the scoping exercise focused particularly on water-related components of the EWS, it is likely that there are other actors, and other aspects of the listed organisations' roles, which have not been captured.

| | **Woreda** | **Zone** | **Region** | **Federal** |
|---|---|---|---|---|
| **Ministry of Agriculture (DRMFSS)** | • Leads early warning assessments at *woreda* level, coordinating experts from different sector offices and providing guidance.<br>• Leads the team in the estimation of needs bringing together field data and other information e.g. rainfall data, and coordinates report writing. | • Food Security and Disaster Prevention and Preparedness Office facilitates seasonal assessments at *woreda* level, collects *woreda* reports and submits them to the region, and leads on emergency responses at zone level. | • Coordinates early warning data collection and analysis.<br>• Monitors and evaluates resulting interventions.<br>• Analyses data from across the region and presents them to federal and regional House of Representatives to secure funds.<br>• Participates in development of checklists and tools. | • Coordinates food security assessment and response and provides overall guidance.<br>• Develops assessment tools and checklists.<br>• Coordinates DRM Technical Working Group with two subgroups: methodology and logistics. |
| **Ministry of Water and Energy** | • Some flexibility to develop context-specific checklists to assess water needs.<br>• Collects data from communities focusing on water needs and identifies schemes requiring intervention and the number of people affected. | • Member of zonal emergency task force. Plans and implements emergency responses in the water sector for the zone. | • Participates in water-related assessments.<br>• Develops interventions in serious cases when response is beyond the capacity or resources of *woredas* and zones. | • Member of DRM Technical Working Group. Develops sector-specific checklists for assessment. Conducts analysis of water needs.<br>• Uses results to inform development planning. |
| **Ministry of Health** | • Collects data on health situation, malnutrition and sanitation. | | | • Develops sector-specific checklists for assessment.<br>• Conducts analysis of health, nutrition and sanitation needs. |
| **NGOs (individual roles vary)** | • Participate in assessments.<br>• Provide logistics and facilitation.<br>• Implement response interventions. | • Participate in assessments.<br>• Support government teams with logistics and finance for seasonal assessments.<br>• Capacity building on assessment methods. | • Some co-lead seasonal assessments (e.g. Save the Children in Somali and Afar regions). | |
| **World Food Program** | | • Member of zonal task force. | | • Backstop assessments from preparation to |

| | | | | |
|---|---|---|---|---|
| **(WFP)** | | • Participates in assessments, provides training on use of assessment tools, and provides regular weekly information to government that includes market data and water. | | report-writing, including financial resources, training, logistical support and assistance with data analysis and reporting. |
| **FEWS NET** | | | | • Provides early warning and vulnerability information to government (see box 6).<br>• Supports analysis of field data. |
| **USAID** | | | | • Provides financial support and policy/practice guidance to DRMFSS.<br>• Member of the editorial committee that produces the Humanitarian Requirements document. |
| **National Meteorological Agency** | | | | • Provides agro-meteorological information and takes part in food security analysis. |

RiPPLE

# Research-inspired Policy and Practice Learning in Ethiopia and the Nile Region

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*RiPPLE Working Papers contain research questions, methods, analysis and discussion of research results (from case studies or desk research). They are intended to stimulate debate on policy implications of research findings as well as feed into Long-term Action Research Studies.*

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UKaid
from the Department for International Development

**Working Paper**