



water & sanitation

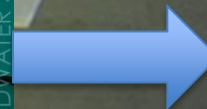
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

DRAFT National Groundwater Strategy - Input to Stakeholder Consultations 2016

Department of Water and Sanitation

Jointly with Water Research Commission

Gauteng, 2016-05-04



NGS

Why a National Strategy for Groundwater?

Experience (own and world-wide): development of effective approaches for groundwater management will require a long term process through which viable national, regional and local systems can evolve.

A national strategy is required to:

- *To let the full role/potential of groundwater towards water security in SA unfold.*
- *To establish a framework within which stakeholders at all levels can become an essential part of good groundwater governance in SA.*
- *To initiate a long-term process of rolling out sustainable groundwater utilization within IWRM.*

- *This is fully in line with the direction of the DWA Functional Management Committee 2/2011*

Background and Process followed with the Groundwater Strategy

Functional Management Committee

- Presented - DWA Functional Management Committee 2/2011 (28 February 2011)
- Accepted with the following recommendations:
 - The Groundwater Strategy should not be published as a final strategy,
 - Instead *inter alia*, a public-participation process to solicit comments on the strategy is initiated, and
 - Roles and responsibilities of the wider sectors in relation to groundwater management, water security, future exploration, transboundary aquifers, etc. should be clarified and drafted more clearly.

Guidance from NWRSII

National water resources towards achieving SAs development priorities:

- support development and the **elimination of poverty and inequality** and
- contribute to the **economy and job creation**; - *in an equitable and sustainable manner.*

Continued focus to **address past imbalances** (access to water services, access to water resources, access to benefits from water resource use)

Water-stressed country: Surface water sources are limited in many catchments

Climate change as an important driver of water availability and demand

Groundwater high priority part of a mix of options and as sole source
– there is still significant potential for development

Guidance from National Development Plan

Groundwater **was able to provide a basic domestic water supply** to about 60% of communities throughout the country in some 15 000 villages. Although largely limited in yield, this resource could also play an **important role in creating productive livelihoods** for the poor in smallholder irrigation. Its natural storage can provide the resilience to bridge seasonal and even over-year shortages in water for irrigation.

- ECONOMY AND EMPLOYMENT(Outcome 6)
 - Increase rural water infrastructure
- ENVIRONMENTAL SUSTAINABILITY AND RESILIENCE (Outcome 10)
 - Disaster preparedness; protection of rural livelihoods
- INCLUSIVE RURAL ECONOMY (Outcome 7)
 - Service to small and micro farmers - especially women

Objectives of NGS

(to be formulated with Stakeholders)

To ensure sustainable, accessible and cost-effective groundwater supplies for human survival and socio-economic development, while maintaining environmental services that groundwater is supporting, in an integrated development approach.

- improved rural water supplies (groundwater and other local sources)
- sustainable small town / village supplies (local scale IWRM)
- improved water security in urban development (conjunctive use)
- expanded irrigated agriculture, especially for small-scale and supplementary irrigation (sustainability and cost-effectiveness)
- new groundwater sources in increasingly complex locations (for industrial / mining supply in situations of increasing water scarcity)
- **An appropriate groundwater governance system**
to ensure sustainable resource utilization

Stakeholder Interaction 2016

- Meeting individual stakeholder representatives (mining, agriculture, energy, local government, rural development)

How to find / how to sustain relationship ??

- Regional meetings with spectrum of stakeholders (including provinces and CMAs)

How to build on DWS stakeholder network and initiate communication / awareness-building??

Global Groundwater Governance - A Framework for Action (2015)

Partners: UNESCO, GEF, FAO, World Bank, IAH

Series of 3 Outcome Documents

- Global Diagnostic
- A Shared Global Vision for 2030
- Global Framework for Action



Groundwater Governance Project A Global Framework for Action

The project

The Groundwater Governance project is a 3-year initiative (2011-2014) designed to address emerging global concerns on groundwater resources management.

It is funded by the Global Environment Facility (GEF) and is jointly executed by the Food and Agriculture Organization of the United Nations (FAO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank and the International Hydrological Association (IAH).



Objectives

The project is designed to increase awareness of the paramount importance of sound groundwater resources management to tackle the global water crisis. It intends to identify and promote best practices in groundwater governance as a way to achieve the sustainable management of groundwater resources.

Expected outputs

The project will develop a Global Framework for Action consisting of a set of general principles and guidelines for policy-makers and stakeholders, including policy options, laws, regulations and customary practices.

A Shared Vision on Groundwater Governance based on case studies, thematic papers and a Global Groundwater Diagnostic integrating experiences and information collected from a series of regional consultations around the world, will inform the design of the Global Framework for Action.

Targeted outreach events will be organized to promote the results of the Project and the Global Framework for Action.



Strategic Framework for Groundwater Governance

”Governance is the operation of rules, instruments and organisations that can **align stakeholder behaviour and actual outcomes with policy objectives.**”

Enabling Environment / Policy level

Processes by which a nation establishes its **objectives** for groundwater, **integrates** those policies with water, land and environmental policies, and **aligns and harmonises** them with other related **policies** affecting groundwater.

Strategic / National level

Institutions and instruments designed by a nation to align stakeholder behavior and actual outcomes with policy objectives. These include planning, regulation, economic instruments, institutional development and information management.

Local level

Organisations and institutions that control actual outcomes on the ground and respond (in varying degrees) to the rules and incentives from strategic level governance. This level includes the individual groundwater users, local collective management institutions and relevant public agencies.

Global Groundwater Governance Initiative (2012)

From Principles to Management Tools

Example: NSW (Australia) Groundwater Policy Framework, 1997

- Groundwater management plans where necessary
(high and over-exploitation ~ 20 for State)
- Groundwater Management Committees
- Supporting guidelines for local government and industry;
- Creation of aquifer resources and vulnerability maps;
- An education strategy;
- Legislative mechanisms for groundwater management;
- Licensing tools and conditions for users that better reflect resource protection objectives;
- Economic instruments applicable to groundwater management.
- Extensive monitoring to support adaptive management

National Groundwater Strategy Framework

National Level (enabling environment)

0. Enabling legislation and strategy (is in place)
1. Stakeholder-driven development
2. National Groundwater Leadership

National / Provincial (Basin) Level

3. Responsive groundwater regulatory framework
4. Groundwater resource protection
5. Sustainable groundwater resource utilization
6. Appropriate institutional development
7. Redirecting finances
8. Groundwater resource planning and development
9. Groundwater information management
10. Regional and international partnerships
11. Water sector skills and capacity

Local (District / Aquifer) Level

12. Local level action

1. Stakeholder-driven development

- **Objectives:** Continuously improve stakeholder understanding and collectively agree on and work within an expanding framework of local level participative management and 'good' groundwater governance.'
- **Preamble of NWA, 1998:** Recognising the need for the integrated management of all aspects of water resources and, where appropriate, the delegation of management functions to a regional or catchment level so as to enable everyone to participate.
- **Current challenges:** Despite the good intent of the Act, stakeholder involvement, a critical requirement, is still virtually completely missing for groundwater resources.

1. Stakeholder-driven development

Strategic Actions

- **DWS commitment**

Commitment to policy innovation with stakeholder participation to guide and carry out the groundwater institutional development process

- **Institutional development**

A long-term process from strategic analysis to step-wise institutional development and the wider implementation of improved groundwater resource management

- **Groundwater awareness-raising**

A major ongoing awareness campaign at all levels during the long-term process. An important role for the academic sector to support the other sectors with capacity-building and skills- training programmes.

- **Groundwater Trust**

A strategic step to mobilise the groundwater sector / industry as a whole to develop and lead the multilevel awareness and education campaign.

2. National Groundwater Leadership

- **Objectives:** Develop and maintain the national groundwater champion that must hold the overall groundwater governance framework together and facilitate and support its roll-out, smooth functioning and growth.

- **Challenges:**

There is still limited understanding at DWS decision-making level on the long-term role and unique and critical governance requirements of groundwater resources.

At present, the country lacks the depth in skills and leadership in hydrogeology to drive the understanding and acceptance of groundwater from national down to local management level.

2. National Groundwater Leadership

Strategic Actions

- **Groundwater governance unit**

Establishment of such a unit at DWS has in principle approval.

A task description as soon as possible. Focus on an appropriate structure as well as the necessary coordination processes.

Foresee a 'governance center' which could draw on the resources of other institutions to fulfil the evolving, wide range of its responsibilities.

- **Needs and Constraints Assessment**

together with stakeholders, to analyse potential impediments to the management process (e.g. weak regulatory enforcement, lack of social consensus, poor inter-institutional coordination, lack of adequate information) and define ways of confronting them.

7. Redirecting Finances

Objectives: Redirect incentive policies and public expenditures impacting groundwater by and within different sectors to achieve a combined, much stronger focus on sustainable and efficient groundwater management.

Challenges: Lack of finance could become a serious bottleneck to the implementation of the groundwater governance framework, particularly because of groundwater's 'private water', neglected, and under-valued status.

International experience obtained from the Global Groundwater Governance Framework completed recently was included in the proposed actions.

7. Redirecting Finances **Strategic Actions**

Align groundwater finance

Align all public groundwater finance with the new priorities.

Address financing as a high priority.

Alignment particularly important between different sectors, e.g. farming, fuel and electricity subsidies could counter groundwater over-use control.

The systems of regulations and incentives should encourage private investment in sustainable groundwater management.

in this regard.

Invest in governance

Funding of groundwater governance must be in line with its strategic importance. The basic groundwater management functions should not be compromised. Legal instruments and regulatory provisions must be matched by the means required for their implementation.

Develop investment portfolios to encourage private investment.

Improve efficiency of charging for groundwater use

Questions

- In the proposed framework, have we missed an important strategy theme(s)?
- In your view, how would real and sustained stakeholder engagement take place?
- How do you see your sector owning, implementing and achieving the Strategic Objectives/Actions?
- Could you see a type of Groundwater Trust function and be sustained in our institutional situation?
- Do you agree that the strategy needs strong national government leadership?
- How could such capacity be established, given the capacity distribution we have in the country at present?
- Any thoughts how finances could be (re) directed towards the increasing groundwater priority

3. Responsive groundwater regulatory framework

Objectives: Anchor the shared understanding of groundwater governance in appropriate policy and regulations that will enhance sustainable and efficient use of groundwater resources. (taking into account the unique characteristics of groundwater that have a bearing on its sustainable development and management (ubiquitous occurrence, many users, open access and invisible nature, complex physical characteristics, availability of natural storage)).

Challenge: At this stage there is no national groundwater management policy which lays down norms and standards to guide regional and local groundwater management practices.

Responsive groundwater regulatory framework

Strategic Actions

- **Valuation of groundwater resources** (to become std. practice)
- **Groundwater norms and standards** (to guide groundwater management and become regulated Best Practices)
- **Policy coordination** (in terms of the principle of integrated land, water and environment management)
- **Groundwater use authorization** (review in terms of implementation experience)
- **Groundwater use verification** (this and licence compliance monitoring needs to be implemented as high priority)

Responsive groundwater regulatory framework

Strategic Actions (2)

- **Aquifer management** (in identified priority aquifers by aquifer management committees, based on appropriate guidelines and regulations)
- **Regulated groundwater use** (Specific regulations for all sectors using and impacting groundwater; priority for domestic use; involvement of professional hydrogeologist etc)
- **Regulation of the groundwater industry** (mix of voluntary regulation by the industry and agreed national regulation)

4. Groundwater resource protection

Objectives: Develop and maintain approaches for pro-active protection of groundwater resources and aquifer-dependent ecosystems to secure a sustainable supply of water for human survival and socioeconomic development, while maintaining essential groundwater environmental services (based on the vulnerability and regional / local importance of aquifers).

Challenges:

No assessment of country-wide pollution of aquifers available;
RDM measures have to date achieved no practical groundwater resource protection despite considerable investment;

Protection of highest priority groundwater supplies for domestic use completely neglected to date.

Groundwater resource protection

Strategic Actions

- Policy and Strategy for Groundwater Quality Management (implement widely consulted policy of 2000)
- Groundwater pollution assessment (undertake national assessment)
- Public awareness (make a key instrument of precautionary approach)
- Groundwater use verification (achieve within 3 years)
- Groundwater-use authorization (use conditions to achieve resource protection)
- Resource-directed measures (urgently review methodology)
- Regulation and prohibition of land-based activities (develop suite of regulations and guidelines / best practices to underpin these)
- Cross-sector collaboration (formalise)

5. Sustainable groundwater resource utilization

Objectives: Translate practical understanding of groundwater resources into appropriate guidance material to fully capacitate those responsible at all levels for sustainable groundwater resource utilization, covering planning, development, management and protection (Groundwater source development; protection; Conjunctive use; Artificial recharge; Operation and maintenance)

Challenge: Still widespread lack of understanding about the unique characteristics of groundwater that have a bearing on its appropriate utilization, management and protection;

No special management/protection for country's most vulnerable aquifers, the dolomitic aquifer systems and the coastal aquifers. Serious degradation of these important resources has taken place.

Existing guidelines have found little practical application.

Sustainable groundwater resource utilization

Strategic Actions

- Sustainable utilisation objectives and plans (with the relevant stakeholders)
- Review / development of guidelines (a series of official, widely available and regularly reviewed guideline documents)
- Training programmes in support of guideline implementation
- Inter-departmental cooperation (through formal agreements and focused guidelines)
- Ongoing auditing and awareness-raising (through formal agreements and focused guidelines; use of updated BlueDrop assessment)
- National capacity for groundwater governance (essential)
- Local Hydrogeologist (District and Local municipalities' to appoint/contract/share a hydrogeologist to manage their aquifers, if necessary in terms of appropriate regulation.)

6. Appropriate institutional development

Objectives: Develop, facilitate, capacitate and support appropriate institutions that will allow effective local level participative management of groundwater resources.

Challenges:

- Weak groundwater function in national government at a time when new groundwater capacity has to be built in CMAs, local government, and local management institutions.
- The devolution of water resource management to lower levels is taking much longer than expected (CMAs etc.).
- Groundwater is lagging far behind surface water resources in terms of local institutional development.
- Lack of capacity in municipalities a major threat to sustainable development of groundwater resources.
- Next 10-20 year period will be particularly challenging, moving from highly centralized to new, functional, highly participative institutions

Appropriate institutional development

Strategic Actions

A strategic governance framework (accepted way to integrated water resources management implementation; agreed with stakeholders)

Capacitating municipalities (new functions / institutions supported with capacity development; work through whole sector)

Compliance with existing government requirements (compliance monitoring; groundwater infrastructure in asset registers; Blue Drop)

Communication / awareness-raising (find champion in each sector who sees groundwater management issues within the municipal environment)

Local participative management institutions (Systematically develop, capacitate and support local management institutions -monitoring committees aquifer management committees and water user associations)

National sector support for local management (identify and strengthen within-sector support structures and processes which could facilitate local-level management by that sector)

Questions

- In your view, what are some of the critical groundwater issues requiring regulation?
- Do you think our groundwater industry needs some form of regulation - suggestions? Self-regulation?
- How would you see achieving protection of widely distributed groundwater resources? – Quality / Quantity?
- Where do you see groundwater still very much misunderstood and inappropriately used/managed – suggestions for improvement?
- How do you see groundwater professional expertise being introduced to the local level management?
- What kind of institutions do you foresee at shared aquifer level and how should they be supported nationally/regionally?

8. Groundwater resource planning and development

Objectives: Achieve integrated groundwater resource planning at national, regional and local levels that will fully and sustainably establish the unique potential of groundwater for socio-economic development.

Integration at three effective levels:

- within the hydrological cycle (the physical processes);
- across land and water, across river basins (catchments) and aquifers (spatial integration);
- across the overall social and economic fabric from national to local level.

Challenges:

- Groundwater is not incorporated into regional / local level water development plans, or else treated a last resort, during emergencies;
- Despite groundwater's crucial role in drought preparedness and emergency response, this has not yet been mainstreamed into on-going planning and development processes.

Groundwater resource planning and development

Strategic Actions

Groundwater priority (worked into all instruments of planning and financing, eg. Treasury instructions)

Macro planning (planning beyond resource reconciliation issues, to also address regulatory support and human / institutional capacity requirements)

Catchment management strategies (include a groundwater management plan; integrated approach)

Best Practice Guidelines (for all sectors, regulated where necessary)

Groundwater resource planning and development

Strategic Actions (2)

Drought risk management (plans for monitoring and targeting drought-proofing measures during and ahead of droughts)

Stakeholder involvement in planning (formally establish a process)

Groundwater information (Appropriate information is often the bottleneck in planning, eg existing groundwater infrastructure and cost requirements)

Groundwater development (Systematic groundwater resource assessment and development programmes, eg. for Comprehensive Rural Development Programme; for areas with threats of water shortages)

9. Groundwater Information Management

‘No sustainable development of a scarce natural resource is possible without understanding the resource and managing it wisely according to this growing understanding’ (Minister of Water Affairs, Ronnie Kasrils, 2003).

To transform water management in South Africa from a highly centralized to a strongly devolved and participative approach, information management will become a strategic requirement. A rapidly increasing number of stakeholders will have to provide groundwater data and will need information support.

Challenges

Continued undervaluation of groundwater resources

Geohydrology unit in DWS disbanded in 2003.

No more regional exploration and no more DWS drilling

Most groundwater info generated not on national data base

Groundwater Information Management

Strategic Actions

Appropriate groundwater knowledge base (address strategically as part of a groundwater Research & Development plan)

Groundwater data and information (address strategically with stakeholders; a specialized support facility like the Computing Centre for Water Information could be considered)

Groundwater monitoring strategy (focused monitoring for different purposes, e.g. water use authorization, resource protection and planning; integrated with surface water monitoring)

Groundwater use information (regulations regarding compliance uploading of info)

Centralized “private” data (expand national groundwater data archives with data from private consultants and drillers)

Related data from other institutions (rainfall, mining; support the effort)

Groundwater Information Management

Strategic Actions (2)

Harmonisation of data bases / information systems (Improve accessibility and exchange of data, standardization of data capturing formats for various purposes, reporting of data and information)

Integrated information service (GISsupported information service at municipal and aquifer management level)

Knowledge sharing (ever wider sharing, archiving and effective communication of information and knowledge products; WRC the lead organization.)

Groundwater use and infrastructure information (extend GRIP programme in all regions; Stop wastage of groundwater infrastructure)

Monitoring as part of aquifer management (aquifer monitoring and modelling as integral part of aquifer management)

National State of Water Resources Reporting (streamlined, integrated)

10. Regional and international partnerships

Objectives

Actively participate in and grow appropriate regional and international partnerships towards groundwater resource understanding and optimal utilization, including transboundary resource management.

Principles

Sharing knowledge and experience across boundaries has the potential to accelerate our learning processes significantly. It improves efficiency, stimulates development and reduces the probability of making wrong decisions.

Challenges

Before 1994, South Africa had been in international isolation. The water sector has not yet fully responded to the opportunities offered by international collaboration.

Regional and international partnerships

Strategic Actions

SADC and Africa (SA an active role in the SADC Groundwater Programme
AMCOWs Africa Groundwater Commission)

Basin Commissions (take groundwater fully on board)

UNESCO International Hydrological Programme (national leadership
from DWS for active participation)

International Association of Hydrogeologists (IAH) (seek widespread
membership of South African groundwater professionals; seek deal with
employers and with IAH)

Groundwater Division (should become sector leader – coordination for
scientific links with Africa)

11. Water sector skills and capacity

Objectives

Develop and maintain skills and capacity for the sustainable development and management of groundwater resources **at all management levels** and with participation of all stakeholders as part of a long-term, ongoing process.

Principles

It is important that all levels of capacity development must be addressed, **the individual, the institutional and societal levels** – towards a well-performing groundwater sector.

It is important to have ways to **measure capacity and monitor progress** in its development.

Challenges

Seriously missing the public sector as a major player in capacity building and mentoring;

Complete lack of capacity within municipalities for local management;

Vulnerable capacity situation in groundwater academic sector

Water sector skills and capacity

Strategic Actions

Capacity gap analysis (within emerging groundwater governance framework; linked to the groundwater research planning of WRC and to capacity building initiatives in different sectors)

DWS lead role (as identified in NWRS; use of PSP contracts to leverage capacity-building)

WRC leveraging role (build networks of people and technology across institutional borders)

FET-Water (strong emphasis to achieve stakeholder cooperative projects)

Academic institutions (from single discipline to grooming 'broader' professionals)

Private sector role (much larger role in education and training; Groundwater Division a mobilizing role)

SA Groundwater Center of Excellence (industry-supported virtual centre)

Water sector skills and capacity

Strategic Actions (2)

Technical Education & Training (a rethink needed on role of universities and technical universities to cater for different capacity gaps)

Professional registration (system of required Continued Professional Development; greater role for DWS Learning Academy)

Long-term relationship: government / academic institutions (anchored in agreements of sustainable cooperation)

Public/private sector partnerships (private sector role in capacity building at local level during transition period)

Stakeholder involvement (systematic involvement of all stakeholders,)

International cooperation (capacity development linked to regional cooperation objectives of DWS and WRC)

Capacity building indicators (measure and monitor capacity development)

Questions

- Do you see ways how higher level planning can better enable local groundwater development and management? How could this work into catchment management plans?
- Do you see links between groundwater resource planning and assessment – how could they work together in practice?
- Where do you see the biggest shortcoming in groundwater resource assessment and information management at this stage?
- How can centralizing of private groundwater data become a win-win situation?
- Do you see any groundwater-related priority in Africa and international partnerships – how can we achieve and share the benefits?
- Do you see ways to overcome the large groundwater capacity gap in the public sector?
- Can you see a larger role for the private sector in education and training – how?

Local Action

Principles

The unique, widely distributed groundwater resource, with its open access to a large number of users and a wide range of impacts, requires local level management of the shared groundwater resources within an appropriate enabling and supporting environment.

Situation Assessment

Very little groundwater local action has happened in South Africa to date. Key reasons for this are the slow establishment of catchment management agencies, the lack of national regulation in this regard and lack of sustained support for the establishment and capacitating of appropriate local management institutions.

Experience gained in the Global Groundwater Governance initiative has been consulted widely for possible strategic actions at this level.

Local Action

Strategic Actions

Aquifer management

Users of a shared aquifer resource have to implement detailed planning, implementation of regulations, demand / supply-side measures, resource / source protection, and groundwater use / resource monitoring.

Action by municipalities

Local governments are uniquely positioned to foster integration between land management and groundwater management and protection. As such they should support integration of land use planning and groundwater management; also achieve integrated management of the subsurface zone.

Action from utilities

Water utilities – source protection, waste water management; Energy utilities - achieve water conservation goals through energy pricing

Local Action

Strategic Actions (2)

Action from Other State Institutions

Schools, Clinics, Community Gardens, etc. – own operation and advocacy

Action from private sector players

Small farmers - develop and operationalize institutional measures for self-regulation and local collective management

Larger agricultural ventures – achieve good groundwater management through linkages like certification and labelling of sustainable practices

Industries - major users that can be called on to conserve groundwater and protect quality

Mining companies - share the same subsurface space as groundwater

Users; share data and be responsible users in terms of pollution, safety and geological disturbance. Share community benefits.

Energy – increasing groundwater use, green groundwater?

Local Action

Strategic Actions (3)

Action by media and civil society

Making the case for the need to govern and manage groundwater; wider public discussion could trigger citizen initiatives, increase political support and strengthen the motivation of those directly involved to act on the issues. Act as watchdog on bad practices.

Questions

- What type of local best practice and management do envisage for groundwater?
- How could its introduction be facilitated and speeded up?
-
- Do you see more practical / realistic ways to roll out this strategy?
- What role could you / your sector play in moving improved groundwater governance forward

Way forward - 2016

- Achieve buy-in from key stakeholders and produce a national strategy;
- Achieve DWS acceptance by adopting and linking NGS into the National Water Resource Strategy.
- Establish a stakeholder core group to guide implementation of NGS.
- Agree on critical deliverables with stakeholders with mutual commitment and monitoring (see concluding table in NGS)

Table 1: Critical Deliverables for National Groundwater Strategy

| Deliverable | Implementation (Year 1-10) | | | | | | | | | | Financial Implication* | Responsibility |
|--------------------------------------------------|----------------------------|---|---|---|---|---|---|---|---|---|------------------------|----------------|
| Stakeholder Communication in place | █ | | | | | | | | | | Once-off | DWS, WRC |
| Critical Assessments undertaken (Themes 4,9, 11) | █ | █ | | | | | | | | | Once-off | DWS, WRC |
| Strategic Governance Framework agreed | █ | █ | | | | | | | | | Once-off | DWS, Sector |
| National Champion functional | █ | █ | | | | | | | | | Annual | DWS |
| Groundwater regulations drafted | █ | █ | █ | | | | | | | | Once-off | DWS |
| Groundwater Trust established | █ | █ | █ | | | | | | | | Annual | GW Sector |
| Municipal GW Management framework | █ | █ | █ | | | | | | | | Once-off | DWS, DLG |
| Groundwater regulations published | █ | █ | █ | █ | | | | | | | Once-off | DWS |
| Revised Groundwater RDM in place | | █ | █ | █ | | | | | | | Once-off | WRC, DWS |
| Guidelines & training pgms for Municipalities. | | | █ | █ | | | | | | | Once-off | DWS, WRC |
| 15% GW Management Institutions in place | | █ | █ | █ | █ | | | | | | Once-off | DWS, CMAs |
| National Information System functional | | █ | █ | █ | █ | | | | | | Annual | DWS, WRC |
| 5 groundwater protection zonings in place | | | █ | █ | █ | | | | | | Once-off | DWS, Munps. |
| Shared GW COE of Excellence functional | | █ | █ | █ | █ | | | | | | Annual | |
| | | | | | | | | | | | | |
| 40% GW Management Institutions in place | | | | | | █ | █ | █ | █ | █ | Once-off | DWS, CMAs |

*Cost estimates will be included in time

A detailed action plan must be developed together with key stakeholders. **A prototype has already been developed by the Department of Water and Sanitation, listing current actions, future actions and responsibilities under the different strategy themes.**

Questions

- In the proposed framework, have we missed an important strategy theme(s)?
- How would you like to be beneficially involved in the process over the next few years?
- How could real responsibilities be taken up by different sectors as a joint strategy is rolled out?
- What critical deliverables do you see as your sector and in general?
- What kind of report could give you a sense of progress with the NGS implementation?