

# 2019 CALL FOR PROPOSALS RESEARCH PRIORITIES

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## WRC Call for Proposals for Projects Commencing on 1st April 2020

The WRC hereby announces its annual call for proposals for the financial year commencing on 1 April 2020. The WRC's financial year extends from 1 April to 31 March. All annual project budgets will be required to coincide with this financial year period although start and end dates of contracts are flexible within a financial year. Proposals in response to this Open Call can be submitted on-line. Proposals in response to the Directed Call and associated terms of reference will be opened on the web as they become available. The on-line submission system for Directed projects will open on 1 June 2019.

Please familiarise yourself with the information below and in the WRC **Guidelines for Writing WRC Proposals**, before you start preparing a proposal. *In order to stimulate ingenuity and competitiveness, the WRC has intentionally omitted budgets from this Call.*

The **deadline** for the submission of both **Open and Directed proposals** is **29 June 2019 at 23:30**. Please ensure that proposals are completed well in advance of the deadline as the volume of last-minute submissions could affect the efficiency of the system.

An electronic helpdesk [bms-support@wrc.org.za](mailto:bms-support@wrc.org.za) (08:00 – 16:00 on week days) is available should you encounter any problems in completing or submitting the proposal submissions online.

## OPEN CALL

### KSA 1&2: WATER RESOURCES AND ECOSYSTEMS

Please contact the Executive Manager, Dr. Shafick Adams (E-mail [shaficka@wrc.org.za](mailto:shaficka@wrc.org.za)). The following Thrusts and Programmes are available for Open Call proposals in KSA 1&2:

<b>THRUST 1: Governance and Institutional Arrangements</b>	
<p><b>Scope:</b> Governance that is based on well-defined principles, tools and effective institutions are critical for the sustainable development and management of natural resources. Creating adequate and effective governance provisions form the basis for good management and custodianship of natural resources and in particular water. Vertical and horizontal linkages of institutions, policies, regulations and laws will ensure improved management, service delivery and meeting broader economic, environmental and societal goals. Representative community and stakeholder participation, amongst other principles of integrated water resources management, across sectors needs to be strengthened. Typical areas related to water management reforms and the related governance aspects will be covered such as cooperative governance at all levels, water sector legal frameworks and broader institutional arrangements, financing and pricing, civil society participation and the equitable provision of access and services. The sustainability of water systems ultimately depends on how we operate and manage these schemes or interventions.</p>	
<p><b>Programme 1: Cooperative governance for water resources management</b></p>	<p><b>Focused:</b> Addressing knowledge gaps in the transition to a new institutional landscape for water governance.</p>
<p><b>Programme 2: Policy, science and implementation</b></p>	<p><b>Open</b></p>
<p><b>Programme 3: Water pricing and financing</b></p>	<p><b>Closed:</b> This programme is closed for the 2020/21 cycle.</p>
<p><b>Programme 4: Gender and equity</b></p>	<p><b>Focused:</b> Strengthening polycentric governance by exploring hybrid approaches to water governance (including the roles of traditional leaders, customary and informal water rights and dispute resolution procedures)</p>
<p><b>Programme 5: Operation &amp; maintenance</b></p>	<p><b>Open</b></p>
<b>THRUST 2: Hydrological and Ecosystem Processes</b>	
<p><b>Scope:</b> This thrust focuses on developing a scientific understanding of the hydrological processes to promote better understanding of the variability of the quantity and quality of water available for use and development in South Africa. This understanding will assist those managing the water resource to maximise socio-economic benefits in a sustainable manner. The aim is to generate knowledge that informs decision-making. All water resource types will be covered. This thrust includes research addressing the biophysical processes, form and function of ecosystems. This understanding will assist those managing the resource (water services, aquatic plants and aquaculture, biodiversity, etc.) to maximise socio-economic benefits in a sustainable manner.</p>	
<p><b>Programme 1: Eco and socio-hydrology</b></p>	<p><b>Open</b></p>
<p><b>Programme 2: Data and hydroinformatics</b></p>	<p><b>Open</b></p>
<p><b>Programme 3: Hydrology</b></p>	<p><b>Open and Focused:</b></p>

	Review of environmental tracers and its application in SA.
<b>Programme 4: Water security</b>	<b>Focused:</b> Ensuring water security at the local level

#### **THRUST 4: Environmental Change and Adaptation**

**Scope:** The Thrust will address research to improve our understanding of the connectivity between land, water, atmosphere and people and the contribution to global change. The impact of any change in the environment has an impact on each ecological factor and should be assessed to be able to quantify the risks, develop appropriate strategies and to mitigate against disasters. The thrust will also focus on movement of people (migration) and the responses of aquatic ecosystems to these population dynamics.

<b>Programme 1: Urbanization</b>	<b>Focused:</b> Priority will be given to proposals that offers applied solutions and not a repeat of diagnosis/characterizing.
<b>Programme 2: Climate change and variability</b>	<b>Focused:</b> Priority will be given to proposals that offers applied solutions and not a repeat of diagnosis/characterizing.
<b>Programme3: Land use planning and changes</b>	<b>Focused:</b> Priority will be given to proposals that offers applied solutions and not a repeat of diagnosis/characterizing.
<b>Programme 4: Environmental risk and disaster management</b>	<b>Focused:</b> Priority will be given to proposals that offers applied solutions and not a repeat of diagnosis/characterizing.

#### **THRUST 5: Resource Quality and Management**

**Scope:** The Resource Quality and Management Thrust will focus on research on the water resources and their quality in terms of chemical, biological and ecological health as well as their flow and volumetric characteristics. The health / quality of these resources have an effect on the fitness for use and similarly the users have an impact on the resources. There is a need for research and development as well as tools for monitoring, modelling, prediction and early warning systems to understand the interplay between the environment, users and pollution sources. The quality of the resource has a direct impact on human health. Projects in this thrust will build towards the Water Quality and Health Lighthouse.

<b>Programme 1: Water pollution, depletion and human health</b>	<b>Focused:</b> Priority will be given to analytical methods that are cost effective and rapid which will aid in measuring human exposure to multiple pathogens from source water. There is a need to understand direct exposure and infection in order to determine which water related diseases pose the greatest health risk to communities and can be classified as a priority.
<b>Programme 2: Emerging contaminants</b>	<b>Focused:</b>

	Priority will be given to the development of effective risk assessment models of known emerging contaminants in source water as well as the predictive capability of these models to inform future scenarios.
<b>Programme 3: Source water protection</b>	<b>Focused:</b> Priority will be given to adequate water source protection mechanisms (upstream advances) that are suitable and cost effective for keeping out known contaminants.
<b>THRUST 6: Water Resources Innovation and Technologies</b>	
<b>Scope:</b> Process innovation and <b>new</b> technologies are crucial in ensuring water and environmental security. Real-time data and information is becoming important for decision-making and systems management. A decline in land-based data collection is countered by the use of remotely sensed data and information. A combination of land-based and remotely sensed observations can be integrated into scenario models and early warning systems. The use of automated communication systems improves data distribution, reduces costs and allows for near real-time uploading of data. In-situ treatment of water resources can be effectively used to improve water quality and reduce water treatment costs. This thrust aims to establish, stimulate and pilot innovations and appropriate novel technologies that could be taken up by the sector and beyond.	
<b>Programme 1: Apps</b>	<b>Open &amp; Focused:</b> Fish health ID and assessment, fish kill assessment tools will be reviewed as key to enhance water resource management
<b>Programme 2: Remote sensing and telemetry</b>	<b>Open</b>
<b>Programme: 3 Environmental sensors &amp; detectors</b>	<b>Open</b>
<b>Programme 4: Models and early warning systems</b>	<b>Open</b>
<b>Programme 5: Treatment technologies</b>	<b>Open</b>
<b>Programme 6: Blue-Green technologies and infrastructure</b>	<b>Focused:</b> Socio-Economic Innovations in the Blue Economy: Community/SMME based case studies

### **KSA 3: WATER USE AND WASTE MANAGEMENT**

Please contact the Executive Manager, Mr Jay Bhagwan Backeberg (E-mail [jayb@wrc.org.za](mailto:jayb@wrc.org.za)). The following Themes in the Thrusts and Programmes are available for Open Call proposals in KSA 3:

<b><i>Thrust 1 is open for proposals from programmes 1 to 4.</i></b>
<b>THRUST 2:</b>
<b><i>Thrust 2 is open for proposals from programmes 1 to 4.</i></b>
<b><i>Priority will be given to proposals that cover the following themes:</i></b>
<ul style="list-style-type: none"> <li>• A review of drinking water quality regulation in South Africa</li> <li>• Supporting the development of standards for water use, efficiency and safety in buildings</li> </ul>

- Source, occurrence and levels of perfluorinated compounds in drinking water and associated risks
- Towards a toxicity pathway-based paradigm for drinking water safety assessment

### **THRUST 3: SUSTAINABLE MUNICIPAL WASTEWATER MANAGEMENT AND SANITATION**

**Programmes 1, 2, 3 & 4** will be open and prioritised during the open call for priority area 1 (Programme 5 will be open, but a priority for priority area 2).

#### **Priority Area 1: Sustainable Municipal Wastewater Management**

Top priority will be given to proposals that fall under the following themes;

- *Regulations/best practice promoting pollution prevention at source*
- *New & Emerging Low Energy Treatment Options for Wastewater*
- *Nature Based Solutions Community of Practice*
- *Wastewater Bio-refinery Technologies and Innovations*
- *Approaches/Tools for Integrated Resource Recovery*

#### **Priority Area 2: Sanitation**

Priority will be given to proposals that address the following themes:

- *Re-engineered toilet solutions*
- *Faecal sludge beneficiation technologies and accompanying business models*
- *Solutions aimed at improving or optimising the faecal sludge value chain, including innovative planning and management models.*

### **THRUSTS 4 & 5: INTEGRATED INDUSTRIAL AND MINE WATER MANAGEMENT**

Programmes 1,2, 3, 4 & 5 will be open and prioritised during the open call (Programmes 1 & 3 will be further prioritized under the directed call).

Programme 1: Quantification of Water Use and Waste Production

Programme 2: Regulatory Mechanisms to Improve Industrial and Mine Water Management

Programme 3: Minimization of Waste Production and Impact on the Water Resources

Programme 4: Improved Ability to Predict and Quantify Effects

Programme 5: Beneficiation and Treatment of Industrial and Mining Effluents

### **KSA 4: WATER UTILISATION IN AGRICULTURE**

Please contact the Executive Manager, Prof Sylvester Mpandeli (E-mail [sylvesterm@wrc.org.za](mailto:sylvesterm@wrc.org.za)).

Themes in the Thrusts and Programmes are available for Open Call proposals in KSA 4:

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<b>Programme 1: Water-efficient production methods in relation to soils, crops and technology in rain-fed and irrigated agriculture</b>
Theme: Water use of indigenous root and tuber food crops
Theme: Determine water use of selected fruit tree crops at industry/national level within relevant food value chain
<b>Programme 1: Sustainable water-based agricultural activities in rural communities</b>
Theme: Review and develop guidelines for operating, maintaining, utilising water in small dams on farms and in communal areas with macro rain water harvesting for agricultural production with special attention to drought mitigation
Theme: Assess and understand barriers for improving implementation of water efficient irrigation technologies by small scale farmers
<b>Programme 2: Integrated water management for profitable farming systems</b>
Theme: Promotion of rain-fed crops and associated best management practices through efficient water-use for food production to supplement irrigated crops
Theme: Assessing and understanding the potential of social media in disseminating information for improved water use efficiency in agriculture
Theme: Application of big data to improve agricultural water management: Phase 1- Collating multiple data sets and Phase 2- Interpreting data and application of information
Theme: An investigation into the entrepreneurial risks associated with quality and security of water supplied to urban-based farming and agro-processing enterprises
<b>THRUST 4: THRUST 4: WATER RESOURCE PROTECTION, RESTORATION AND RECLAMATION IN AGRICULTURE</b>
<b>Programme 1: Sustainable water resource use on irrigation schemes and within river catchments</b>
Theme: Assessment of the impact of aquatic weeds and review of control measures and guidance for sustainable use of irrigation canals and dams
Theme: Investigating the conjunctive use and management of surface and ground water for irrigation
<b>Programme 2: Impact assessment and environmental management of agricultural production</b>
Theme: Assessment of the cumulative impact on quality and quantity of water resources of large-scale herbicide application for reducing bush encroachment in rangeland areas
Theme: Technology exchange and training on hydroponics and vertical farming in closed environments with recycling of water
Theme: Utilising the water- energy- food (WEF) nexus as a framework for catchment-based assessments and identifying policy recommendations to improve resilience within selected water management areas

## DIRECTED CALL

The call for Directed projects and full details such as budget allocations, time frames and terms of reference will be posted on the web as the ToR's become available. The system will open for submissions on 1 June 2019. It is important to take note of the titles of the planned Directed projects in order to avoid preparing and submitting a bid in the Open Call when a similar Directed project is planned.

### KSA 1&2: WATER RESOURCES AND ECOSYSTEMS

Planned directed projects for KSA 1&2: Water Resources and Ecosystems will be advertised and opened later during the year.

### KSA 3: WATER USE AND WASTE MANAGEMENT

The following Themes in the Thrusts and Programmes are available for Directed Call proposals in KSA 3:

<b>THRUST 3:</b>		
	<b>Budget 2020/21 (R)</b>	<b>Total contract budget (R)</b>
<b>Programme 5:</b>		
<i>Theme: Understanding bound water content and water binding strength in faecal sludge from on-site sanitation technologies and human faeces</i>	350,000	700,000
<i>Theme: Guidelines for the Utilisation and Disposal of Faecal Sludge: Requirements for Disposal of On-Site Sanitation Sludge</i>	300,000	600,000
<i>Theme: Quantities and Quality of Poop and Pee in School Sanitation Facilities</i>	350,000	700,000
<b>THRUSTS 4 &amp; 5: INTEGRATED INDUSTRIAL AND MINE WATER MANAGEMENT</b>		
	<b>Budget 2020/21 (R)</b>	<b>Total contract budget (R)</b>
<b>Programme 1:</b> Quantification of Water Use and Waste Production		
Natsurv 4: Water and Wastewater Management in the Dairy Industry	650 000	1 500 000
<b>Programme 3:</b> Minimising the Impact of Waste on the Water Environment		
<i>Revision of the 1996 South African Water Quality Guidelines: Volume 3 – Industrial Use</i>	1 000 000	2 000 000

### KSA 4: WATER UTILISATION IN AGRICULTURE

**NO PLANNED DIRECTED PROJECTS ARE ANTICIPATED FOR KSA 4: WATER UTILISATION IN AGRICULTURE**