

## THE WRC'S RESEARCH, DEVELOPMENT AND INNOVATION PRIORITIES FOR THE 2020 ANNUAL CALL FOR PROJECT PROPOSALS

### Annual Call for Project Proposals that will Start on 1<sup>st</sup> April 2021

The WRC hereby announces the Annual Call for project proposals for the financial year commencing on 1 April 2021. All annual project budgets will be required to coincide with the WRC's financial year which is from 1 April to 31 March. The start and end dates of project contracts are however flexible. Project proposals in response to the **Open Call** can be submitted on-line from 1 May 2020. Project proposals in response to the **Directed Call** and associated terms of reference will be opened on 1 June 2020.

Please familiarise yourself with the information below and in the two WRC **Guidelines for Writing WRC Proposals**, before you start preparing an application. Please note further that the WRC does not prescribe hourly, daily or any other rate for proposers and prospective project teams. Also, *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 **31 July 2020 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

The Open Call for project proposals that addresses the themes in the specified and available thrusts and programmes appears in the table below. For more information, please contact the Executive Manager Dr Shafick Adams (E-mail [shaficka@wrc.org.za](mailto:shaficka@wrc.org.za)).

#### THRUST 1: GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS

##### **Programme 1: Cooperative governance for water resources management**

Priority will be given to proposals that address any of the following:

1. Water sector institutions in transition
2. Developing and implementing pathways to effective mechanisms of lobbying for and institutionalising gender-equitable technical, institutional and financial support to self-supply as interim water service provision models.
3. Polycentricity as a conceptual framework for analysing and refining governance arrangements in the South African water sector



4. Alternative inclusive village-based participatory water supply planning models feeding into the WSDP and IDP
<p><b>Programme 2: Policy, science and implementation</b></p> <p>Priority will be given to proposals that address any of the following:</p> <ol style="list-style-type: none"> <li>1. Policy implementation as an area of research focus, including the political economy of water and opportunities for embedded research</li> <li>2. Transforming the water governance research community of practice</li> <li>3. Integrity in the water sector</li> <li>4. Strengthening municipal accountability in the provision of water in rural areas</li> </ol>
<p><b>Programme 3: Water pricing and financing</b></p> <p>Priority will be given to proposals that address any of the following:</p> <p>Theme 1: Enabling sustainable financing for Catchment Management Agencies, including public benefit vs. water user-funded functions</p>
<p><b>Programme 4: Gender and equity</b></p> <p>Priority will be given to proposals that address any of the following:</p> <ol style="list-style-type: none"> <li>1. Experience to date in implementing compulsory licencing</li> </ol>
<p><b>Programme 5: Operation &amp; maintenance</b></p> <p>Priority will be given to proposals that address any of the following:</p> <ol style="list-style-type: none"> <li>1. Co-ownership and co-management of water systems in particular municipal boreholes or irrigation schemes as solutions to sustainable water supply.</li> </ol>
<b>THRUST 2: HYDROLOGICAL AND ECOSYSTEM PROCESSES</b>
<p><b>Programme 1: Eco and socio-hydrology</b></p> <p>Open</p>
<p><b>Programme 2: Data and hydroinformatics</b></p> <p>Open</p>
<p><b>Programme 3: Hydrology</b></p> <ol style="list-style-type: none"> <li>1. Integrating hydrogeology in wetlands management and development authorization - focus on demonstrating the role of hydrogeology in wetlands management at catchment and site specific scales.</li> <li>2. Knowledge application of the groundwater footprint on both fossil and renewable energy production in South Africa – An overview of the WEF nexus.</li> </ol>
<p><b>Programme 4: Water security</b></p> <ol style="list-style-type: none"> <li>1. Point of use purification as a mechanism to expand access to water supply for communities residing along large irrigation schemes</li> <li>2. Assessing indigenous knowledge and management of multiple sources for multiple gendered uses to inform planning and design</li> </ol>
<b>THRUST 3: WATER RESOURCE AND ECOSYSTEM PROTECTION AND UTILIZATION</b>
<p><b>Programme 1: Resource directed measures</b></p>
<p><b>Programme 2: Rehabilitation and conservation</b></p> <ol style="list-style-type: none"> <li>1. Review and update of the NFEPA as a proactive developmental framework</li> </ol>

<b><i>Programme 3: Water system utilisation and augmentation</i></b>
<b><i>Programme 4: Environmental Economics and resource accounting</i></b> 1. Evidence based research in support and promotion of the green-blue economic policies. Development of partnership models to fast track implementation and develop markets along the value chain.
<b>THRUST 4: ENVIRONMENTAL CHANGE AND ADAPTATION THRUST</b>
<b><i>Programme 1: Urbanization</i></b> Priority will be given to work that address adaptive response to urbanization challenges exacerbated by the changing climate.
<b><i>Programme 2: Climate change and variability</i></b> Priority will be given to work that proposes practical solutions to improve adaptive capacity and increase resilience across ecosystems, society and the rural periphery.
<b><i>Programme 3: Landuse planning and changes</i></b> 1. Africa’s Living River catchments or basins for greener future The focus of this call is on consolidation of multitudes of information SA and other countries generated into a set of tools that can be used in land use, planning and development without causing further landscape degradation, avoiding restoration costs. The overall aim of the study is to re-package SA knowledge together with other African tools in order develop and integrate diverse social and ecological modelling in the early stages of basin planning and development in Africa.
<b><i>Programme 4: Environmental risk and disaster management</i></b> 1. Focus should be given on practical measures to address and/or mitigate against/reduce the impacts of extreme events (droughts and floods, also extreme temperatures) which are projected to increase in the next 90 years in Strategic Water Source Areas. 2. Focus should also be on improving water security in areas almost permanently affected by recurring droughts (mostly in rural settings).
<b>THRUST 5: RESOURCE QUALITY AND MANAGEMENT</b>
<b><i>Programme 1: Water pollution, depletion and human health</i></b> 1. Priority will be given to local and regional (transboundary) projects that harness hydrological information to explore the trends in water quality and its effect on human health during extreme climate events.
<b><i>Programme 2: Emerging contaminants</i></b> 1. Priority will be given to the development of effective risk assessment models of emerging contaminants in source water as well as the predictive capability of these models to inform the development of novel products. There should also be a focus on current and future regulatory policy product design scenarios and established partnerships between researchers, policy regulators and industry are encouraged.
<b><i>Programme 3: Source water protection</i></b> 1. The Source Water Protection programme strives to protect sources of water (especially drinking water) by developing tools (including citizen science ) and approaches that can prevent contamination and maintain the quality of source water.
<b>THRUST 6: WATER RESOURCES INNOVATION AND TECHNOLOGIES</b>
<b><i>Programme 1: Apps</i></b>

<b>Programme 2: Remote sensing and telemetry</b>
<b>Programme 3: Environmental sensors and detectors</b> 1. Smart City Monitoring  Focus should be on developing low-cost sensors (wireless sensors and detectors such as GPR, acoustics and remote sensing) for monitoring ageing water and related infrastructure (buried water pipes, UST's, etc).
<b>Programme 4: Models and early warning systems</b>
<b>Programme 5: Treatment technologies</b>
<b>Programme 6: Blue-green technologies and infrastructure</b>

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

A general request for Open Call proposals addressing the themes in the following programmes: Please contact the Executive Manager (E-mail [jayb@wrc.org.za](mailto:jayb@wrc.org.za)). The following Thrusts and Programmes are available for Open Call proposals in KSA 3:

<b>THRUST 1: WATER SERVICES – INSTITUTIONAL AND MANAGEMENT ISSUES</b>	
	<p>This thrust will only be opened for proposals for Thrust 1 to 5. Areas for consideration:</p> <ul style="list-style-type: none"> <li>• Reviewing the water services regime after more than 20 years in operation.</li> <li>• How to gear up WSAs</li> <li>• Smart water utilities of the future</li> </ul>
<b>THRUST 2: WATER SUPPLY AND TREATMENT TECHNOLOGY</b>	
Programme 1 to 4	<p>This thrust will be open for proposals in Programmes 1 to 4. Priority will be given to proposals that fall under the following themes:</p> <ul style="list-style-type: none"> <li>• Smart water quality monitoring and decision making - development of innovative methods for detection, monitoring and the subsequent use of the information for decision making</li> <li>• Water quality regulation, compliance and reporting</li> <li>• Risk assessment for water quality management</li> <li>• Emerging issues and substances of concern in water</li> <li>• Development, testing and demonstration of innovative water treatment technologies</li> </ul>
<b>THRUST 3: SUSTAINABLE MUNICIPAL WASTEWATER MANAGEMENT AND SANITATION</b>	
Programmes 1 to 5	<p>This thrust will be open for proposals in Programmes 1 to 5. Priority will be given to proposals that fall under the following themes:</p> <ul style="list-style-type: none"> <li>• Effluent Treatment, Volatilization and Reuse - 'fit-for-purpose' reuse will be prioritized</li> <li>• Advanced Technologies and Processes for Resource Recovery – development, testing and scale up recovery of water-based, material-based and energy-based resources</li> <li>• Nature-based Tools, Solutions and Innovations - nature inspired RDI targeting products and innovations</li> <li>• Back-end off-grid toilets that valorise / eliminate sludges</li> <li>• Innovative communication tools, business tools and marketing strategies that can encourage uptake of new sanitation</li> <li>• Collaborative research projects aimed at addressing key knowledge gaps in municipal sludge management</li> </ul>

THRUST 4: SUSTAINABLE AND INTEGRATED INDUSTRIAL WATER MANAGEMENT	
Programmes 1 to 4	This thrust will be open for proposals in Programmes 1 to 4. Priority will be given to proposals that fall under the following themes: <ul style="list-style-type: none"> <li>Quantification and Minimization of Water Use and Effluent Production - development of new tools, methodologies and models that aid the evaluation (prediction, quantification, minimization) of water use and effluent production.</li> </ul>
THRUST 5: MINE WATER TREATMENT AND MANAGEMENT	
Programmes 1 to 5	This thrust will be open for proposals in Programmes 1 to 5. Priority will be given to proposals that fall under the following themes: <ul style="list-style-type: none"> <li>Effluent Treatment, Volatilization and Reuse - 'fit-for-purpose' reuse will be prioritized</li> <li>Sustainable Mine Closure Management - innovative solutions addressing environmental, social and economic challenges arising from mine closure including long-term mine water management post closure</li> </ul>
THRUST 6: WATERSMART FUND	
	This thrust is open for 2021/20

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

The Open Call for project proposals that addresses the themes in the specified and available thrusts and programmes appears in the table below. For more information, please contact the Executive Manager, Professor Sylvester Mpandeli (E-mail [sylvesterm@wrc.org.za](mailto:sylvesterm@wrc.org.za)).

THRUST 1: WATER UTILISATION FOR FOOD, FORAGE AND FIBRE PRODUCTION
<i><b>Programme 1: Water-efficient production methods in relation to soils, crops and technology in rain-fed and irrigated agriculture</b></i>
<i>Theme: Water use of Moringa tree crop</i>
<i>Theme: Determine water use of Cannabis tree in Eastern Cape and KwaZulu – Natal Provinces</i>
<i>Theme: Water use of the pomegranate orchards</i>
THRUST 2: WATER UTILISATION FOR FUELWOOD AND TIMBER PRODUCTION
<i><b>Programme 1: Water-efficient production methods and systems in agro-forestry, woodlands and forestry plantations</b></i>
<i>Theme: Quantifying the water use of indigenous forestry</i>
THRUST 3: WATER UTILISATION FOR POVERTY REDUCTION AND WEALTH CREATION IN AGRICULTURE
<i><b>Programme 1: Sustainable water-based agricultural activities in rural communities</b></i>

<i>Theme:</i> Applying the WEF nexus integrative model in a real and practical situation to inform policy and decision makers to achieve sustainability
<i>Theme:</i> Explore opportunities that enhance sustainable intensification for increased yields and water productivity in rainfed systems
<b><i>Programme 2: Integrated water management for profitable farming systems</i></b>
<i>Theme:</i> Quantifying trade-offs in agricultural water use between rural and urban areas focusing on food systems
<i>Theme:</i> Exploring opportunities for water markets under water scarce conditions in South Africa.
<i>Theme:</i> Application of big data to improve agricultural water management: Phase 1- Collating multiple data sets and Phase 2- Interpreting data and application of information
<b>THRUST 4: WATER RESOURCE PROTECTION, RESTORATION AND RECLAMATION IN AGRICULTURE</b>
<b><i>Programme 1: Sustainable water resource use on irrigation schemes and within river catchments</i></b>
<i>Theme:</i> Use of drone technology to monitor water availability and quality in irrigation canals and dams
<i>Theme:</i> Development of a drought early warning system for South Africa through geospatial techniques
<b><i>Programme 2: Impact assessment and environmental management of agricultural production</i></b>
<i>Theme:</i> Impact of shale gas extraction on quality and quantity of water for natural grazing and livestock production and livelihoods of rural communities

## 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 they become available. The system will open for submissions on 1 June 2020. It is important to take study the titles of the planned Directed projects in order to avoid preparing and submitting a project proposal in the Open Call when a similar Directed project is planned and available.

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

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

	Budget	Total Contract

	2021/22 (R)	Budget (R)
<b>THRUST 5: Resource Quality and Management</b>		
<b>Programme 1: Water pollution, depletion and human health</b>		
<b>1. Management of Water Related Water Microbial Diseases (Update on First Edition)</b>  A 5 volume series on the Management of Water Related Water Microbial Diseases was published in 2010. These guides provided awareness-building information to keep water supplied clean of microbial contamination and reduce the incidence of water-related diseases. 10 years later, there is a need to update these guidelines due to the emergence of new microorganisms such as antimicrobial resistant (AMR) organisms as well as the increase in water reuse for various purposes. These updated guides should be aimed at water supply agencies, water resources managers, workers in health-related fields as well as communities throughout South Africa.	R 400 000	R 400 000
<b>2. An evidence-based review of the health effects of extreme weather events: towards developing a health vulnerability index</b> <b>Programme 2: Emerging contaminants</b> Wastewater-based epidemiology (WBE) as a Tool for Effective Public Health Monitoring and Early Predictor of Population Exposure to Hazardous Substances (with an emphasis on emerging contaminants)	R 500 000	R 2 000 000
<b>THRUST 2: HYDROLOGICAL AND ECOSYSTEM PROCESSES</b>		
<b>PROGRAMME 3: HYDROLOGY</b>		
<b>1. Subsurface water in terms of future urban settings.</b>  Groundwater and specifically its function, governance and sustainable management in future urban area context demands special consideration. Any city-centric model of water issues has to take groundwater into account and recognise that water resources are supplied from a much wider catchment area extending beyond the city's administrative boundary, with flows into and out of the city precinct requiring special consideration. <b>Key research questions and gaps to consider:</b> <ol style="list-style-type: none"> <li>How can the need for city-scale monitoring and assessment be met? Can a more robust methodology for urban groundwater planning be developed?</li> <li>Can priority South African aquifers be assessed with respect to their potential impact on urban areas, the broader water cycle and the provisions of services for cities (e.g. water resources, wastewater reuse, heating and cooling, etc.</li> </ol>	R400 000	R1000 000

c. How can we create a better understanding about urban recharge processes and shallow urban aquifers, in terms of their ability to reduce the effects of hydrological extremes?		
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**SPECIAL COVID-19 RELATED CALL**

Proposals addressing identified gaps and challenges relating to COVID-19 are also invited. The proposals should address the knowledge and innovation gaps regarding operation and management of water and sanitation. Impact of COVID-19 on all water users and their operations should be given attentions as well. Proposals that show address all or key parts of the water and sanitation value chain and also provide system analyses for better decision making and implementations will be prioritized.

***Note In addition, that the WRC will also advertise proposal topics in this subject through out the year.***

