Revision of the Pricing Strategy for Water Use Charges: Public Interest Functions of Water Resource Management Activities

Report to the
WATER RESEARCH COMMISSION

by

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ACRONYMS & ABBREVIATIONS

CMA	Catchment Management Agency
CMS	Catchment Management Strategy
DWS	Department of Water and Sanitation
ICAEW	Institute of Chartered Accountants in England and Wales
IFAC	International Federation of Accountants
NWA	National Water Act
OECD	Organisation for Economic Co-operation and Development
WMA	Water Management Area
WRC	Water Research Commission

GLOSSARY

1 **Public interest.** The interests of the public at large, and not only those of the parties who are directly affected.

2 ***Neutrality.*** The tax that is levied to fund the public interest function, and the transfer that is provided to fund these activities should be non-distortionary, neutral, and equitable between forms of business activities, thus contributing to efficiency by ensuring that optimal allocation of the means of production is achieved. For water resource management functions, neutrality implies that the tax system that raises revenue will minimise discrimination in favour of, or against, any particular economic choice, and is spent on activities or functions where the incidence of benefit is fairly weighted among beneficiaries (OECD, 2014).

3 ***Efficiency.*** Tax compliance costs to business and administration costs for governments should be minimised as far as possible, and the spending of the tax revenue on the activities of government should ensure good value for money for the outputs generated (OECD, 2014).

4 **Certainty and simplicity.** Tax rules should be clear and simple to understand for individuals and businesses. A simple tax system makes it easier for individuals and businesses to understand their obligations and entitlements. As a result, businesses are more likely to make optimal decisions and respond to intended policy choices. The government spending that will result from taxation should also be certain and consistent in nature (OECD, 2014).

5 ***Effectiveness and fairness.*** The effectiveness of public spending (which is the relationship between the outcome of the spending and the amount of money spent) should be maximised, and the incidence of the tax and benefit should be designed to be as fair as reasonably possible (OECD, 2014).

6 **Flexibility.** Taxation systems should be flexible enough to meet the current revenue needs of governments, while adapting to changing needs on an ongoing basis. Correspondingly, government spending should adapt to the changing demands and policy landscape (OECD, 2014).

1. INTRODUCTION

1.1 BACKGROUND

Water resources management functions have an inherent public benefit that extends beyond the immediate users of the water. This is acknowledged in South African policy and legislation, with the National Water Act (NWA) stating that “water is a natural resource that belongs to all people” (Preamble: p.1) and “that the protection of the quality of water resources is necessary to ensure sustainability of the nation’s water resources in the interests of all water users” (Preamble: p.1).

Sections 56-60 of the NWA allow the Minister to establish a pricing strategy for water use. The original Pricing Strategy was established in 1999, and a revised version approved in 2007. The Department of Water and Sanitation (DWS) has instituted a process to publish a revised Pricing Strategy in 2023, with the support of Operation Vulindlela in National Treasury. The Water Research Commission (WRC) is supporting DWS and have contracted PDG to define and cost the public interest component of the Catchment Management Agencies’ (CMAs) functions.

1.2 PROJECT AIMS

The overall objective of the project was to quantify the portions of water resources management activities that are in the public interest, the portions to be funded from the fiscus, and the portions to be funded from raw water tariffs.

Its specific goals were to:

1. Revisit the theoretical foundations as well as existing, relevant policy principles and intent that underpin the fiscal funding of components of water resources management activities.
2. Develop a standardised approach for determining the public interest component of the water resources management activities.
3. Separate and calculate the components of these activities to be funded from raw water use charges from those to be funded through fiscal support.

1.3 APPROACH AND METHODOLOGY

The approach to the research was firstly to review the legal, economic and policy literature on ‘public interest’ in order to find or design the definition that is most applicable to the water resources sector in South Africa. This literature review was based on previous work that has been undertaken on this subject in South Africa.

The second stage of the project was to apply the definition of public interest to the different functions and activities of the CMAs. This was done through an assessment of previous submissions from DWS and the two established CMAs, an assessment of previous research and the experience of the service provider team. The output of this stage was a percentage of each function that is in the public interest and for which there is therefore a justification for funding through the fiscus.

The third stage of the project was to determine the cost of each of the CMA functions. This was done through an assessment of the current and desired levels of expenditure on water resource management activities by CMAs and proto-CMAs in South Africa.

In the fourth stage, the percentages of each function that were determined to be in the public interest in stage 2 were applied to the CMA function costs developed in stage 3, to determine the total expenditure by CMAs on public interest functions.

The final stage of the project was to develop a Microsoft Excel based model that can be applied by a designated official to calculate the cost of the public interest functions performed by CMAs.

LIMITATIONS OF THE STUDY

This research was conducted over the period November 2021 to March 2022. It is intended to align with the DWS and National Treasury's Operation Vulindlela programme to update the 2007 Raw Water Pricing Strategy. This is a short time frame, and as such there was limited scope for consultation. Data availability was also a challenge. These limitations have been addressed to some extent through the creation of a model which is flexible enough to allow the user to amend the assumptions and data inputs to calculate the public interest component of CMA activities more accurately.

Once established, there are likely to be three sources of support from the fiscus to the CMAs. These are: the public interest function subsidy, the establishment grant, and a subsidy for the charge capping. The public interest function only relates to water resource management activities that are in the public interest. This subsidy has been calculated in this research report. Consequently, there are other costs associated with the CMAs that are specifically excluded. This includes the establishment costs of CMAs, including items such as the appointment of the board and initial capacity building, appointing a Chief Executive Officer, the setting up of the business and information management systems and human resources system, staff transfer from proto-CMA (if applicable), initial capital expenditure on premises and computer systems, initial planning, and strategy development, etc. Allowances for under-recovery and charge capping are not considered under the public interest operating subsidy allocation.

2. PUBLIC INTEREST FUNCTION IN CMAS

2.1 DEFINING PUBLIC INTEREST

Rabie (1990) describes the public interest as “a vague concept which resists precise definition”. Not only is it unclear what the public's interests are, but it's also unclear who the public are whose interests are to be supported by the law, or the activity taking place. Rabie sees the public interest as a flexible concept that changes both with time and location. He believes, however, that when the concept is applied in a specific context or in practice, much of the ambiguity disappears, as in the legal case of *SA Industrial Cellulose Corporation vs. Umkomaas Town Board* (1960). In this case, the court upheld the fact that the public interest refers to “the interests of the public at large, and not only those of the parties who are directly affected.”

The term "public interest" can also be used to refer to a wide range of economic, strategic, administrative, social, and legal interests that are worthy of legal protection (Uys, 1996; Thompson, 2006). Rabie goes on further to state that the "public interest" is sometimes used interchangeably with "general welfare," "common good," and even "national interest" (Rabie (1990) in Mqingwana, 2011).
The public interest, according to Wheeler (2016), is “a term for which there is no single precise and immutable definition,” which is similar to the definition posed by Rabie (1990). The answer to the question “what is the public interest?” depends almost entirely on the circumstances in which the question is asked. However, Wheeler (2016) further comments that the public interest as a general concept refers to considerations affecting the good order and functioning of the community and government affairs for the wellbeing of a group of affected citizens. Equivalent concepts to the public interest have been discussed since at least the time of Aristotle (‘common interest’), including by Aquinas and Rousseau (‘common good’) and Locke (a variation of the term ‘public good’). Public interest is generally referred to in terms of equality and fairness.

It must be noted however that there is a distinction in definition and in application between “the public interest” and “a public good”. In some instances, the terms “the public interest” and “the public good” tend to be used interchangeably as equivalent terms, as mentioned in Wheeler’s definition and as illustrated by the definition of The Institute of Chartered Accountants in England and Wales (ICAEW) which says:

“The public interest is an abstract notion. Asserting that an action is in the public interest involves setting oneself up in judgement as to whether the action or requirement to change behaviour will benefit the public overall. Other terms can be used, largely interchangeably. Examples include public benefit, the public good, and the common good” (ICAEW, 2012, p. 2).

The use of the term “the public good” in the ICAEW’s definition should not be confused with the economic concept of “a public good”. In economic theory a public good is “a product or service that is non-excludable and nondepletable (or “non-rivalrous”)” (Ingham, 2018). Non-excludable means that no individual can be excluded from enjoying the benefits of the good when it is provided. Nondepletable/non-rivalrous means that one individual’s enjoyment of the good does not diminish the amount of the good available to others (Ingham, 2018). Examples of public goods include law enforcement, national defence, and the rule of law. Public goods also refer to more basic goods, such as access to clean air (Fernando, 2020).

When the definitions of both these concepts are considered, it is evident that “a public good” refers to a strictly defined economic concept with established criteria, namely a non-rivalrous and non-excludable commodity or service. The term "the public interest" or “the public good” has a more variable definition that is significantly influenced by the context or circumstances in which it is used. In general, the term "the public interest" is a legal or political term that refers to a normative ethical position or legal standard or guide for evaluating specific public policies and/or administrative actions that affect the good order and functioning of a community (the ‘public at large’).

The International Federation of Accountants (IFAC) defines the public interest as “the net benefits derived for, and procedural rigor employed on behalf of, all society in relation to any action, decision or policy”. Where the “public” includes the widest possible scope of society, such as individuals and groups sharing a marketplace for goods and services (including those provided by government). “Interest” refers to all things valued by individuals and by society. These include rights and entitlements (including property rights), access to government, economic freedoms, and political power. Interests are things we seek to acquire and control; they may also be ideals we aspire to, and protections from things that are harmful or disadvantageous to us (IFAC, 2012). This definition further highlights the distinctions between “a public good” and “the public interest”, as public interest is not limited only to non-rivalrous and non-excludable commodities or services but can refer to all things valued by society or “the public at large” as mentioned above. The focus of this study is on the definition of “the public interest”.

According to Wheeler (2016), distinguishing what is not in the public interest is at times easier than identifying what is in the public interest. The "public interest," for example, can be distinguished from:

- Private interests of a particular individual or small group of individuals – public interest is distinguishable from the private interest because it extends beyond the interests of an individual (or possibly even a group of individuals) to the interests of the community as whole, or at least to a particular group, sector or geographical division of the community. However, even such a statement must be qualified because there are some circumstances where an individual’s private interests can be aligned to the interest of the public.
- Personal interests of the decision-maker (including the interests of members of their direct families, relatives, business associates, etc.).
- Personal curiosity – for example, something that the individual is seeking to know or understand but will not be in the interest of the public in general to be known.
- Personal opinions – for example, the political or philosophical views of the decision-maker, or considerations of friendship or their associations.
- Parochial interests – for example, the interests of a small or narrowly defined group of people with whom the decision-maker shares an interest or concern.

Most academic commentators have assumed that the “public interest” relates to the interests of members of the community as a whole, or at least to a significant portion of it, and that it should be distinguished from individual, sectional or regional interests. On the other hand, it is widely accepted that the "public interest" can extend to certain private 'rights' of individuals, such as privacy, procedural fairness, and the right to silence, which are regarded as fundamental in many societies that their protection is seen as being in the public interest. Wheeler (2016) comments that the public interest must also apply to the interests of groups, classes, or sections of a population. The “public” whose interests are to be considered can also consist of a relatively small group, class, or section of a total population. This is applicable for example when the decision-maker considers the best interests of a group or sub-group of the total population based on geography, where the "public" could refer to all residents of the country when exercising discretionary power at the national level; and at the provincial level, the

"public" whose interests are relevant would primarily be residents of that province; and at the local level, the "public" would primarily be residents of the local area.

Furthermore, in trying to find a meaning of the term, it is important to draw a distinction between the question and its application – between what the public interest “is” as a concept, and what is “in” the public interest in any particular circumstance. While the definition of "public interest" remains the same, the answer to the question of what is "in" the public interest is entirely dependent on the circumstances. It is because of this variability that the term is so valuable as a decision-making tool. If a distinction is made between the concept and its application, it is easy to identify what is meant by "public interest". Instead of being a definite and unchanging objective to be accomplished, the "public interest" might best be viewed as the goal of, or the strategy to be taken, in decision-making (Wheeler, 2016).

The definition of public interest is applied to the functions of catchment management agencies, in order to distil which of these functions or activities subscribe to the principles of the public interest.

2.2 THE PUBLIC INTEREST IN SOUTH AFRICAN WATER LAW

The concept of public interest first appeared in South African water law in 1934, when a clause was added to the 1912 Irrigation Act, through an amendment. The amendment clause had the effect of allowing a riparian owner (anyone who owns a property where there is a watercourse within or adjacent to the boundaries of their property) who wanted to use extra water for tertiary uses to apply to a water court, which could approve the use if it was in the public interest (Uys, 1996). Public interest was not defined in the Act but was included to convey the concept that the state should have increased control over the water resources in order to be able to control water use for the benefit of the whole nation and all user sectors, and not only for riparian owners (Uys, 1996).

The term "public interest" (or "national interest") appears frequently in the current National Water Act 36 of 1998 (Government of South Africa, 1998), particularly in relation to water allocation inside control areas, but this term is never defined in the Act. Uys (1996) goes on to suggest that the concept of water control in the general interest of the nation, was most likely the motivation behind the inclusion of the term "public interest" in several provisions of the National Water Act, and that the regular use of the term "public interest" in the Water Act was intended to simply convey the new state policy, namely that all water user sectors were to be accommodated, and that the state was appointed as the trustee with the duty to regulate common use of public water in such a way that the public at large was served.

The term “public interest” originates in Roman law where it states that water belongs to each and all in need of it in common use, subject to state control. In Roman law, running water was classified as “*res communes*” (referring to things owned by no one and subject to use by all) in terms of “*ius naturale*”, which is the natural law or laws common to all beings. This meant that the nature of water as a life-giving and natural resource made it essential for all forms of life. For this reason, it could not be appropriated by anyone, but had to be shared by all in need of it. Water was common to all by its nature and by principles of justice and equity and so it was only fair if everyone allowed others to share in the use of this natural resource, because it belonged to all and that no-one was entitled to use water in such a way that harmed another user who had similar rights of use (Uys, 1996). This concept was later adopted by the Roman-Dutch law, where the state had similar but even stricter administrative powers to regulate the common use of water. Then, in early South African law, which is based on the Roman-Dutch law, this concept of running water being common to all was kept, but the role of state control was reduced. For example, the courts of the nineteenth century placed strong emphasis on the fact that

public water could not be appropriated and should be available for all in need of it according to natural law. Yet, despite this view, riparian owners progressively controlled public water, to the exclusion of other water users (Uys, 1996).

According to the National Water Act (Government of South Africa, 1998) the minister has the ultimate authority to ensure that water is allocated in the public interest. However, in some cases, the term "public interest" has been used as a jurisdictional fact or a specific restriction on the minister's discretion, limiting the minister's discretionary powers as the minister must ensure that at least the following two criteria are met: the principle that water is common to all, and that the principles of justice are upheld (Uys, 1996).

For example, in the case of water allocation. When the minister or the water court is given the authority to allocate water for any reason, the minister is bound by the public interest in two ways: first, water is common to all, and if the water needs of any water user sector are disregarded during allocation, it will be contrary to the common rights of all in respect of water. Second, justice requires the minister to follow the law in order to avoid judicial review on any of the grounds of review, namely the rule of law, natural justice, presumptions of interpretation, reasonableness, and simple justice for all. Disregarding any of these rules negates the purpose of administrative law and law in general, and hence undermines the public interest (Uys, 1996). The apportionment of water from a river in an area will affect the water availability lower down the river's course, or the ground water in the area, or the stream's permanence, or the quality, run-off, and temperature, among other things. If an administrative decision to allocate water from a part of a stream is made, all water user sectors that rely on water from that stream along its length, as well as water sources fed by it, should be treated fairly. Each competitive water user sector that is impacted by the administrative action has the right to have the decision reviewed under one of the grounds for review (Uys, 1996).

Uys (1996) comments that in South African water law, which is based on justice, the public interest seems to have a very specific meaning. Regardless of whether it is mentioned in the legislation or law, the public interest is an objective of law and also serves as a jurisdictional fact (i.e. a set condition which must exist before a statutory power can be exercised) to all administrative decisions.

2.3 IDENTIFYING PUBLIC INTEREST FUNCTIONS

Identifying or determining the relevant public interest in a particular circumstance is not always easy, as the previous sections have described. Wheeler (2016) proposes a three-stage process to making an assessment as to how the “public interest” applies in a particular circumstance. This process includes:

- Firstly, identifying the relevant population – the "public" whose interests must be considered in making the decision;
- Secondly, identifying the various "interests" applicable to an issue or decision;
- Thirdly, assessing and weighing each applicable "public interest," including balancing conflicting or competing "public interests".

In the first step the policy maker needs to identify the "public" whose interests must be considered. However, the issue of what constitutes the “public” in “public interest” has largely been unexplored. Most attempts to describe what is meant by the “public interest” refer to the “community”, “common” good or welfare, “general” welfare, “society”, “public” or the “nation”.

The second step is to determine the specific public interest objective or objectives. According to Wheeler (2016) these objectives can be obtained from various sources such as legislation, government policy or plans, or procedure manuals and delegations of authority, or through a consultative process to engage the relevant public on the matter.

The third step for a decision-maker is to assess and apply weightings/levels of importance to the identified public interests. Options available for making assessments as to what is in the public interest and the relative weightings to be given to competing or conflicting public interests would include:

- the revealed majority views or opinions of the public;
- the views of the elected representatives of the people; or
- an objective assessment of the public interests by an impartial person.

In practice, a policymaker will often be confronted by a range of conflicting or competing public interest objectives or considerations. As part of the third step, decision-makers also need to balance any such conflicting or competing public interests.

It is noted by Wheeler (2016) that the public interest is not a single, undifferentiated concept. It will often be multi-faceted, and the decision-maker will need to assess and weigh the relative importance of different aspects before deciding where the public interest lies. This final determination of the public interest will mean understanding what the conflicting aspects of the public interest are, and the relative significance that should be assigned to them in order to determine and serve the general "public interest". In some cases, one or more considerations will be so important that they will take precedence over all others. In other cases, the opposing considerations will be more finely balanced, resulting in a less obvious outcome.

Where there are conflicting or competing public interests, it may be possible to address them through compromise or the prioritisation of different interests. Sometimes it may be more appropriate to choose the 'least bad' option – the decision that causes the least harm rather than the most good. While there may be circumstances where public interest objectives are entirely incompatible where one must be chosen at the expense of the other, in practice it is more likely that there will be degrees of incompatibility between various objectives (Wheeler, 2016).

The ICAEW also proposed a framework or "step by step process" approach in determining the public interest in a particular circumstance, as they acknowledged that there is a wide set of individual circumstances, which a detailed definition of public interest would not be able to adequately cover without unintended consequences. Therefore, the ICAEW proposed a framework instead, allowing for variation in circumstances and public interest interpretations in the decision-making process. The aim of the framework is that it would be used to assist decision makers who claim to be acting, or implementing measures to act, in the public interest, to understand or test what they really mean (ICAEW, 2012).

The framework covers several stages such as:

- Justification of credentials of the individual or group seeking to represent the public and invoke the public interest. Trust in those claiming to be acting in the public interest is critical as a validation and as a motivation to comply.
- Identification of whether a matter is actually a public interest matter.
- Consideration of who the relevant public are, what they want and whether their wants contrast with needs or other constraints.

- Aggregation of sometimes conflicting inputs – those deciding on a public interest action must apply judgment to information acquired about individual desires. There may be a few measurement challenges to solve, including quantification, interaction, weighting, and determining how to maximize the ultimate outcome when there are multiple viable options.
- Outcome determination – to decide what outcome would be in the public interest, or, in the case of a range of possible positive outcomes a logical method is required to determine the public interest.
- Implementation of the desired action – if a proposed public policy action is in the public interest, it follows that it is in the public interest for that action to be implemented and implemented effectively. This requires post-decision action by those charged with implementation, following consideration of how best to do it.

In determining and assessing which of the CMA functions are in the public interest a similar approach to Wheeler (2016) and the ICAEW (2012) has been adopted for the purposes of this study.

2.4 FUNDING CMA FUNCTIONS

A CMA is a national public entity as defined under the Public Finance Management Act (Act No 1 of 1999) Schedule 3A. Part 2, Clause 11 of the NWA states that the Minister and the CMA "must give effect to any catchment management strategy established under this Part when exercising any power or performing any duty in terms of this Act."

Section 84 of the NWA gives the CMA full authority to raise funds for the purpose of exercising its powers and duties from various sources. The Act states that "a CMA must be funded by":

- Parliamentary appropriation
- Water use charges
- Money obtained from any other lawful source, which may include:
    - Recreational concessions;
    - License application fees;
    - Donor support and sponsorship;
    - Contractual payments;
    - Return on Investment; and
    - In-kind contributions.

Thus, the State must provide financial support to the CMA during the initial stages of its development to ensure that it can begin to implement the catchment management strategy (CMS). Pegram & Palmer (2001) and the Department of Water and Sanitation (2017) reinforce this idea, and state that water use charges should be set aside for the implementation of water resources management in the Water Management Area (WMA), and not be used for the establishment of new institutional arrangements.

DWS intends for the CMAs to be partly funded through water use charges. However, where subsidy arrangements exist, and for some ongoing functions, operational funding support from a parliamentary appropriation is likely to be necessary. This funding should be targeted towards the CMA functions that are in the public interest (Department of Water and Sanitation, 2017).

The DWS has advocated extensively for the funding of the public interest functions, which DWS terms as activities for "the public good". As described in Section 2.1 the use of the term "the public good" (not "a public good") by DWS can be understood to be interchangeable with the term "the public interest".

However, the term “the public good” should not be confused with “a public good” or “public goods” which refer to a type of good or product within economic theory. Therefore, to avoid any misinterpretations it is recommended that the term “the public interest” should be used for the 2022 update of the Raw Water Pricing Strategy when describing the CMA activities, instead of the term “the public good”.

Gildenhuys (1997) mentions that for financial purposes, services or functions may be classified as:

- Collective services, which are non-apportionable[1], non-exclusive[2] and inexhaustible[3] (the ‘public good’ services);
- Particular services, which are apportionable, exclusive and exhaustible (generally provided by the private sector); and
- Quasi-collective services, which have characteristics of both services.

Collective services are usually provided by the public sector, funded through taxation for which taxpayers do not get a direct return. Particular services are generally supplied by the private sector, although it may be made a public sector function through legislation, and consumers receive corresponding value for payment rendered for each discrete unit of the service. Pegram & Palmer (2001) classify water resources management as a quasi-collective service, with certain functions (such as ensuring resource sustainability through the Reserve) being collective in nature, while the functions ensuring reliable availability of water of adequate quality for users are more particular in nature. This differentiation is important when considering the funding flows for the different CMA functions.

Based on this classification of the activities of CMAs, the costs of water resources management may be funded through a mixture of parliamentary appropriations (taxation) and revenue collected directly from consumers of water (water user charges). Pegram & Palmer (2001) suggest that it may be more appropriate for the fiscus to cover functions that are non-apportionable and non-exclusive, although this is not always a clear distinction. An example given by Pegram & Palmer (2001) is the allocation to the ecological reserve, which provides for sustainable functioning of the resource and in some cases the protection of systems with national importance. It may be argued that this should be funded from the general taxation through the parliamentary appropriation, because it benefits current and future generations of the country as a whole. On the other hand, the local users may not be able to use the resource at the same level in the future if the reserve is not maintained, which may imply that they have a responsibility to contribute to its maintenance.

Pegram & Palmer (2001) suggest that user charges for quasi-collective services should cover the operating costs of providing the service to users, while the capital cost should be financed through taxation. According to this, the capital costs of establishing a CMA should be funded through an allocation from the fiscus. Similarly, they suggest that the capital and operation costs that would be incurred in managing a pristine water resource without users should be funded through parliamentary appropriation. The additional capital and operating costs required to manage the use of water should be financed through user charges. Although Pegram & Palmer believe that this is theoretically sound, determining the difference is not easy in practice, and the distinction between the capital and operating costs of quasi-collective services is not useful, as it could be argued that one is only incurred because

[1] Services that cannot be divided into consumption units and can therefore not be supplied per unit according to a market demand and sold at a price per unit determined by the free interaction of supply and demand in the market-place.

[2] Members of the public cannot, under normal circumstances, be excluded from utilising such services, irrespective of whether they are paying for them or not.

[3] Services that cannot become depleted in the process of utilisation. Given adequate maintenance, the services remain available to the public.

of the other and the source of the funding should depend on the type of function or activity, rather than the classification of expenditure.

3. WORKING PRINCIPLES AND DEFINITIONS

The process undertaken to classify the water resource management functions and/or activities of CMAs as being in the public or private interest (or a combination of these) is described below. Firstly, the term 'public interest' is defined, and secondly a series of guiding principles are identified and applied to the CMA's functions/activities to determine which are in the public interest.

3.1 DEFINITION OF PUBLIC INTEREST

The definition of public interest is:

"Public interest refers to the interests of the public at large, and not only those of the parties who are directly affected."

This definition is broad, but when applied to specific functions or activities, it illustrates which of these have effects outside of the directly affected parties and could therefore have a public interest component.

When the definition of public interest is applied to CMA functions, it is:

"A function or activity is at least partly in the public interest if it has a benefit that is experienced not only by the customers of the CMA."

A few other terms are used in the application of the term 'public interest' to the CMA functions. These terms are defined below:

- Customers: A party that contracts directly with the CMA (i.e. they pay user charges to the CMA). Includes municipalities, water boards, agricultural users, and stream flow reduction activities. Schedule 1 users are not customers of the CMA. The interests of customers we have termed 'private' interests.
- Public at large: Includes all parties affected by the activities of the CMA. Includes customers, Schedule 1 users, parties outside of the catchment, users of the environmental reserve, and possibly other countries.
- Benefits: There are two primary benefits that the public at large can experience as a result of the activities performed by CMAs:
    - Ensuring security of water supply. This includes ensuring that there is an economically and socially optimum allocation of water between customers, other users, ensuring adequate allocations to the ecological reserve and to meet international commitments. This will also include the monitoring of water use, and the enforcement of compliance. In general, there is a significant public interest in ensuring that there is a security of water supply, so activities that affect water resource availability typically have a public interest component.
    - Ensuring quality of water by monitoring and enforcing compliance with quality standards.
    - There is the additional benefit of disaster preparedness and disaster management that is in the public interest, as it affects the public at large, and not only the customers of the CMA.

3.2 OVERARCHING PRINCIPLES OF TAXATION, PUBLIC SPENDING & AVOIDING DOUBLE PAYMENT

If it is determined that there is a public interest component of the CMAs functions, the costs of implementing this portion of the function or activity should be funded from the fiscus. This funding arrangement should adhere to a set of broad, public finance principles. These principles include neutrality, efficiency, certainty and simplicity, effectiveness and fairness, and flexibility. The principles are defined in the glossary of terms in the beginning of this report.

There is a risk that customers may perceive that they are paying twice for services rendered by the CMAs for which they are receiving a benefit, as they are paying tax which contributes towards the public interest component of the activity, and they are paying again through their water resource management charge. We do not believe that this perception is accurate, as the principle being applied is that customers are only paying for the additional benefit that accrues to them because of the CMA's activities, where the funding from tax revenue is intended to cover only the base benefit that accrues to customers as members of the public at large.

3.3 QUESTIONS AND PRINCIPLES TO IDENTIFY PUBLIC INTEREST ACTIVITIES

Any activity that has a benefit that is experienced by a broader group than CMA customers alone has a public interest component. In other words, if the benefit of an activity is experienced *not only by* the CMA customers, then it has a public interest component. If a customer is receiving a benefit that is additional to that experienced by other affected parties, then the customers should pay for the additional benefit accrued. The remainder is in the public interest, as the CMA cannot levy a charge on non-customers and hence the benefit will need to be paid for by the fiscus.

If the customer is receiving no additional benefit compared to non-customers, then the activity is exclusively in the public interest.

The benefits experienced by the respective parties will vary depending on the activity that is being performed. When the benefits of an activity that are experienced by CMA customers is larger than that experienced by others, it can be expressed in one of three categories:

- The extent of benefits experienced by CMA customers as a separate group from the public is significantly higher than the extent experienced by the public at large: mostly private = 20% to 40% public
- The extent of the benefits experienced by CMA customers as a separate group from the public is approximately the same as that experienced by the public at large: Even mix = 40% to 60% public
- The extent of benefits experienced by CMA customers as a separate group from the public is significantly lower than the extent experienced by the public at large: mostly public = 60 to 80% public

If an activity has benefit to customers only, then the customers should be responsible for paying for the whole cost incurred in the creation of that benefit. A useful check for this is: "Would this activity need to be undertaken even if there were no CMA customers?" If the answer to this question is no, then this activity is 0% in the public interest. If the answer is yes, then there is at least some public interest component to the activity or function. The polluter pays principle has been applied as it relates to the achievement of water quality objectives; if the customers are responsible for reducing water quality, then they are responsible for paying the Waste Discharge Charge, and the regulatory and testing costs to ensure that water quality objectives are met.

3.4 FUNDING THE PUBLIC INTEREST FUNCTIONS

Any water resource management function/activity that only benefits or disbenefits the users should be funded from the user charges. Public interest functions/activities, or the portion of a function/activity that is in the public interest, should be funded from the fiscus. If a function or activity affects non-users, as well as users, there is an argument made for this function having a public interest component. In this case there will be a portion funded from the fiscus, and a portion funded from user charges.

4. DETERMINING THE PUBLIC INTEREST FUNCTIONS

The CMAs and proto-CMAs are performing a set of functions, as outlined in the NWA, and amended over time as functions mature and additional functions are delegated to the institutions. The 11 functions (as outlined in the 2015 pricing strategy) are:

1. Catchment management strategy (CMS) & water resources planning
2. Resource directed measures
3. Water use authorization
4. Control and enforcement of water use
5. Disaster management
6. Water resource management (WRM) programmes
7. Water related institutional development (stakeholder management empowerment)
8. Water weed control
9. Maintenance and restoration of ecosystems to improve water resources
10. Geo-hydrology and hydrology
11. Administration and overheads

The budgeting of the CMAs and proto-CMAs is still in line with the 2007 functional classifications, which are different to those described above. The 2015 categorisation has not been formally implemented, and the 2023 review of the Pricing Strategy will use the 2015 functional classification listed above.

Each of these *functions* is made up of several *activities*. These activities, and the respective responsibilities between CMAs/proto-CMAs, the DWS Regional Offices and the DWS Head Office, have been agreed to by the relevant stakeholders. This research investigates only those activities performed by the CMAs, and not those of the Regional Offices and Head Office. The principles described in Section 3 above have been applied to the water resources management activities undertaken by CMAs.

Applying the principles to CMA activities

Activities related to disaster management, geo-hydrology and hydrology, resource directed measures, and administration & overheads are mostly private. They benefit CMA customers directly by ensuring the security of their water allocations and water quality. They also benefit the rest of the public at large by ensuring the security of the ecological reserve and international commitments. Given the volumes of water allocated to these different needs, the bulk of the benefit is towards the CMA customers and these activities are thus mostly in private interests, with a small public interest component.

Activities related to water use authorization, compliance monitoring and enforcement should be paid for by the customers who are being assessed or having licenses issued to them and are thus completely in the private interest.

Activities related to ensuring water quality are mostly in the private interest. Customers of the CMA should be extracting water from the resource in accordance with their abstraction licenses, and they may be degrading water quality based on the wastewater they are discharging into the environment. Thus, the customers should pay for the benefits that they will receive from improved water quality.

Developing an appropriate catchment management strategy, maintaining ecosystems, and implementing water resource management programs have benefit throughout the catchment to all users and to the environment, as well as to meet international obligations and are therefore mostly or entirely in the public interest. There are also some functions which relate to the assessment and classification

of dams which are exclusively in the public interest due to the dispersed benefit that water resource infrastructure has in the catchment.

Institutional development is an exception to the principles. It is typically a function that is related to the existing institutions and stakeholders, and therefore these costs are incurred by the customers of the CMA. However, the CMAs are also responsible for broadening the stakeholders that are being consulted by the CMAs. This broadening includes incorporating resource poor farmers, which is in the public interest, and thus there is a public interest component in this function.

Weighting the CMA activities

The proportion of each activity that is in the public interest was then weighted and combined to determine what proportion of each of the 11 functions is in the public interest. Activities were evenly weighted within a function unless there was a sensible reason to apply uneven weightings. The percentage of each function that is in the public interest was then applied to the calculated cost benchmark on that function and aggregated to determine the cost of a CMAs operations that are incurred in the public interest.
This process is, by its nature, a subjective exercise, and there were three approaches taken to address this subjectivity.

Firstly, there has been previous work undertaken on the public interest function of CMAs. This work identified some aspects of the public interest, and this was incorporated into the research. As a part of this, submissions on the definition and identification of the public interest activities that had previously been submitted by CMAs were included in the assessment.

Secondly, DWS contributed to the research by describing the extent to which it is believed each of the activities or functions are in the public or private interest. Given the subjective nature of the research, results are calculated in a lower and upper bound. The results presented in this report are the median results, as this best represents a balance between the different interests of the parties.

Finally, the research team applied its judgement to the balance of evidence proposed, the previous research undertaken on this subject in South Africa and international research that has been conducted to estimate the costs of water resources management and the public interest component thereof.

Deciding what is in the public interest is inherently a subjective process and so there is acknowledged subjectivity in the selection of these percentages. The consultative process followed allows for a balanced interpretation of the extent of the public interest components of the different CMA functions.

Table 1 below describes each of the 11 CMA functions, and the activities that make them up, as they relate to the public interest. The process above was applied to the CMA functions, whereby the activities within each of the functions were investigated to determine who the beneficiaries of the activity are, the extent to which these beneficiaries can and should be charged for the benefit accrued, and how the different interests can be weighed against one another to determine the proportion of the cost which should be funded from the fiscus as it is in the public interest.

Table 1: Public interest components of CMA functions (2015 Draft Pricing Strategy classification)

No	Function	Activities	Beneficiaries	Classification	Rationale	Function % public
1.	**Catchment management strategy and Water resources planning**	Resource studies, investigations and integrated strategy development at catchment level	All	Even mix	The public at large benefits from efficient water resource management planning. Customers experience additional benefits from efficient planning through improved water quality and ensured water resource availability.	67%
		Water allocation administration	All	Public		
		Water quality management plan	All	Even mix		
2.	**Water related institutional Development (Stakeholder Management empowerment)**	Stakeholder participation, empowerment, institutional development & coordination of activities	All	Mostly private	Customers will benefit from involvement in the stakeholder participation process. There is a public interest in expanding the institutional development to non-customers who are affected by the activities of the CMA.	20%
		Establishment and regulation of water management institutions (e.g. WUAs)	Customers	Private		
		Stakeholder consultations	Customers	Private		
		Capacity and Empowerment of stakeholders	All	Mostly private		
3.	**Disaster management/Pollution control and emergency incidents**	Planning and preventative management of disaster including risk monitoring (Management)	All	Mostly private	This function is largely to do with the planning for disaster management and pollution control. The CMA participates in municipal processes as the representative of the customers. The municipality is responsible for representing other interests, including those of the Schedule 1 users. Therefore, this function is mostly in the private interest.	30%
		Pollution incident planning and response (management)	All	Mostly private		

No	Function	Activities	Beneficiaries	Classification	Rationale	Function % public
4.	**Maintenance and restoration of ecosystems to improve water resources**	Adopting of rivers by doing the following activities: Removal of solid waste in and around the river. Invasive plants removal on the river banks and within the river. Identify sources of pollution and other impacts to the river like soil erosion; develop interventions to curb further pollution and degradation of rivers. Monitoring (taking samples, in-situ monitoring of water quality, mini SASS, visual assessments) of the rivers. Stabilization and restoration of river banks by vegetating indigenous trees. Rehabilitation of the eroded river banks.	All	Mostly public	Public at large will benefit from improved ecosystem health. Customers benefit additionally in the form of improved water quality.	70%
5.	**Water use authorization**	Water use authorization [Registration of water use (Include Validation and verification of registered water use)]	Customers	Private	Public at large benefits from the economically and socially efficient allocation of water. Customers benefit directly from their water use allocation and should pay for this benefit.	0%
		Maintenance of water management area register of water use	Customers	Private		
		Revenue management with the following charges Set, consult and collect WRM charges in the water management area aligned to the pricing strategy	Customers	Private		
		Abstraction & stream flow reduction activities Authorization	Customers	Private		

No	Function	Activities	Beneficiaries	Classification	Rationale	Function % public
		Waste discharge activities Authorization	Customers	Private		
6.	**Geo-hydrology and hydrology**	Groundwater and surface water and eco system (quality) monitoring in respective catchment areas	Customers	Mostly private	This is the baseline for monitoring and enforcement, related to water quality and water resource availability. This benefits the public at large. Customers benefit from improved data availability for water resource management activities.	30%
		Maintaining the geo-hydrological database & compilation of information in respective catchment areas	Customers	Mostly private		
7.	**Resource directed measures**	Implement programmes to monitor Resource Quality Objectives (RQOs)	Customers	Private	Customers benefit from the improved water quality and should pay for the regulatory and operational activities associated with the management of their own water abstraction.	0%
		Implement source-directed controls to achieve resource quality objectives	Customers	Private		
		Report against the achievement of the Class and RQOs	Customers	Private		
		Report on the water balance per catchment (i.e. water available for allocation after consideration of ecological requirements)	Customers	Private		
8.	**Water resources management programmes**	Integrated Water resources programmes	All	Public	Design, management and implementation of water resource management programmes benefits public at large, international obligations and the ecological reserve. Customers benefit additionally from improved water quality and availability and should pay for a portion of the benefit.	53%
		Implementing of Water management strategies (e.g. Water conservation and demand management)	All	Mostly private		
		Implementing of Water management strategies (e.g. cleaner technology, dense settlements, waste discharge strategies)	All	Mostly private		

No	Function	Activities	Beneficiaries	Classification	Rationale	Function % public
9.	**Control and enforcement of water use**	Compliance Promotion and audit sampling (users discharge)	Customers	Private	Public at large benefits from investigations of water crimes occurring in the catchment. Using the polluter-pays principle, the customers should pay for the regulatory functions associated with monitoring their activities.	0%
		Monitoring of water users (per sector: public institutions, mining, industry, agriculture and dam owners)	Customers	Private		
		Enforcement of Water Use (e.g. enforcing meter installations, suspending entitlements, enforcing licence conditions)	Customers	Private		
		To conduct investigations of water crimes are conducted in relation in accordance with the National Water Act and other relevant legislations.	Customers	Private		
		Implementation of Strategies, SP's tools and guidelines	Customers	Private		
		Compilation, Serve and implement administrative notices	Customers	Private		
		Abstraction & stream flow reduction activities control	Customers	Private		
		Waste discharge control	Customers	Private		
		Classification of dams	Customers	Private		
10.	**Water weed control**	Aquatic weeds control	All	Mostly public	Public at large will benefit from improved ecosystem health. Customers benefit additionally in the form of improved water quality.	70%

No	Function	Activities	Beneficiaries	Classification	Rationale	Function % public
11.	**Administration & Overheads**	Administration& overheads for regional office or CMA	All	Mostly private	The costs of the public interest are already incorporated into the other 10 functions (including staff costs allocated to these functions), so this function is about the management of the institution to benefit customers (billing, management, etc.) so is mostly in the private interest. The small public interest component is to ensure the sustainability of the overhead component of the CMA. By ensuring that the CMA is reliant on the tariff revenue, it encourages the CMA to bill and collect revenue.	30%

5. COSTING THE CMA FUNCTIONS

Costing the public interest functions requires establishing the cost of each of the 11 CMA functions and applying the percentages determined in Section 4 to determine what proportion of the total cost is in the public interest. Simply put, the 'cost' of a function could simply be assumed to be the amount that a CMA spends in executing that function. There are several concerns here. Different CMAs spend different amounts on each function. Differences may be driven by underlying cost drivers (such as different geographic footprints or numbers of customers), varying levels of efficiency or varying levels of under-expenditure. When deciding how much of an expenditure to fund from the fiscus, it is important that the expenditure funded is both effective and efficient. This typically requires establishing some sort of 'benchmark' cost for a function. Cost benchmarking is a complex exercise often limited by the data available.

This section provides an overview of CMA budgeting and tariff-setting, which informs the data available for costing the CMA functions. It then discusses the approach adopted in determining cost benchmarks and the basis of calculations applied as well as key assumptions made. Results of the costing are then presented.

5.1 OVERVIEW OF CMA BUDGETING AND TARIFF-SETTING

As of early 2022, the two existing CMAs and seven existing proto-CMAs each implement a zero-based budget at the start of their budget cycle. Each of the General Ledger items are projected to the following year based on the anticipated requirements for the year ahead. The one important exception to this is the budgeting for employee related costs, for which the CMA or proto-CMA projects their expenditure based on the current organogram, and not the ideal organogram. The ideal organogram for each of these institutions is contained in their business plans.

The full-cost tariffs are calculated based on total ideal expenditure as calculated in the zero-based budget, divided by the higher of the yield or registered volume of water licensed or abstracted in the water management area. However, these are not necessarily the final tariffs that are approved, as there are limits to the extent to which the tariff can change (known as 'capping'). If the tariff increase is capped, and hence the revenue likely to be lower than the amount required to cover the cost of the zero-based budget, the institution must identify areas in which to cut expenditure. The zero-based budgets available for this research were for the financial year 2022/23.

This system has evolved from a previous budgeting system whereby the CMAs and proto-CMAs would create budgets based on an aspirational level of expenditure, which they would spend based on the available revenue. This data is available for the financial years 2016-2021. A combination of full-cost zero-based budgeting and the historical aspirational budgeting have been used to determine the actual cost of CMA activities.

5.2 COSTING METHODOLOGY

Three different approaches were used to determine the cost of the CMA functions. These are described in the sections that follow.

5.2.1 BUDGETED EXPENDITURE APPROACH

As described above, the CMAs and the proto-CMAs will annually produce a zero-based costing estimate of the expenditure required to fulfil their legislated obligations. Once adjusted for the full organograms, this represents the organisation's own best estimates of the cost of the CMA functions. The costing model created for this study can use this information to determine the public interest subsidy required.

5.2.2 UNIT COST APPROACH

In order to determine what 'should' be spent on an activity, there is a need for a benchmark cost of some sort. The determination of the benchmark can be approached in two different ways. These are described below.

The first way to determine the benchmark cost of an activity is a 'relativist' approach, whereby the expenditure of one entity performing an activity is compared to the expenditure of another entity performing the same activity, which is known to be performing the activity well. For example, in the case of CMAs and proto-CMAs, the expenditure of the Vaal proto-CMA on Institutional Development could be compared to that of the Limpopo-North West proto-CMA on Institutional Development, and an assessment could be made on the performance of these (and other) CMAs as they relate to Institutional Development to determine the efficient level of expenditure on the function. These costs can be normalised to a technical indicator of the scale of activity of some sort. It is intuitive, for example, that a CMA that covers a larger area will spend more on functions that are affected by the area covered. Other examples that can be used to normalise include the registered use or yield in the CMA or the number of customers or population served.

The second approach to determining a benchmark cost is a zero-based approach. This approach is based on developing costing norms (cost per unit) and applying them to the various functions that a CMA performs. A zero-based benchmarking approach is thus focussed on building up a bottom-up estimate of what should be spent by a CMA. It is more closely aligned with the zero-based budgeting approach referred to previously. The complexity in this approach is in determining the costing norms. For clearly defined, well established activities, there may be international benchmarks that can be drawn on, but this is seldom the case. The source of the costing norms is thus typically data on actual expenditure by the entity being investigated and so both approaches are often based on the same datasets: expenditure by existing entities.

Neither of the above methods of cost benchmarking is 'correct', but both will provide an indication of the actual cost of performing a function. This study on the costing of the public interest function combines elements of both approaches. The 2022/23 zero-based budgets were available to the research team, and the budgeted expenditure for the period 2016-2021 was also available. This data is broken down into the 11 different functions of the CMAs or proto-CMAs. The General Ledger items are also broken down into type of cost (such as employee related cost, advertising, communication, consumables, contracted services, etc.). The employee related costs are amended to reflect the ideal staffing structures which are outlined in the business plans of the respective CMAs. The costs of the top management and board are incorporated into the ideal costing structures of the CMAs which is taken from the business plans for the CMAs.

A combination of full-cost zero-based budgets and the historical aspirational budgeting are used to determine the actual cost of CMA activities. The use of financial data over a six-year period accounts for the unpredictable nature of spending on items such as catchment management strategies or other large operational expenditure items. Given that the majority of the CMA expenditure is on employee related costs, the expenditure is relatively equal year-to-year.

An analysis of the cost drivers of CMAs was conducted for this research. It found that the area of the CMAs, the population served, and the registered yield volume in each of the CMAs will affect the cost of each of the

CMA functions. These cost drivers have been considered as the bases for the costing model. The data was sourced from the business plans for the six proposed CMAs.

Table 2: Physical properties of six proposed CMAs

	Registered volume (Ml)	Population size	Area
Limpopo-Olifants CMA	3 767 940 628	15 000 000	183 125
Inkomati-Pongola CMA	2 370 210 700	2 153 500	45 918
Mkuze-Mtamvuna CMA	2 778 000 000	11 705 497	84 064
Vaal-Orange CMA	8 542 687 374	12 600 000	600 990
Mzimvubu-Tsitsikamma CMA	1 976 163 129	7 170 793	163 173
Breede-Olifants CMA	2 880 773 260	7 262 734	142 502

For three of the CMA functions (namely disaster management, geo-hydrology and hydrology and resource directed measures) there are no entities that are currently performing the function. In this case the entered budgeted data is used to calculate the cost.

Unit costs are calculated as the weighted average of the actual level of expenditure per function over the previous six years. This does not include a weighting for performance, and therefore there is an inherent level of inefficiency and/or underperformance of the calculated unit costs.

5.2.3 MINIMUM COST APPROACH

The two approaches described above are applied for each of the 11 different CMA functions. The third costing approach uses the lower of the unit costing approaches and the budgeted expenditure approach, per function.

5.3 RESULTS

5.3.1 RESULTS OF UNIT COST ANALYSIS

The unit costs for each CMA and the benchmark unit cost applied are presented below for each function. While area and population served were considered as bases for the unit costs, the analysis revealed that the registered volume of water in the catchment best describes the actual level of expenditure for all of the CMA's functions. Recall that the benchmark is a weighted average of the unit costs for each CMA.

CATCHMENT MANAGEMENT STRATEGY AND WATER RESOURCES PLANNING

Registered volume was selected as a cost driver for Catchment Management Strategy (CMS) and Water Resources Planning. The results of the unit cost analysis are shown in Figure 1 below.

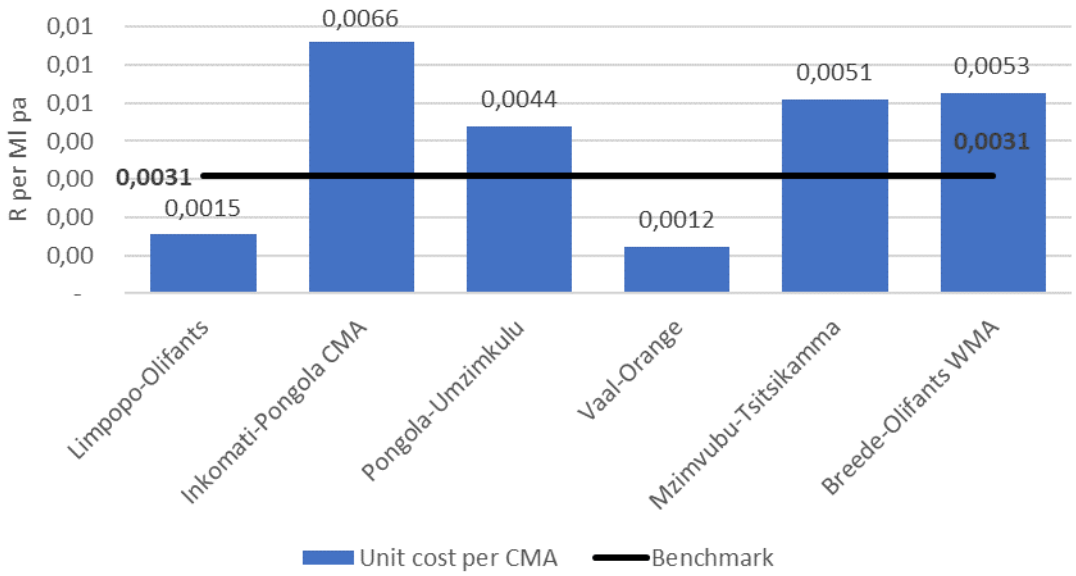

Figure 1: Cost comparison and benchmark cost for CMS and Water Resources Planning.

INSTITUTIONAL DEVELOPMENT

Registered volume was selected as a cost driver for Institutional Development. The results of the unit cost analysis are shown in Figure 2 below.

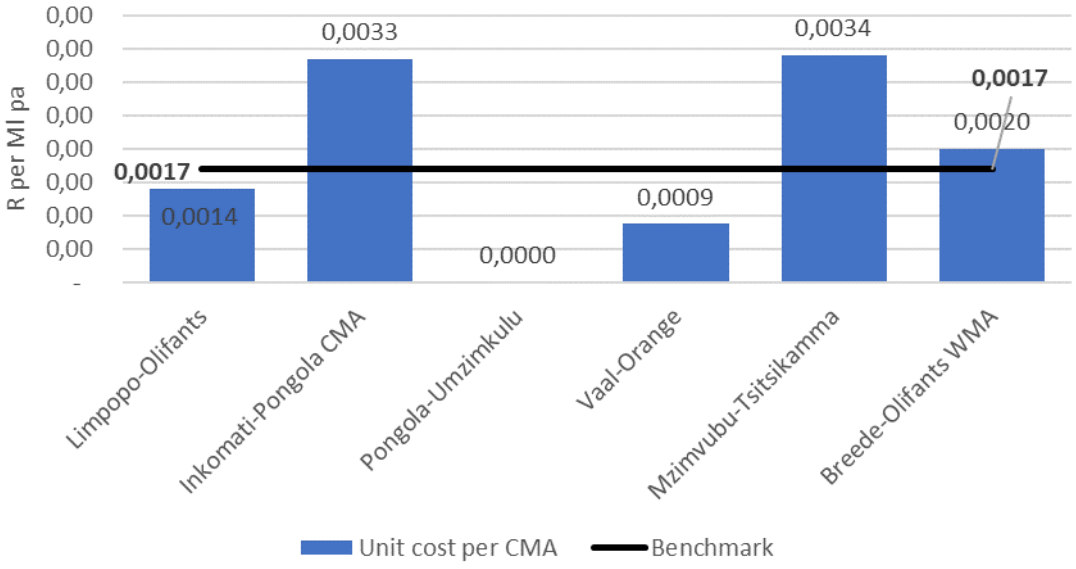

Figure 2: Cost comparison and benchmark cost for Institutional Development.

DISASTER MANAGEMENT

None of the proto-CMAs currently undertake this function and there is thus no basis for costing this. It is omitted from the unit cost-based analysis.

WATER WEED CONTROL

Area was selected as a cost driver for Water Weed Control. The results of the unit cost analysis are shown in Figure 4 below.

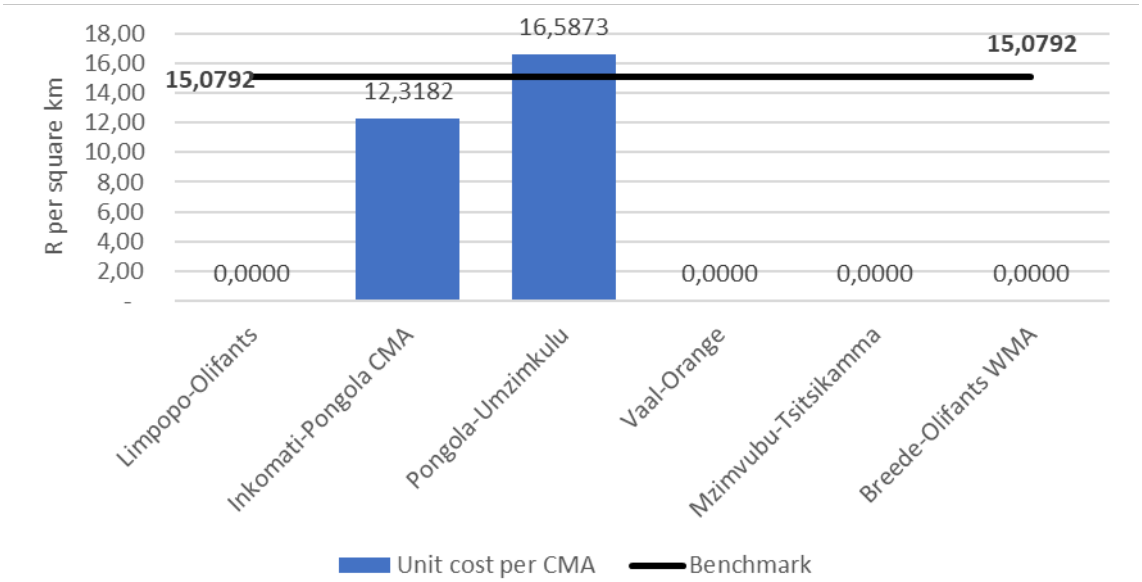

Figure 3: Cost comparison and benchmark cost for Water Weed Control

Water wee control was only performed by two CMAs, and therefore the unit cost for this function is likely to not represent the actual cost of performing this function adequately.

MAINTENANCE AND RESTORATION OF ECOSYSTEMS

Registered volume was selected as a cost driver for Maintenance and restoration of ecosystems. The results of the unit cost analysis are shown in Figure 4 below.

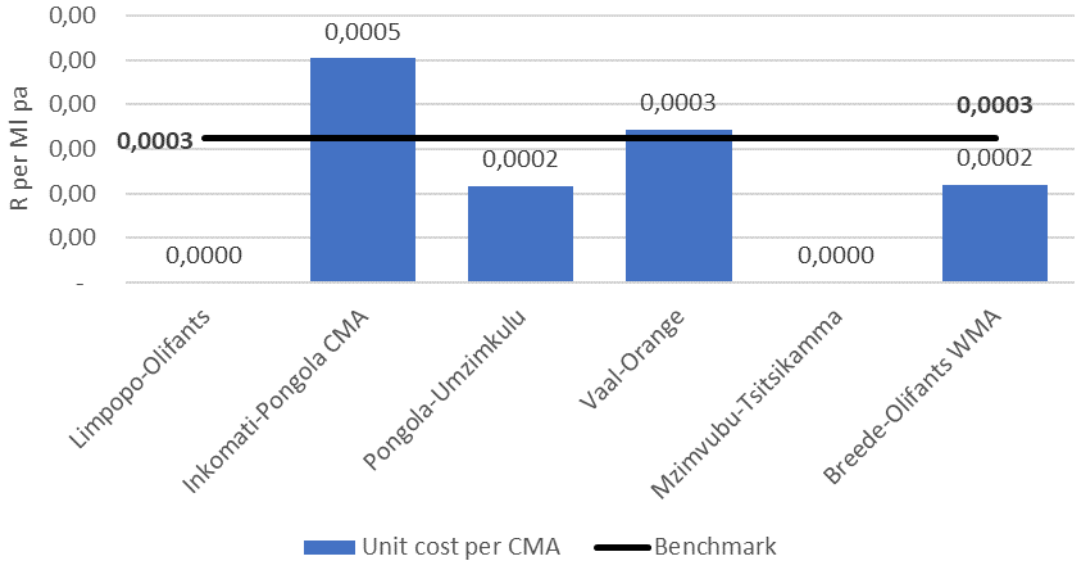

Figure 4: Cost comparison and benchmark cost for Maintenance and Restoration of Ecosystems

WATER USE AUTHORISATION

Registered volume was selected as a cost driver for Water Use Authorisation. The results of the unit cost analysis are shown in Figure 5 below.

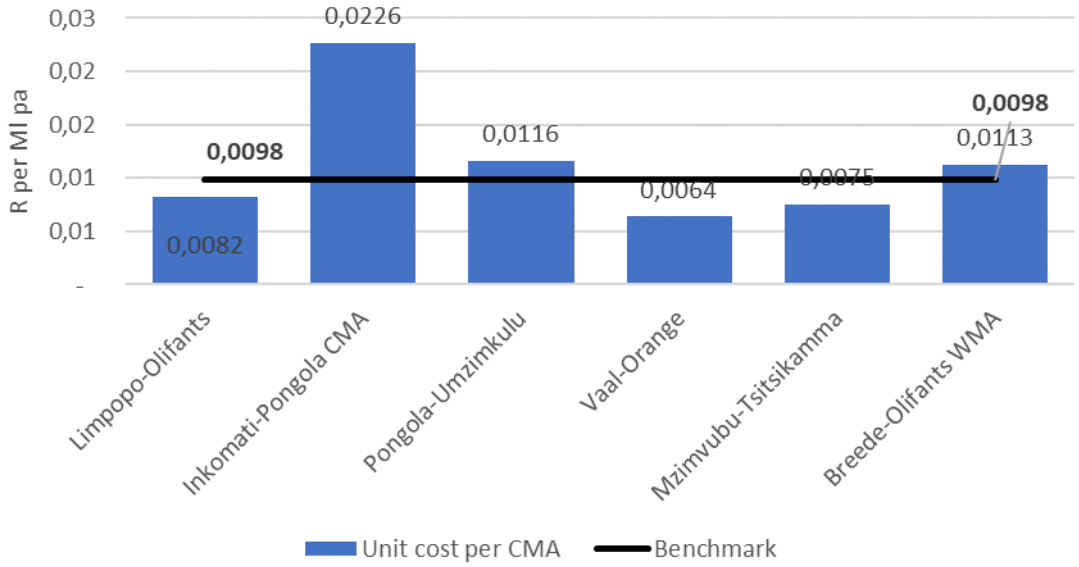

Figure 5: Cost comparison and benchmark cost for Water Use Authorisation.

GEO-HYDROLOGY AND HYDROLOGY

None of the proto-CMAs currently undertake this function and there is thus no basis for costing this. It is omitted from the unit cost-based analysis.

RESOURCE DIRECTED MEASURES

None of the proto-CMAs currently undertake this function and there is thus no basis for costing this. It is omitted from the unit cost-based analysis.

WATER RESOURCE MANAGEMENT PROGRAMMES

Registered volume was selected as a cost driver for Water Resource Management Programmes. The results of the unit cost analysis are shown in Figure 6 below.

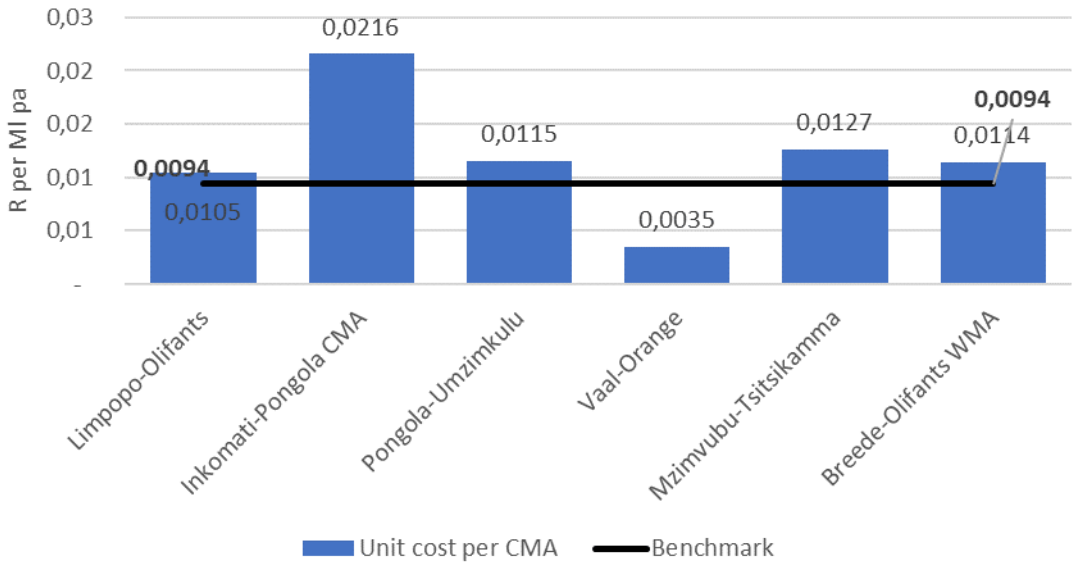

Figure 6: Cost comparison and benchmark cost for Water Resource Management Programmes.

CONTROL AND ENFORCEMENT

Registered volume served was selected as a cost driver for Control and Enforcement. The results of the unit cost analysis are shown in Figure 7 below.

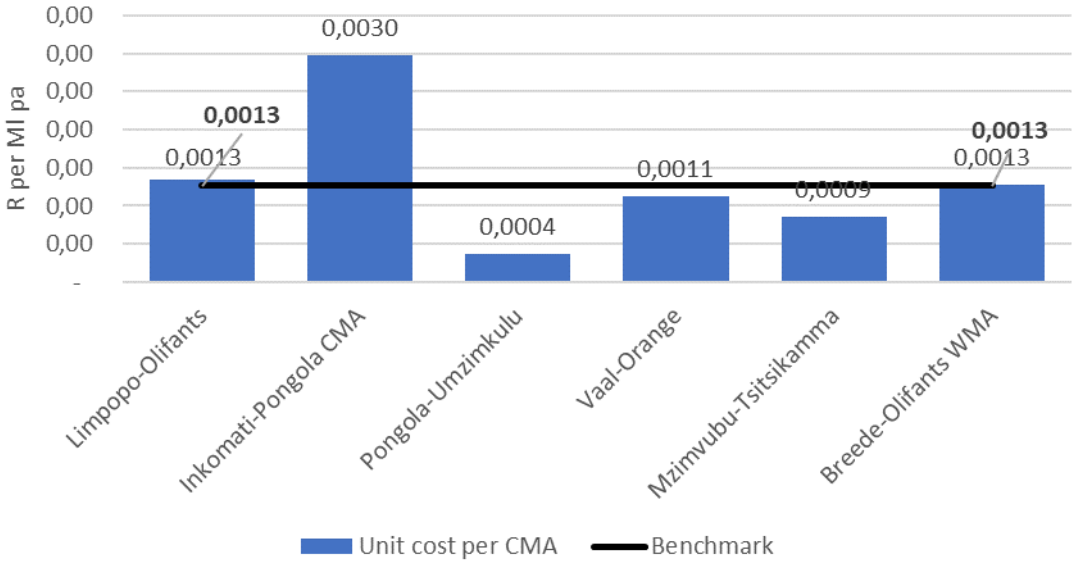

Figure 7: Cost comparison and benchmark cost for Control and Enforcement.

ADMINISTRATION AND OVERHEADS

Registered volume was selected as a cost driver for Administration and Overheads. The results of the unit cost analysis are shown in Figure 8 below.

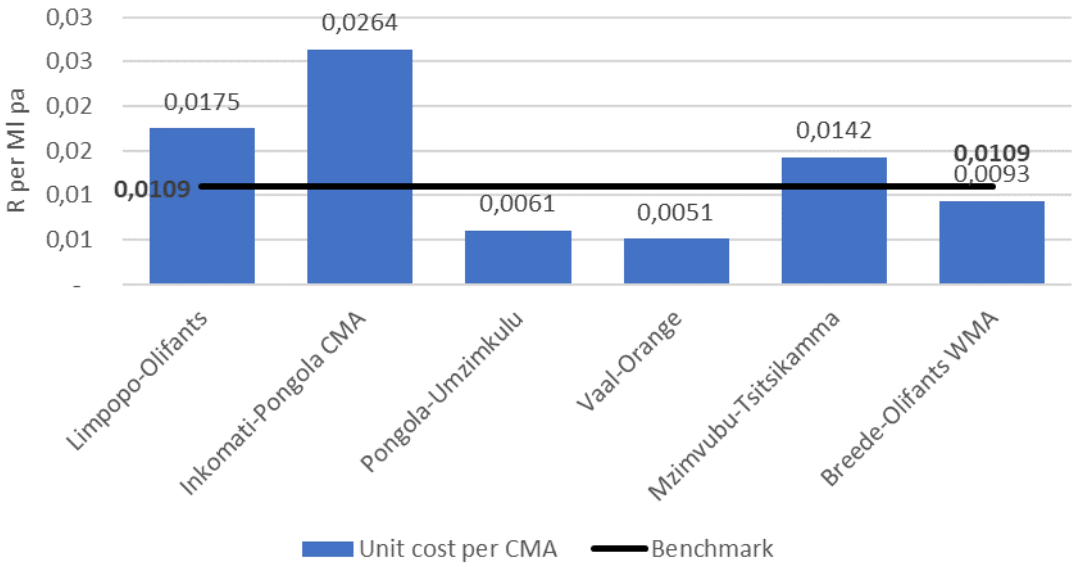

Figure 8: Cost comparison and benchmark cost for Administration and Overheads.

SUMMARY OF UNIT COST ANALYSIS RESULTS

The results of the Unit Cost analysis are shown in Table 3 below.

Table 3: Cost of performing function, per CMA (2023) calculated by unit cost approach

	Limpopo-Olifants CMA	Inkomati-Pongola CMA	Mkuze-Mtamvuna CMA	Vaal-Orange CMA	Mzimvubu-Tsitsikamma CMA	Breede-Olifants CMA
CMS & water resources planning	R 11 698 220	R 7 358 727	R 8 624 779	R 26 522 243	R 6 135 338	R 8 943 856
Institutional development	R 6 412 770	R 4 033 932	R 4 727 961	R 14 539 054	R 3 363 291	R 4 902 874
Disaster management	R0	R0	R0	R0	R0	R0
Water weed control	R 2 761 376	R 692 404	R 1 267 618	R 9 062 436	R 2 460 512	R 2 148 815
Water use authorization	R 36 876 671	R 23 197 149	R 27 188 165	R 83 606 910	R 19 340 623	R 28 194 003
Geo-hydrology and hydrology	R0	R0	R0	R0	R0	R0
Resource directed measures	R0	R0	R0	R0	R0	R0
Maintenance and restoration of ecosystems	R 1 219 576	R 767 170	R 899 160	R 2 765 026	R 639 628	R 932 425
WRM programmes	R 35 474 253	R 22 314 963	R 26 154 201	R 80 427 343	R 18 605 100	R 27 121 786
Control and enforcement	R 4 755 406	R 2 991 373	R 3 506 031	R 10 781 472	R 2 494 057	R 3 635 738
Administration and overheads	R 41 143 055	R 25 880 904	R 30 333 654	R 93 279 669	R 21 578 203	R 31 455 860
TOTAL	**R 140 341 327**	**R 87 236 621**	**R 102 701 568**	**R320 984 152**	**R 74 616 751**	**R107 335 356**

5.3.2 RESULTS OF BUDGETED EXPENDITURE APPROACH

The budgeted expenditure approach uses the zero-based budgets of the CMAs, moderated upward by the cost of a full organogram. The overall cost of the public interest subsidy is very similar between the budgeted expenditure and the unit cost approaches, but the difference between the CMAs is extensive. This is particularly relevant for the Vaal-Orange CMA, which has very high levels of registered volume (more than twice as much as the second largest in the country), as well as the two established CMAs, which would receive less subsidy under the unit cost approach, for the reasons mentioned above. The modified budgets for the CMAs are shown in Table 4 below.

Table 4: 2023/24 budgets for CMAs

	Limpopo-Olifants CMA	Inkomati-Pongola CMA	Mkuze-Mtamvuna CMA	Vaal-Orange CMA	Mzimvubu-Tsitsikamma CMA	Breede-Olifants CMA
CMS & water resources planning	R4 985 529	R13 355 253	R13 973 536	R9 632 105	R10 898 772	R26 711 526
Institutional development	R3 607 098	R5 424 292	R0	R9 196 844	R6 599 505	R7 484 555
Disaster management	R0	R0	R0	R0	R0	R0
Water weed control	R500 000	R5 062 017	R500 000	R6 181 489	R500 000	R500 000
Water use authorization	R23 007 241	R29 452 214	R32 756 957	R46 339 877	R15 135 161	R28 754 239
Geo-hydrology and hydrology	R0	R0	R0	R0	R0	R5 078 383
Resource directed measures	R0	R0	R0	R0	R0	R0
Maintenance and restoration of ecosystems	R0	R0	R0	R0	R0	R13 332 350
WRM programmes	R33 951 203	R31 747 599	R36 294 820	R37 765 910	R25 646 636	R23 713 039
Control and enforcement	R3 370 753	R6 581 777	R1 001 394	R14 884 789	R1 892 491	R11 476 184
Administration and overheads	R62 407 187	R40 414 847	R17 344 926	R54 969 548	R36 232 254	R29 380 898
Total	**R131 829 011**	**R132 038 000**	**R101 871 633**	**R178 970 563**	**R96 904 819**	**R146 431 175**

There were not available for disaster management and resource directed measures, as no CMA is currently performing these functions.

5.3.3 RESULTS OF MINIMUM COST APPROACH

The minimum cost analysis selects the lower of the unit cost analysis and the budgeted expenditure analysis, per function. The total allocation to CMAs is shown in Table 5 below.

Table 5: Total cost of performing functions, per CMA (2023)

Cost per function	2023
Limpopo-Olifants CMA	R111 784 454
Inkomati-Pongola CMA	R87 236 621
Mkuze-Mtamvuna CMA	R86 440 586
Vaal-Orange CMA	R177 632 271
Mzimvubu-Tsitsikamma CMA	R67 849 212
Breede-Olifants CMA	R105 281 216
Total	**R636 224 360**

5.3.4 FAVOURED COSTING APPROACH

In principle, the unit cost analysis is the preferred approach to calculate the ideal level of expenditure for the CMAs, however, in this case it is difficult to make comparisons between the CMAs. Two CMAs are established and are therefore more mature institutions than the proto-CMAs. The established CMAs also incur additional costs that the proto-CMAs are not yet incurring. Additionally, the unit costs are not moderated for performance or inefficiency and may therefore may not be the costs that best represent an optimal level of expenditure.

As a result of these constraints, the established CMAs appear to be spending above the ideal level of expenditure and may therefore be unfairly curtailed if the public interest subsidy is calculated using the unit cost approach. Once more CMAs are established and deemed to be functioning effectively, it is recommended that the unit costs be recalculated and applied to the CMAs to determine optimal levels of expenditure, and thus the appropriate public interest subsidies.

6. DETERMINING THE COST OF THE PUBLIC INTEREST FUNCTIONS AND THEREQUIRED FUNDING FROM THE FISCUS

Once the total cost of each CMA function has been established, determining the cost of the public interest component is relatively simple. It requires applying the percentages of each function that is in the public interest (determined in Section 4 of this report) to the total cost of the function (determined in Section 5).

It is important to bear in mind that CMAs are established in several phases. As the CMAs mature, they will take on additional functions. The *CMA Viability Assessment and Policy Considerations* document developed by the DWS states that there are some “key institutional establishment processes and initial projects such as the catchment management strategy development” (Department of Water and Sanitation, 2012. p. 26) processes which will require support from the fiscus, as opposed to being funded from user charges. The extent to which the fiscus will provide funding to the CMAs may also vary in time, as the CMAs are expected to improve their financial viability in time. In addition, there are activities that CMAs will perform in their initial, establishment phases that will be funded from the fiscus, but which the CMAs are expected to fund from user charges in future years (such as the development of the first catchment management strategy (as suggested in *CMA Viability Assessment and Policy Considerations*) and the initial verification and validation of users).

6.1 ACTIVITIES AND ITEMS SPECIFICALLY EXCLUDED FROM THE REQUIRED FUNDING FROM THE FISCUS

The public interest function only relates to water resources management activities that are in the public interest. As a result, there are other costs associated with the CMAs that are specifically excluded. Examples of these include the establishment costs, which would include items such as the appointment of the board and initial capacity building, appointing a CEO, the setting up of the business and information management systems and human resources system, staff transfer from proto-CMA (if applicable), initial capital expenditure on premises, computer systems, etc. Subsidies for under-recovery and charge capping are not considered under the public interest operating subsidy allocation.

The water resource management activities performed by the DWS Regional Offices or the Head Office to support the CMAs’ public interest functions are excluded from the costing exercise.

6.2 PROVISION FOR A RANGE OF RESULTS

As discussed in Section 4, the determination of what is in the public interest is implicitly a normative process. The process outlined in this report has applied broad categories (purely public interest, mostly public interest, even mix, mostly private interest and purely private interest) to the activities that fall under each CMA function. In order to capture the normative nature of these classifications, a range of percentages in the public interest has been linked with each category. For example, ‘mostly public interest’ is considered to mean that between 60% and 80% of this activity is in the public interest. Once weights are applied to each activity and they are aggregated to function level, this results in a range in the percentage of each function that is in the public interest, and thus a range in the level of funding required from the fiscus. The table of weightings is shown in Annexure A.

Results are therefore shown as a median, minimum, and maximum, reflecting the range in assumptions regarding the proportion of CMA expenditure that is in the public interest. It is recommended that the median

value be applied. The range is provided to give a sense of the sensitivity of the results to different assumptions about what proportion of an activity is in the public interest.

6.3 KEY ASSUMPTIONS UNDERLYING THE ESTIMATES PRESENTED

A number of assumptions have been made in developing the estimates of the cost of the public interest functions performed by CMAs, and the funding required for these from the fiscus. These are captured below:

- The **proportion each of the 11 CMA functions that is in the public interest** was assumed based on the categorisation of the functions as outlined in Section 4 of this report.

- The assumptions regarding the **benchmark unit cost and cost driver** for each of different functions have been provided in Section 5 of this report.

- The model allows for a decrease in the **extent of parliamentary support** to CMAs. The base assumption is that the fiscus will continue to fund 100% of public interest activities for the coming 10 years.

- As CMAs mature, they will take on new functions, at the discretion of the minister. For this set of results, it is assumed that all CMAs will perform all 11 functions in the first year of their full operation (i.e. 2023).

- Note that an Excel-based tool has been developed as part of this study that allows all of the above assumptions to be adjusted. See the discussion of the tool in section 7 of this report.

6.4 RESULTS

The required public interest subsidies calculated using the budgeted expenditure approach are shown in Table 6 below.

Table 6: Public interest subsidy calculated using budgeted expenditure approach (2023).

	Public interest funding required (Upper bound)	Public interest funding required (Median)	Public interest funding required (Lower bound)
Limpopo-Olifants CMA	R54 310 919	R42 446 917	R30 582 916
Inkomati-Pongola CMA	R55 730 772	R44 328 671	R32 926 571
Mkuze-Mtamvuna CMA	R44 339 165	R35 839 919	R27 340 673
Vaal-Orange CMA	R67 023 775	R52 187 952	R37 352 129
Mzimvubu-Tsitsikamma CMA	R43 124 954	R34 285 855	R25 446 755
Breede-Olifants CMA	R66 625 091	R53 993 494	R41 361 898
Total subsidy required	**R331 154 675**	**R263 082 809**	**R195 010 943**
Subsidised proportion of CMA expenditure	**42%**	**33%**	**25%**

The required public interest subsidies calculated using the unit cost approach are shown in Table 7 below.

Table 7: Public interest subsidy calculated using unit cost approach (2023).

	Public interest funding required (Upper bound)	Public interest funding required (Median)	Public interest funding required (Lower bound)
Limpopo-Olifants CMA	R57 085 431	R45 132 902	R33 180 373
Inkomati-Pongola CMA	R35 073 698	R27 659 462	R20 245 226
Mkuze-Mtamvuna CMA	R41 472 918	R32 737 471	R24 002 024
Vaal-Orange CMA	R131 665 744	R104 286 748	R76 907 752
Mzimvubu-Tsitsikamma CMA	R30 749 271	R24 379 330	R18 009 389
Breede-Olifants CMA	R45 706 019	R36 056 133	R26 406 246
Total subsidy required	**R341 753 082**	**R270 252 046**	**R198 751 010**
Subsidised proportion of CMA expenditure	**33%**	**26%**	**19%**

The required public interest subsidies calculated using the minimum cost approach are shown in Table 8 below.

Table 8: Public interest subsidy calculated using minimum cost approach (2023).

	Public interest funding required (Upper bound)	Public interest funding required (Median)	Public interest funding required (Lower bound)
Limpopo-Olifants CMA	R46 780 926	R36 921 381	R27 061 835
Inkomati-Pongola CMA	R35 073 698	R27 659 462	R20 245 226
Mkuze-Mtamvuna CMA	R35 412 869	R28 178 288	R20 943 707
Vaal-Orange CMA	R68 825 464	R53 918 304	R39 011 144
Mzimvubu-Tsitsikamma CMA	R28 700 159	R22 766 621	R16 833 082
Breede-Olifants CMA	R41 409 472	R32 472 838	R32 472 838
Total subsidy required	**R256 202 589**	**R201 916 894**	**R156 567 833**
Subsidised proportion of CMA expenditure	**25%**	**19%**	**15%**

The overall results of the analysis for the three different costing methodologies are shown in Figure 9 below.

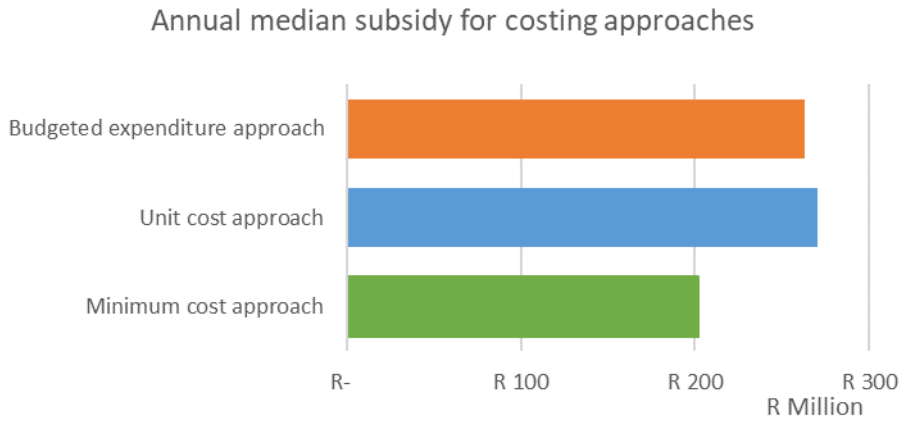

Figure 9: Results of different costing methodologies.

For reasons stated above, the budgeted expenditure approach is regarded to be the most appropriate approach at this stage of the evolution of CMAs. The median cost of the public interest functions of CMAs in 2023, based on the assumptions outlined above, is shown in Table 9 below for the six proposed CMAs.

Table 9: Public interest funding required (2023)

CMA function	Public interest funding required (Median)
Limpopo-Olifants CMA	R42 446 917
Inkomati-Pongola CMA	R44 328 671
Pongola-Umzimkulu CMA	R35 839 919
Vaal-Orange CMA	R52 187 952
Mzimvubu-Tsitsikamma CMA	R34 285 855
Breede-Olifants CMA	R53 993 494
Total	**R263 082 809**
Proportion of total cost that is public interest	**33%**

The amount of funding required for the CMAs will vary with time, given the timing of new functions and the level of parliamentary support provided for the public interest functions. Given the set of assumptions outlined earlier in this section, the amount of funding required to implement the public interest function for each CMA in would not vary annually (i.e. the level of parliamentary support will not vary, and the functions are assumed to all come on mine in 2023).

The funding required to subsidise the public interest component of each of the 11 functions of CMAs is shown in Table 10 below for 2023. The functions that the CMAs are not performing, and do not currently budget for, present a value of R0 public interest subsidy. In order for the public interest subsidies for these functions to be calculated, the budgeted values for these functions will need to be inserted into the model, and the corresponding public interest subsidy to be calculated.

Table 10: Public interest funding required per function in 2023 (2021Rand).

CMA function	Required subsidy (2023)
CMS & water resources planning	R53 303 003
Institutional development	R6 462 459
Disaster management	R0
Water weed control	R9 270 455
Water use authorization	R8 772 284
Geo-hydrology and hydrology	R1 523 515
Resource directed measures	R0
Maintenance and restoration of ecosystems	R9 332 645
WRM programmes	R100 233 180
Control and enforcement	R1 960 369
Administration and overheads	R72 224 898
Total:	**R263 082 809**
Proportion of total cost that is public interest	**33%**

The model provides for a disaggregated cost per function per CMA per year. An example of the data given per CMA is shown in Figure 10 below, for a standard set of assumptions.

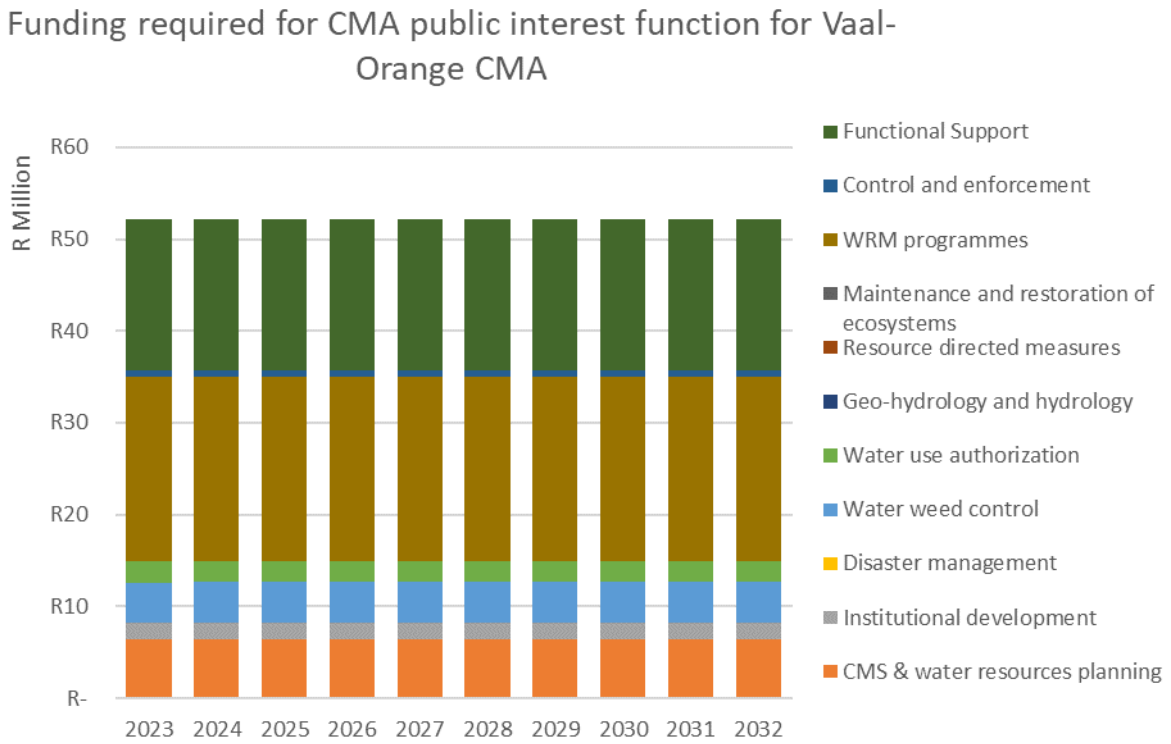

Figure 10: Median funding required for CMA public interest function for Vaal-Orange CMA (2023).

Further examples of the model outputs are shown in Section 7.

6.5 VERIFICATION OF THE COSTING MODEL

Previous work has been undertaken on the costing of the public interest functions of CMAs. A brief description of the outcomes of this work is below.

The *CMA Viability Assessment and Policy Considerations* document developed by the DWS in June 2012 estimated that approximately 35% of the budget of the CMAs should originate from the fiscus as an operating subsidy to cover the public interest functions. Interestingly, this document also states that the proportion of the CMA functions that are to be covered by the public interest operating subsidy should remain 35% over the CMA's maturation.

The WRC has been active in the publication of research into the financing of CMAs. Pegram and Palmer (2001) authored a paper on the different financing arrangements that CMAs could adopt in South Africa and identified that there was a need for certain functions of the CMAs to be funded from a parliamentary allocation. This is tacitly agreed to by Pearce et al. (2014), as it is acknowledged that the set of charges are not sufficient to cover the cost of the CMA's functions and additional revenue, perhaps from a parliamentary allocation, is required to fund the activities.

The business cases for the CMAs assume a 'public interest grant' of 26%. The origin of this number is uncertain. The extent to which the business cases are considered when determining an allocation from this fiscus is also uncertain.

The *Business Case for the Single CMA* published in 2017 by DWS indicates that the public interest operating subsidy should be approximately R40 million per annum to the single CMA (in 2017 Rands). The average

annual budget for the CMA over the same period is approximately 840 million (a figure corroborated by Pearce et al., 2014), which indicates a public interest operating subsidy proportion of approximately 5%. This document erroneously conflates the capping subsidy and the support that CMAs provide in rural areas to the public interest function, and thus comes out with a much lower public interest subsidy than other research.

7. COSTING MODEL APPLICATION GUIDELINES

The costing model has been developed in Microsoft Excel. This format was chosen as it is the most used modelling software in the South African public sector and could therefore be easiest understood and amended if necessary.

GENERAL MODEL DETAILS

The model has two dashboards, two data inputs tabs and a set of engine tabs.

- **Summary dashboard:** This dashboard indicates the overall public interest subsidy required for the CMAs. There are two important user choices on this sheet; the level of parliamentary support and the costing approach used.
- **CMA dashboard:** This dashboard allows the user to see the public interest subsidy for each of the CMAs, and for each of the function that the CMA performs. The CMA can be selected from the dropdown list at the top of the page.
- **Data inputs:** This sheet is where the data is inserted by the model user.
- **CMA function inputs:** This sheet is where the unit costing information and the functional arrangements of the CMAs are entered.
- **E_unitcost:** This engine sheet is where the calculations for the Unit Costing Approach are made.
- **E_budgeted:** This engine sheet is where the calculations for the Budgeted Expenditure Approach are made.
- **E_mincost:** This engine sheet is where the calculations for the Minimum Cost Approach are made.

The engine sheets are followed by a sheet for each of the 6 proposed CMAs which calculates the unit cost for each of the CMAs.

The model uses a colour coded interface for data input cells, and user input cells.

Yellow cells are data input cells.

Peach coloured cells are user input cells.

Data input cells include financial data and the physical properties of the CMAs. These are located in the ‘Data inputs’ and ‘CMA function inputs’ sheets.

User input cells are assumptions or calculated figures that the user must input into the model. The model is sensitive to these inputs, and therefore care must be taken when amending the data in these cells. This includes the base year of the model, the costing methodology applied, the unit costs, the timing of new functions, and several other inputs.

INPUTS & ASSUMPTIONS

The costing methodology described above has built in assumptions and inputs. There are a set of default assumptions applied to the base model run to determine the approximate cost of the public interest functions. These assumptions can be amended to improve the accuracy of the costing model when new data becomes available.

There are two sets of data inputs: financial data, and the physical properties of the CMAs.

The table of technical properties is shown in Figure 11 below. These figures can be updated when the CMAs grow or are amalgamated.

	Registered volume	Population size	Area
Limpopo-Olifants CMA	3 767 940 628	15 000 000	183 125
Inkomati-Pongola CMA	2 370 210 700	2 153 500	45 918
Mkuze-Mtamvuna CMA	2 778 000 000	11 705 497	84 064
Vaal-Orange CMA	8 542 687 374	12 600 000	600 990
Mzimvubu-Tsitsikamma CMA	1 976 163 129	7 170 793	163 173
Breede-Olifants CMA	2 880 773 260	7 262 734	142 502

Figure 11: Physical properties of CMAs.

The financial data for CMAs is shown in Figure 12 below. These data are the budgeted figures for the coming financial year, for each of the CMAs. The 2015 Pricing Strategy categories have been used. These budgeted figures should be the zero-based budget developed annually by the CMAs and proto-CMAs.

2023/24 budget (Rand)	Limpopo-Olifants CMA	Inkomati-Pongola CMA	Mkuze-Mtamvuna CMA	Vaal-Orange CMA	Mzimvubu-Tsitsikamma CMA	Breede-Olifants CMA
CMS & water resources planning	R 4 985 529	R 13 355 253	R 13 973 536	R 9 632 105	R 10 898 772	R 26 711 526
Institutional development	R 3 607 098	R 5 424 292	R -	R 9 196 844	R 6 599 505	R 7 484 555
Disaster management	R -	R -	R -	R -	R -	R -
Water weed control	R 500 000	R 5 062 017	R 500 000	R 6 181 489	R 500 000	R 500 000
Water use authorization	R 23 007 241	R 29 452 214	R 32 756 957	R 46 339 877	R 15 135 161	R 28 754 239
Geo-hydrology and hydrology	R -	R -	R -	R -	R -	R 5 078 383
Resource directed measures	R -	R -	R -	R -	R -	R -
Maintenance and restoration of ecosy	R -	R -	R -	R -	R -	R 13 332 350
WRM programmes	R 33 951 203	R 31 747 599	R 36 294 820	R 37 765 910	R 25 646 636	R 23 713 039
Control and enforcement	R 3 370 753	R 6 581 777	R 1 001 394	R 14 884 789	R 1 892 491	R 11 476 184
Functional Support	R 62 407 187	R 40 414 847	R 17 344 926	R 54 969 548	R 36 232 254	R 29 380 898
TOTAL	R 131 829 011	R 132 038 000	R 101 871 633	R 178 970 563	R 96 904 819	R 146 431 175

Figure 12: Budget data for CMAs.

The user input cells are peach coloured in the model. The first set of inputs is shown in Figure 13 below. The modelling costing approach, base year and the level of parliamentary support are selected in the 'Summary dashboard' sheet. The base year format must be entered in the format YYYY/YY.

Select the modelled costing approach	Unit cost approach	
	Year 1	Year 10
Level of parliamentary support	100%	100%
Base financial year:	2022/23	2023

Figure 13: Modelling approach and level of parliamentary support.

On the 'CMA dashboard' sheet, the CMA under investigation is selected, as shown in Figure 14 below.

Select CMA	Vaal-Orange CMA

Figure 14: Selected CMA.

Figure 15 below shows the table in which the proportion of public interest for each of the functions is entered. The model is very sensitive to these assumptions, and they should only be amended if consensus is reached between stakeholders that it is appropriate to do so.

	% public interest (upper bound)	% public interest (lower bound)
CMS & water resources planning	77%	57%
Institutional development	30%	10%
Disaster management	40%	20%
Water weed control	80%	60%
Water use authorization	10%	0%
Geo-hydrology and hydrology	40%	20%
Resource directed measures	10%	0%
Maintenance and restoration of	80%	60%
WRM programmes	63%	43%
Control and enforcement	10%	0%
Functional Support	40%	20%

Figure 15: Proportion of public interest, per function.

Figure 16 below shows the unit costs, per function. These unit costs are applied to the registered volume, shown in Figure 11. The model is very sensitive to the unit costs entered, and a separate analysis of expenditure is required in order to calculate the unit costs.

	Unit cost (R/unit)		Unit basis
CMS & water resources planning	R	0,0031	Registered volume
Institutional development	R	0,0017	Registered volume
Disaster management	No basis for unit cost		
Water weed control	R	15,0792	Area
Water use authorization	R	0,0098	Registered volume
Geo-hydrology and hydrology	No basis for unit cost		
Resource directed measures	No basis for unit cost		
Maintenance and restoration of ecosystems	R	0,0003	Registered volume
WRM programmes	R	0,0094	Registered volume
Control and enforcement	R	0,0013	Registered volume
Functional Support	R	0,0109	Registered volume

Figure 16: Unit costs, per function.

Figure 17 shows where the base year functional arrangements for the CMAs are entered. A '1'Represents where the CMA is performing the function, and a '0'Represents where the CMA is not. The base assumption is that the CMAs are performing all of the functions in the base year.

Initial set of functions	CMS & water resources planning	Institutional development	Disaster management	River health	Water use authorization	Geo-hydrology and hydrology	Resource directed measures	International relations	WRM programmes	Control and enforcement	Functional Support
Limpopo-Olifants CMA	1	1	1	1	1	1	1	1	1	1	1
Inkomati-Pongola CMA	1	1	1	1	1	1	1	1	1	1	1
Mkuze-Mtamvuna CMA	1	1	1	1	1	1	1	1	1	1	1
Vaal-Orange CMA	1	1	1	1	1	1	1	1	1	1	1
Mzimvubu-Tsitsikamma CMA	1	1	1	1	1	1	1	1	1	1	1
Breede-Olifants CMA	1	1	1	1	1	1	1	1	1	1	1

Figure 17: Functions implemented in base year.

Where the CMA is not performing the function, the year in which the function will being is entered into the table on the 'CMA function inputs' sheet, shown in Figure 18 below.

	CMS & water resources planning	Institutional development	Disaster management	River health	Water use authorization	Geo-hydrology and hydrology	Resource directed measures	International relations	WRM programmes	Control and enforcement	Functional Support
Limpopo-Olifants CMA	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023
Inkomati-Pongola CMA	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023
Mkuze-Mtamvuna CMA	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023
Vaal-Orange CMA	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023
Mzimvubu-Tsitsikamma CMA	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023
Breede-Olifants CMA	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023	2023

Figure 18: New function timing.

ENGINE

There are two costing methodologies which run simultaneously in the model; the unit cost approach and the budgeted expenditure approach. Therefore, the inputs for both of these approaches should be entered prior to extracting any results from the model.

There are six separate sheets for each of the CMAs. The unit cost approach is calculated for each of these CMAs in these sheets and is collated in the 'E_unitcost' sheet. The model uses INDIRECT formulae, and therefore care should be taken when amending formulae.

The budgeted expenditure approach is calculated in the 'E_budgeted' sheet, using the budget inputs shown in Figure 12 above.

The minimum cost approach compares the results of the unit cost analysis and the budgeted expenditure analysis. This comparison is performed on the 'E_mincost' sheet.

OUTPUTS

The model outputs are shown in two sheets, the 'Summary dashboard' and the 'CMA dashboard' sheet.'

The 'Summary Dashboard' sheet shows the aggregated results for all of the CMAs, shown in Figure 19 and Figure 20 below.

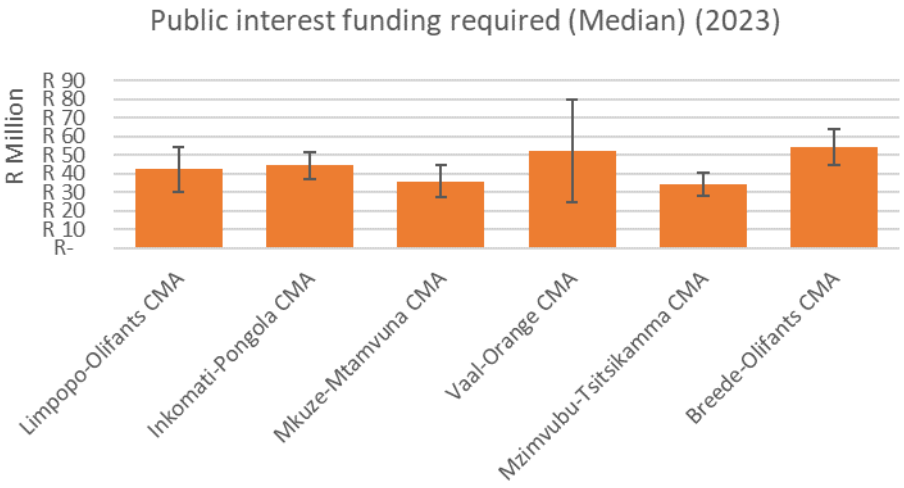

Figure 19: Aggregate results of analysis for selected costing methodology.

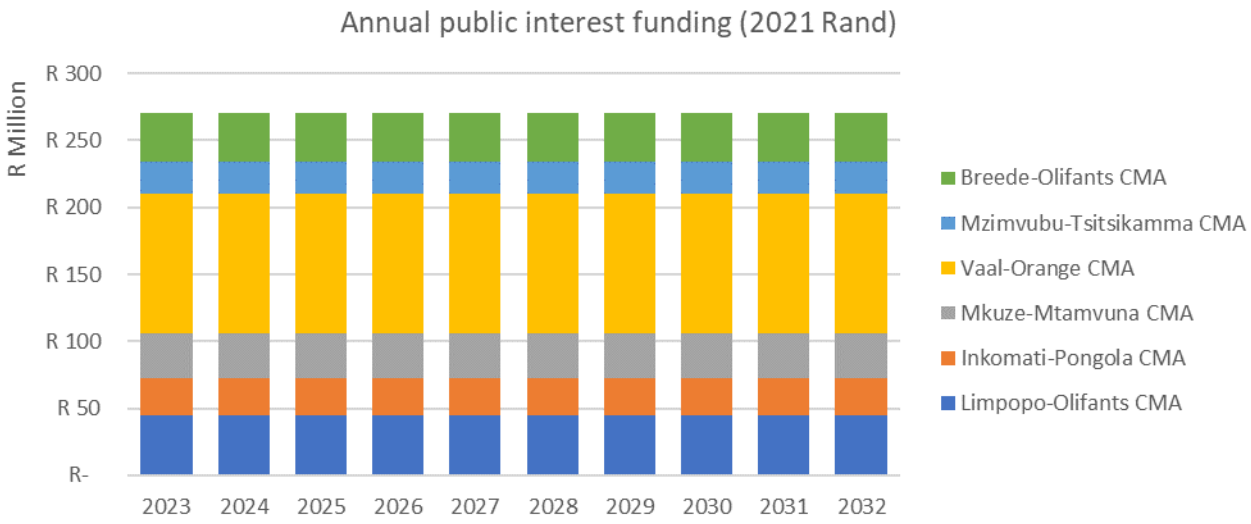

Figure 20: Aggregate results of analysis for selected costing methodology.

The CMA dashboard sheet shows the results of the analysis for a selected CMA, as shown in

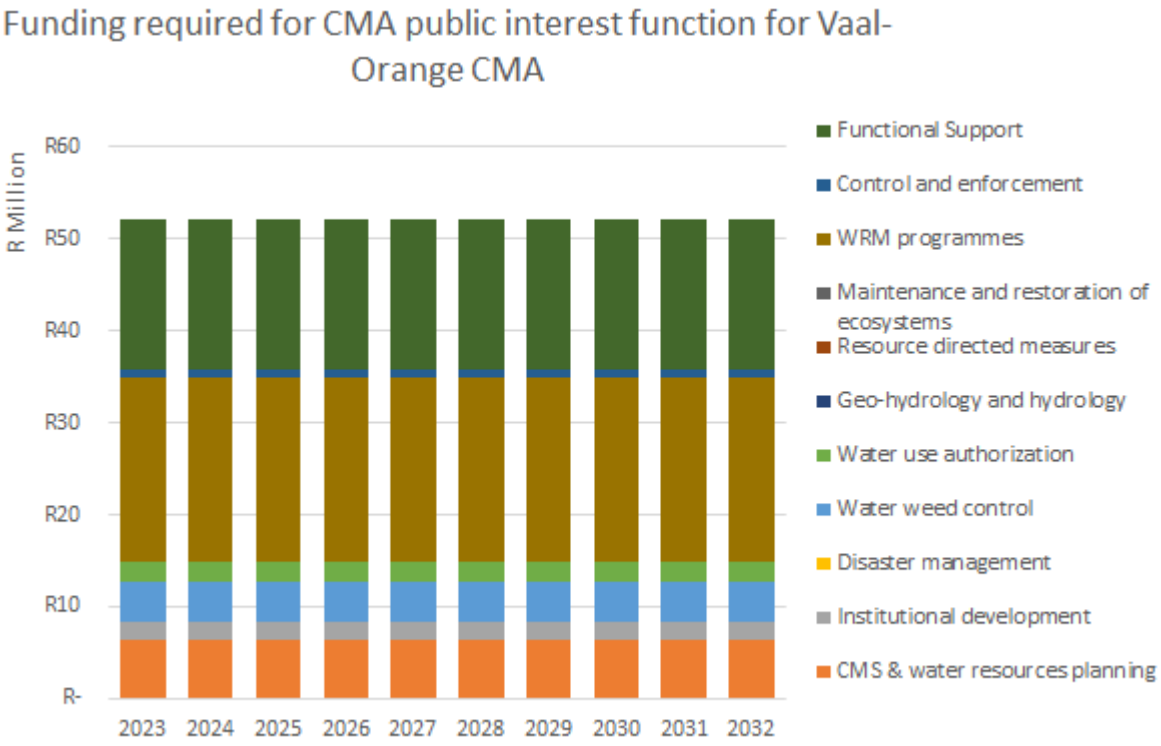

Figure 21: Results of analysis for selected costing methodology for selected CMA.

7.1 MODEL UPDATES

The model is not locked, and edits can be made to the model.

The model may need to be updated when new information becomes available, annually for the financial data, and less frequently for technical data. The data in these cells can be overwritten.

If there is a change to the number of CMAs, or the delineation of the CMAs, the model can be amended to account for this. When the CMAs changes boundary, the physical characteristics of the CMA will need to change, as will the budgeting for the different CMA functions.

The model can calculate the public interest for 6 CMAs. Should there be fewer CMAs, the CMA fields can be left blank. If there is an increase in the number of CMAs, then the model will need to be duplicated and run twice for the additional CMAs. Note that if the CMAs change names, this will affect the INDIRECT formulae, and the model may not run. This can be amended by an intermediate Excel modeller.

8. RECOMMENDATIONS

It is recommended that the budgeted expenditure approach be applied at present as the basis for costing the CMA activities, due to the fact that the water resource management landscape in South Africa currently consists of a mixture of implemented CMAs, and varying levels of maturity of proto-CMAs. However, over the medium term, the unit cost approach is favoured. It is recommended that benchmark unit costs be updated in future once the institutional landscape has matured. The unit costs should be reviewed periodically as the institutions mature. Unit costs should be informed by other processes that are being implemented, such as bottom up costing exercises implemented by other actors, including the South African National Biodiversity Initiative, Cape Town Water Fund, etc.

In the interim, performance data and/or data on cost benchmarks be gathered. At minimum, this will allow the relative performance of the CMAs to be accommodated into the unit cost approach so that the costs of higher performing CMAs are given greater weight when determining unit costs. If good cost benchmarks can be established (possibly per activity), then a zero-based costing approach should be applied to calculating the unit costs in future.

The calculation of required public interest subsidy relies heavily on the proportions of activities and functions that are in the public interest. Given the subjectivity of these proportions, consultations should be as broad as is possible, including officials from DWS, CMAs and other government entities that are involved in water resource management.

9. REFERENCES

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ANNEXURE A: PUBLIC INTEREST ACTIVITIES WEIGHTINGS

Table 11: Weighting of public interest activities

No	Function	Activities	Activity % public	Activity weight	Function % public
1.	**Catchment management strategy and Water resources planning**	Resource studies, investigations and integrated strategy development at catchment level	50%	33%	67%
		Water allocation administration	100%	33%	
		Water quality management plan	50%	33%	
2.	**Water related institutional Development (Stakeholder Management empowerment)**	Stakeholder participation, empowerment, institutional development & coordination of activities	30%	50%	20%
		Establishment and regulation of water management institutions (e.g. WUAs)	0%	17%	
		Stakeholder consultations	0%	17%	
		Capacity and Empowerment of stakeholders	30%	17%	
3.	**Disaster management/Pollution control and emergency incidents**	Planning and preventative management of disaster including risk monitoring (Management)	30%	50%	30%
		Pollution incident planning and response (management)	30%	50%	

No	Function	Activities	Activity % public	Activity weight	Function % public
4.	**Maintenance and restoration of ecosystems to improve water resources**	Adopting of rivers by doing the following activities: Removal of solid waste in and around the river. Invasive plants removal on the river banks and within the river. Identify sources of pollution and other impacts to the river like soil erosion; develop interventions to curb further pollution and degradation of rivers. Monitoring (taking samples, in-situ monitoring of water quality, mini SASS, visual assessments) of the rivers. Stabilization and restoration of river banks by vegetating indigenous trees. Rehabilitation of the eroded river banks.	70%	100%	70%
5.	**Water use authorization**	Water use authorization [Registration of water use (Include Validation and verification of registered water use)]	0%	20%	0%
		Maintenance of water management area register of water use	0%	20%	
		Revenue management with the following charges Set, consult and collect WRM charges in the water management area aligned to the pricing strategy	0%	20%	
		Abstraction & stream flow reduction activities Authorization	0%	20%	
		Waste discharge activities Authorization	0%	20%	
6.	**Geo-hydrology and hydrology**	Groundwater and surface water and eco system (quality) monitoring in respective catchment areas	30%	50%	30%

No	Function	Activities	Activity % public	Activity weight	Function % public
		Maintaining the geo-hydrological database & compilation of information in respective catchment areas	30%	50%	
7.	**Resource directed measures**	Implement programmes to monitor Resource Quality Objectives (RQOs)	0%	25%	0%
		Implement source-directed controls to achieve resource quality objectives	0%	25%	
		Report against the achievement of the Class and RQOs	0%	25%	
		Report on the water balance per catchment (i.e. water available for allocation after consideration of ecological requirements)	0%	25%	
8.	**Water resources management programmes**	Integrated Water resources programmes	100%	33%	53%
		Implementing of Water management strategies (e.g. Water conservation and demand management)	30%	33%	
		Implementing of Water management strategies (e.g. cleaner technology, dense settlements, waste discharge strategies)	30%	33%	
9.	**Control and enforcement of water use**	Compliance Promotion and audit sampling (users discharge)	0%	11%	0%
		Monitoring of water users (per sector: public institutions, mining, industry, agriculture and dam owners)	0%	11%	
		Enforcement of Water Use (e.g. enforcing meter installations, suspending entitlements, enforcing licence conditions)	0%	11%	

No	Function	Activities	Activity % public	Activity weight	Function % public
		To conduct investigations of water crimes are conducted in relation in accordance with the National Water Act and other relevant legislations.	0%	11%	
		Implementation of Strategies, SP's tools and guidelines	0%	11%	
		Compilation, Serve and implement administrative notices	0%	11%	
		Abstraction & stream flow reduction activities control	0%	11%	
		Waste discharge control	0%	11%	
		Classification of dams	0%	11%	
10.	**Water weed control**	Aquatic weeds control	70%	100%	70%
11.	**Administration & Overheads**	Administration& overheads for regional office or CMA	30%	100%	30%